

Project on Capacity Building for Ecosystem Based Disaster Risk Reduction through Sustainable Forest Management in Macedonia

Manual of UAV Flight Plan for Mountainous Area and Aerial Photo Processing to Build Topographic Data

April 2019

JICA Expert Team

Concept of UAV flight planning for mountainous area

Figure 1 shows an example of UAV flight planning for mountainous area. In case the aerial photos with the ground sampling distance (GSD) of 1.8cm are necessary, the flight height is set 70m (not more than 70m) from the ground level of operator when the Phantom 4 Pro camera is used (refer to Figure 2). If the aerial photos of the mountain terrain will be acquired for the purpose of creating topographic data, flight area has be divided based on the altitude of mountain to maintain the flight height as much as possible. In this example, three flight areas are set, and the operator changes the location and ground height of operating UAV to maintain the same flight height. The flight areas are overlapped each other in order to match the aerial photos acquired in the different flight areas.

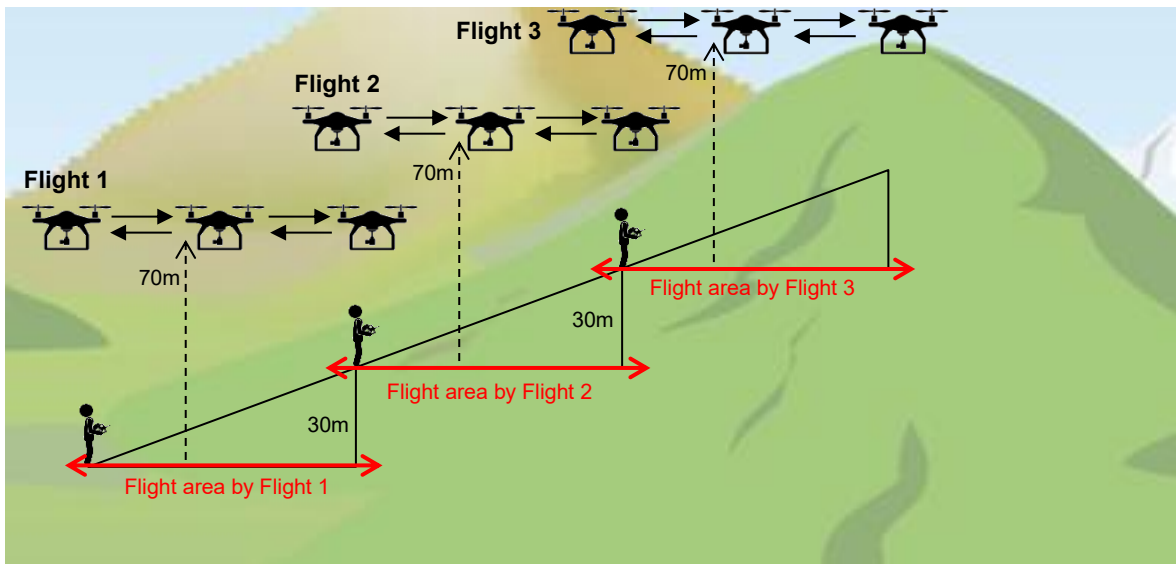


Figure 1. Concept of UAV flight planning for mountainous area

Figure 2 shows the relationship of flight height and GSD of aerial photo to be acquired in case the Phantom 4 Pro camera is used. GSD of aerial photos is determined by the scale of topographic map to be created. For example, if 1:500 scale topographic map will be created, aerial photos with 3cm GSD are required according to the public topographic survey guideline of GSI Japan.

Required GSD for mapping

Map scale	GSD
1:250	Within 0.02m
1:500	Within 0.03m



PHANTOM 4 PRO Camera			
Sensor type	1"		
Sensor resolution (Pixel)	4864	3648	
Sensor size X,Y (mm)	13.2	8.8	
Focal length (mm)	9.16		
(35mm Focal length)	24		
Flight height (m)	GSD	Foot print size(m)	
	(cm)	Left-Right	Front-Back
80	2.1	115.3	76.9
75	2.0	108.1	72.1
70	1.8	100.9	67.2
60	1.6	86.5	57.6
50	1.3	72.1	48.0

Figure 2. Relationship of flight height and GSD in case of Phantom 4 Pro camera

Overall workflow of UAV flight and aerial photo processing

Figure 3 shows the overall workflow of UAV flight and aerial photo processing.

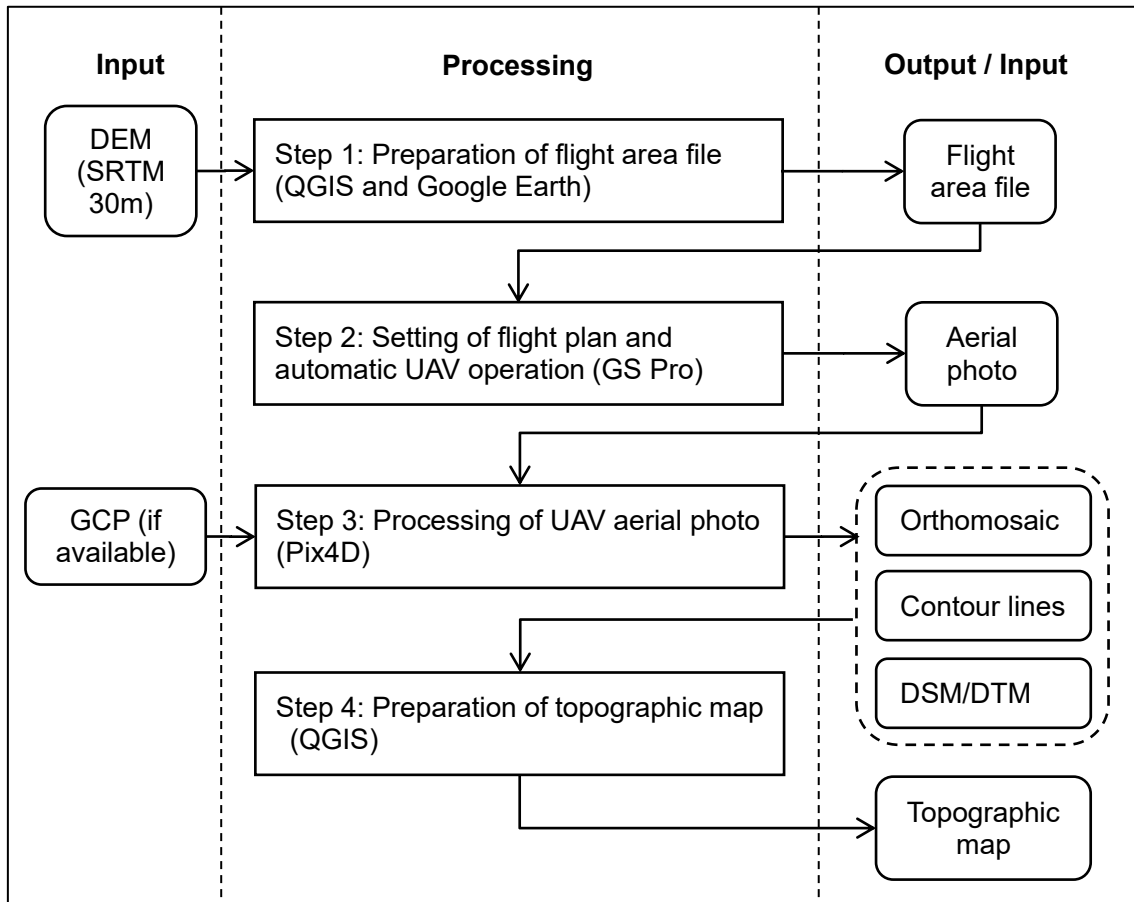


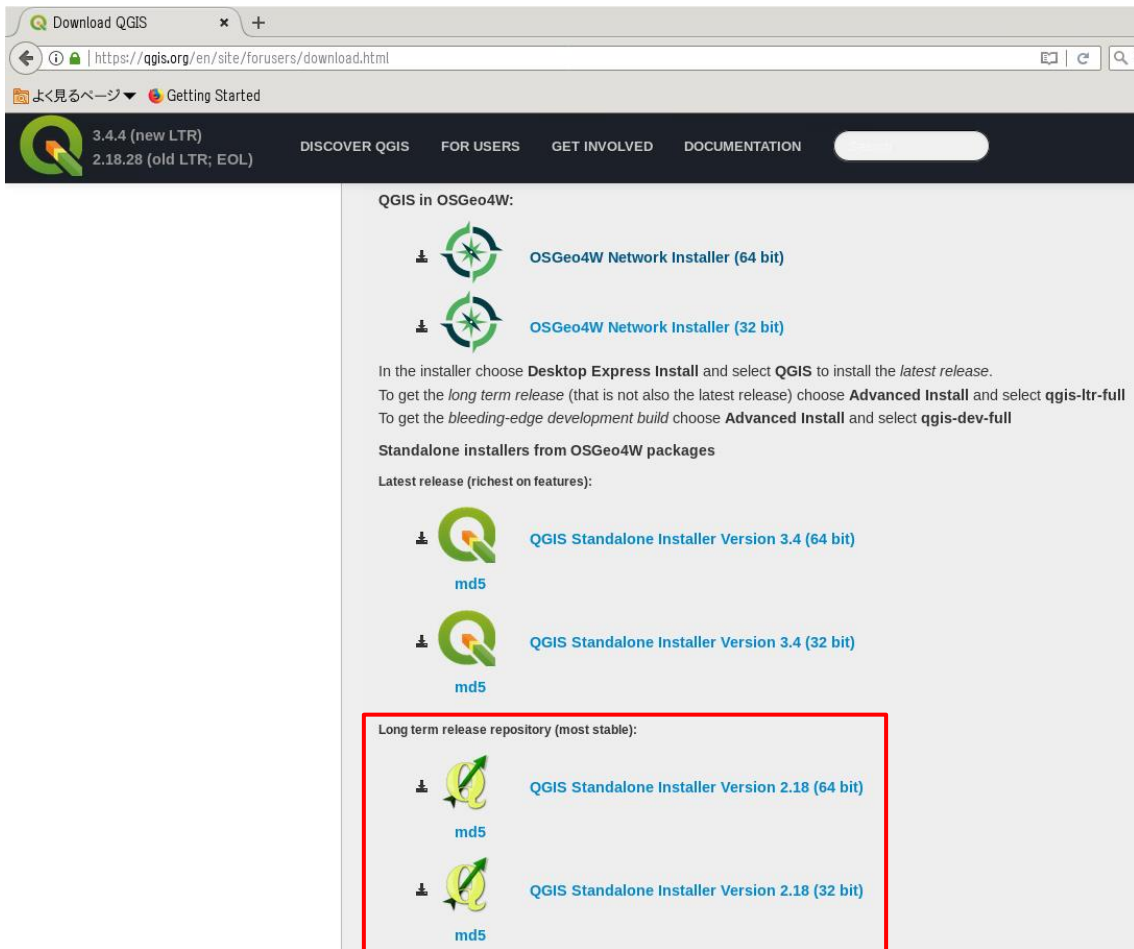
Figure 3. Overall workflow of UAV flight and aerial photo processing

The steps of workflow are described as follows.

Step 1: Preparation of flight area file

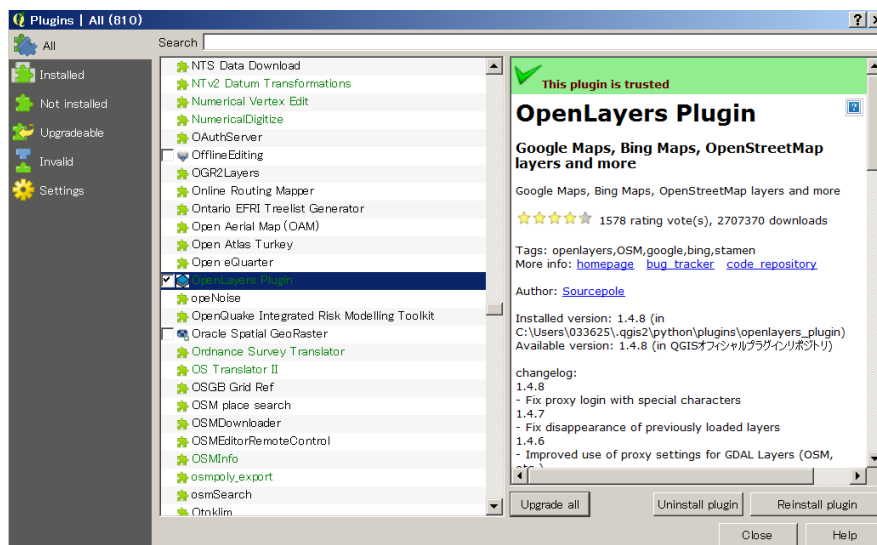
1-1: Installation of QGIS

If QGIS software is not installed in your computer, go to QGIS website (<https://qgis.org/en/site/forusers/download.html>), download and install the most stable version of QGIS software.



1-2: Specification of target area

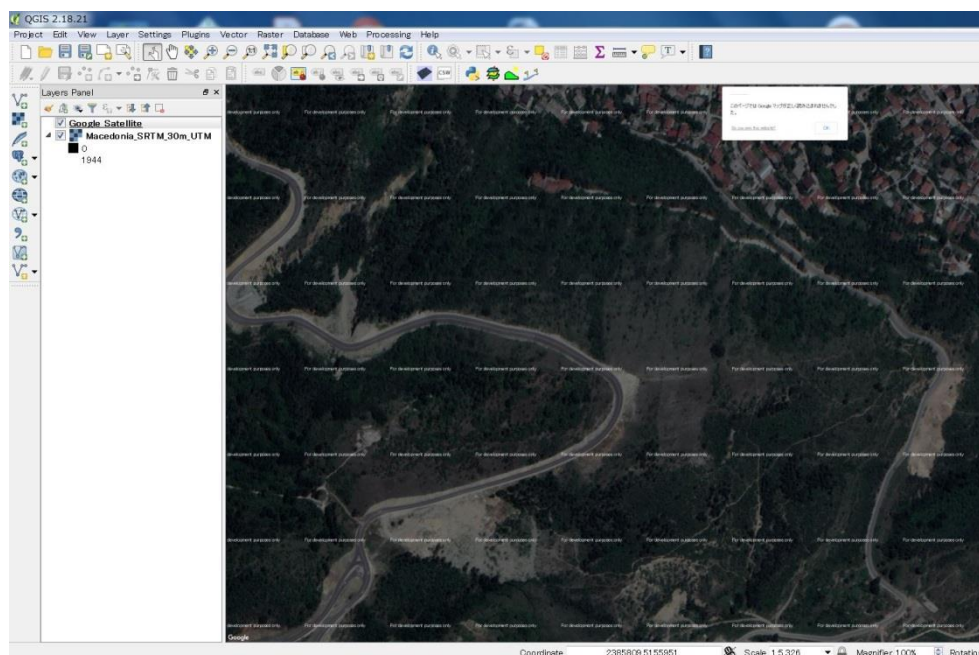
After the installation of QGIS software, open QGIS and move to *Plugins>Manage and Install Plugins* and install **OpenLayers Plugin**.



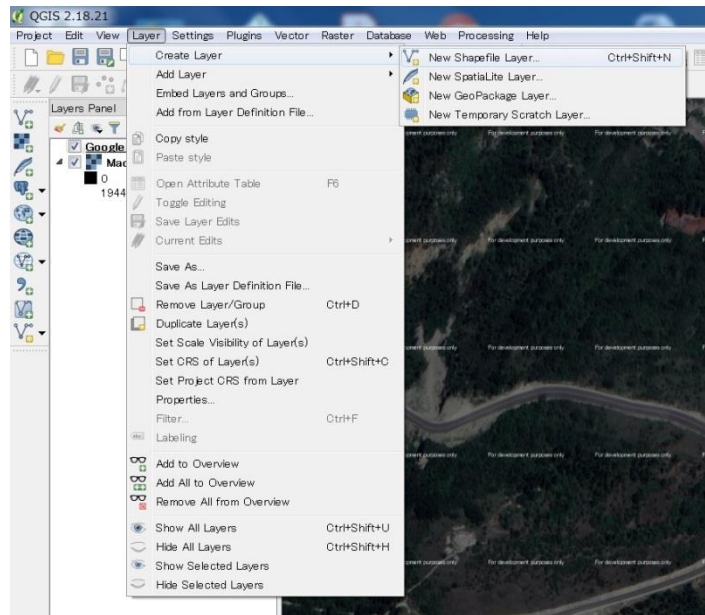
After the installation of plugin, move to *Web>OpenLayers plugin>Google Maps>Google Satellite*.



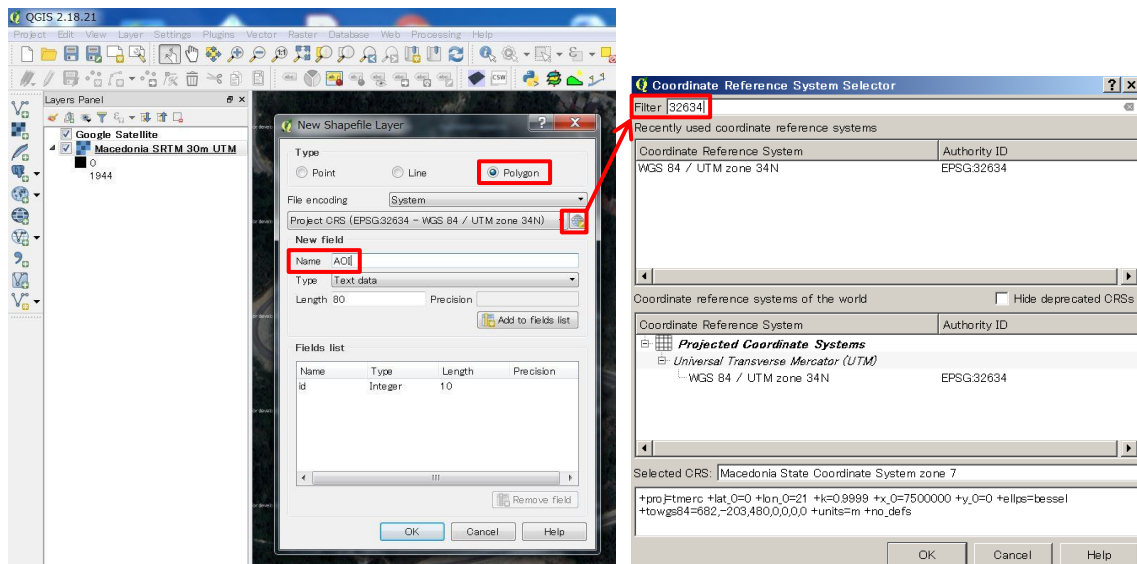
Google imagery is displayed on the viewer. Zoom into the target area of UAV flight.



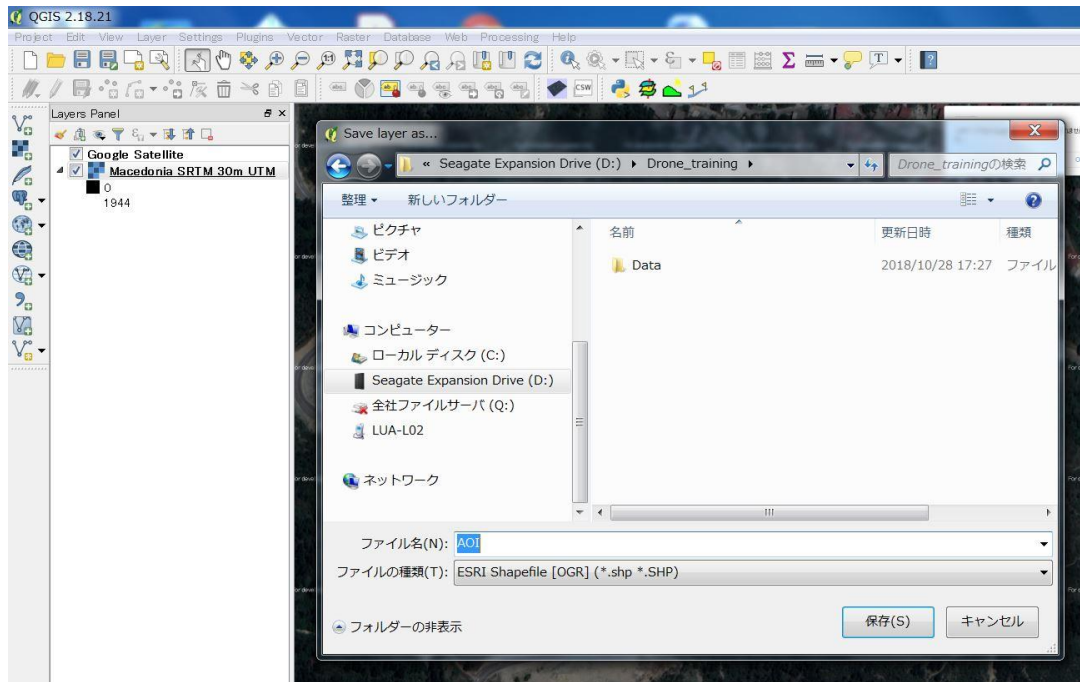
Move to *Layer>Create Layer>New Shapefile Layer*



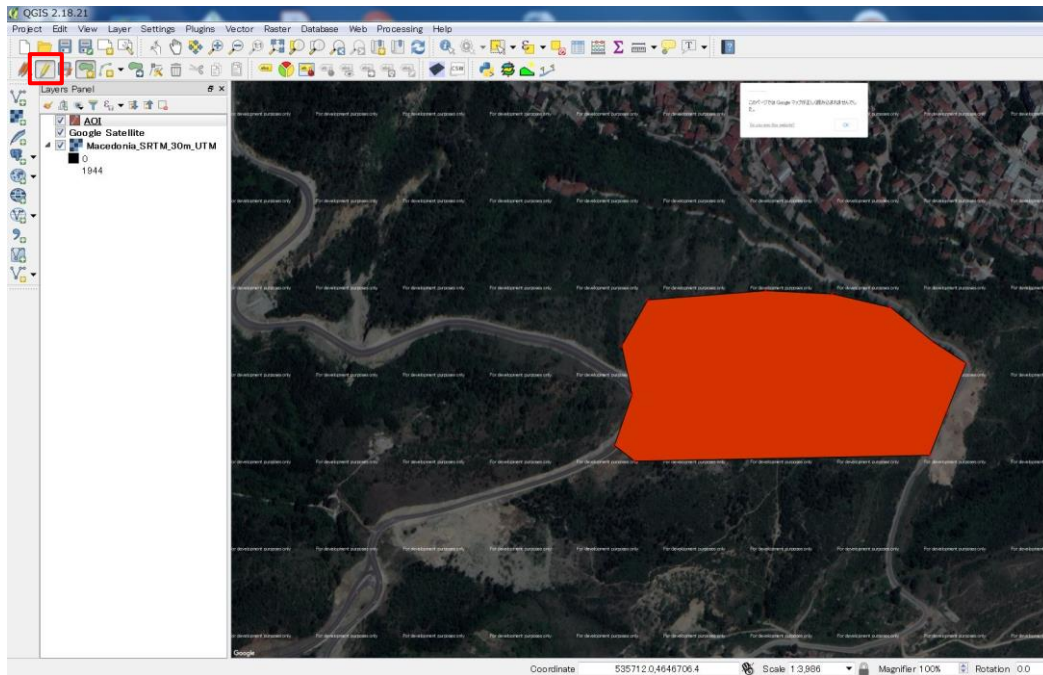
In the *New Shapefile Layer* panel, select *Polygon*. Click the earth bottom to open *Coordinate Reference System Selector* panel. Enter “32634” in Filter and select WGS 84 / UTM zone 34N. Enter field name in *Name* as “AOI”.



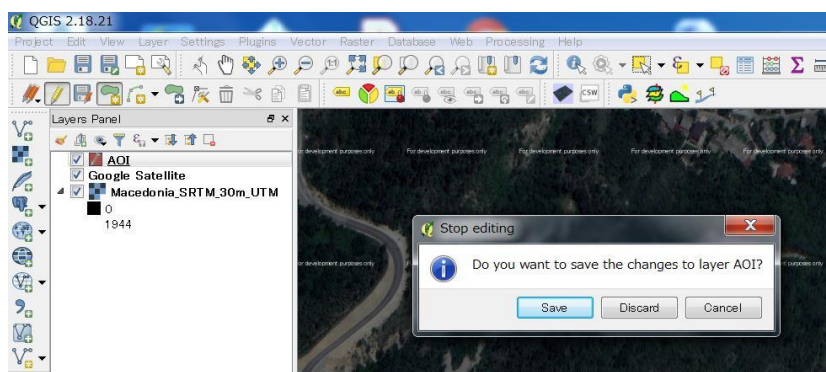
Enter the file name as “AOI” and click **Save**.



Turn on **Toggle Editing** in the tool bar and draw a polygon to specify the target area of UAV flight.

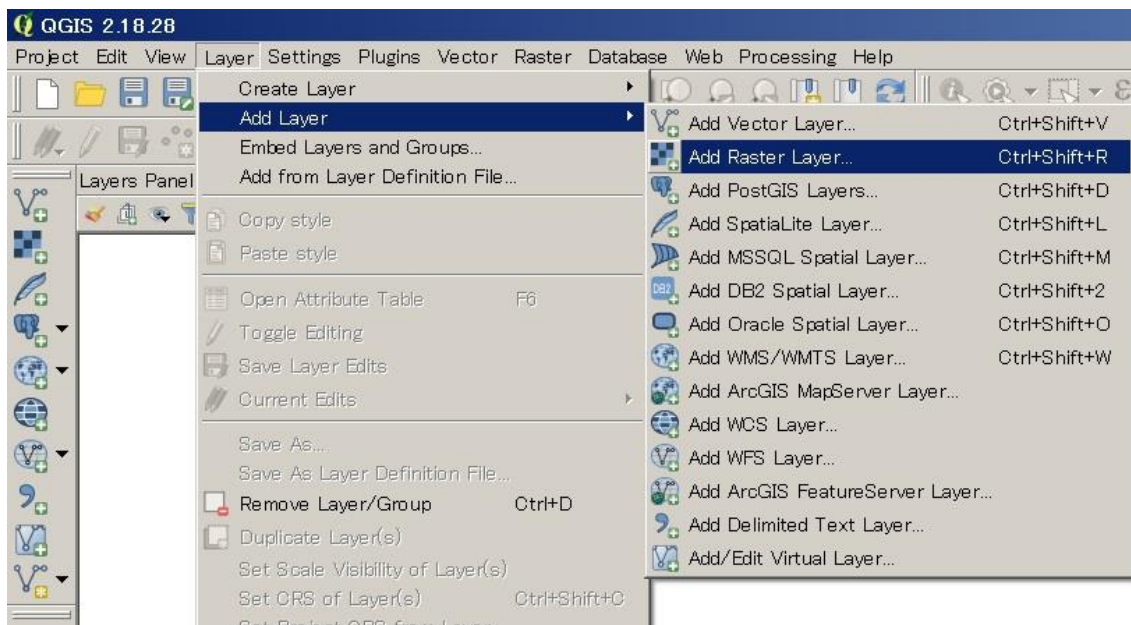


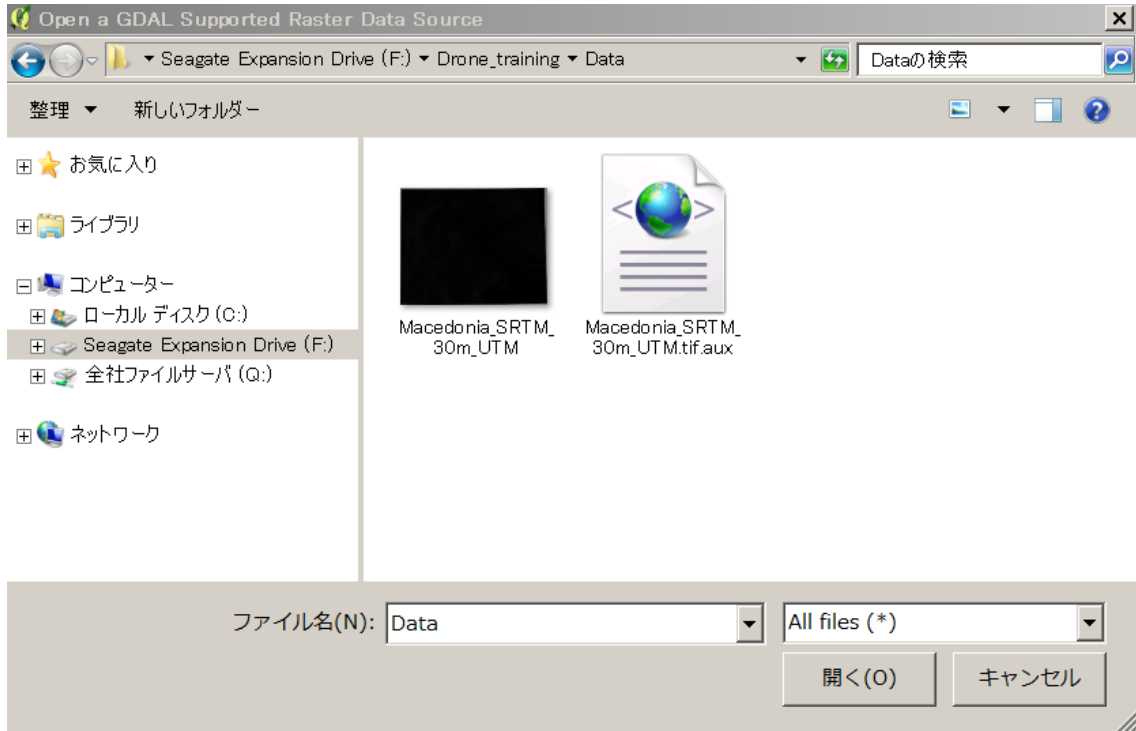
After finish drawing, turn off **Toggle Editing** bottom and click **Save**.



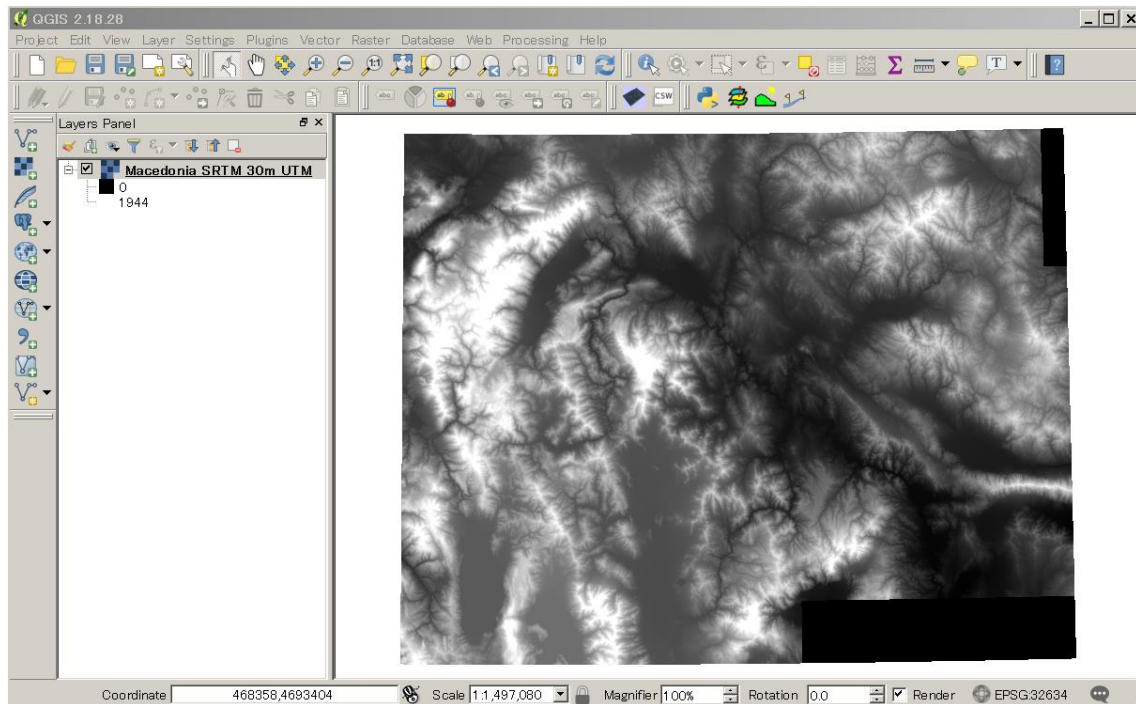
1-3: Stratification of target area by ground height

Move to *Layer>Add layer>Add Raster Layer* and select folder (**Drone_training>Data**) and open **Macedonia_SRTM_30m_UTM.tif**

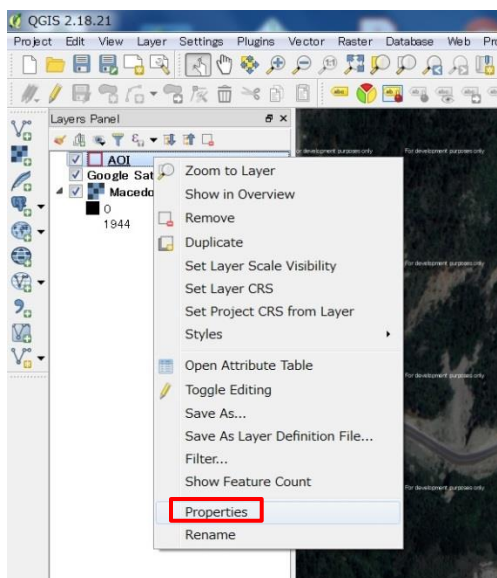




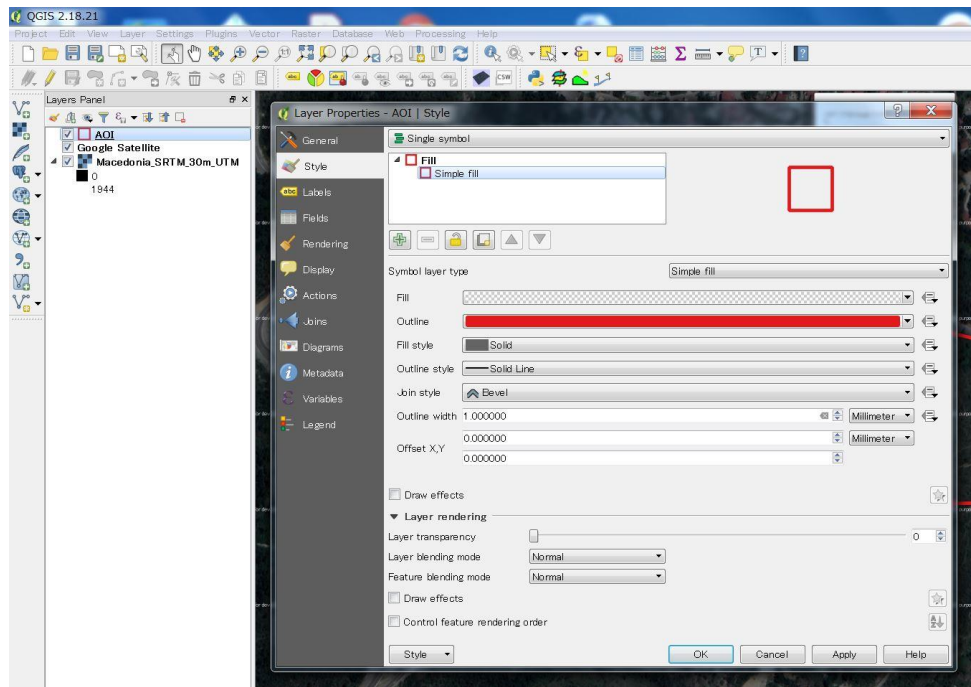
SRTM DEM is displayed on the viewer.



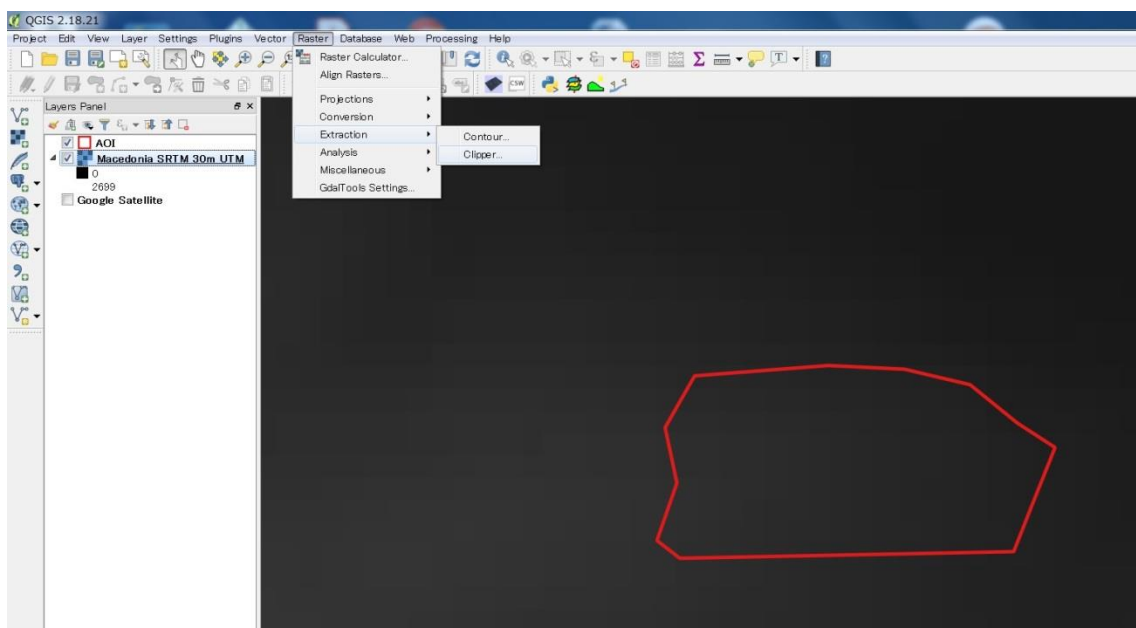
Right click the “AOI” layer and select **Properties**.



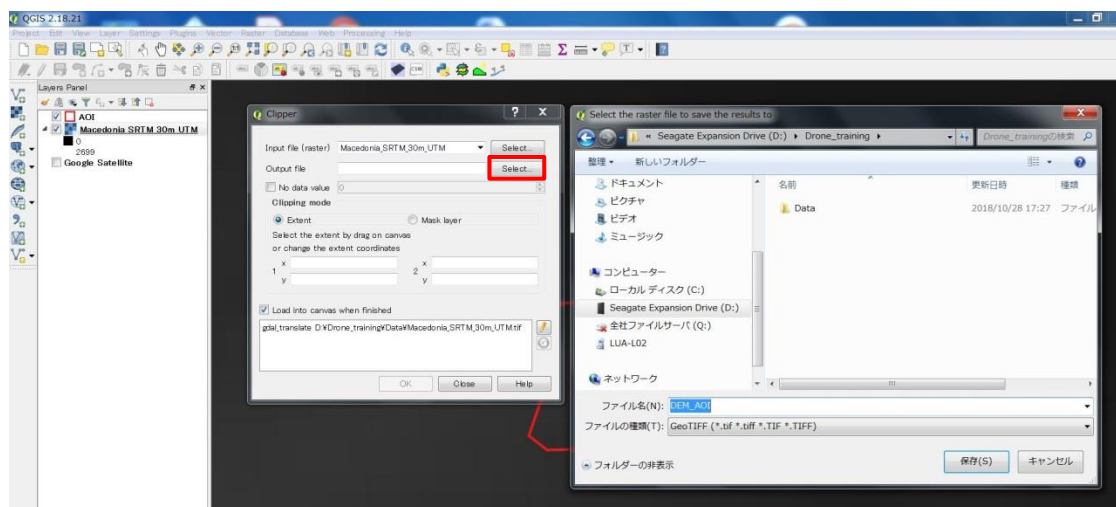
Layer Properties panel opens. In *Style* tab, select *Simple fill*. In *Fill*, select *Transparent fill*. In *Outline*, specify the color of polygon boundary. In *Outline width*, specify the width of polygon boundary. Click **OK**.



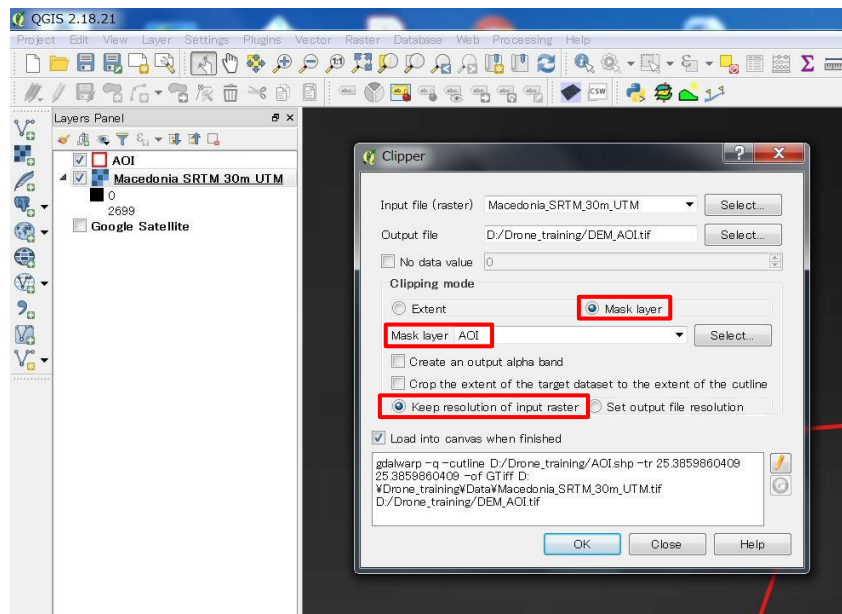
Move to *Raster>Extraction>Clipper*



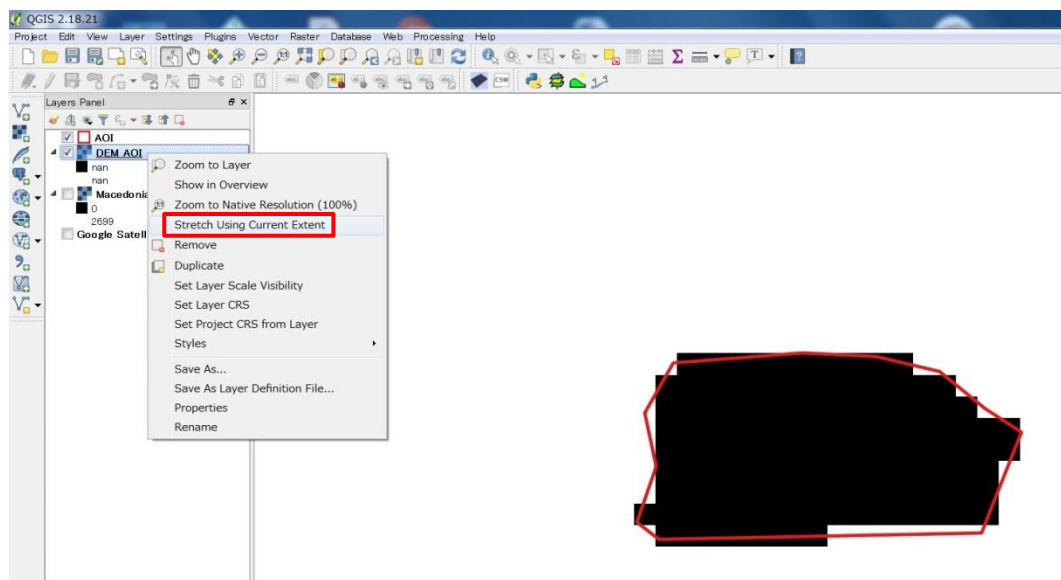
Clipper panel opens. In *Output file*, click *Select* bottom. Specify output file as “DEM_AOI”.



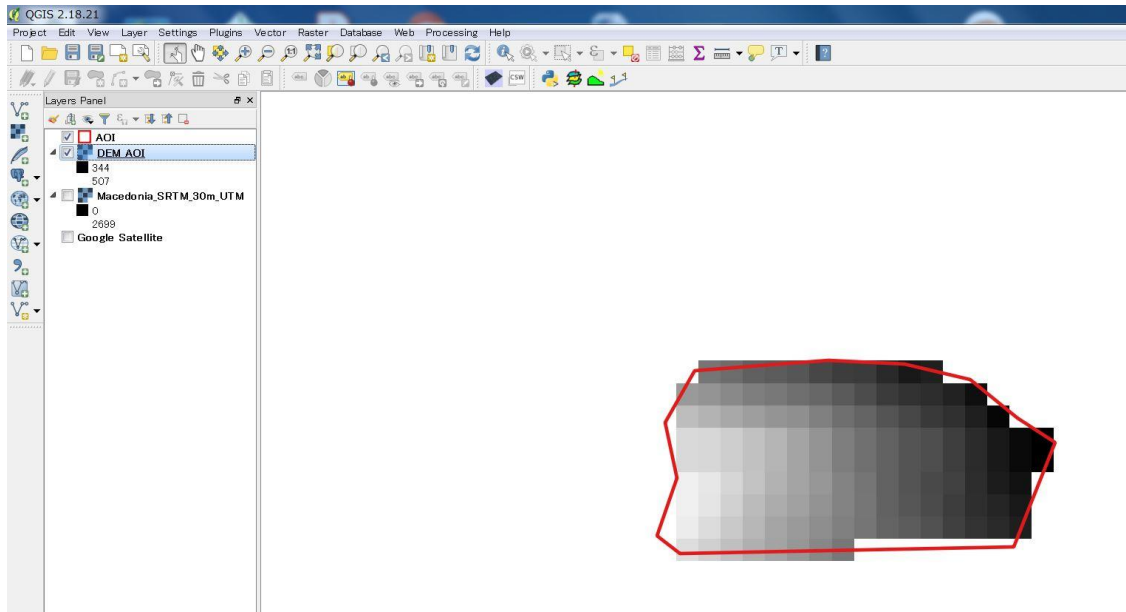
Layer Properties panel opens. In *Clipping mode*, select *Mask layer*. In *Mask layer*, select the layer of “AOI”. Select *Keep resolution of input layer*. Click **OK**.



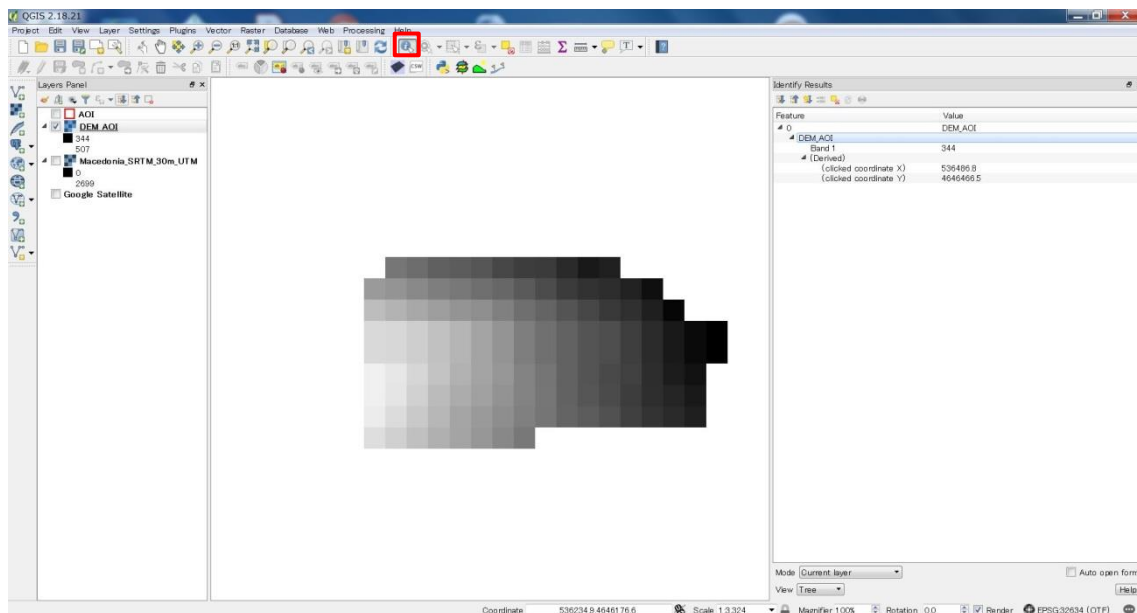
After the processing, right click the output layer and select **Stretch Using Current Extent**.



DEM is displayed with the grayscale of topographic height.



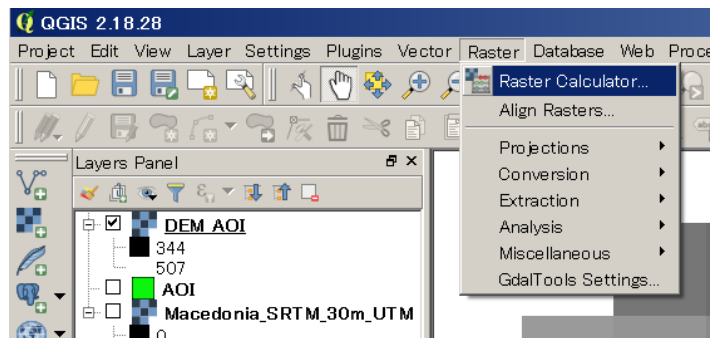
Click **Identify Features** bottom, and click one pixel of the DEM. Topographic height of the pixel is displayed in the *Identify Results* panel. It is observed that this area has height difference approximately between 348m and 498m.



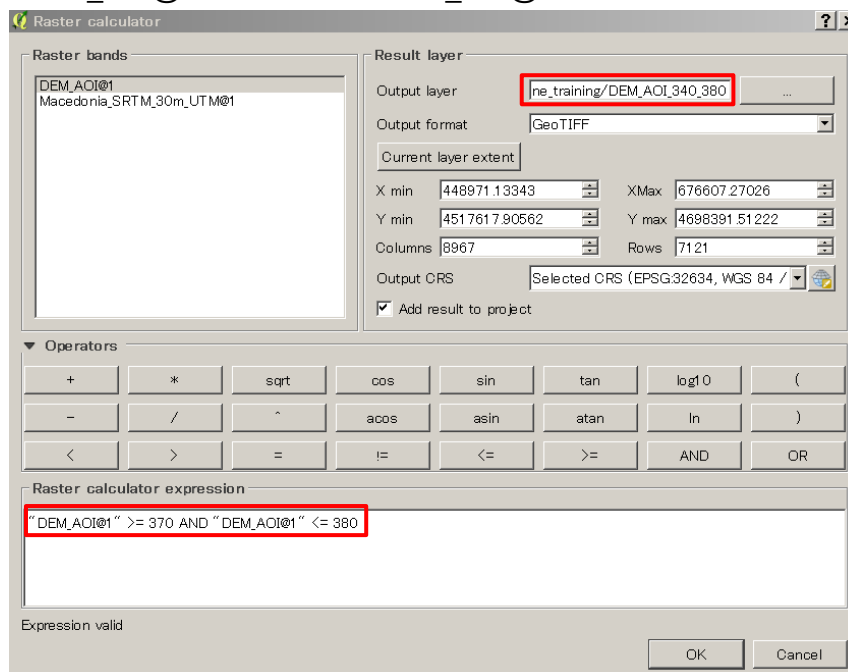
In this exercise, five flight areas are set. Each flight area covers the ground height difference of 40m and each flight area has 10m height overlaps with the adjacent ones.

	Ground height covered
Flight 1	340m to 380m
Flight 2	370m to 410m
Flight 3	400m to 440m
Flight 4	430m to 470m
Flight 5	460m to 500m

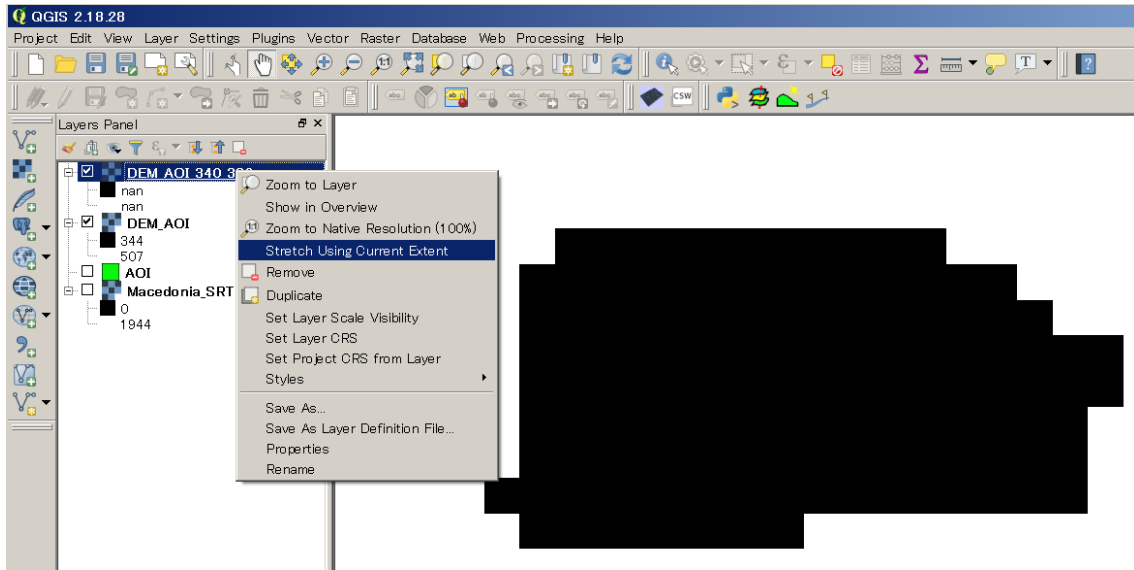
Move to *Raster>Raster Calculator*



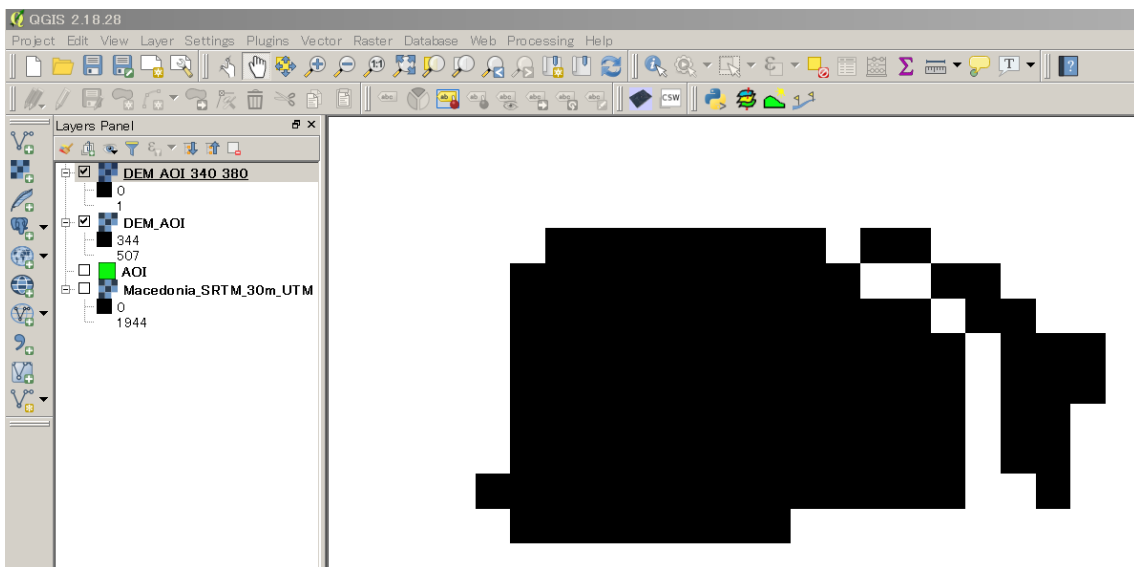
Raster Calculator panel opens. In *Output layer*, specify the output file. In *Raster calculator expression*, enter the calculation to extract ground heights between 340m to 380m for Flight 1 as `"DEM_AOI@1" >= 370 AND "DEM_AOI@1" <= 380`. Click **OK**.



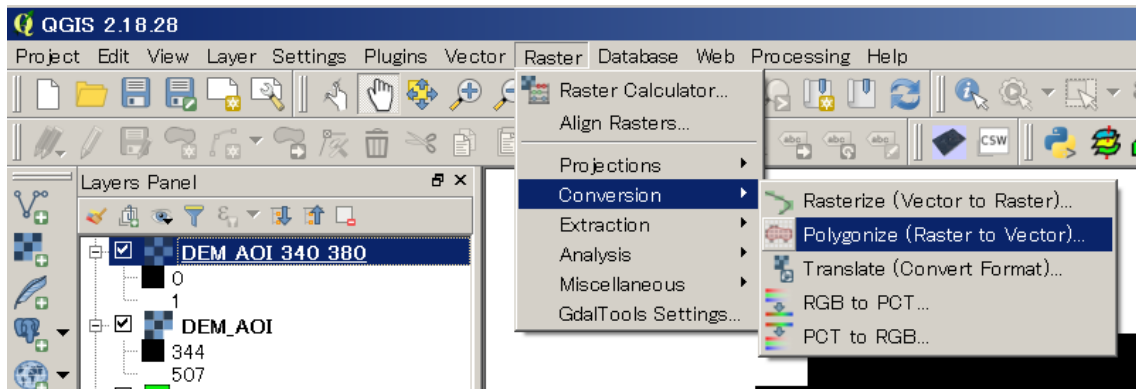
After the processing, right click the output layer and select *Stretch Using Current Extent*.



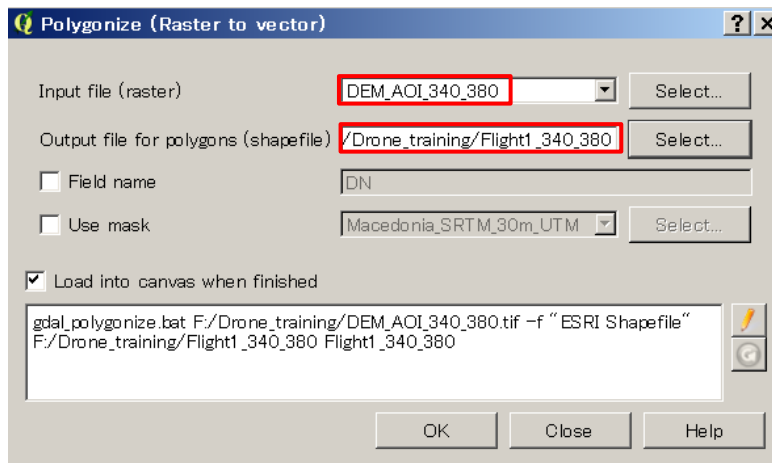
The color setting changes to show the area of 340m to 380m.



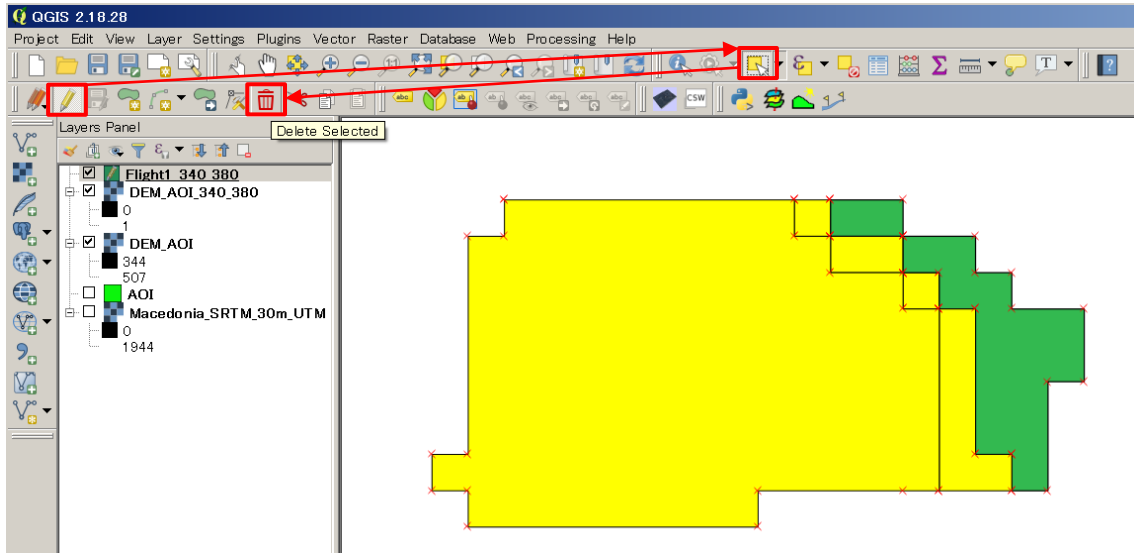
Move to *Raster>Conversion>Polygonize (Raster to Vector)*



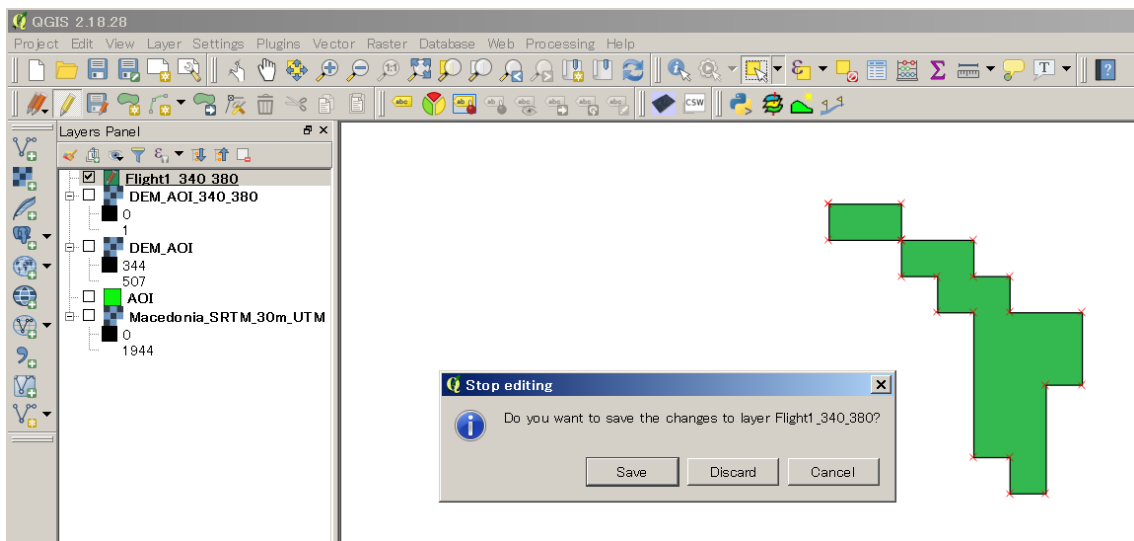
Polygonize (Raster to Vector) panel opens. In *Input file (raster)*, select the extracted DEM (DEM_AOI_340_380) for Flight 1. In *Output file for polygons (shapefile)*, specify the output file. Click OK.



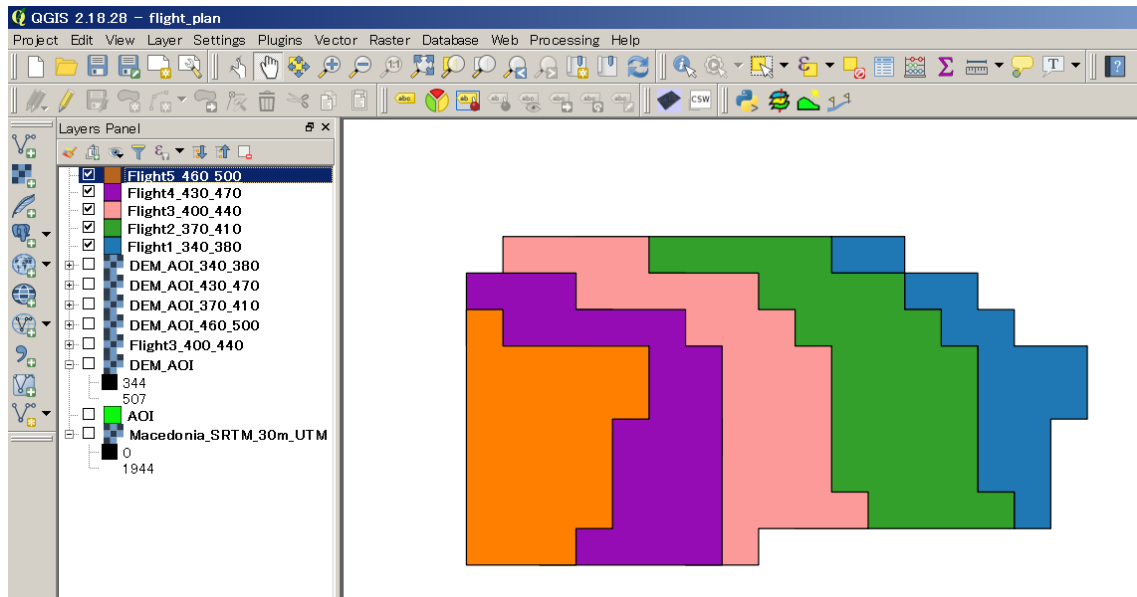
After the processing, the output file displays. Turn on **Toggle Editing** bottom, turn on **Select Feature(s)** bottom and select polygons other than 340m to 380m, and click **Delete Selected** button.



Turn off **Toggle Editing** bottom, and click **Save**.

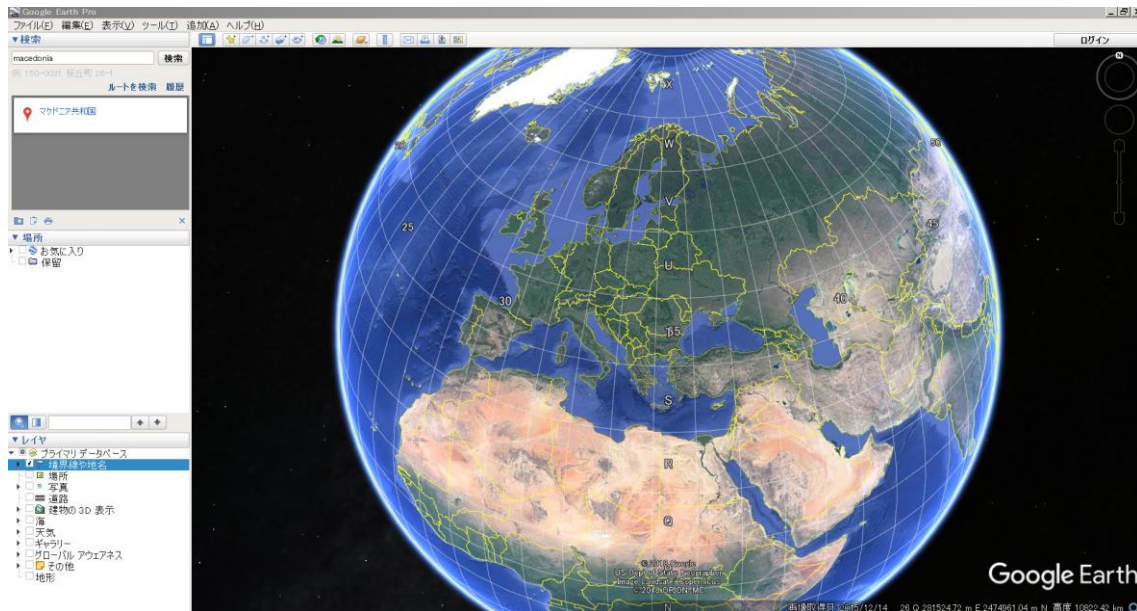


Repeat this process for other flight areas.

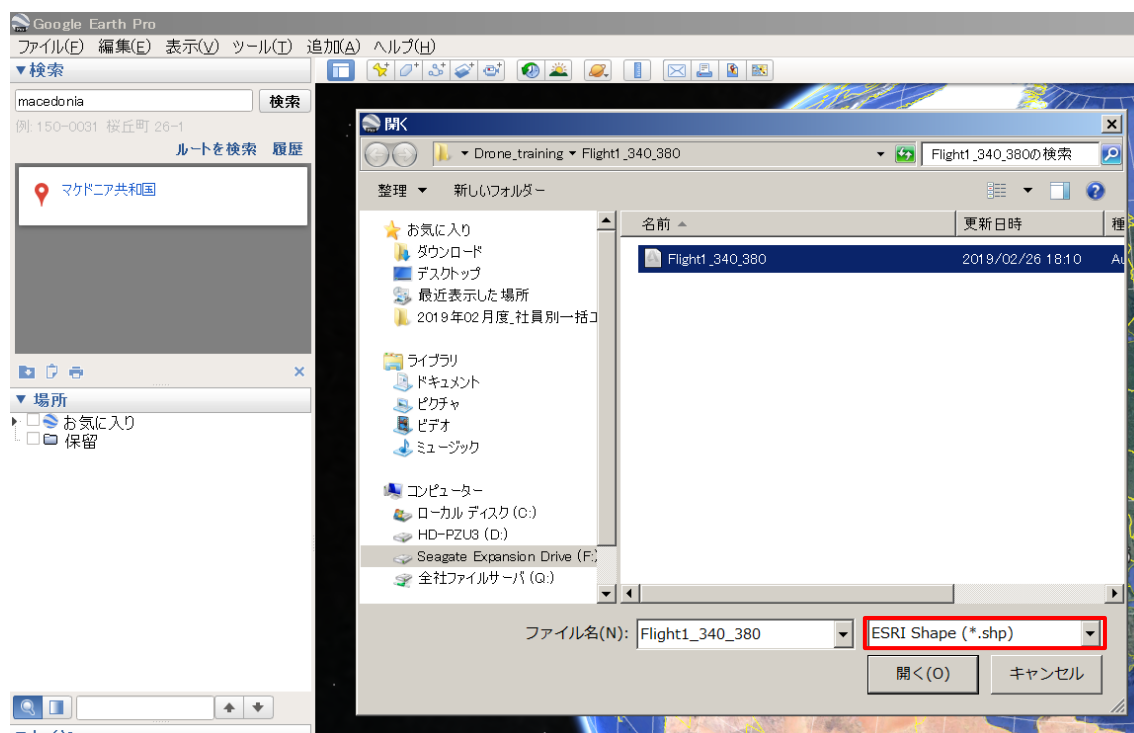


1-3: Create KML file of flight area

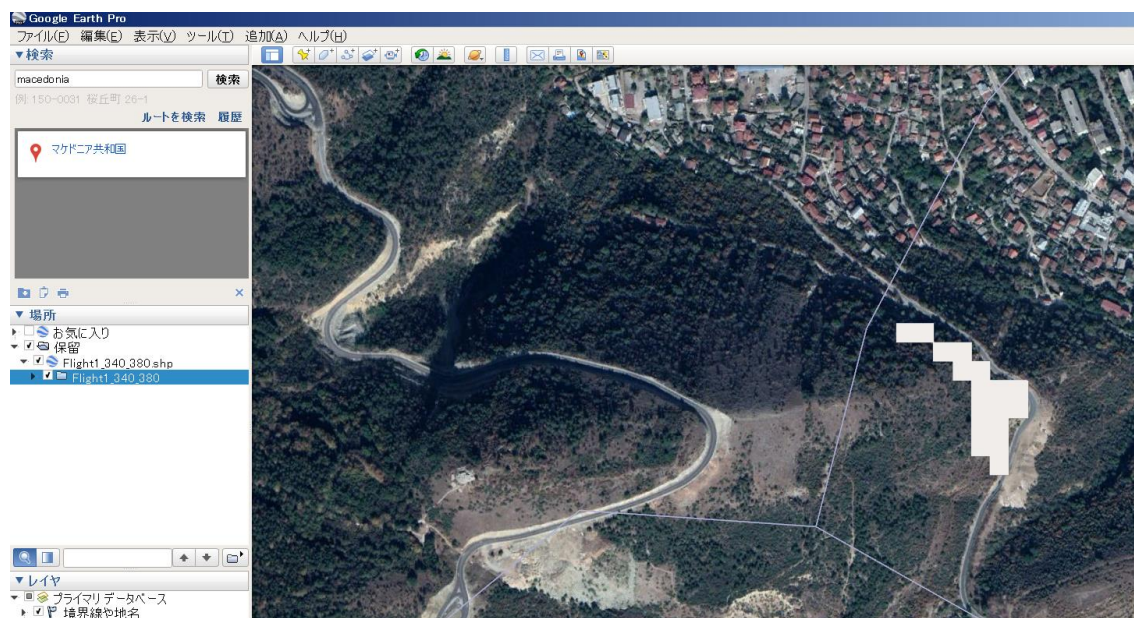
Open Google Earth Pro (Install Google Earth Pro if not installed).



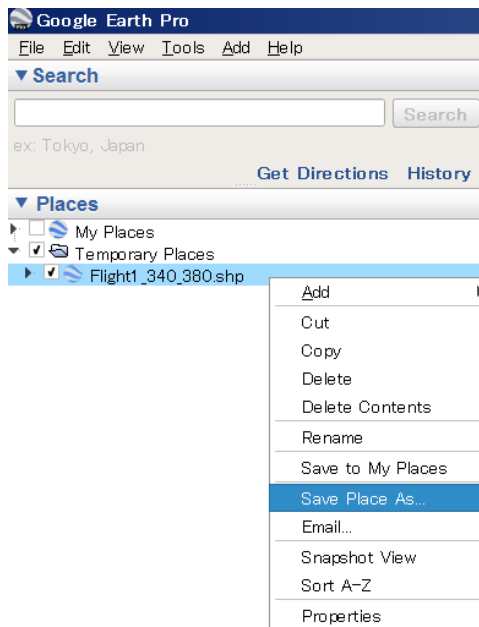
Move to *File>Open*. Select ESRI Shape (*.shp) and select the created flight area file.



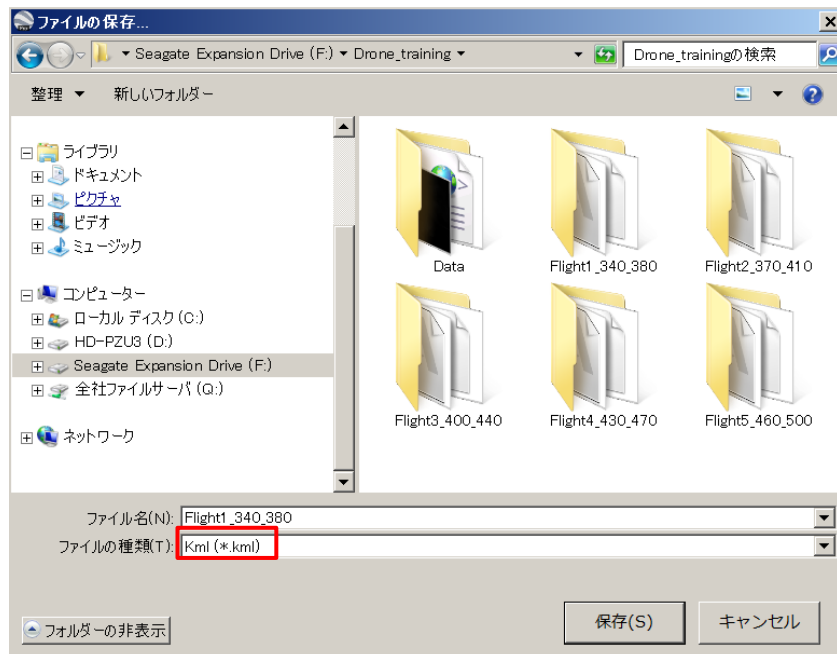
The flight area file is displayed on the viewer.



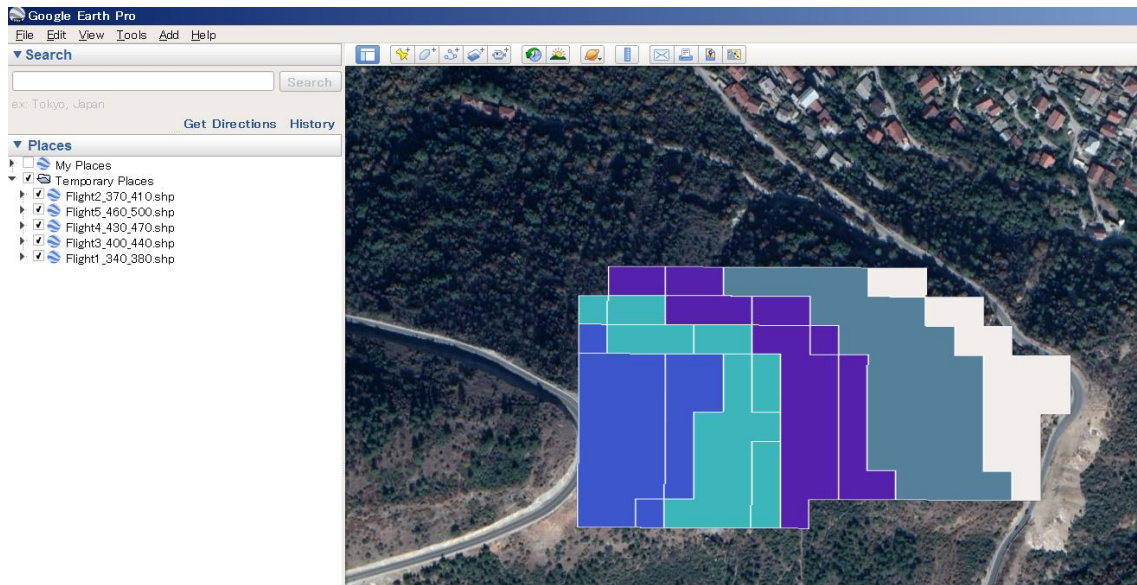
Right click the imported layer and select *Save Place As*.



Move to the output folder, select *Kml (*.kml)* as file format and specify the file name. Click **Save**.



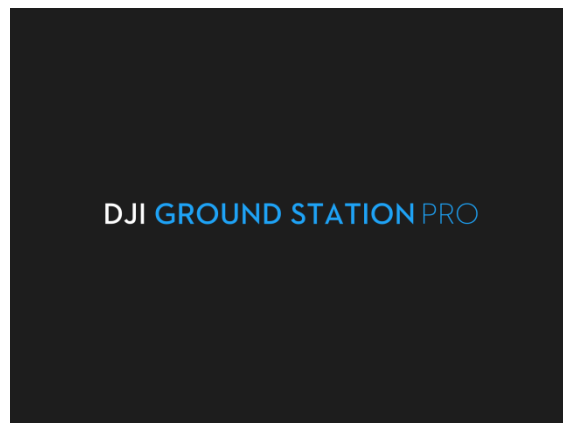
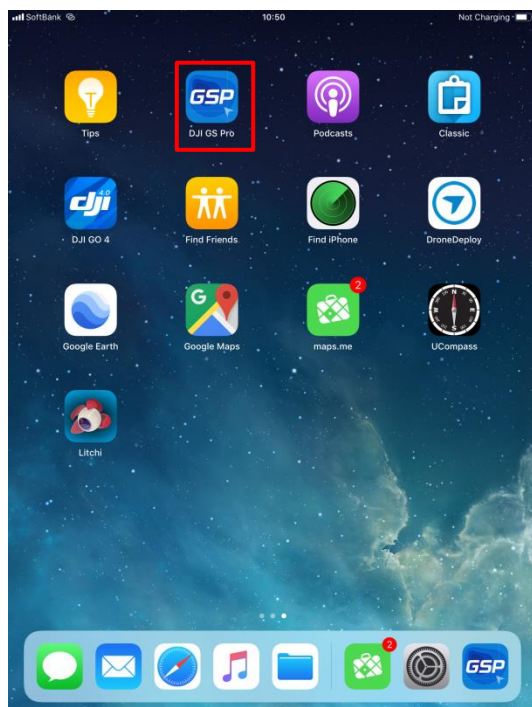
Repeat this process for other flight areas.



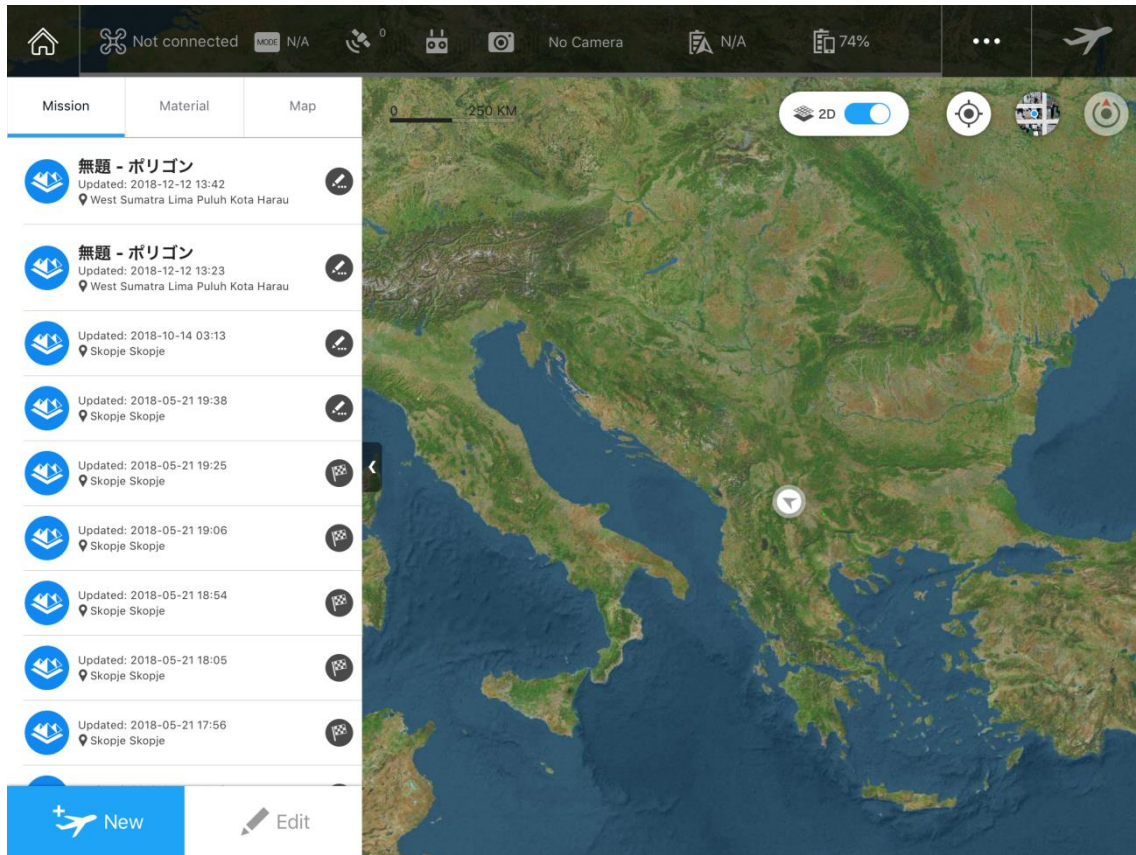
Step 2: Setting of flight plan for automatic UAV operation

2-1: Import flight area file to DJI GS Pro

Start iPad mini and tap DJI GS Pro icon to start DJI GS Pro.

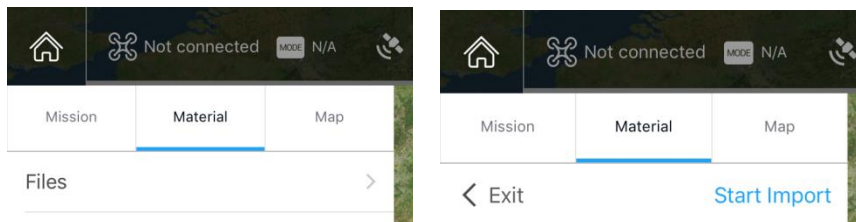


DJI GS Pro opens.

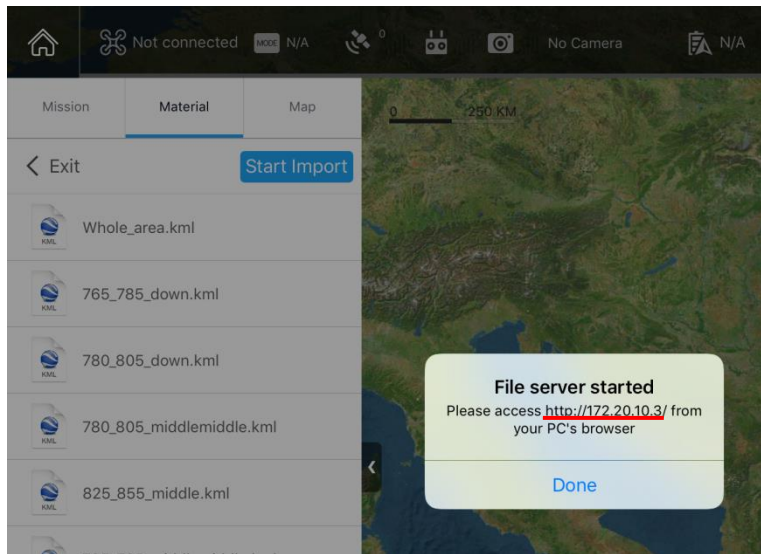


Physically connect iPad mini with your computer using USB cable.

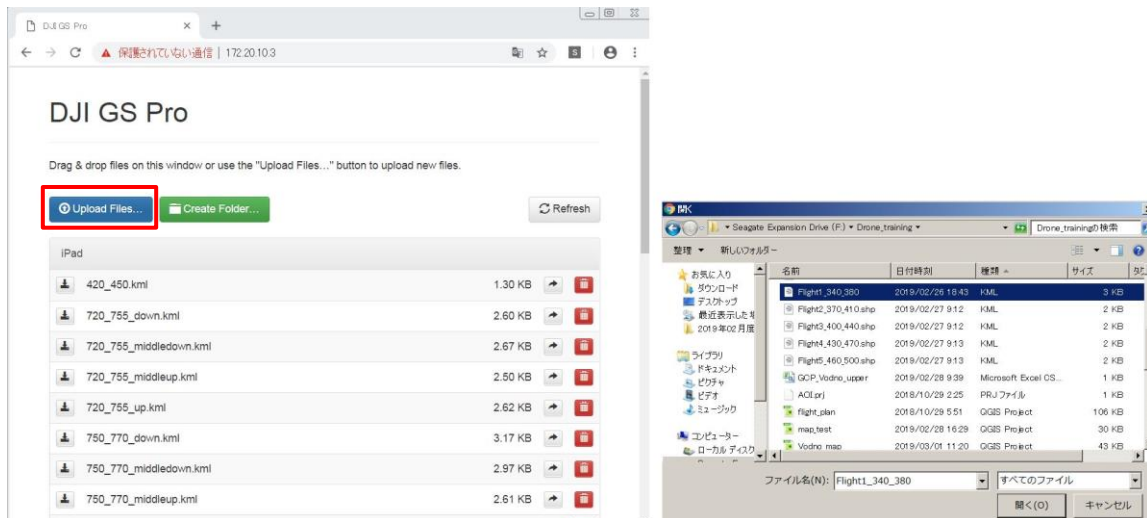
Move to *Material* > *Files*. Press **Start Import**.



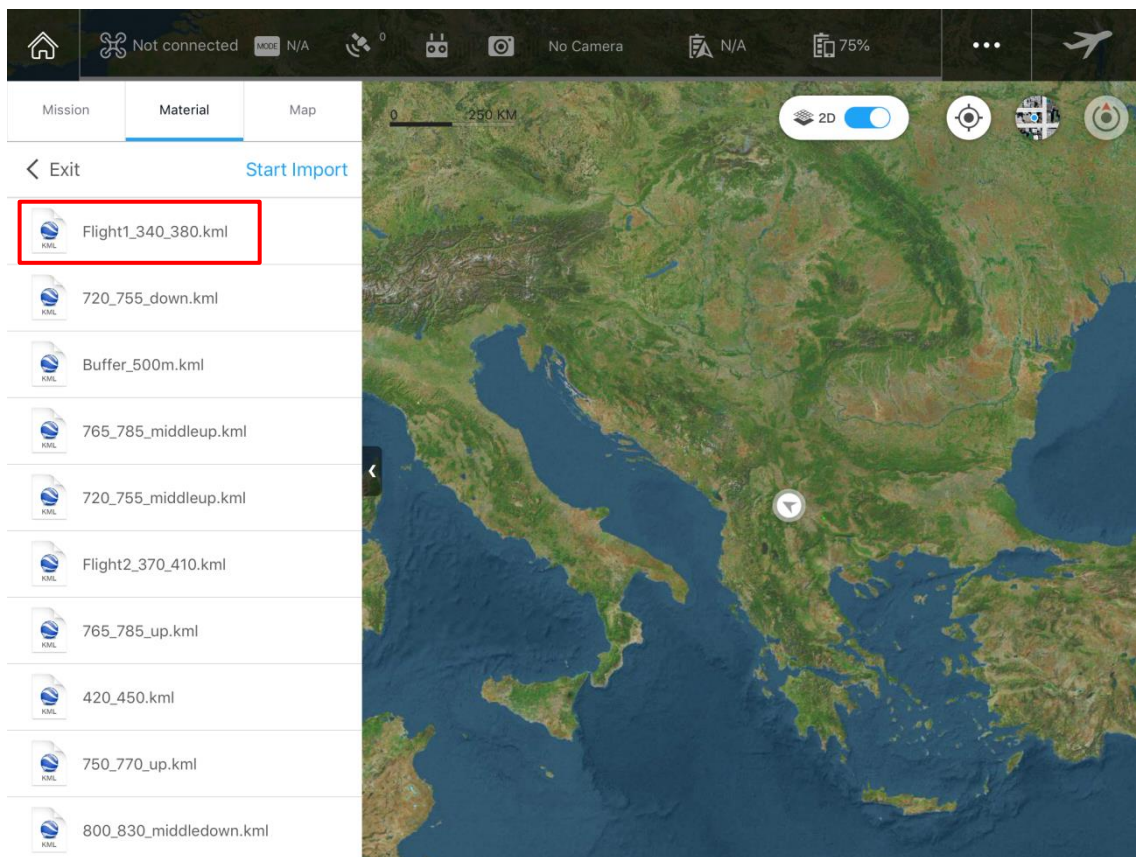
The URL to access the file server is displayed on the panel.



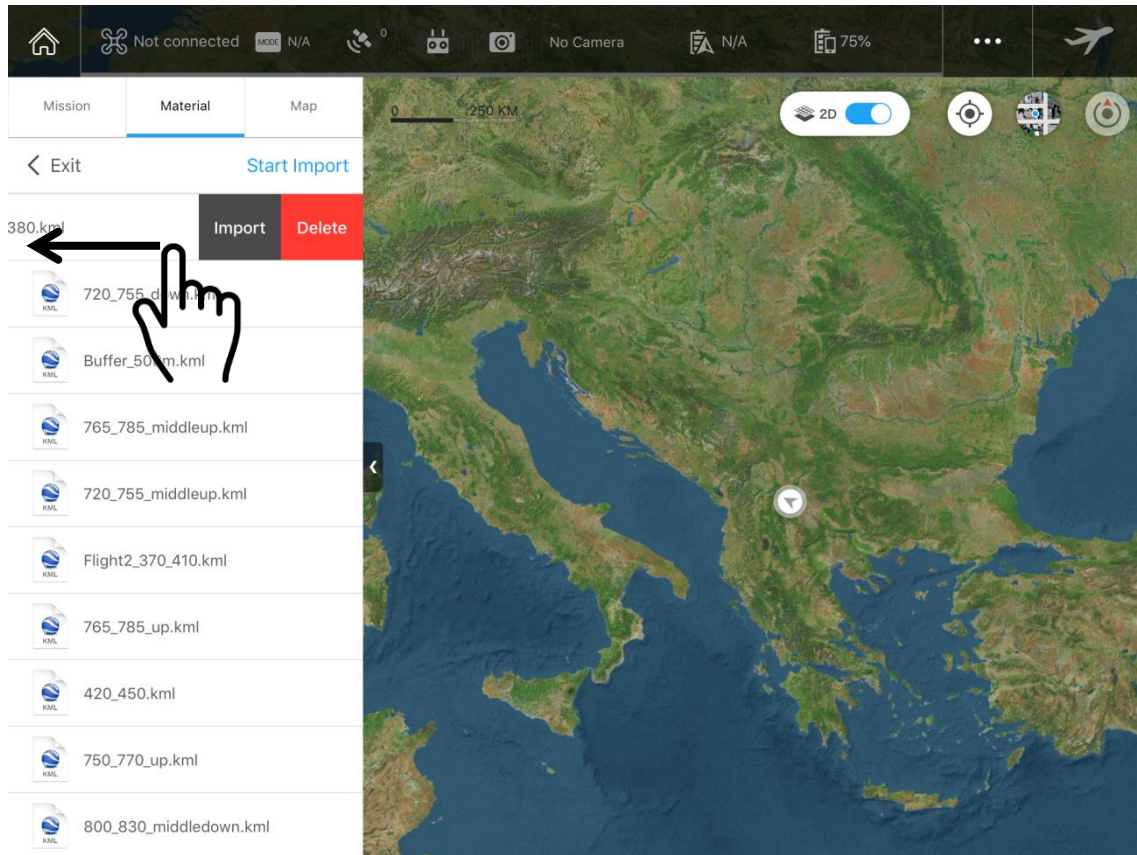
Open web browser of the computer and enter the URL address. Then, the file server of DJI GS Pro is displayed. Click **Upload Files** and select a created KML file to upload.



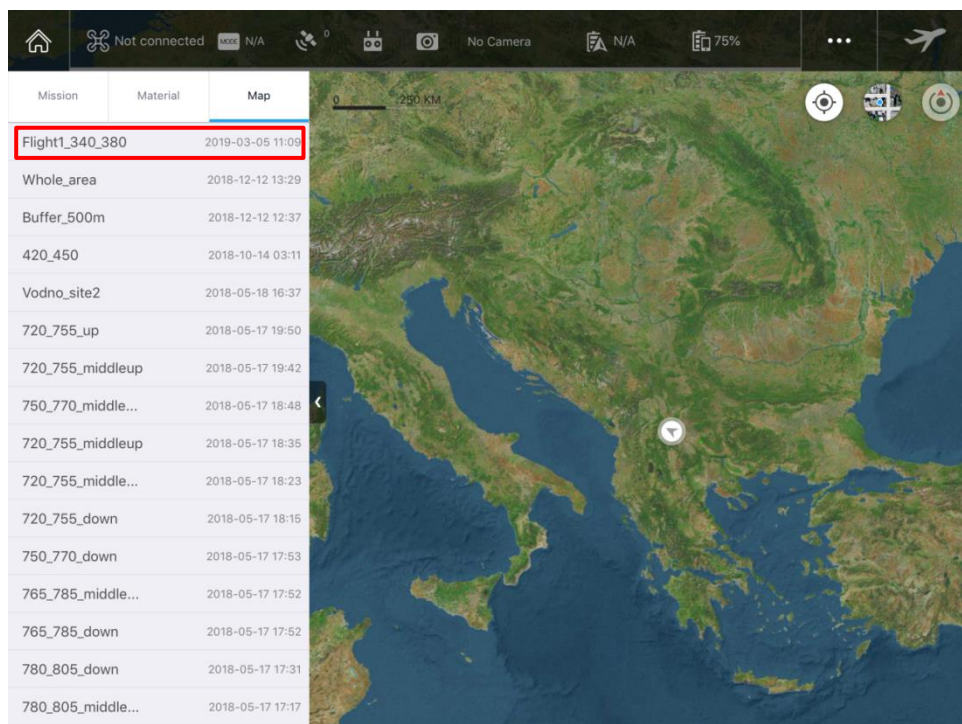
KML file will be uploaded to DJI GS Pro.



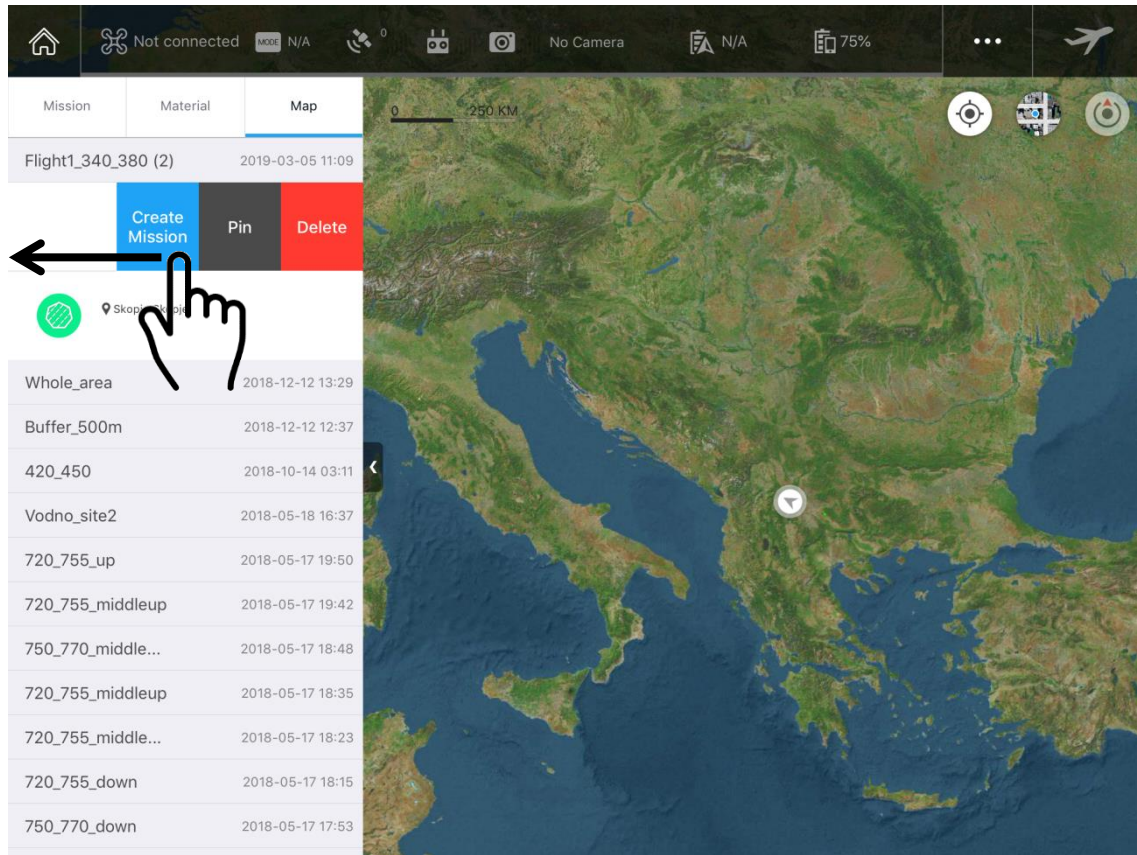
Swipe the uploaded KML file to left direction and tap **Import**.



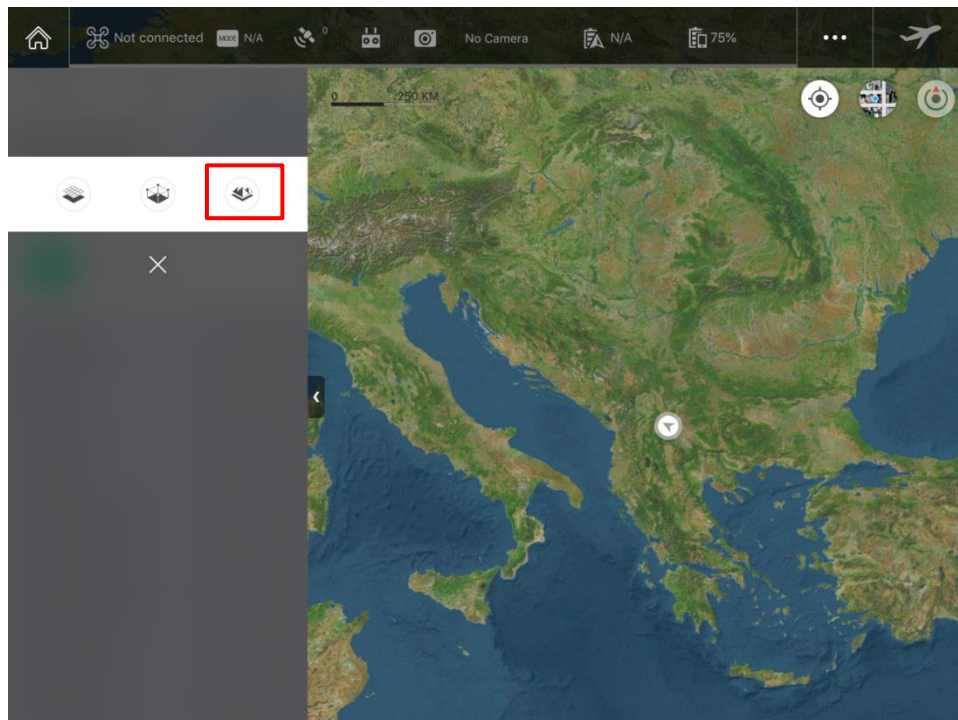
KML file is imported.



Swipe the imported KML file to left direction and tap **Create Mission**.

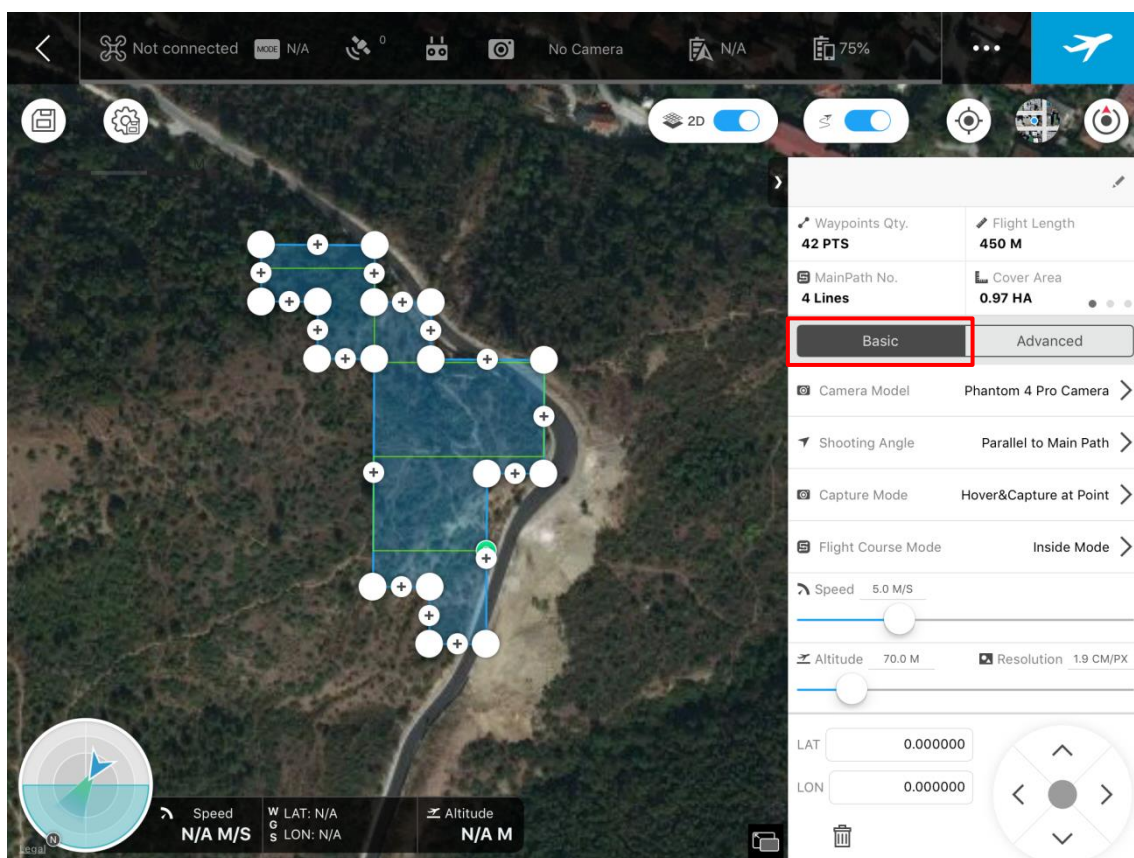


Select 3D Map.



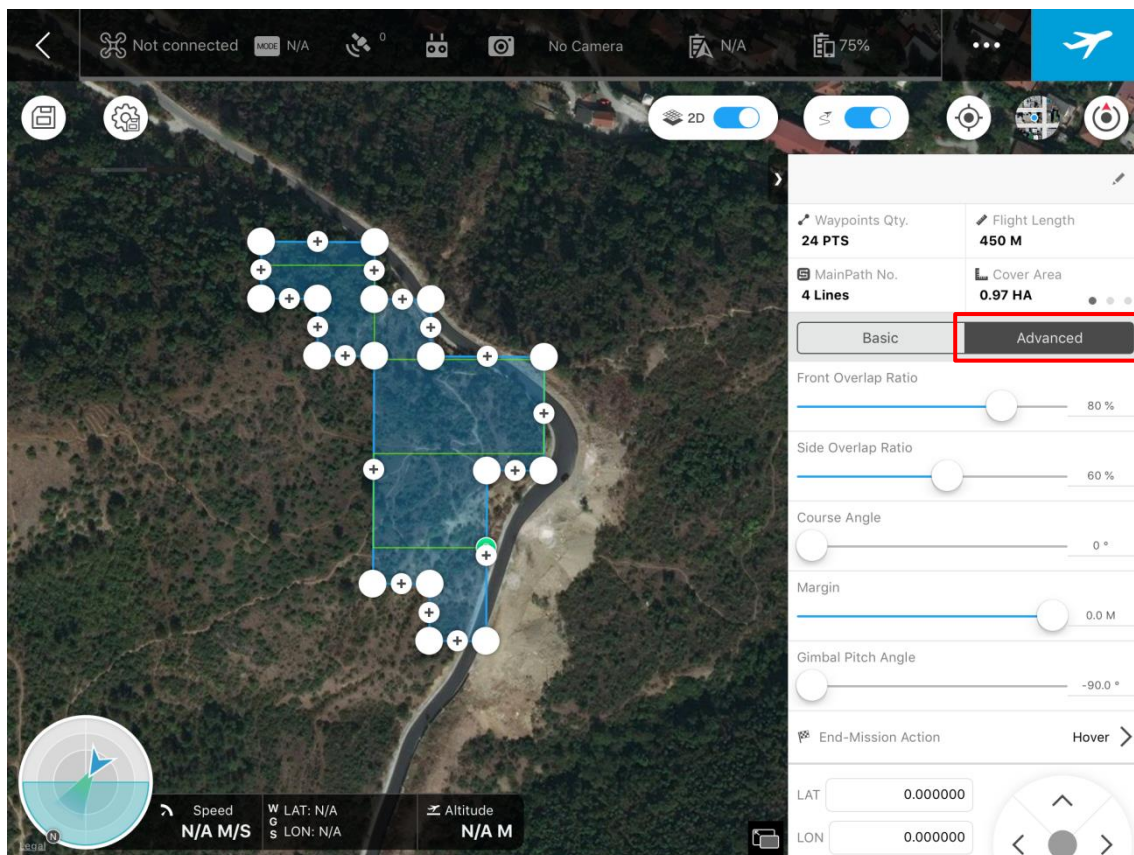
The flight area is displayed on the viewer. Select **Basic**, and set the flight parameters as follows.

- Camera Model: Phantom 4 Pro Camera
- Shooting Angle: Parallel to Main Path
- Capture Mode: Hover&Capture at Point
- Flight Course Mode: Inside Mode
- Speed: 5m/s
- Altitude: 70.0m



Select **Advanced**, and set the flight parameters as follows.

- Front Overlap Ratio: 80%
- Side Overlap Ratio: 60%
- Course Angle: Hover&Capture at Point
- Flight Course Mode: Set the course angle to minimize the flight length
- Margin: 0.0M
- Gimbal Pitch Angle: -90.0°
- End-Mission Action: Hover



Step 3: Processing of UAV aerial photo

3-1: Storage of UAV aerial photos in the computer

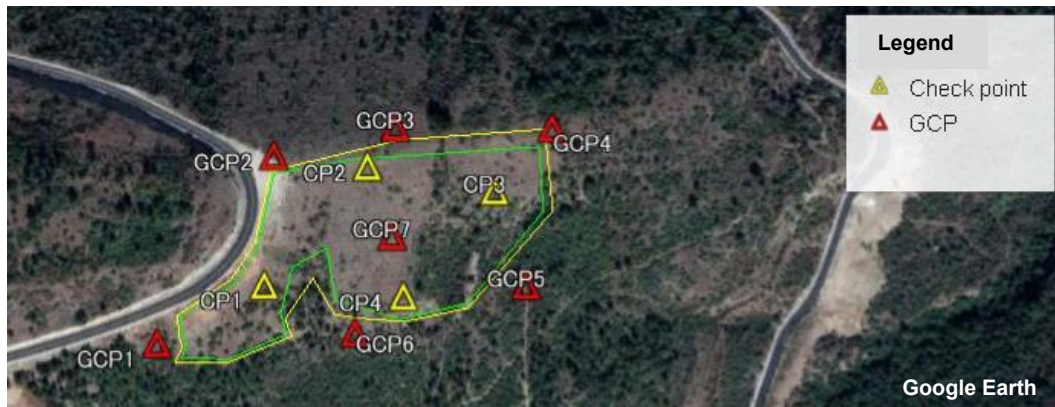
The UAV photos acquired in the field should be stored in the computer. Physically connect Phantom 4 Pro (or use MicroSIM and card reader) with your computer, and import the aerial photo files.

3-2: Preparation of GCP file

In Mt. Vodno, ground control point (GCP) survey was conducted to measure the exact position of the target area using RTK GPS survey. Macedonia State Coordinate System zone 7 was used as the coordinate system of GCPs. In Mt. Vodno, a total of 11 points including 7 GCPs and 4 check points (CPs) were acquired as listed below.




RTK GPS survey conducted in Mt. Vodno



Location of GCPs and CPs in Mt. Vodno

The derived geographic coordinates of GCPs and CPs were compiled as a table listed in the GCP survey report.



TRADE COMPANY FOR GEODETIC WORKS
 "GEO POINT" DOOEL-Skopje
 St.Londonska no.19, part 19
 Telephone: 02 / 3 071-360
 Telephone: 071 / 387-567
 email: geopoint@t-home.mk

Deliverables of GCP survey from Vodno

According to the Target areas and schedule of GCP survey from the Contract from 7th of May, 2018 where sites of survey and designed GCP locations are defined we are preparing you the following data for Vodno Mountain made on 9th of May, 2018:

List of survey equipment used in the GCP survey

Surveying was made with the South GPS S82T Instrument.

Raw GPS data

Raw GPS data for North site (Vodno Mountain): 2.5 ha (See attachment 1)

Raw GPS data for South site (Vodno Mountain): 1.5 ha (See attachment 2)

Geographic coordinates of GCPs summarized as a table

By using EPSG 6316 (Macedonia State Coordinate System zone 7) for the geographic coordinates of GCPs we summarized this tables:

Table 1: Geographic coordinates of GCPs for Vodno Mountain, North site

VODNO 1			
	X	Y	Z
GCP2	7536545.696	4647313.135	503.225
GCP1	7536482.888	4647177.900	497.321
CP1	7536537.777	4647229.134	496.711
GCP6	7536613.206	4647199.813	460.919
CP4	7536635.450	4647221.116	456.040
GCP7	7536626.316	4647263.115	466.411
CP2	7536604.456	4647305.649	484.083
GCP3	7536616.286	4647335.325	470.004
GCP4	7536735.301	4647336.121	428.598
CP3	7536695.626	4647294.682	443.920
GCP5	7536719.530	4647225.256	425.420

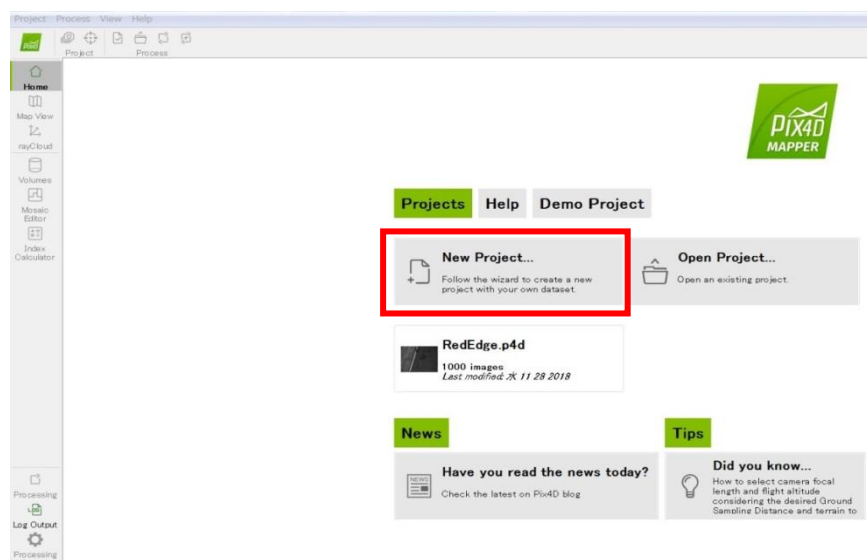
Copy the table of GCPs and paste to Microsoft Excel sheet. Save the table as CSV or text format.

The screenshot shows a Microsoft Excel spreadsheet with the following data:

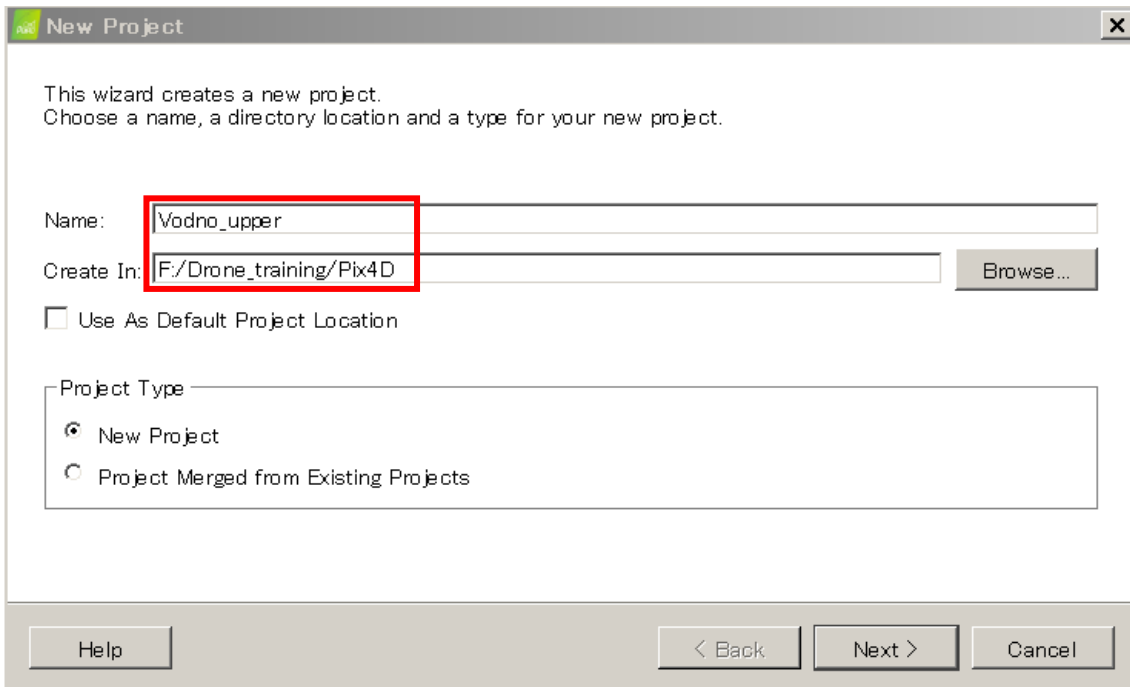
No	X	Y	Z
GCP2	7536546	4647313	503.225
GCP1	7536483	4647178	497.321
CP1	7536538	4647229	496.711
GCP6	7536613	4647200	460.919
CP4	7536635	4647221	456.04
GCP7	7536626	4647263	466.411
CP2	7536604	4647306	484.083
GCP3	7536616	4647335	470.004
GCP4	7536735	4647336	428.598
CP3	7536696	4647295	443.92
GCP5	7536720	4647225	425.42

3-3: Setup of new project and import of UAV aerial photos in Pix4D software

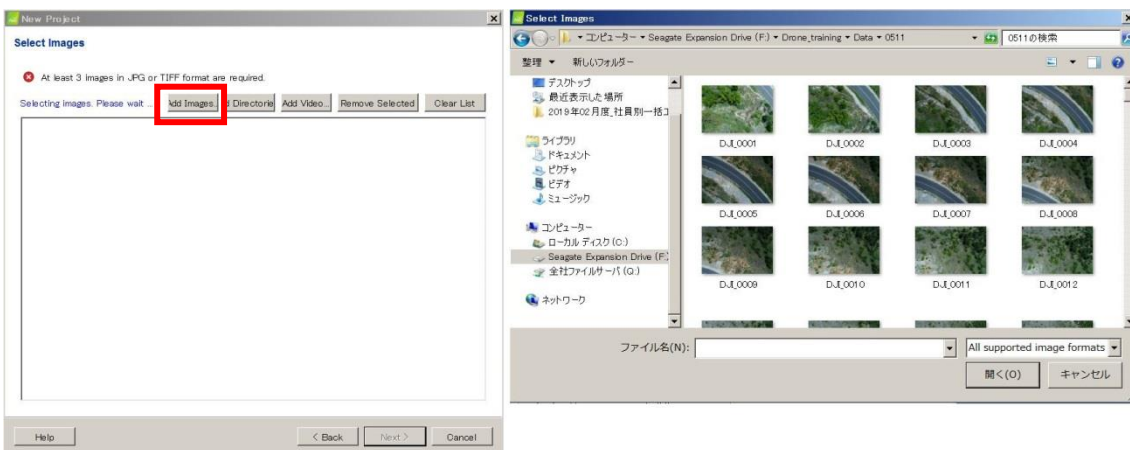
Open Pix4D software and select **New Project**.



New Project panel opens. Specify the name of project and working folder, and select **Next >**.



Select **Add Images**, navigate to the folder of UAV photos in the computer and select all photos to process.



Select Images panel opens. Confirm that all photos are selected, and select **Next >**.

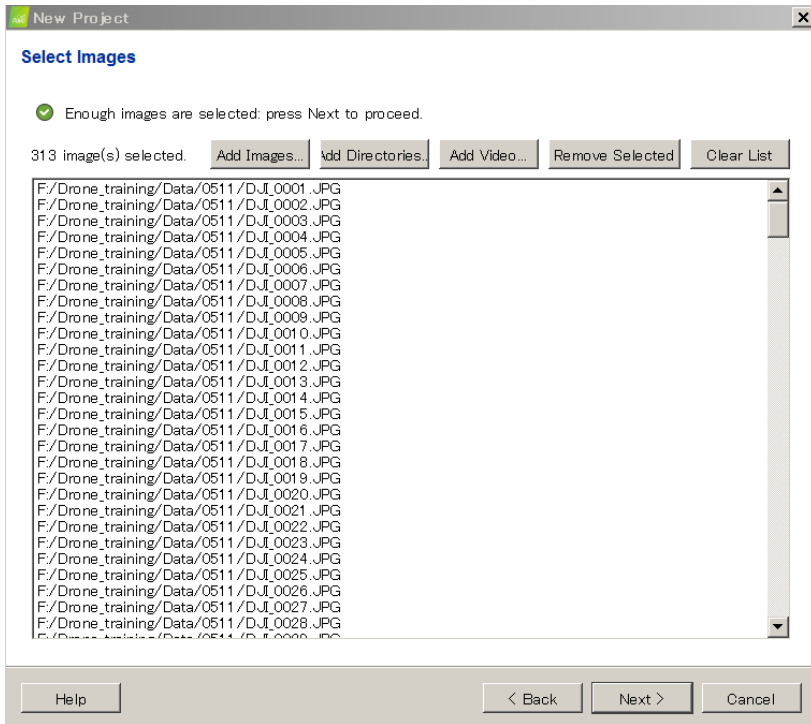
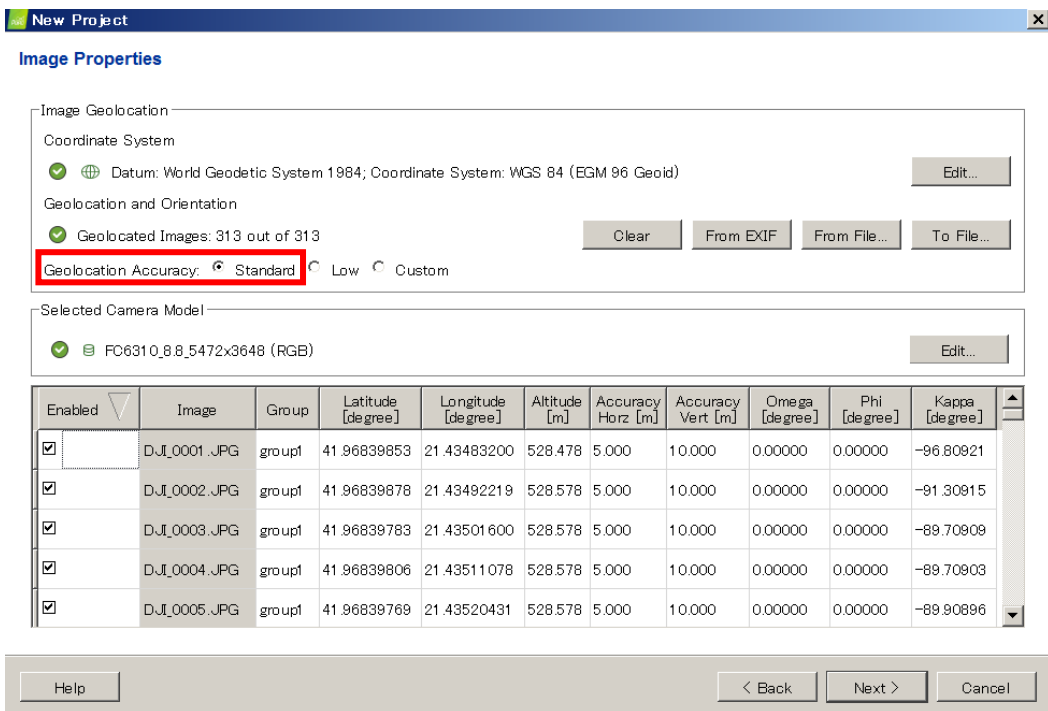
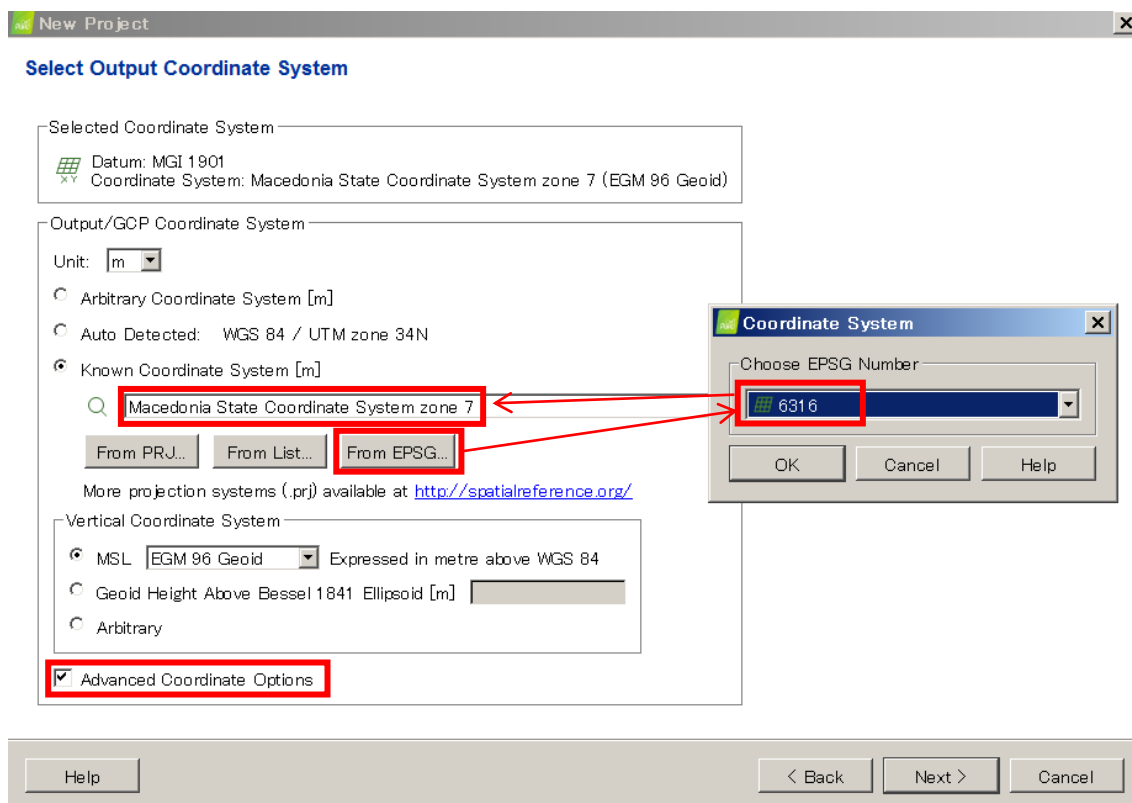


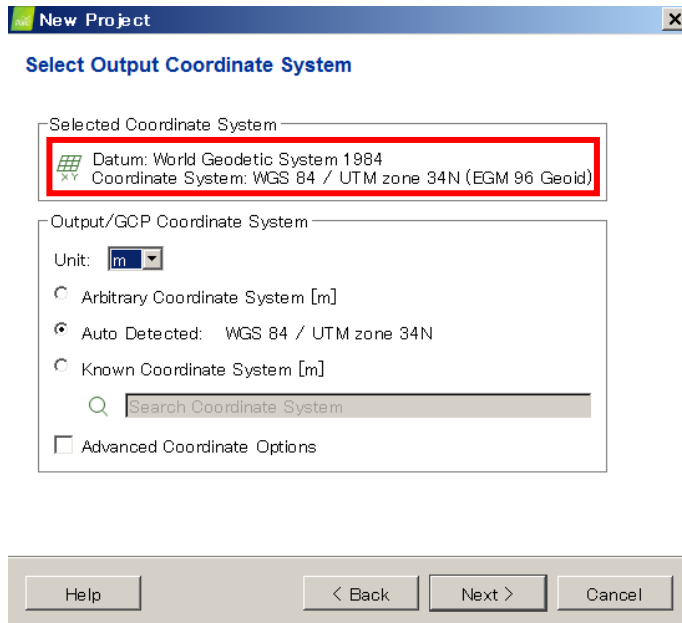
Image Properties panel opens. Confirm that the information of image geolocation and camera model are automatically imported. Confirm that geolocation accuracy is selected as **Standard** and select **Next >**.



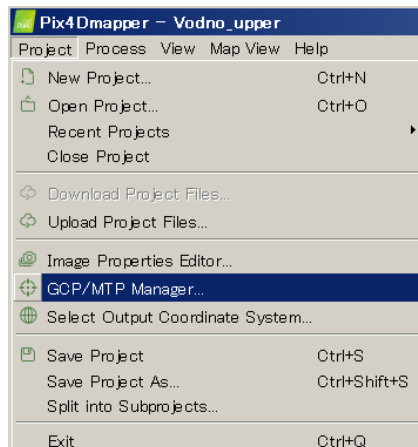
Select *Output Coordinate System* panel opens. In this exercise, GCPs established by the Macedonia State Coordinate System zone 7 are used. Select *Advanced Coordinate Options*, click **From EPSG** button, and choose “6316” as EPSG number for the Macedonia State Coordinate System zone 7. Select **Next >**.



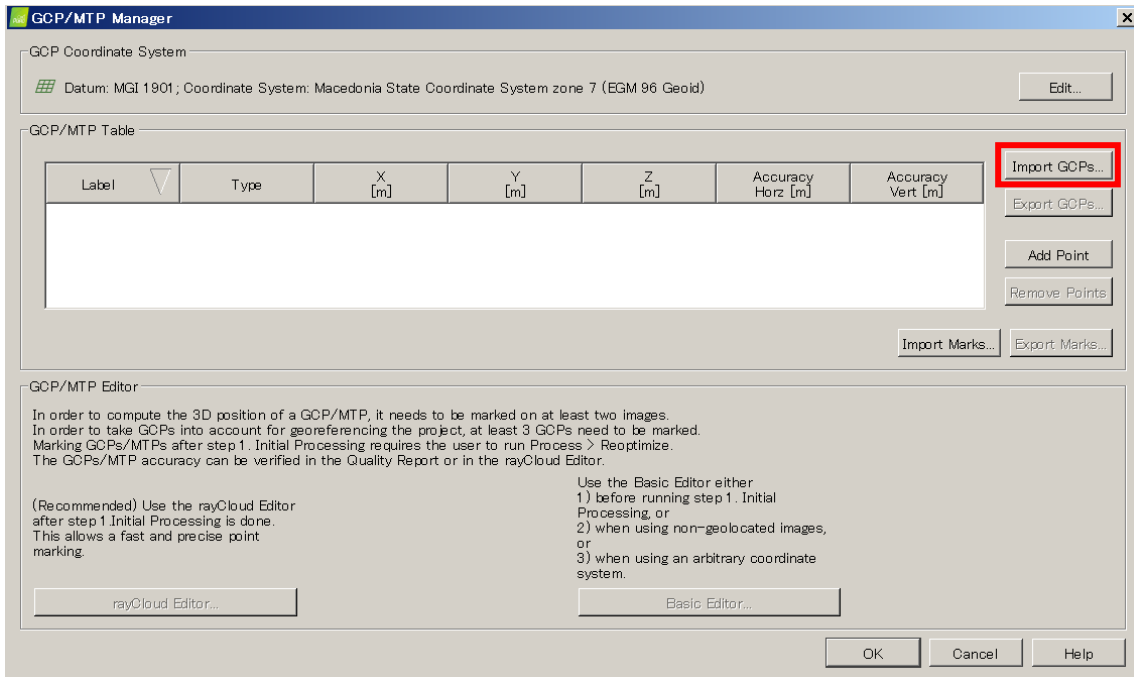
In case GCPs are not used, use the default datum in World Geodetic System 1984 and coordinate system in WGS 84 / UTM zone 34N.



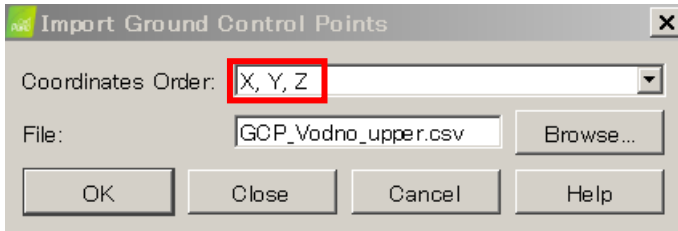
Move to *Project>GCP/MTP Manager*



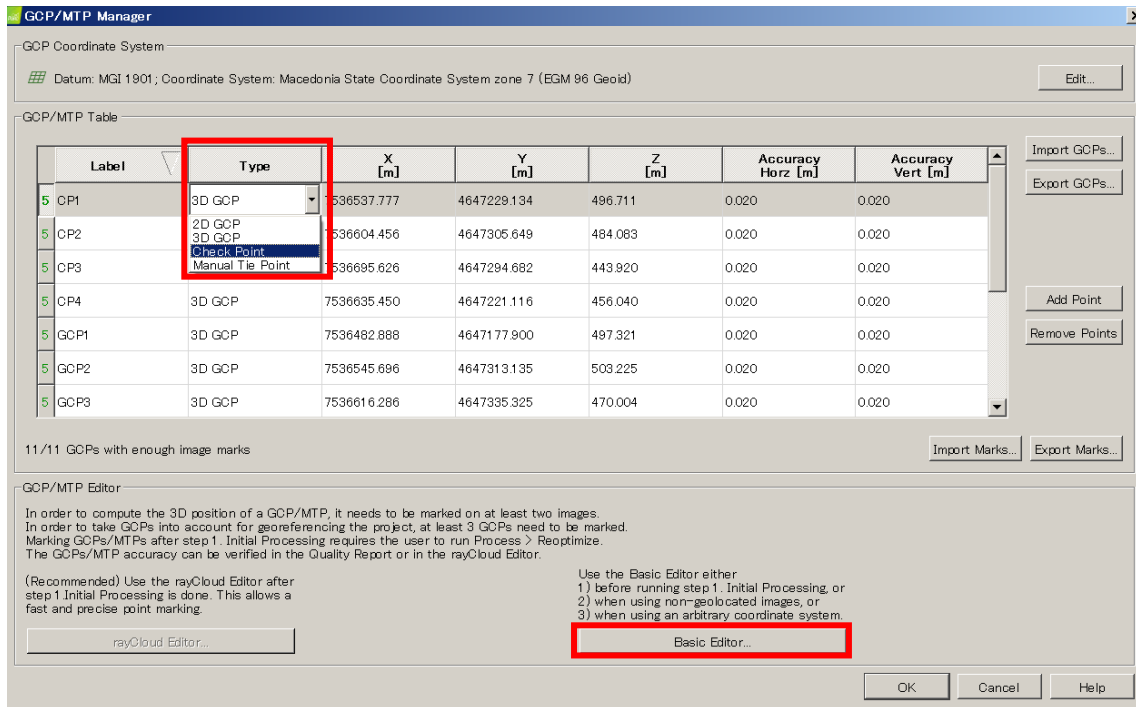
GCP/MTP Manager panel opens. Click **Import GCPs** button.



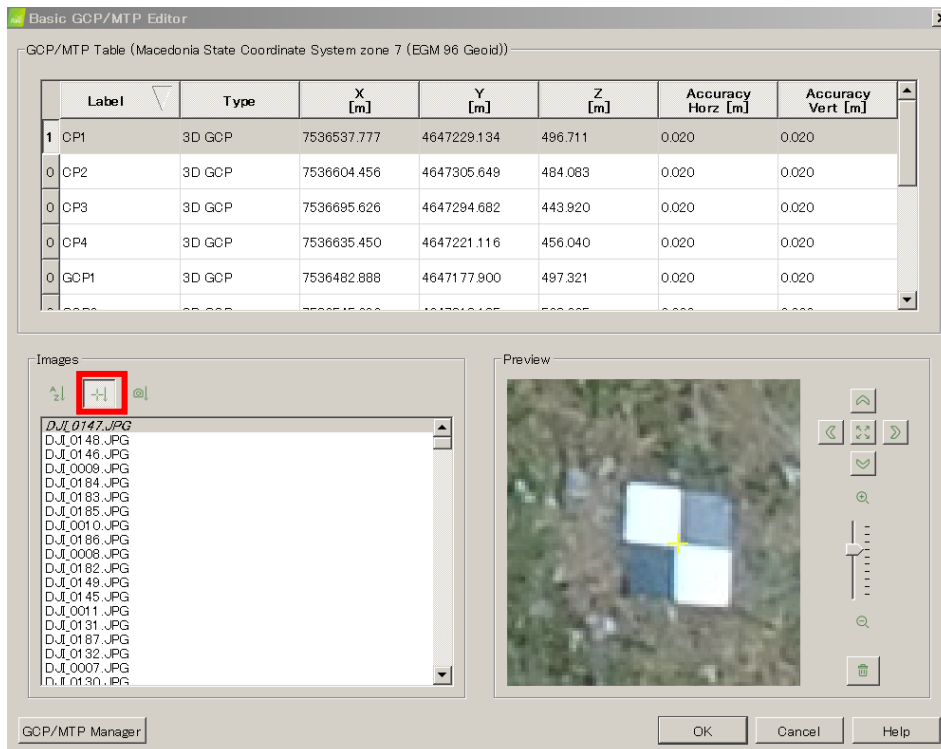
Import Ground Control Points panel opens. Select *Coordinates Order* as X, Y, Z. Browse the CSV or text file of GCPs. Click **OK** to import GCPs.



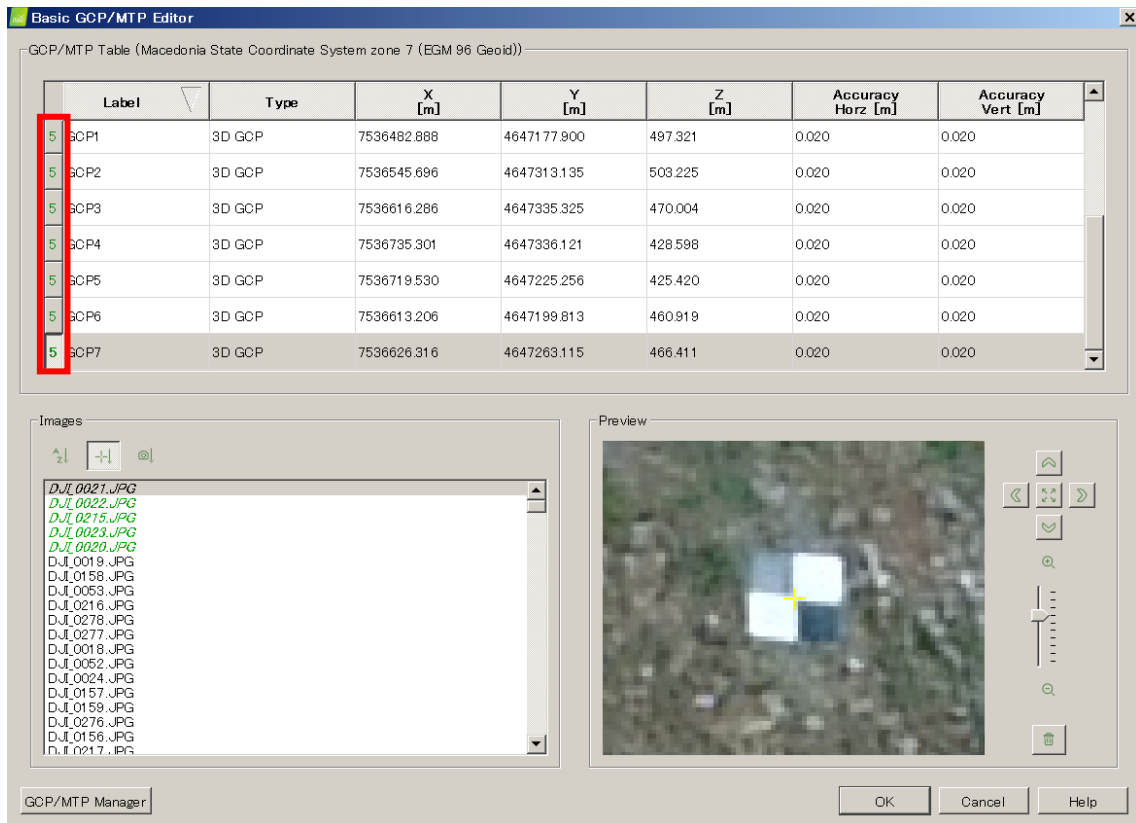
GCPs are imported to *GCP/MTP Manager*. When check points (CP) are available, select *Check Point* from the pull-down menu of **Type**. Click **Basic Editor** button.



Basic GCP/MTP Editor panel opens. Confirm that **Sort Images by Distance to GCP** button is selected. Select an image from top of the list. In *Preview*, zoom into the selected GCP and mark the center of air photo signal. Mark at least 4 or 5 photos for each GCP.



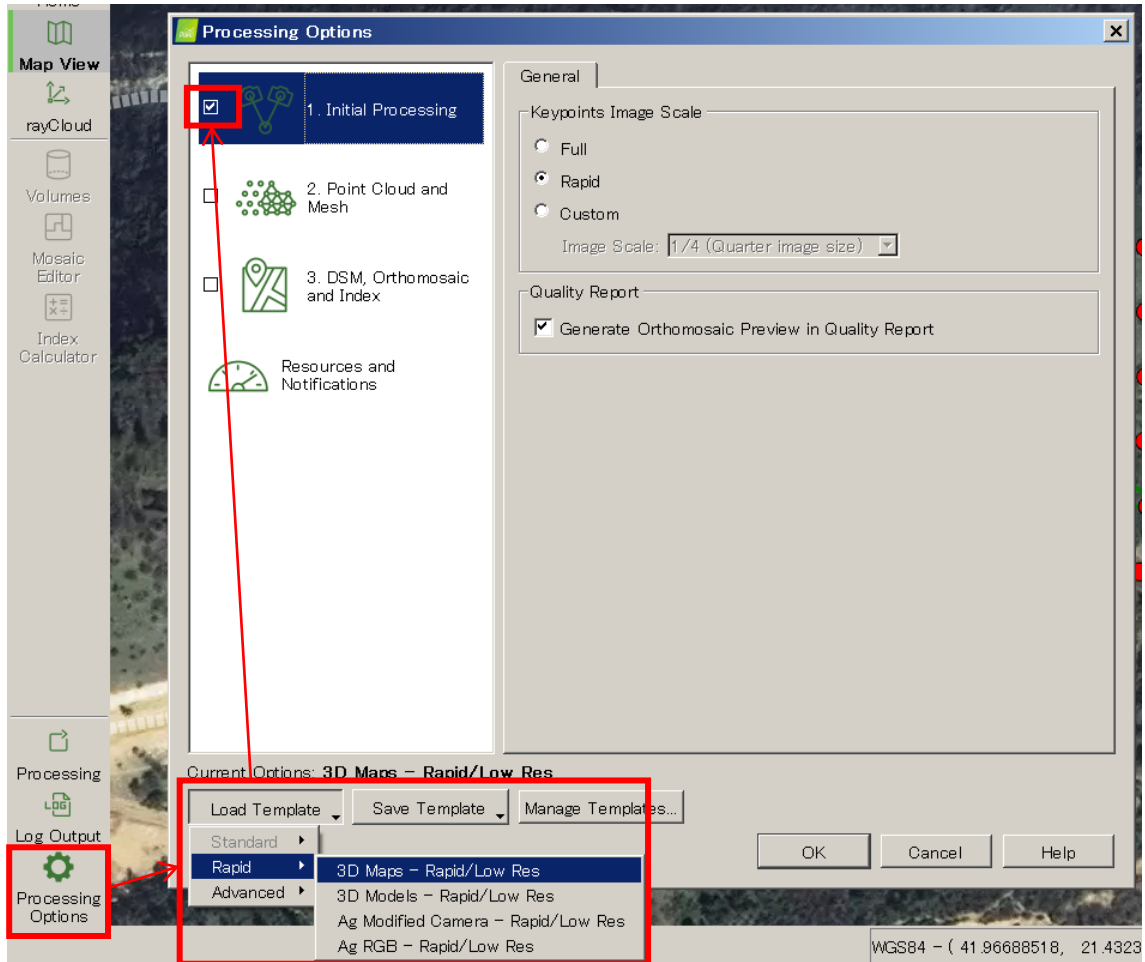
After finish marking, the number of marks are shown in the table. Click **OK** to finish marking.



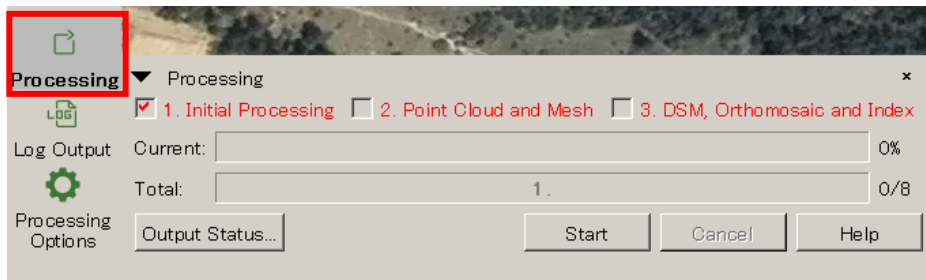
3-4: Run Initial Processing (Rapid) to quickly check if the acquired UAV photos can be used to make stereo models

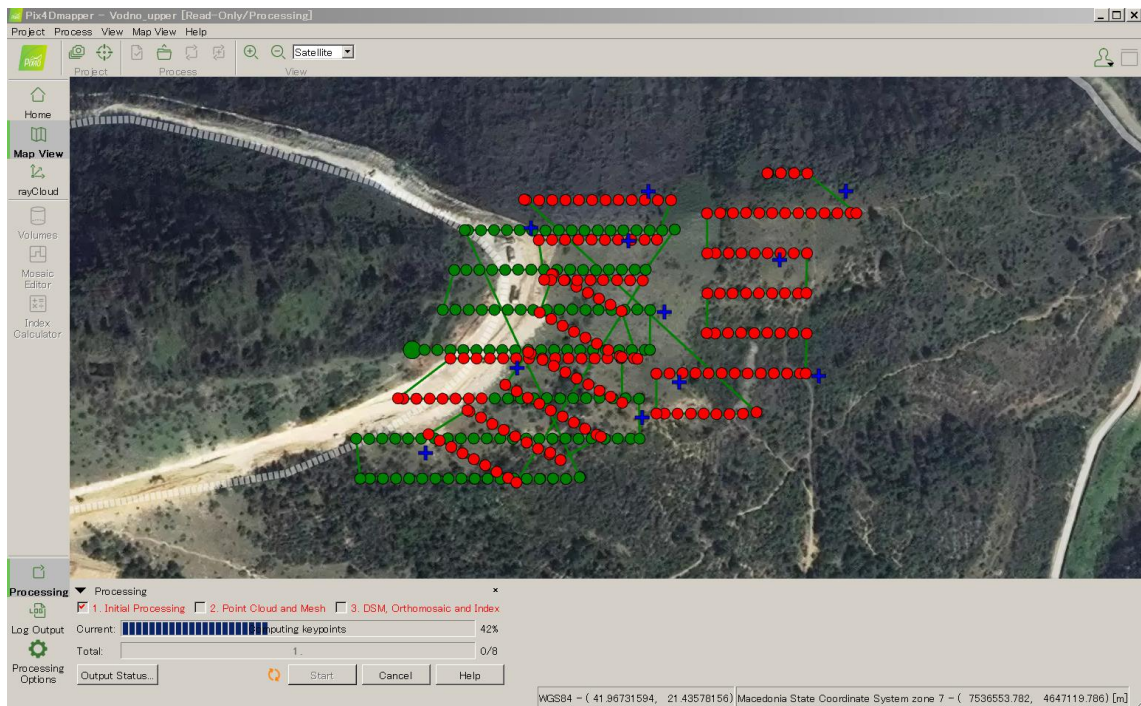
First, initial processing in rapid mode is carried out to quickly check if the acquired UAV photos can be used to build stereo models.

Click *Processing Options*. Select Load Template>Rapid>3D Maps – Rapid/Low Res. Select only 1. *Initial Processing*. Click **OK**.



Click **Processing**. Click **Start** to initiate processing.





After the processing, check quality report to confirm the average ground sampling distance (GSD), result of quality check and number of overlaps. In *Quality Check*, there is an error in Georeferencing in this example. Check the information of Ground Control Points and identified that CP2 has large location errors in X, Y and Z. *Return to GCP/MTP Manager* and re-mark the location of CP2, and run the Initial Processing again.

Quality Report – Vodno_upper

Home PDF Back Forward Online Support

Quality Report

Generated with Pix4Dmapper version 4.3.31

Important: Click on the different icons for:

- ? Help to analyze the results in the Quality Report
- i Additional information about the sections

💡 Click [here](#) for additional tips to analyze the Quality Report

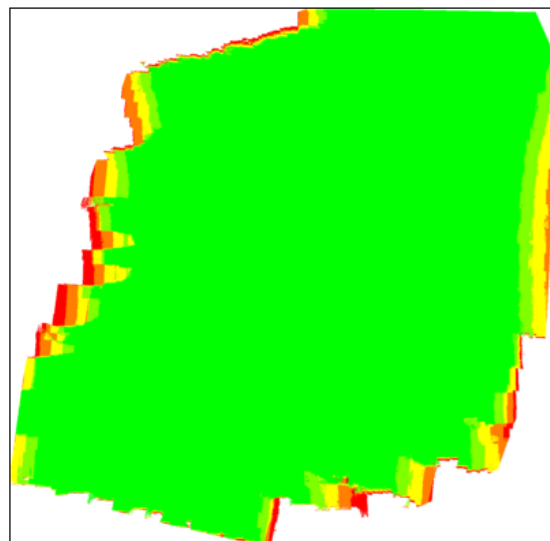
Summary i

Project	Vodno_upper
Processed	2019-02-28 12:06:39
Camera Model Name(s)	FC6310_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.84 cm / 0.72 in
Area Covered	0.100 km ² / 10.0008 ha / 0.04 sq. mi. / 24.7252 acres
Time for Initial Processing (without report)	13m:32s

Quality Check i

? Images	median of 5248 keypoints per image	✔
? Dataset	313 out of 313 images calibrated (100%), all images enabled	✔
? Camera Optimization	0.13% relative difference between initial and optimized internal camera parameters	✔
? Matching	median of 2093.23 matches per calibrated image	✔
? Georeferencing	yes, 11 GCPs (11 3D), mean RMS error = 5.324 m	⚠

? **Overlap**



Number of overlapping images: 1 2 3 4 5+

Ground Control Points



GCP Name	Accuracy XYZ [m]	Error X [m]	Error Y [m]	Error Z [m]	Projection Error [pixel]	Verified/Marked
GCP2 (3D)	0.020/0.020	0.005	-0.000	-0.003	0.084	5 / 5
GCP1 (3D)	0.020/0.020	-0.003	0.002	-0.001	0.044	5 / 5
CP1 (3D)	0.020/0.020	0.001	-0.004	0.008	0.166	5 / 5
GCP6 (3D)	0.020/0.020	-0.004	0.005	0.001	0.115	5 / 5
CP4 (3D)	0.020/0.020	0.009	0.008	0.008	0.070	5 / 5
GCP7 (3D)	0.020/0.020	-0.009	-0.009	-0.002	0.058	5 / 5
CP2 (3D)	0.020/0.020	-11.830	-29.654	14.075	0.132	5 / 5
GCP3 (3D)	0.020/0.020	-0.007	0.006	-0.011	0.063	3 / 5
GCP4 (3D)	0.020/0.020	-0.007	0.001	0.001	0.047	5 / 5
CP3 (3D)	0.020/0.020	0.012	-0.006	0.010	0.081	5 / 5
GCP5 (3D)	0.020/0.020	0.003	0.001	-0.011	0.121	5 / 5
Mean [m]		-1.075347	-2.695527	1.279383		
Sigma [m]		3.400859	8.524897	4.046417		
RMS Error [m]		3.566821	8.940903	4.243856		

After the processing, it is confirmed that there is an enough accuracy to move onto the next step. Move to *Project>Save Project* to save the project before moving to the next step.

Quality Report – Vodno_upper x

Online Support

Quality Report

Generated with Pix4Dmapper version 4.3.31

Important: Click on the different icons for:

- ? Help to analyze the results in the Quality Report
- i Additional information about the sections

Click [here](#) for additional tips to analyze the Quality Report

Summary i

Project	Vodno_upper
Processed	2019-02-28 13:07:04
Camera Model Name(s)	FC6310_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.83 cm / 0.72 in
Area Covered	0.100 km ² / 10.0038 ha / 0.04 sq. mi. / 24.7328 acres
Time for Initial Processing (without report)	11m:41s

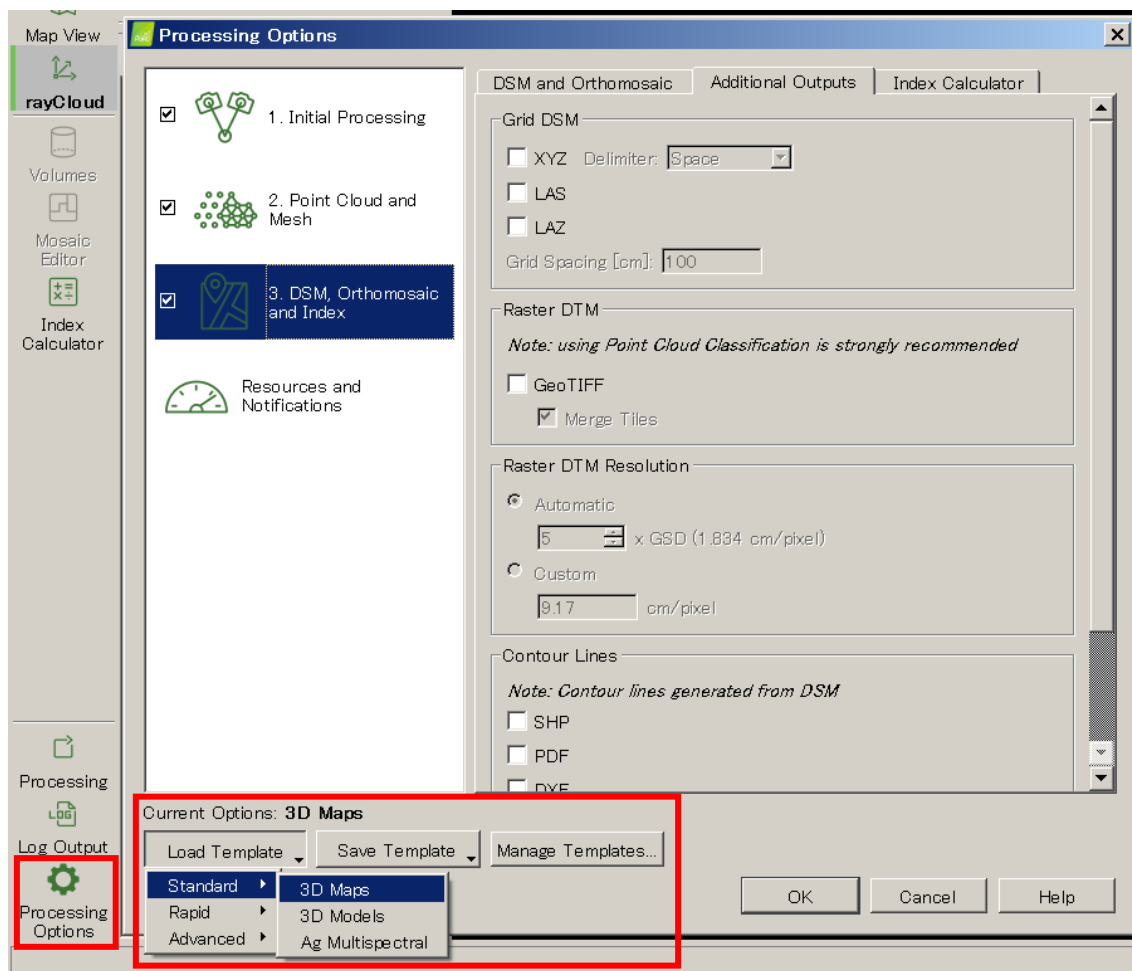
Quality Check i

? Images	median of 5248 keypoints per image	✔
? Dataset	313 out of 313 images calibrated (100%), all images enabled	✔
? Camera Optimization	0.13% relative difference between initial and optimized internal camera parameters	✔
? Matching	median of 2093.23 matches per calibrated image	✔
? Georeferencing	yes, 11 GCPs (11 3D), mean RMS error = 0.005 m	✔

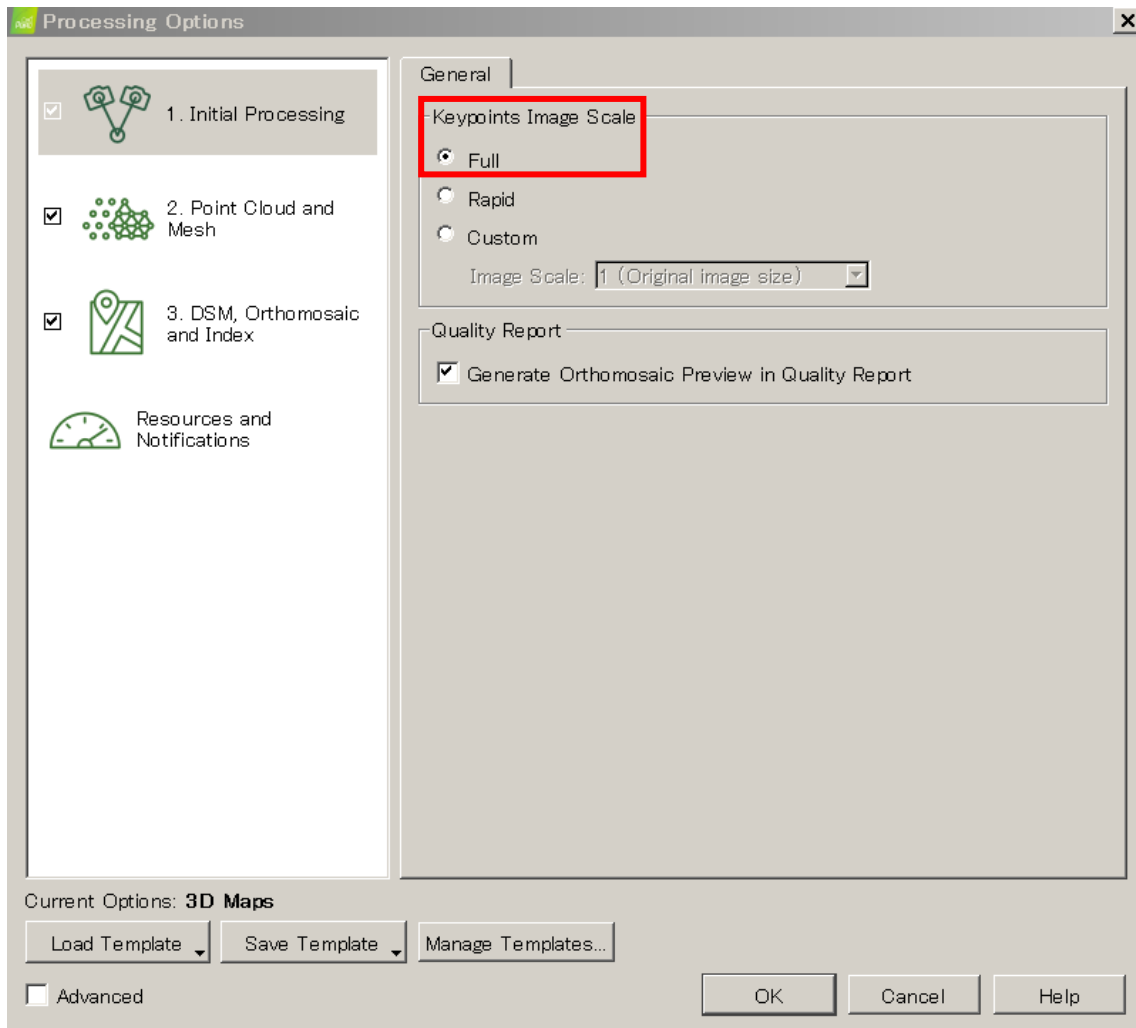
3-5: Run Initial Processing (Full) to make stereo models

Initial processing in full mode is carried out to build stereo models.

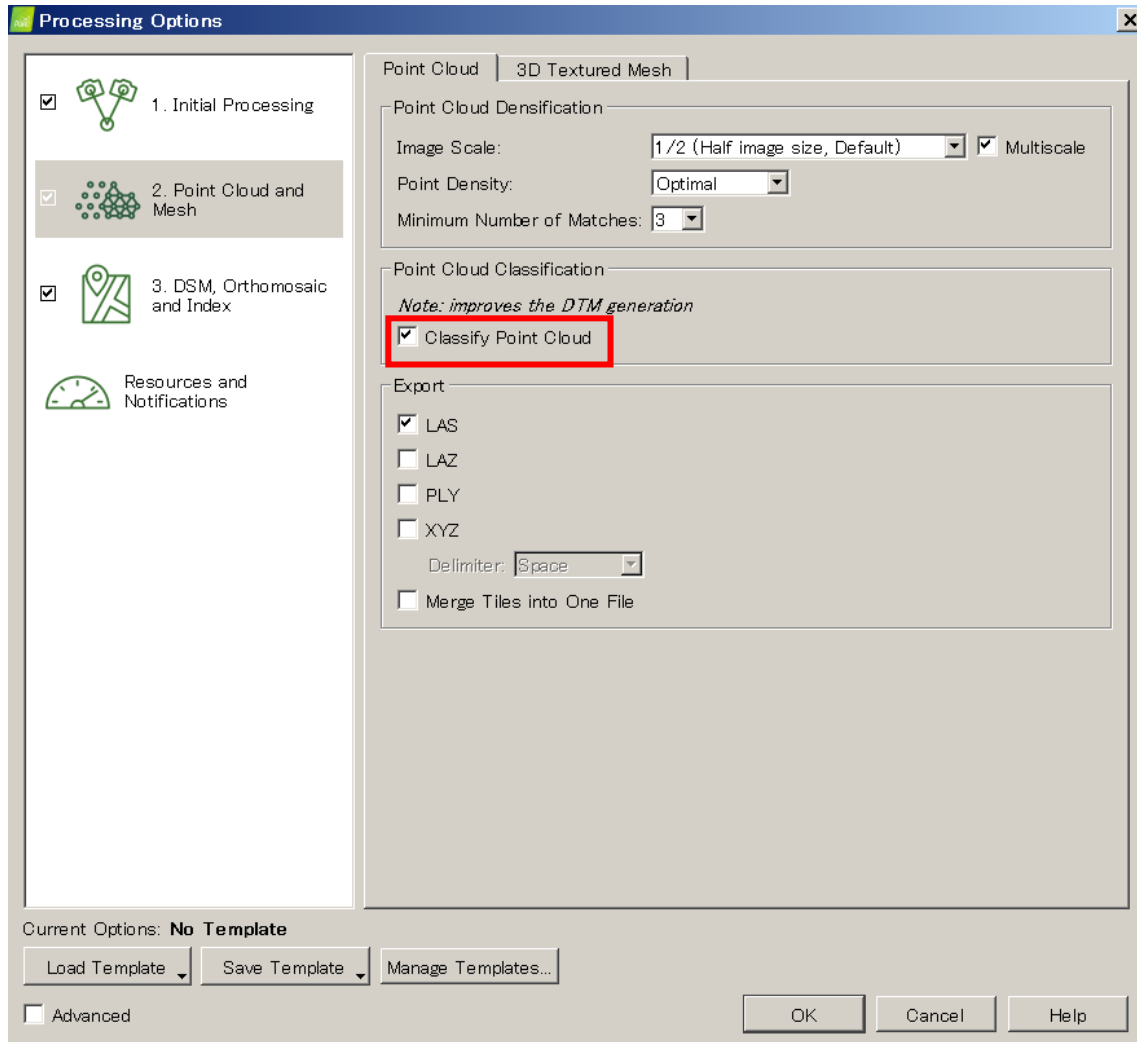
Select Processing Options and select **Load Template > Standard > 3D Maps**.



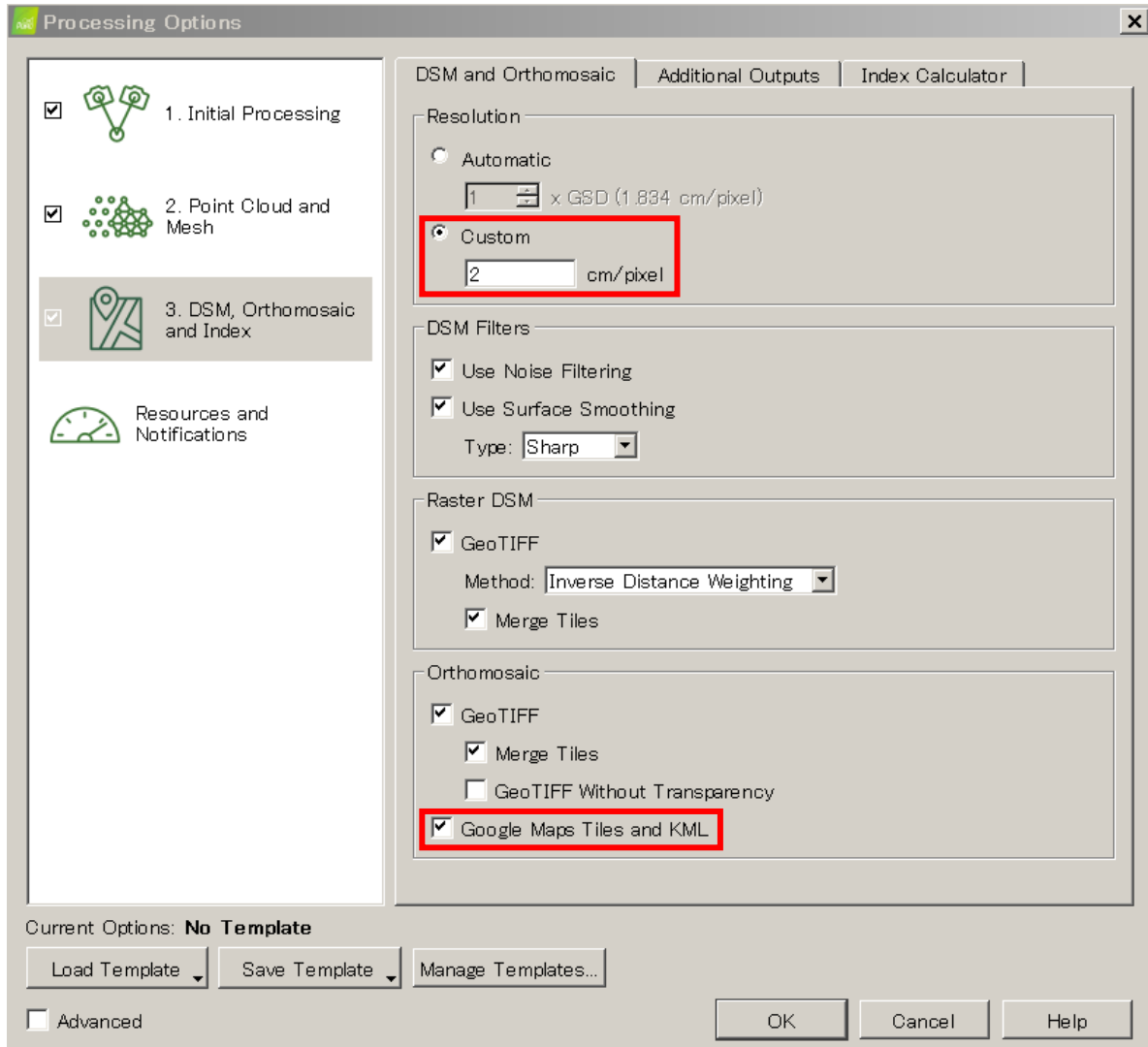
Select **1. Initial Processing** and confirm that Full is selected as *Keypoints Image Scale*.



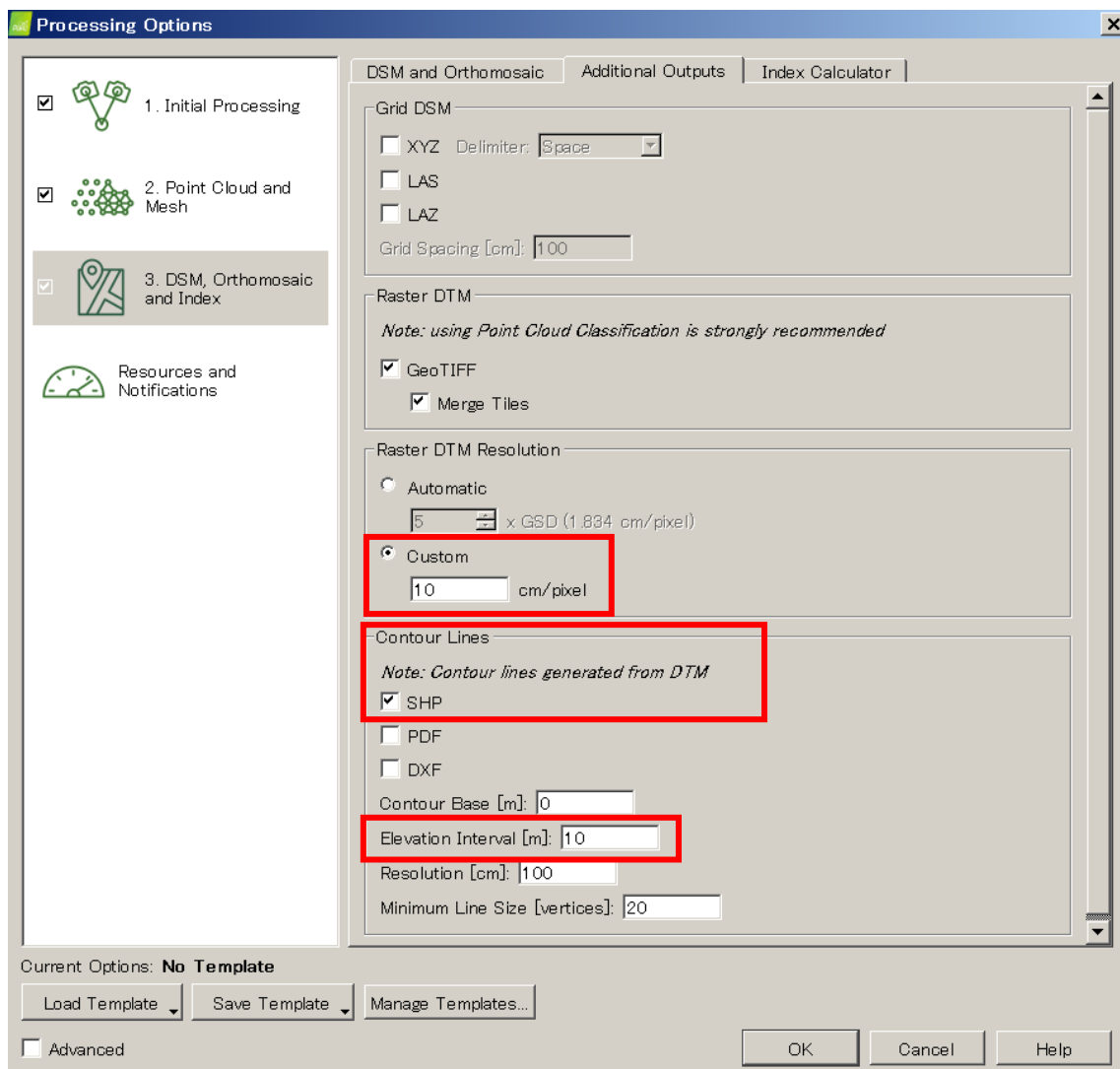
In **Processing Options** select **2. Point Cloud and Mesh**. Under *Point Cloud* tab Select **Classify Point Cloud**. (Classification of point cloud is necessary to generate DTM.)



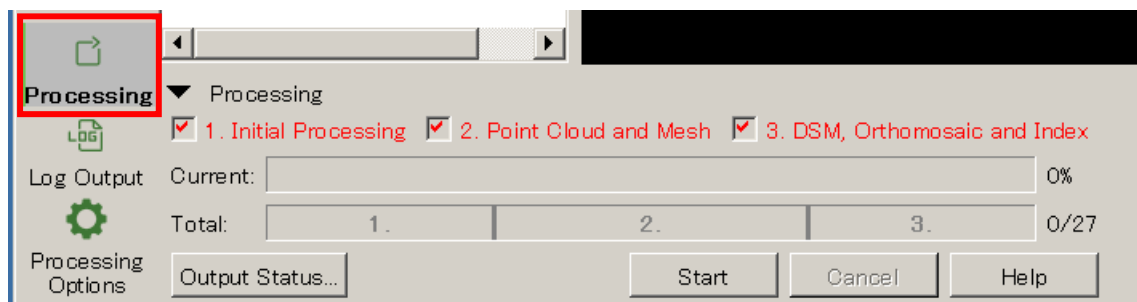
Select **3. DSM, Orthomosaic and Index** and under *DSM and Orthomosaic* tab, enter 2cm/pixel as a resolution of DSM and orthomosaic. Select *Google Maps Tiles and KML* as necessary.



Under *Additional Outputs* tab, enter 10cm/pixel as a resolution of DTM. In *Contour Lines*, select **SHP** (shapefile) as the file format of contour lines. Specify the Elevation Interval [m]. In this example, 10m interval is used.



Click *Processing*. Confirm that all the three processing are selected. Click **Start** to initiate processing.



After the processing. Check the quality report.

The screenshot shows the Pix4D Quality Report interface. At the top, the title bar reads 'Quality Report - Vodno_upper'. Below the title bar, there are navigation icons (home, PDF, back, forward) and an 'Online Support' button. The main content area features a large green 'Quality Report' header and a sub-header 'Generated with Pix4Dmapper version 4.3.27'. A yellow box contains an 'Important' notice with three icons: a warning icon, a question mark icon, and an information icon, with corresponding text. Below this is a tip box with a lightbulb icon and a link to 'here'. The 'Summary' section includes a table with project details. The 'Quality Check' section includes a table with five rows, each representing a different check (Images, Dataset, Camera Optimization, Matching, Georeferencing) with a status indicator (green checkmark).

Quality Report
Generated with Pix4Dmapper version 4.3.27

Important: Click on the different icons for:

- Help to analyze the results in the Quality Report
- Additional information about the sections

Click [here](#) for additional tips to analyze the Quality Report

Summary

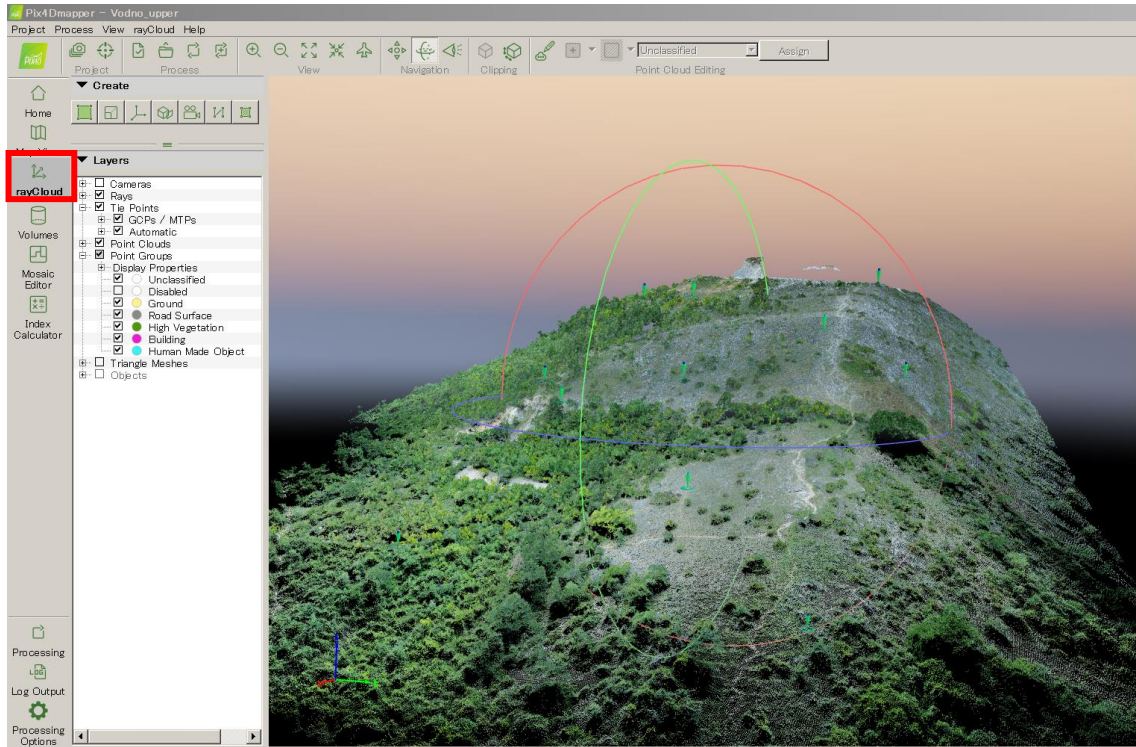
Project	Vodno_upper
Processed	2018-10-12 19:34:57
Camera Model Name(s)	FC6310_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.43 cm / 0.56 in
Area Covered	0.069 km ² / 6.8997 ha / 0.03 sq. mi. / 17.0583 acres
Time for Initial Processing (without report)	12m:18s

Quality Check

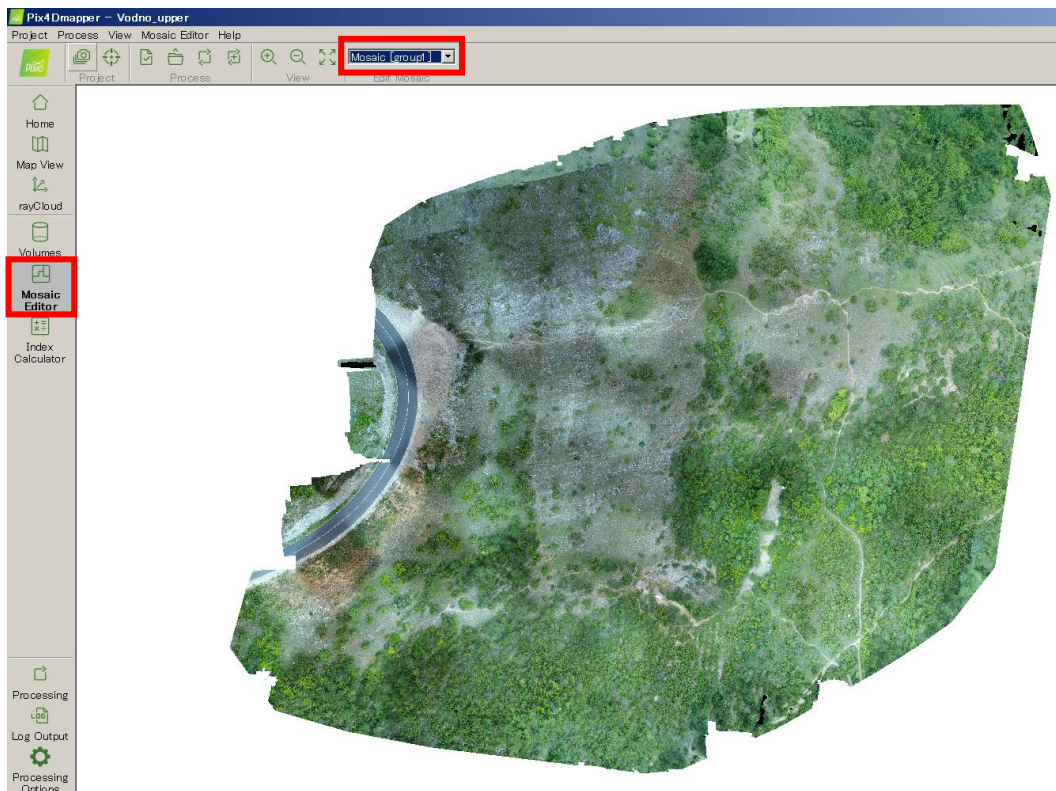
Images	median of 4851 keypoints per image	✓
Dataset	394 out of 394 images calibrated (100%), all images enabled	✓
Camera Optimization	0.05% relative difference between initial and optimized internal camera parameters	✓
Matching	median of 1721.69 matches per calibrated image	✓
Georeferencing	yes, 7 GCPs (7 3D), mean RMS error = 0.002 m	✓

Display Automatically after Processing Close

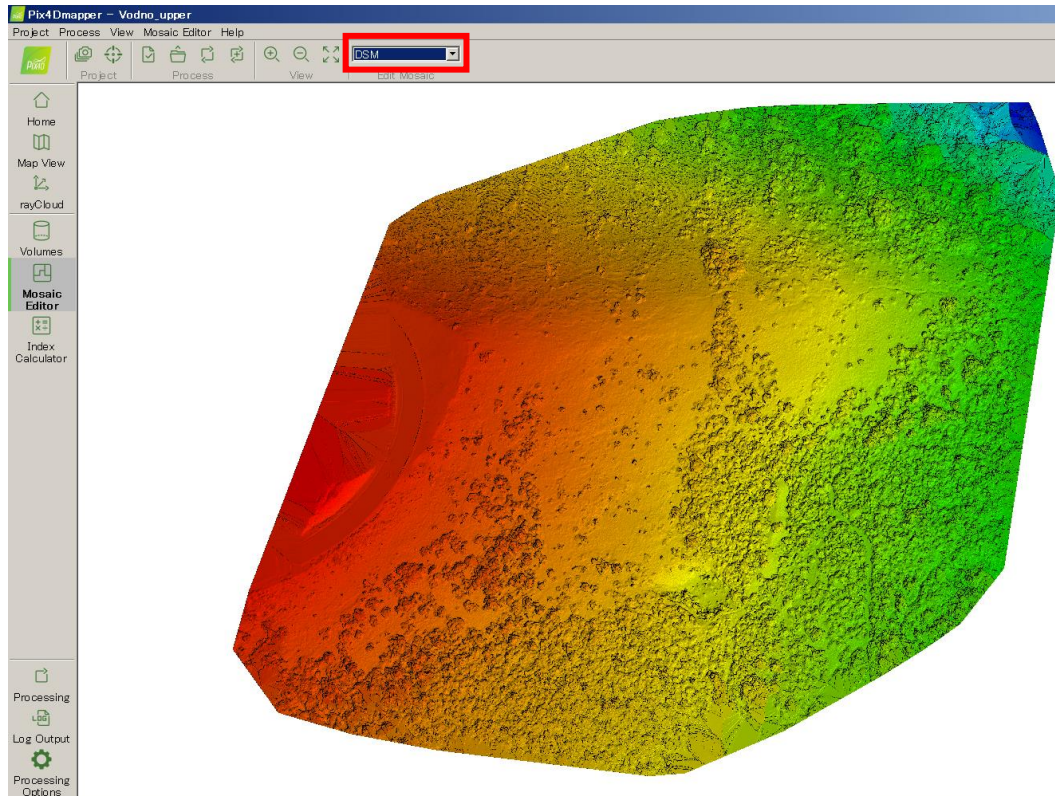
Click *rayCloud* and check the generated point clouds.



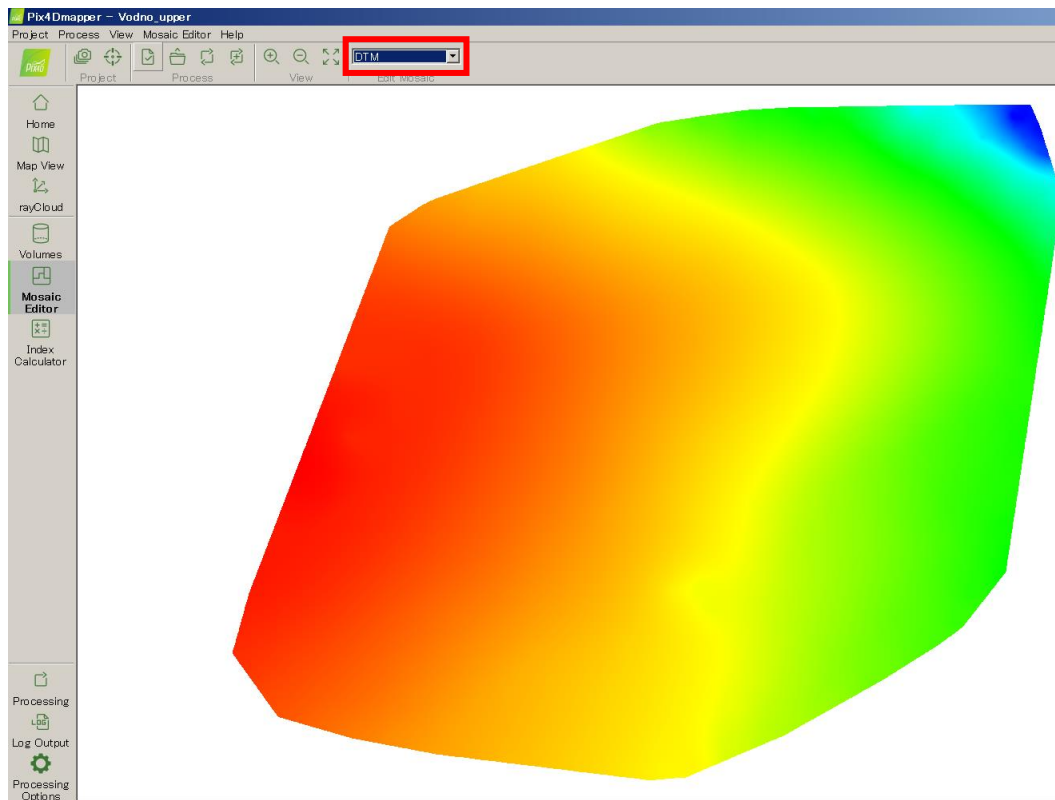
Click *Mosaic Editor* and select **Mosaic** from the pull down menu. Check the generated orthomosaic.



Select **DSM** from the pull down menu. Check the generated DSM.



Select **DTM** from the pull down menu. Check the generated DTM.

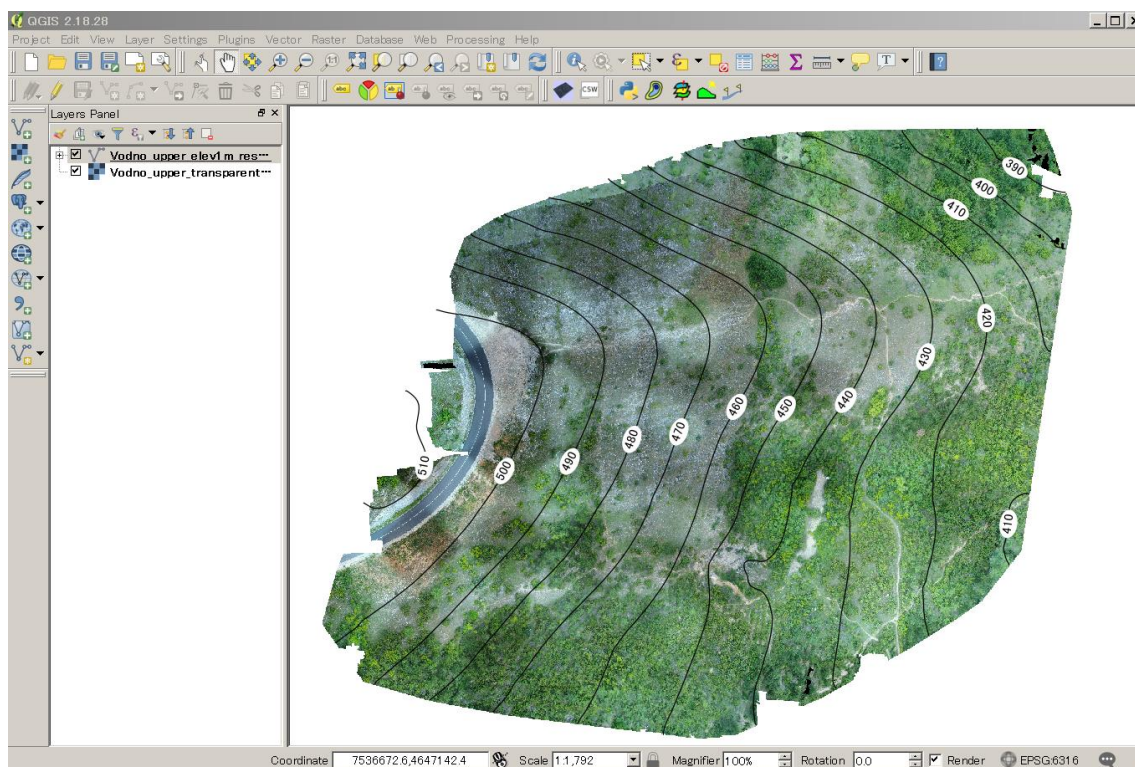


Step 4: Preparation of topographic map

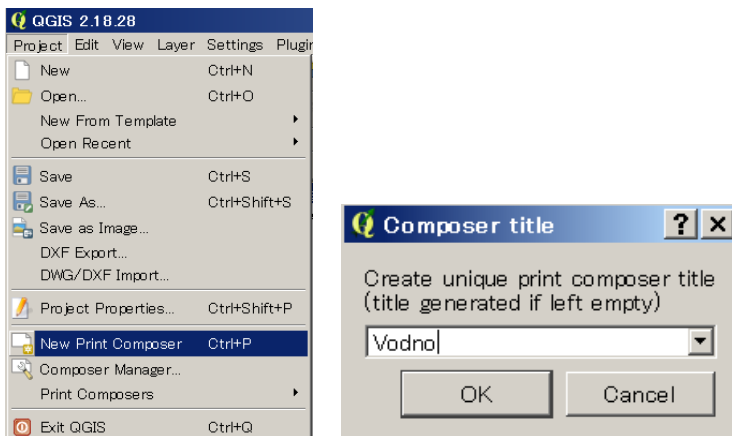
4-1: Preparation of map using QGIS software

In this step, the created orthomosaic and contour lines are used to create a topographic map.

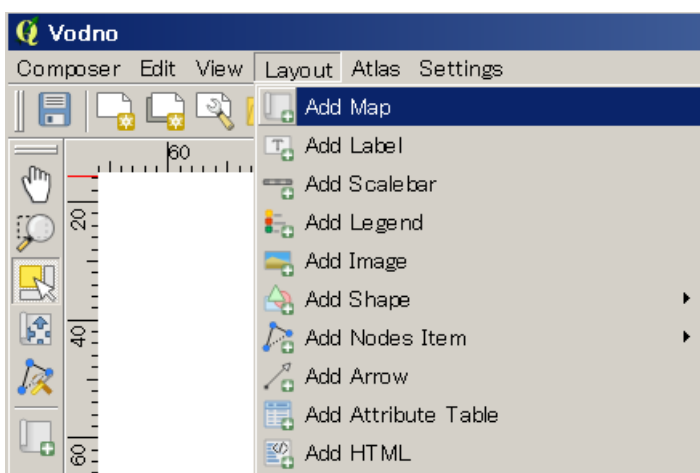
The orthomosaic is stored in the Pix4D project folder under *3_dsm_ortho > 2_mosaic*, and contour lines under *3_dsm_ortho > extras > contours*. Open QGIS and import the orthomosaic and contour lines. Label elevation values of contour lines.



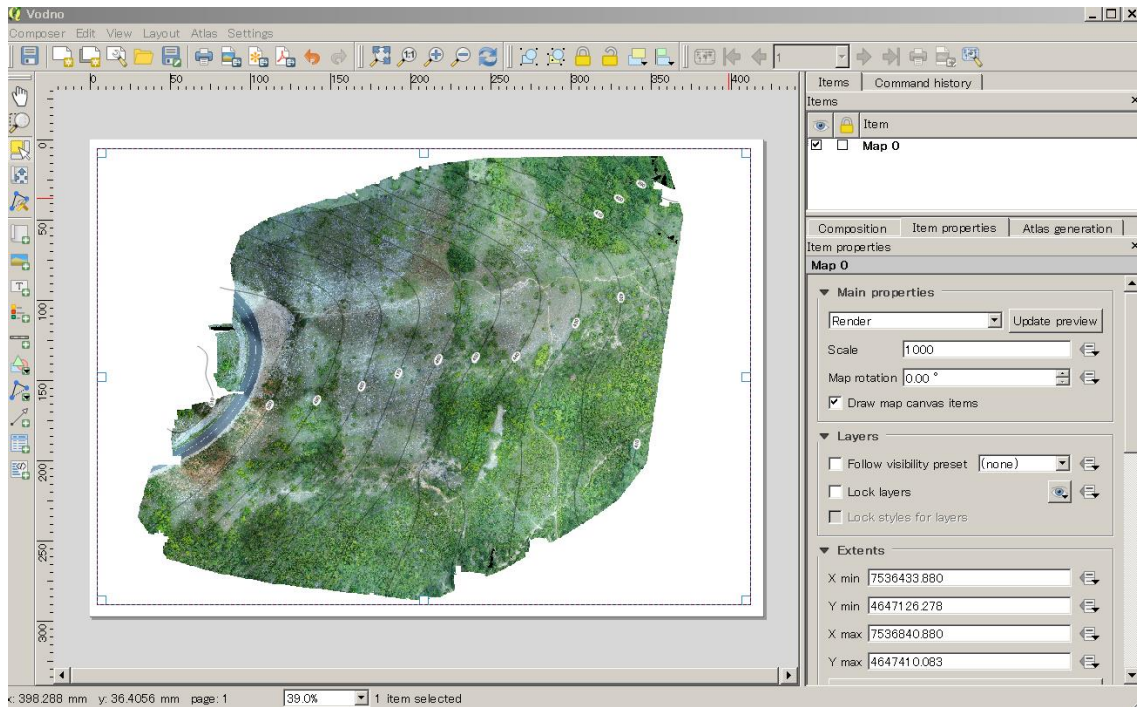
Move to *Project > New Print Composer*. Composer title panel opens. Define the name of map file.



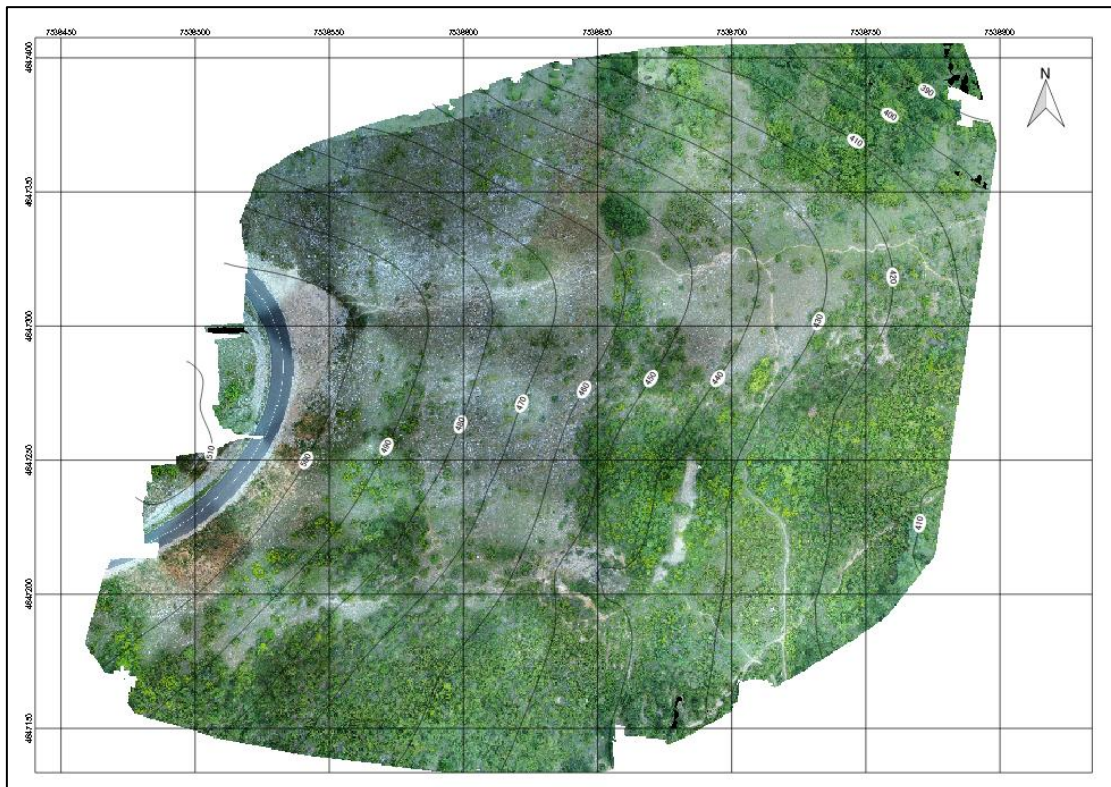
Print composer opens. Move to *Layout > Add Map*.



In the white area, draw an extent to add Map.



Set page size, scale, grid, grid coordinates and north arrow. Export the map as PDF or image format.



Project on Capacity Building for Ecosystem Based Disaster Risk Reduction through Sustainable Forest Management in Macedonia

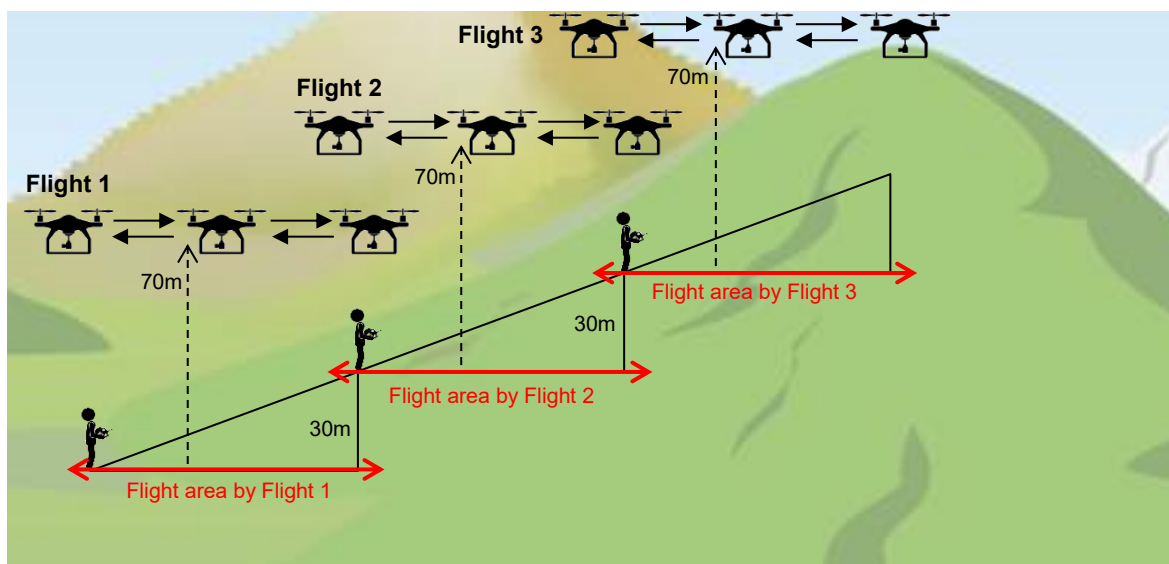
Прирачник за план за летање на UAV за планинска област и обработка на воздушни фотографии за изградба на топографски податоци

April 2019

JICA Expert Team

Концепт за планирање на летот на UAV за планинска област

Слика 1 покажува пример за планирање на летот на UAV за планинска област. Во случај кога се неопходни воздушни снимки со растојание за земање примероци од земја (GSD) од 1,8 cm, висината на летот е поставена на 70 m (не повеќе од 70 m) од нивото на земјата на операторот кога се користи фотоапаратот Phantom 4 Pro (видете на Слика 2). Доколку воздушните снимки од планинскиот терен се добијат со цел да се создадат топографски податоци, областа на летот е поделена врз основа на висината на планината за да се одржи висината на летот што е можно повеќе. Во овој пример, се поставени три области за летање, а операторот ја менува локацијата и висината на теренот на оперативниот UAV за да ја одржи истата висина на летот. Областите на летот се преклопуваат една со друга за да се совпаднат со воздушните фотографии добиени во различните области на летот.



Слика 1. Концепт за планирање на летот на UAV за планинско подрачје

Слика 2 го прикажува односот на висината на летот и GSD на воздушната фотографија што треба да се добие во случај да се користи камерата Phantom 4 Pro. GSD на воздушни фотографии се одредува според скалата на топографската карта што треба да се креира. На пример, ако се креира топографска карта во размер 1:500, потребни се воздушни фотографии со GSD од 3 cm според упатството за јавно топографско истражување на GSI Јапонија.

**Required GSD
for mapping**

Map scale	GSD
1:250	Within 0.02m
1:500	Within 0.03m

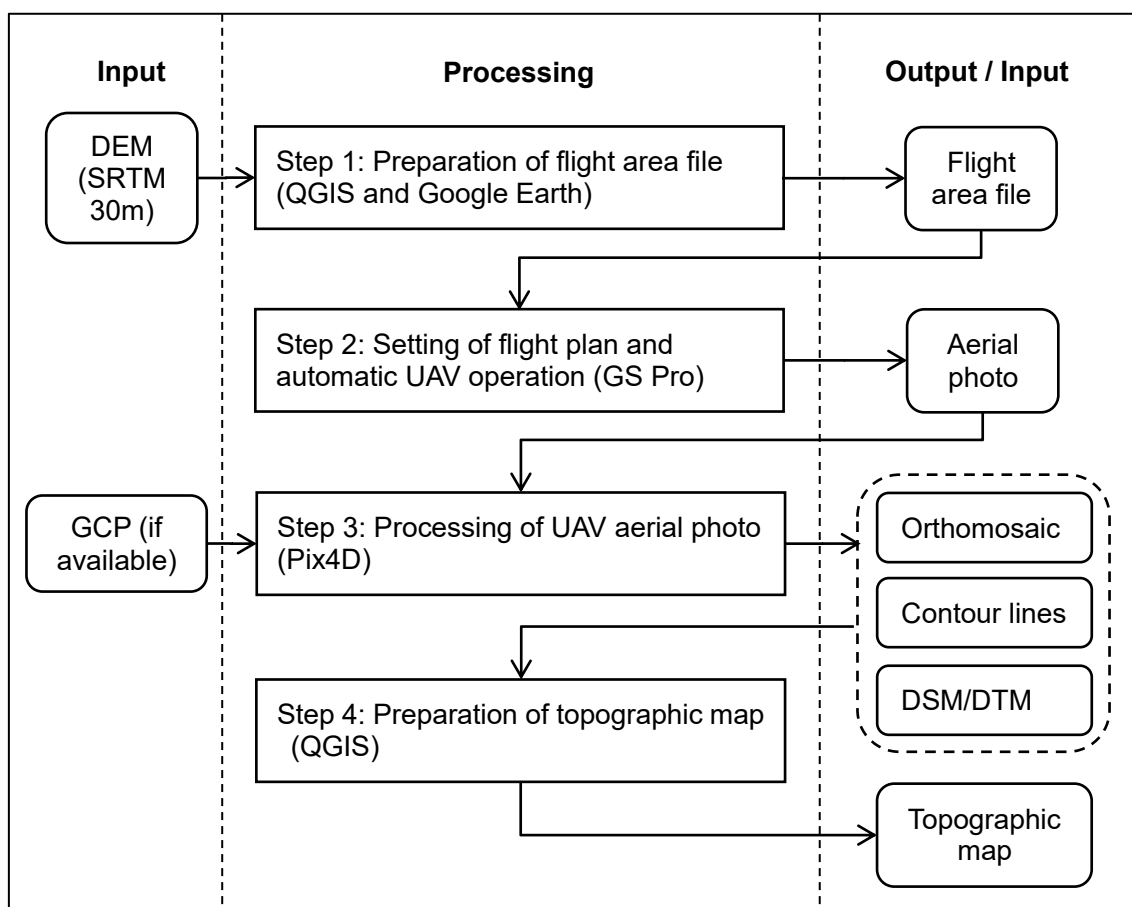


PHANTOM 4 PRO Camera			
Sensor type	1"		
Sensor resolution (Pixel)	4864	3648	
Sensor size X,Y (mm)	13.2	8.8	
Focal length (mm)	9.16		
(35mm Focal length)	24		
Flight height (m)	GSD	Foot print size(m)	
	(cm)	Left-Right	Front-Back
80	2.1	115.3	76.9
75	2.0	108.1	72.1
70	1.8	100.9	67.2
60	1.6	86.5	57.6
50	1.3	72.1	48.0

Слика 2. Поврзаност на висината на летот и GSD во случај на камерата Phantom 4 Pro

Целокупниот тек на работа на летот на UAV и обработка на воздушни фотографии

Слика 3 го прикажува целокупниот работен тек на летот на UAV и обработка на воздушни фотографии.



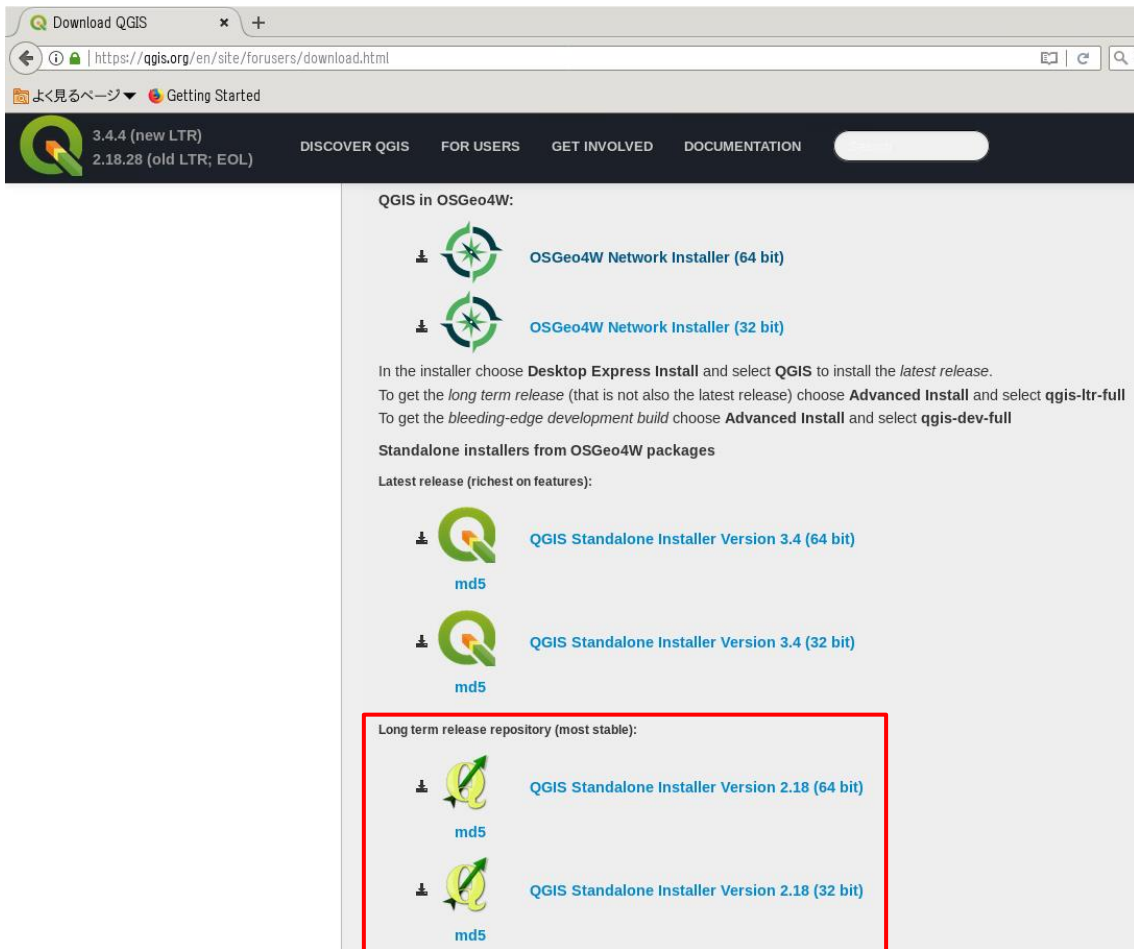
Слика 3. Целокупен тек на работа на летот на UAV и обработка на воздушни фотографии

Чекорите на работниот тек се опишани на следниов начин.

Чекор 1: Подготовка на датотека за областа на летот

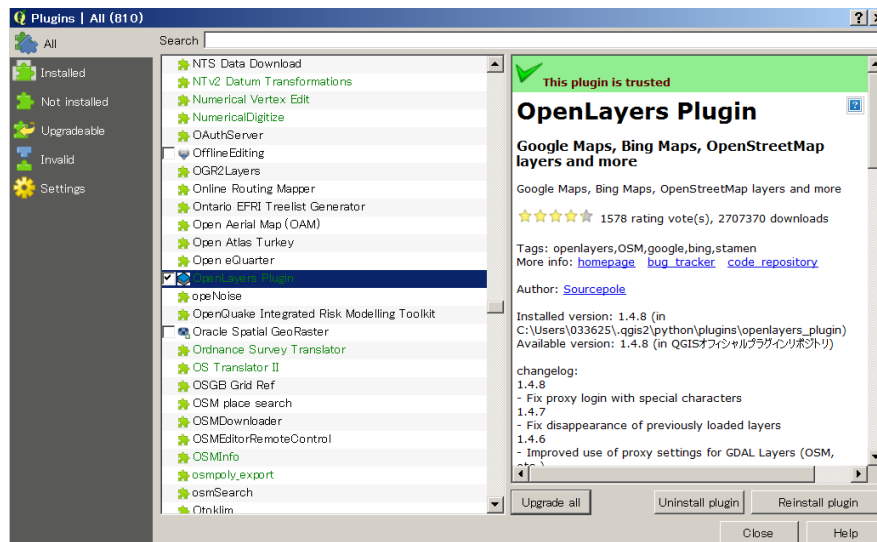
1-1: Инсталација на QGIS

Ако софтверот QGIS не е инсталиран на вашиот компјутер, одете на веб-страната на QGIS (<https://qgis.org/en/site/forusers/download.html>), преземете ја и инсталирајте ја најстабилната верзија на софтверот QGIS.



1-2: Спецификација на целната област

По инсталирањето на софтверот QGIS, отворете го QGIS и преминете на **Plugins > Manage and Install Plugins** и инсталирајте го приклучокот **OpenLayers**.

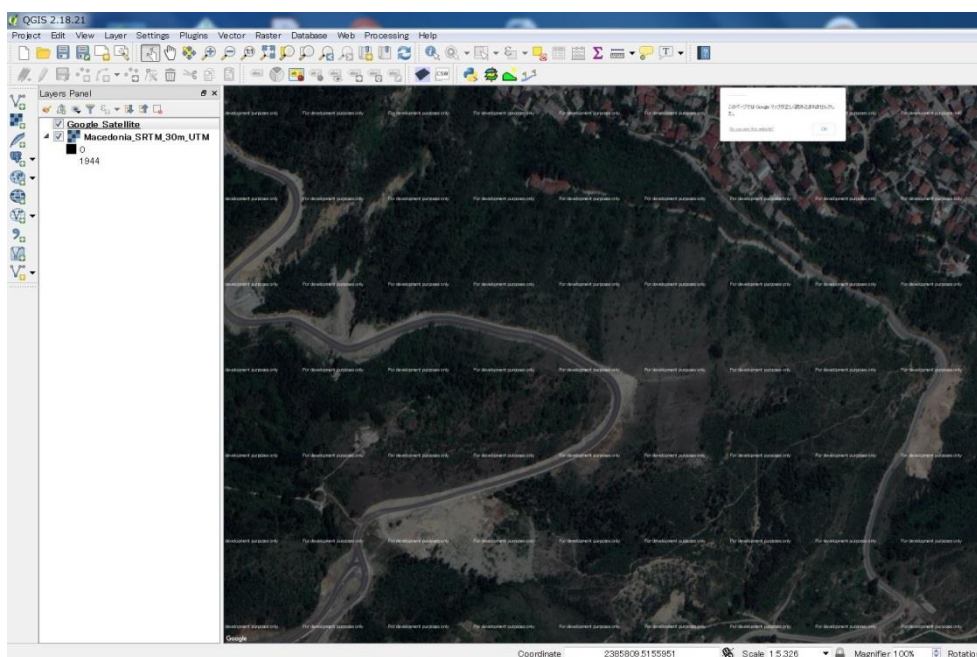


1-2: Спецификација на целната област

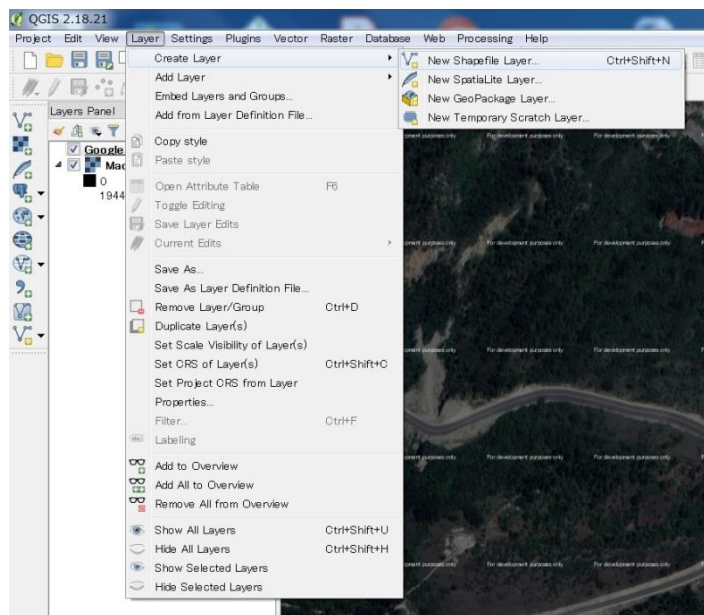
По инсталирањето на софтверот QGIS, отворете го QGIS и преминете на Plugins > Manage and Install Plugins и инсталирајте го приклучокот OpenLayers.



Сликите на Google се прикажуваат на гледачот. Зумирајте во целната област на летот на UAV.

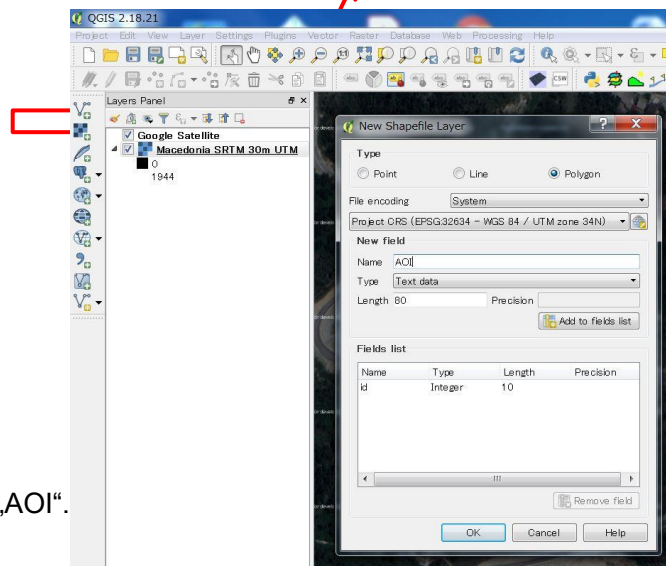


Премести во Layer>Create Layer>New Shapefile Layer



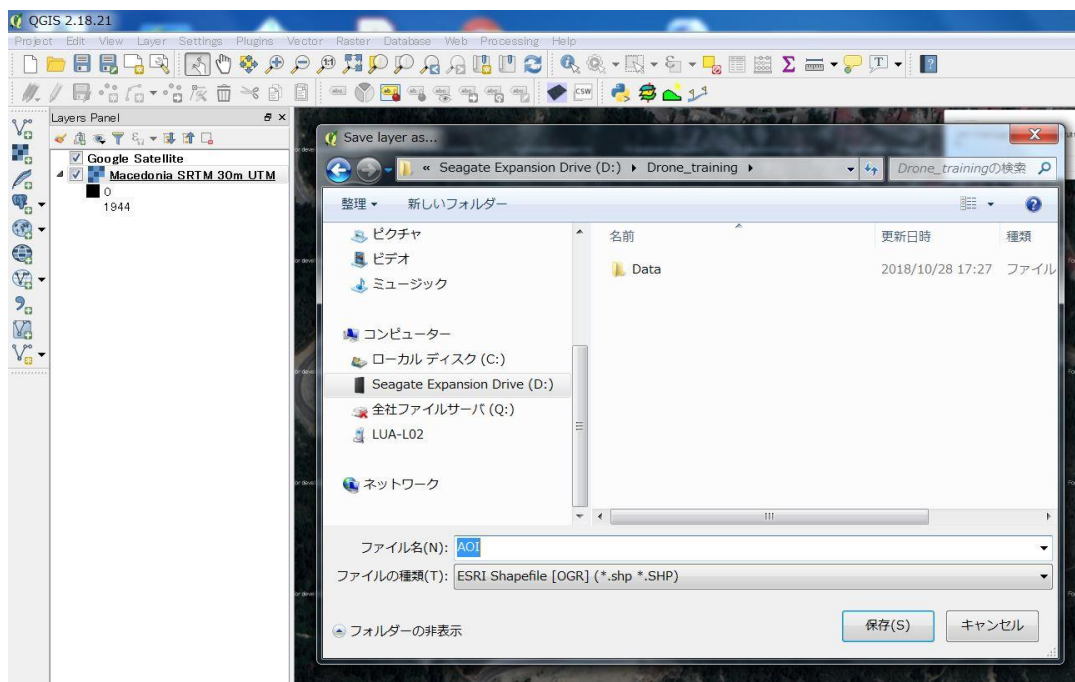
Во панелот New Shapefile Layer, изберете Polygon. Кликнете на дното за заземјување за да го отворите панелот за избирање на референтен систем за координација.

Внесете „32634“ во Филтер и изберете WGS 84 / UTM зона 34N. Внесете го името на

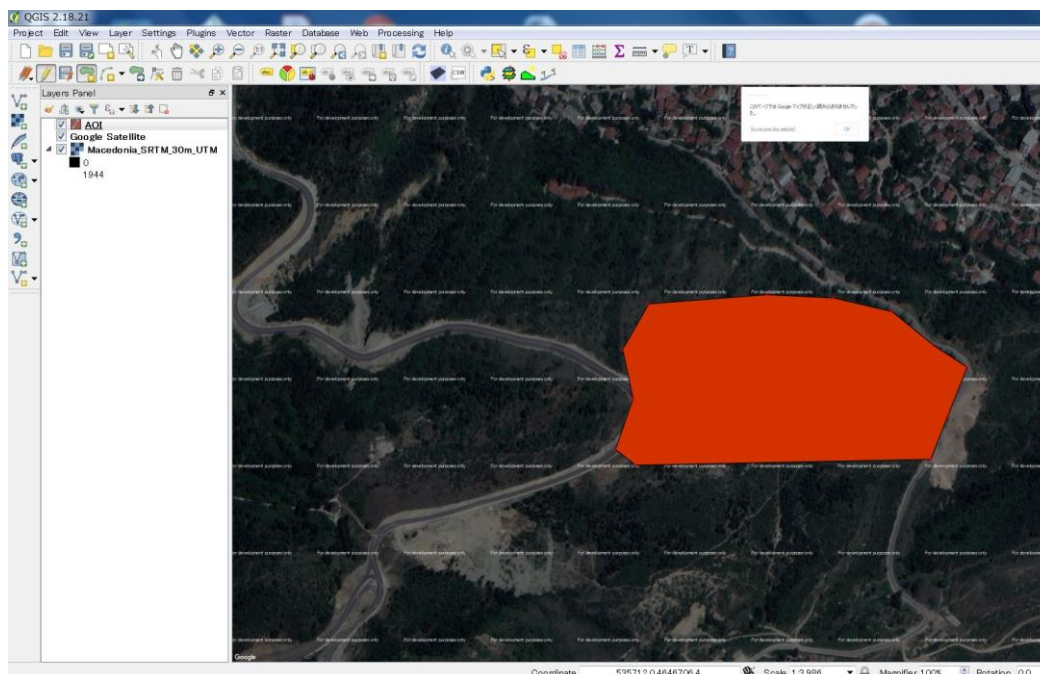


полето во Име како „AOI“.

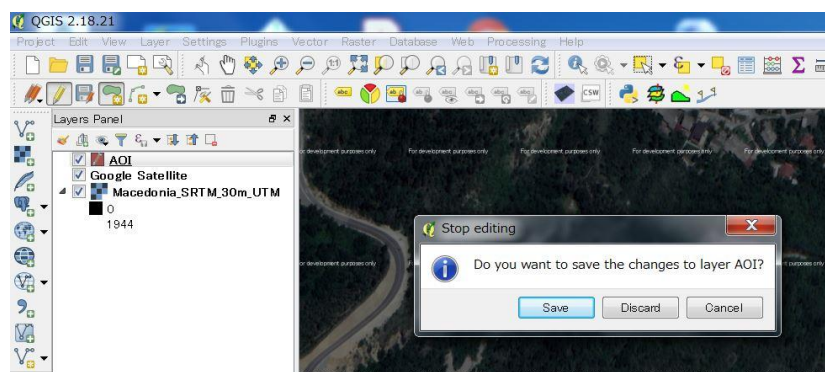
Внесете го името на датотеката како „AOI“ и кликнете Зачувај.



Вклучете Toggle Editing во лентата со алатки и нацртајте полигон за да ја одредите целната област на летот на UAV.

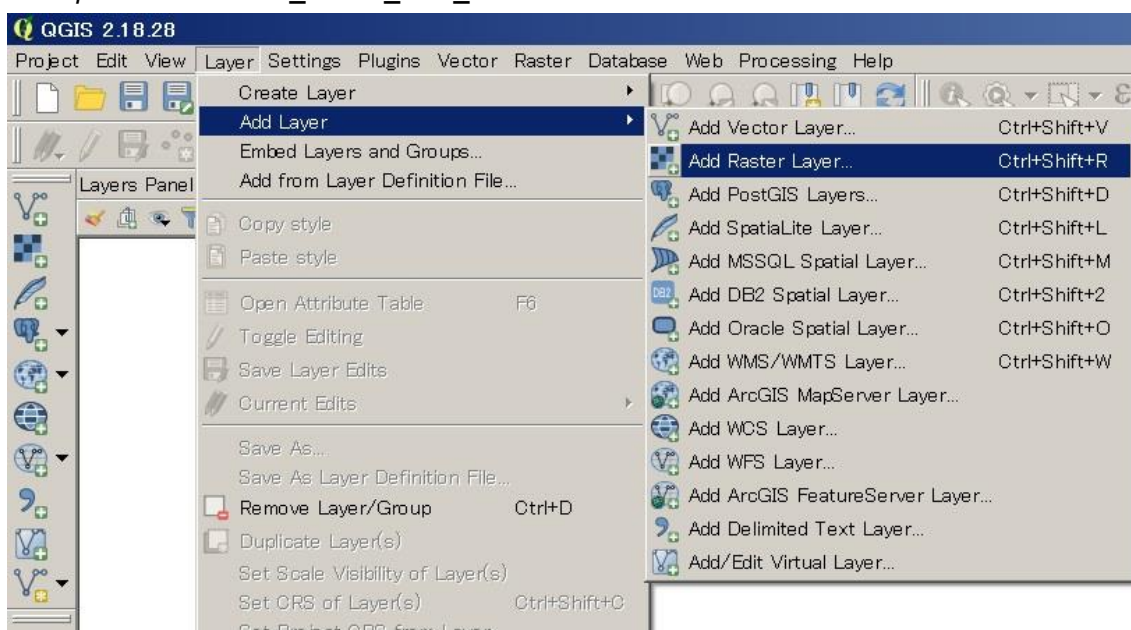


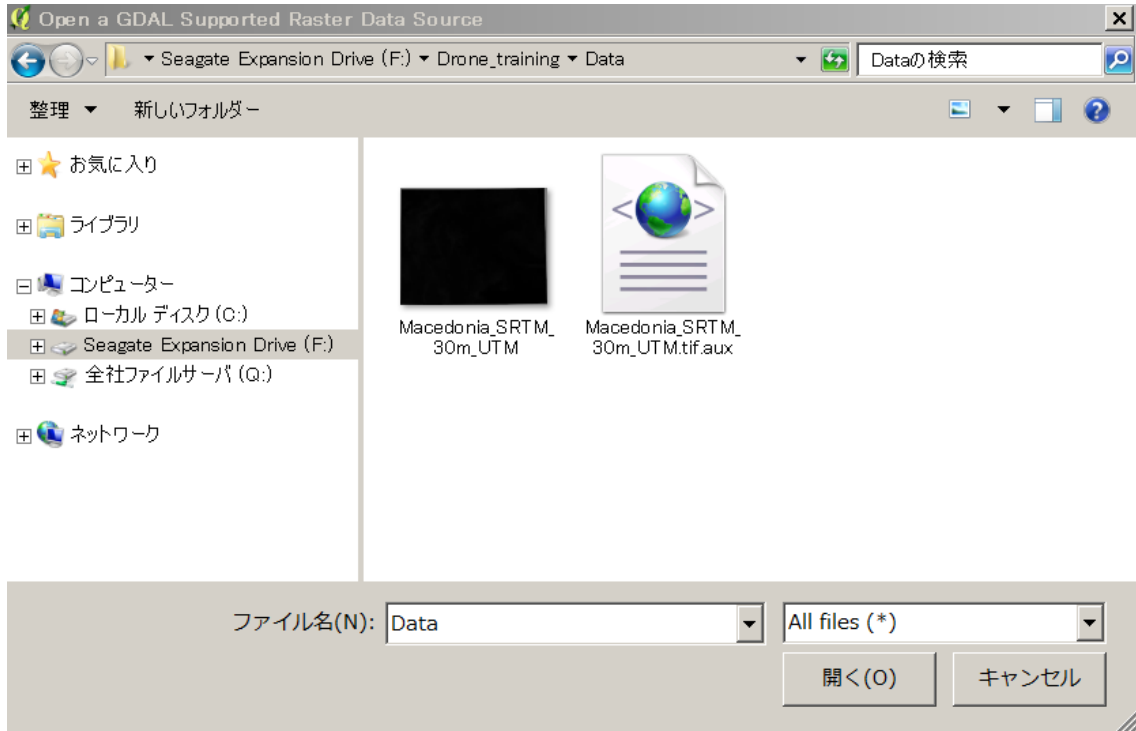
Откако ќе завршите со цртањето, исклучете го копчето за уредување на дното и кликнете Зачувај.



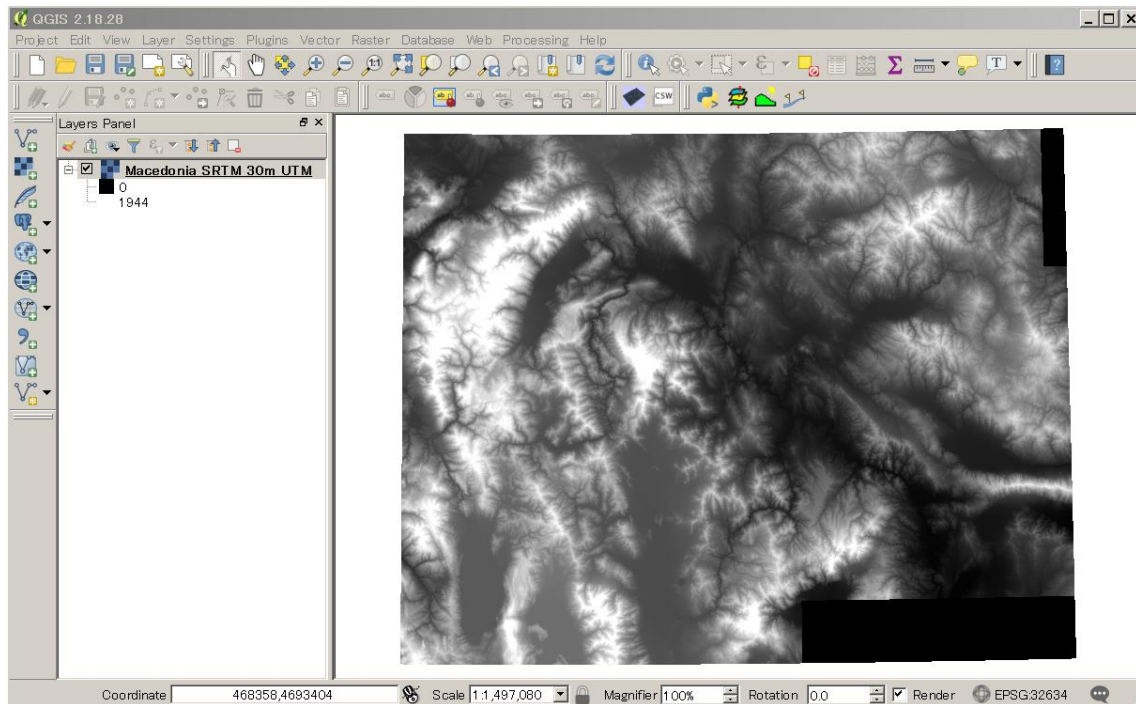
1-3: Стратификација на целната површина според висината на земјата

Одете во *Layer>Add layer>Add Raster Layer* и изберете папка (*Drone_training>Data*) и отворете *Macedonia_SRTM_30m_UTM.tif*

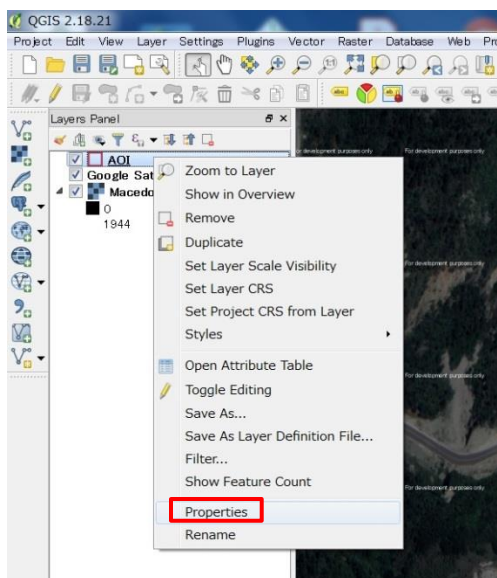




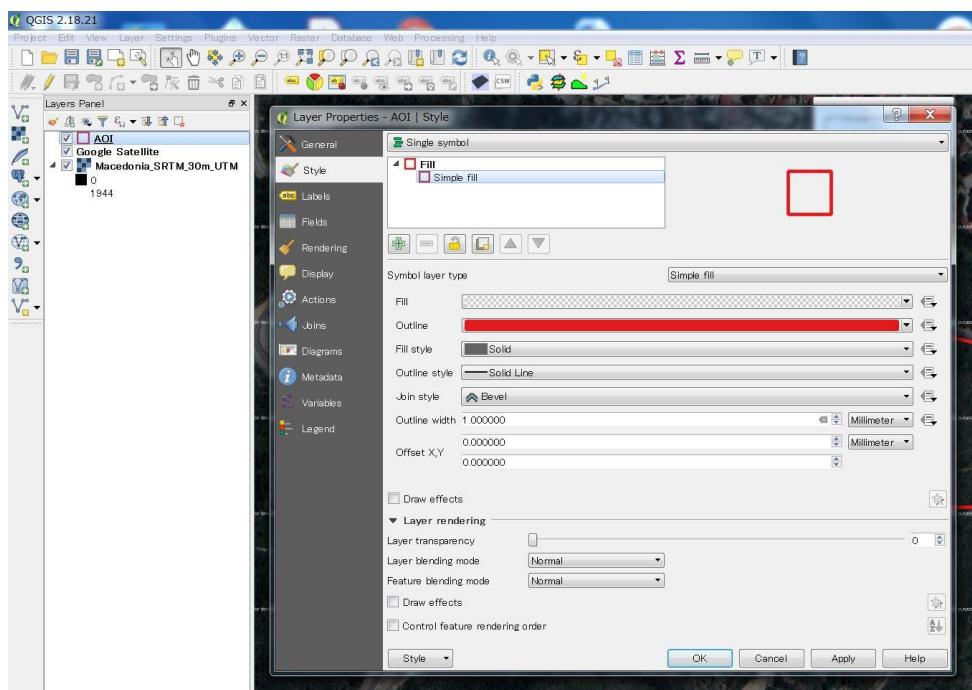
SRTM DEM се прикажува на панелот.



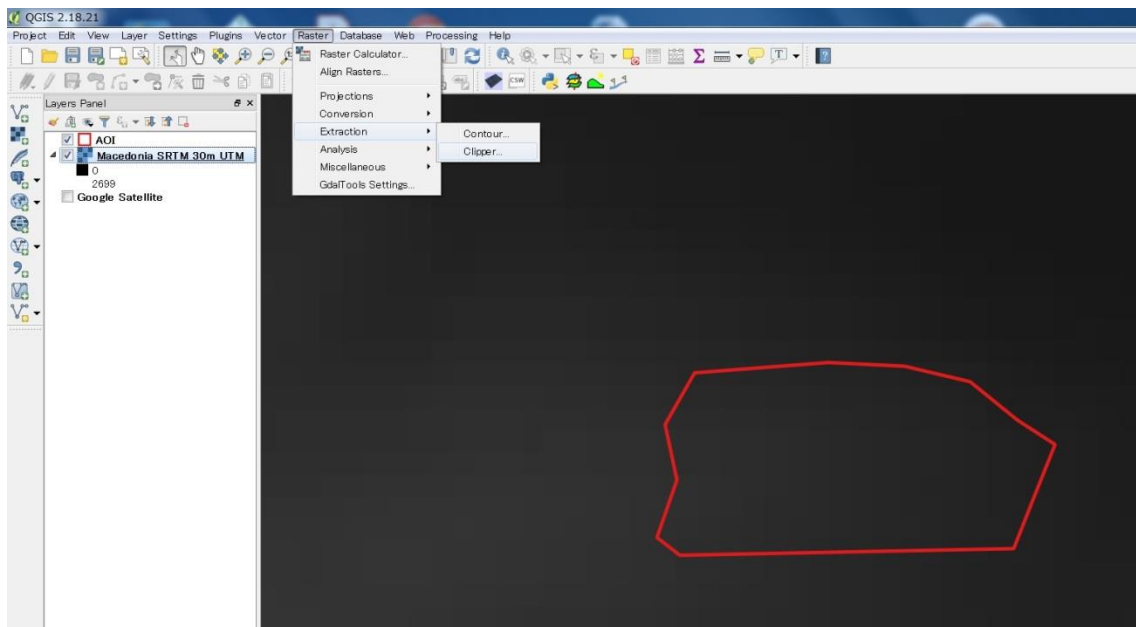
Кликнете со десното копче на слојот „AOI“ и изберете **properties**.



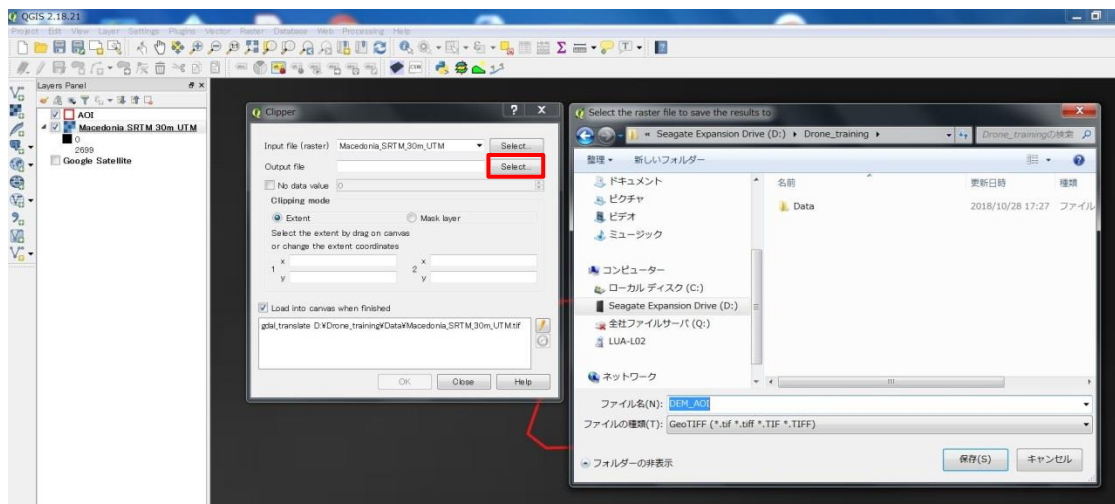
Се отвора панелот за својства на слојот. Во картичката **Стил**, изберете **Едноставно пополнување**. Во **Пополнете**, изберете **Транспарентно пополнување**. Во **Outline**, наведете ја бојата на границата на многуаголникот. Во **Outline width**, наведете ја ширината на границата на многуаголникот. Кликнете на **OK**.



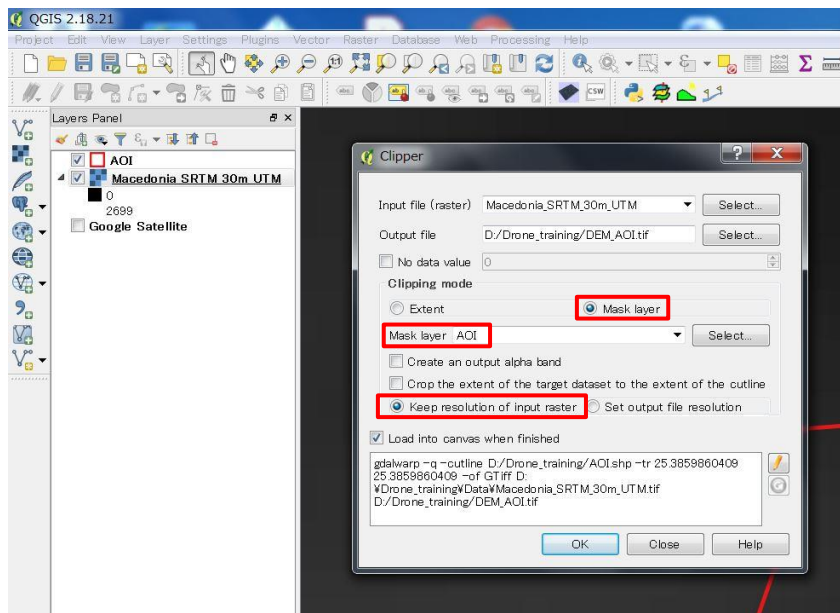
Отворете *Raster>Extraction>Clipper*



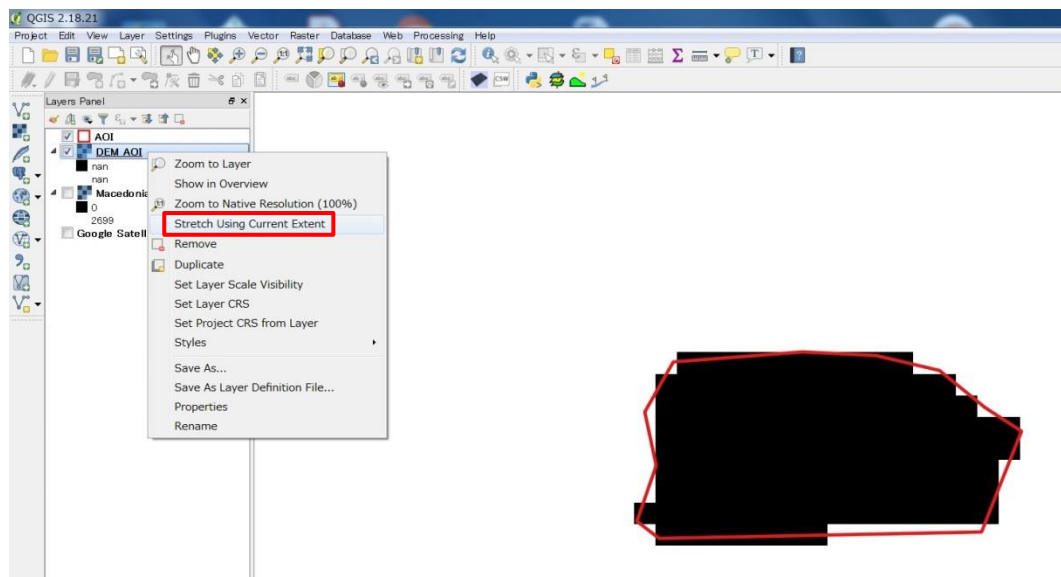
Се отвара *Clipper* panel. Во *Output file*, кликнете *Select* bottom. Слектирај те излезен фајл “DEM_AOI”.



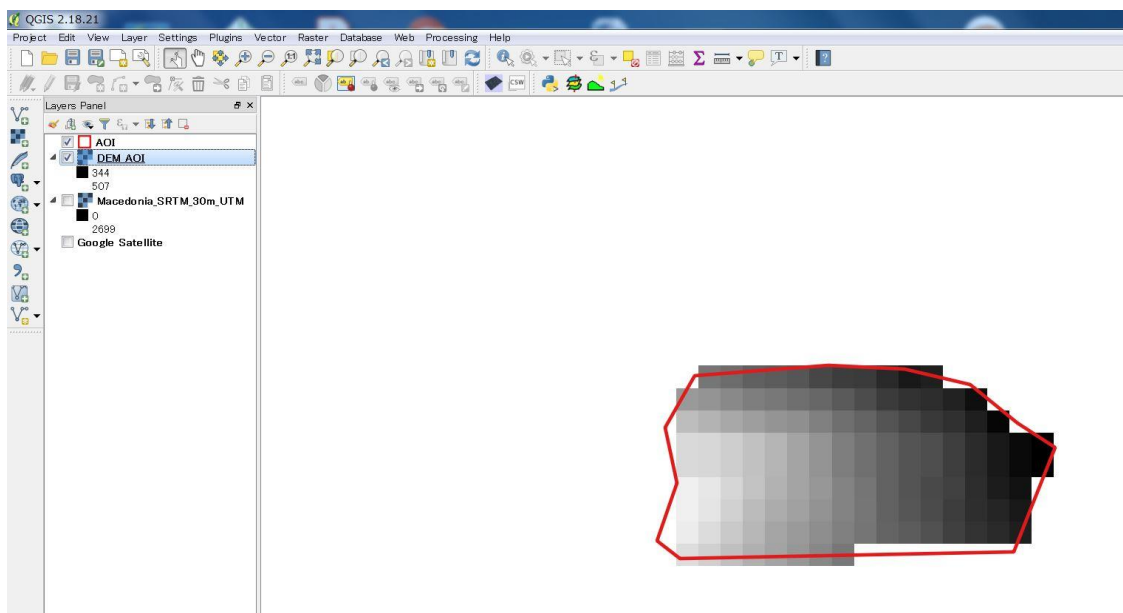
Се отвара панелот Layer Properties. Во Clipping mode, селектирај те Mask layer. Во Mask layer селктирај те го layer of "AOI". Селектирај те Keep resolution of input layer. Кликнете **OK**.



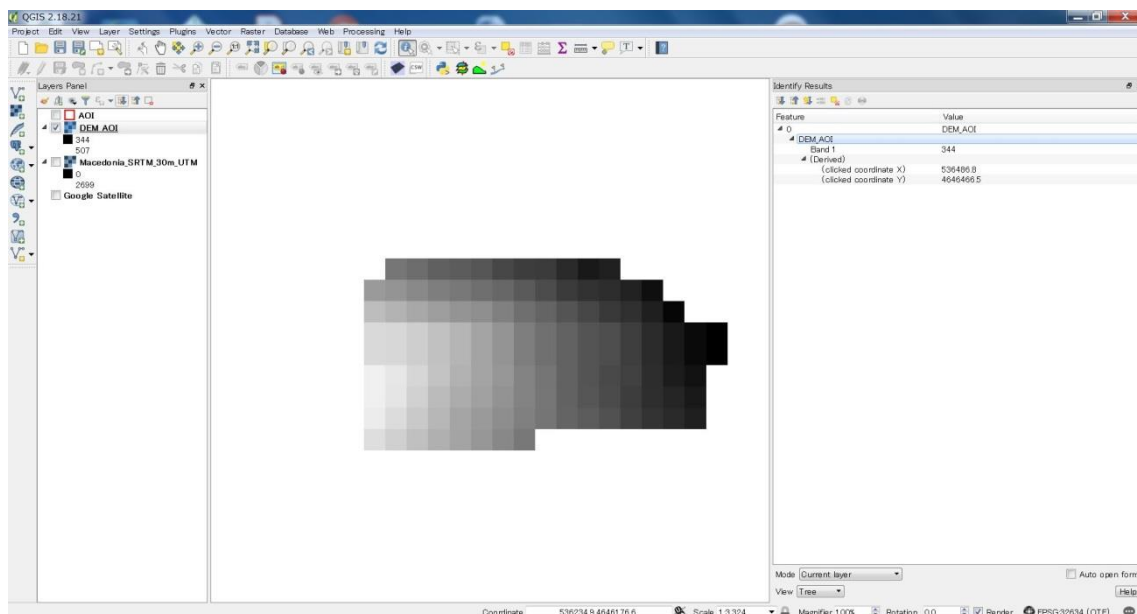
По обработката, кликнете со десното копче на излезниот слој и изберете **Stretch Using Current Extent**.



DEM се прикажува со сивата скала на топографската висина.



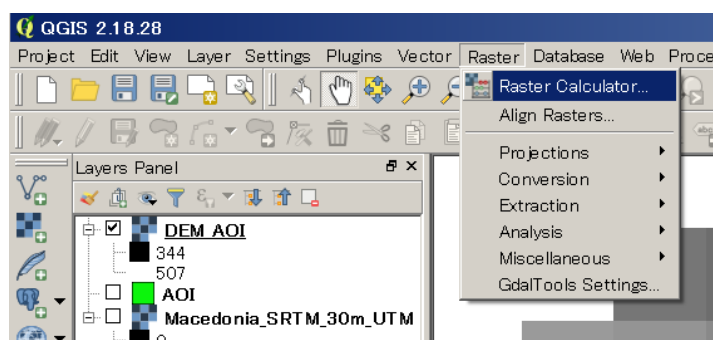
Кликнете го **Identify Features** копче, и кликнете на еден пиксел од DEM. Топографската висина на пикселот се прикажува во панелот **Identify Features**. Забележано е дека оваа област има висинска разлика приближно помеѓу 348m и 498m.



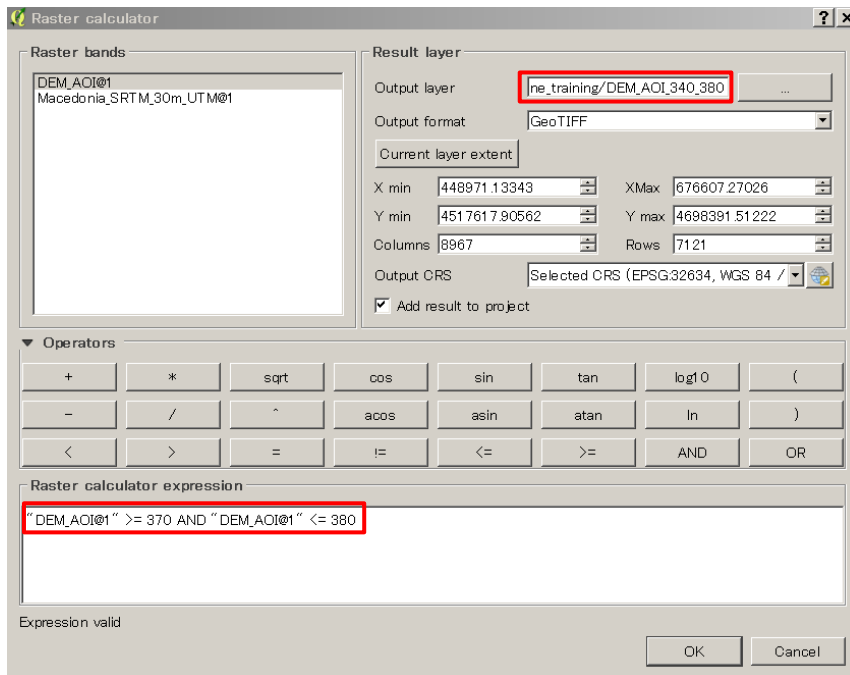
Во оваа вежба се поставени пет области за летање. Секоја област на летање ја покрива висинската разлика на земјата од 40 метри и секоја област на летот има 10 метри висински преклопувања со соседните.

	Ground height covered
Flight 1	340m to 380m
Flight 2	370m to 410m
Flight 3	400m to 440m
Flight 4	430m to 470m
Flight 5	460m to 500m

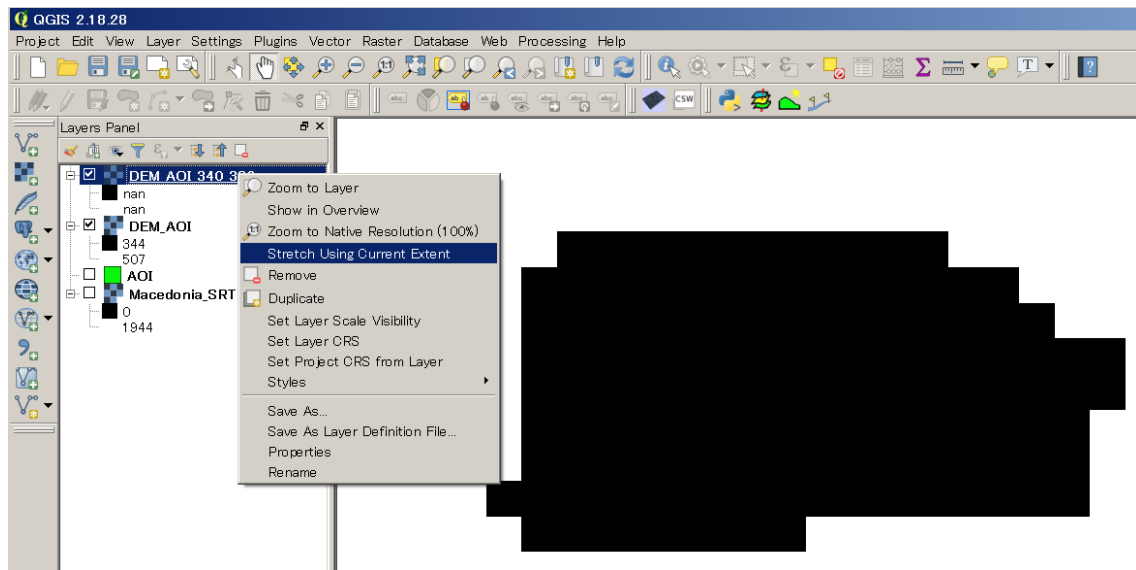
Одете во *Raster>Raster Calculator*



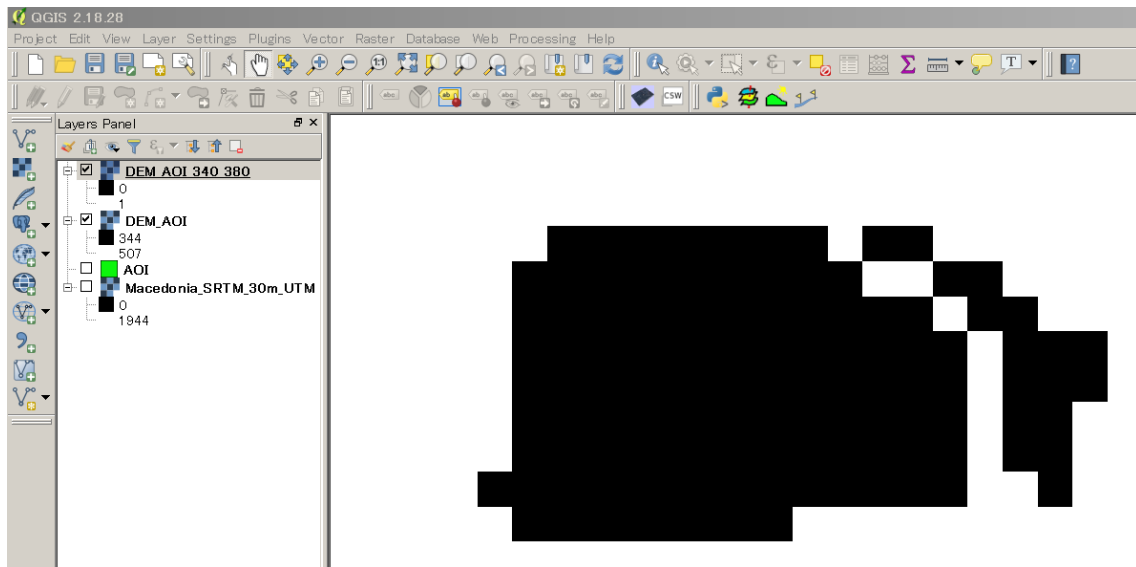
Се отвора панелот на Растерски калкулатор. Во Output layer, наведете ја излезната датотека. Во Растерскиот калкулаторски израз, внесете ја пресметката за да се извлечат височините на земјата помеѓу 340 m до 380 m за летот 1 како „DEM_AOI@1“ >= 370 И „DEM_AOI@1“ <= 380“. Кликнете **OK**.



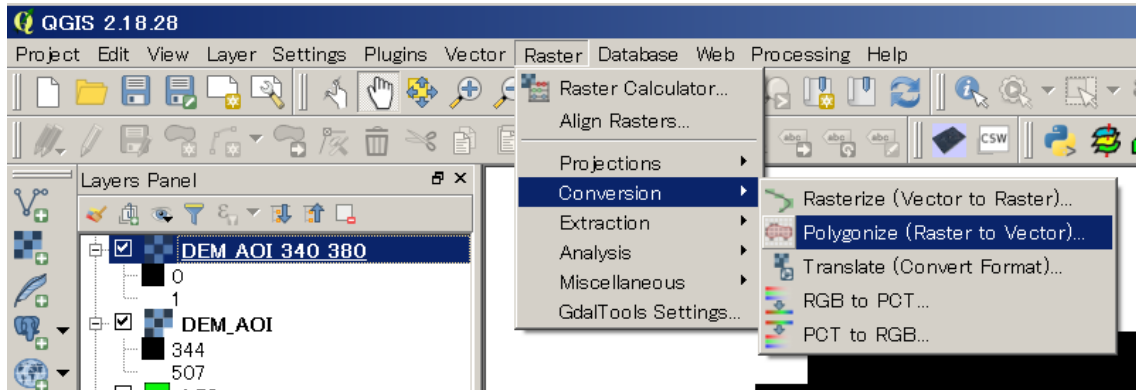
По обработката, кликнете со десното копче на излезниот слој и изберете Stretch Using Current Extent.



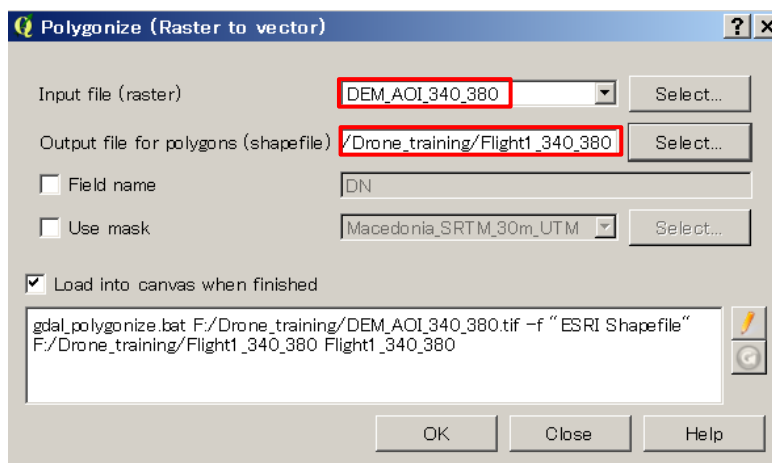
Поставката за боја се менува за да ја прикаже површината од 340 m до 380 m.



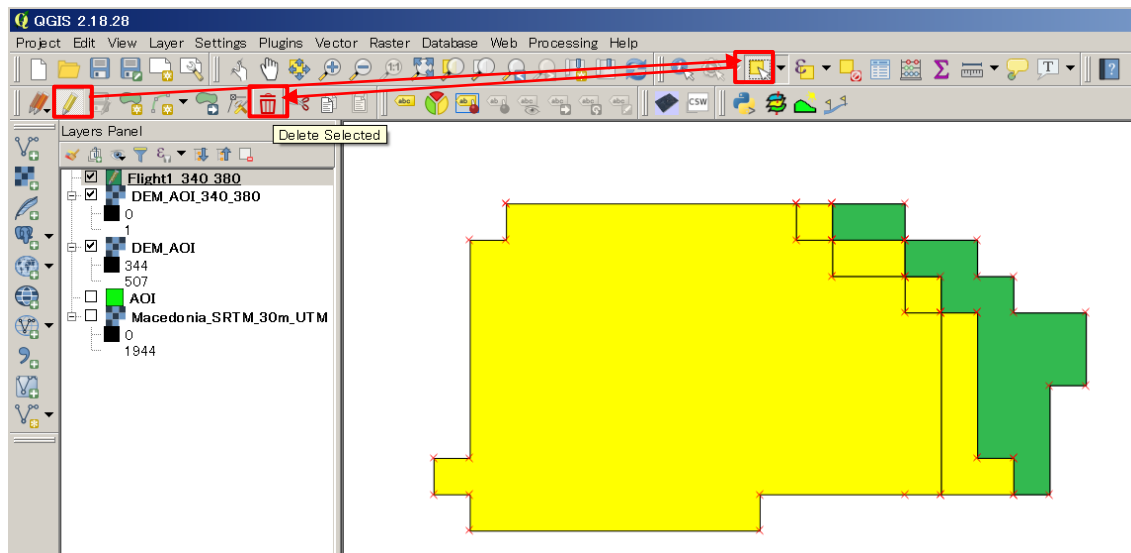
Одете во *Raster>Conversion>Polygonize (Raster to Vector)*



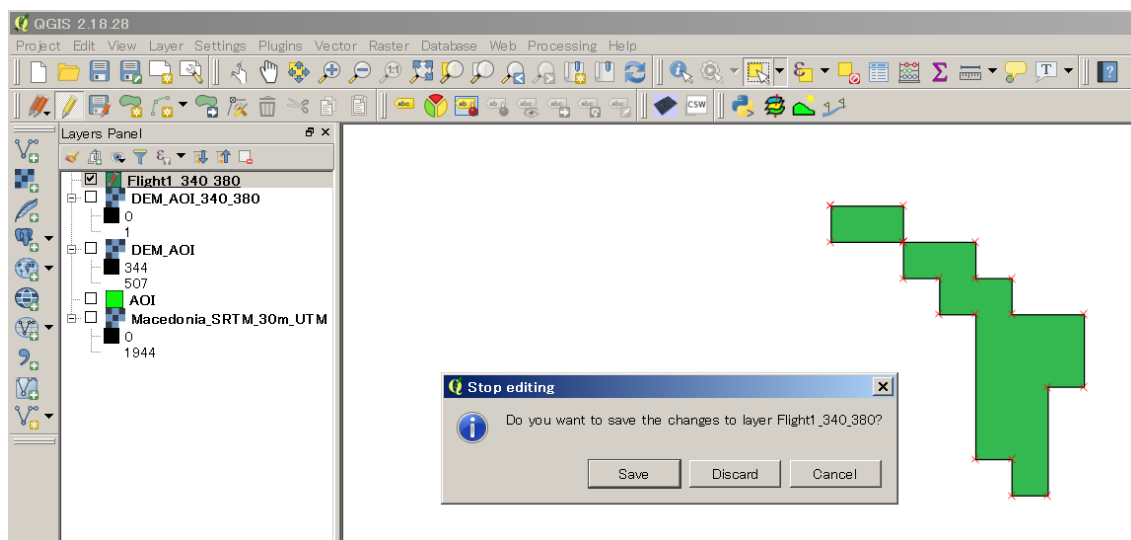
Се отвара панелот *Polygonize (Raster to Vector)*. Во *Input file (raster)*, слектирај те го DEM (DEM_AOI_340_380) за Flight 1. Во *Output file for polygons (shapefile)*, специфицирај те го Output file.Кликнете **OK**.



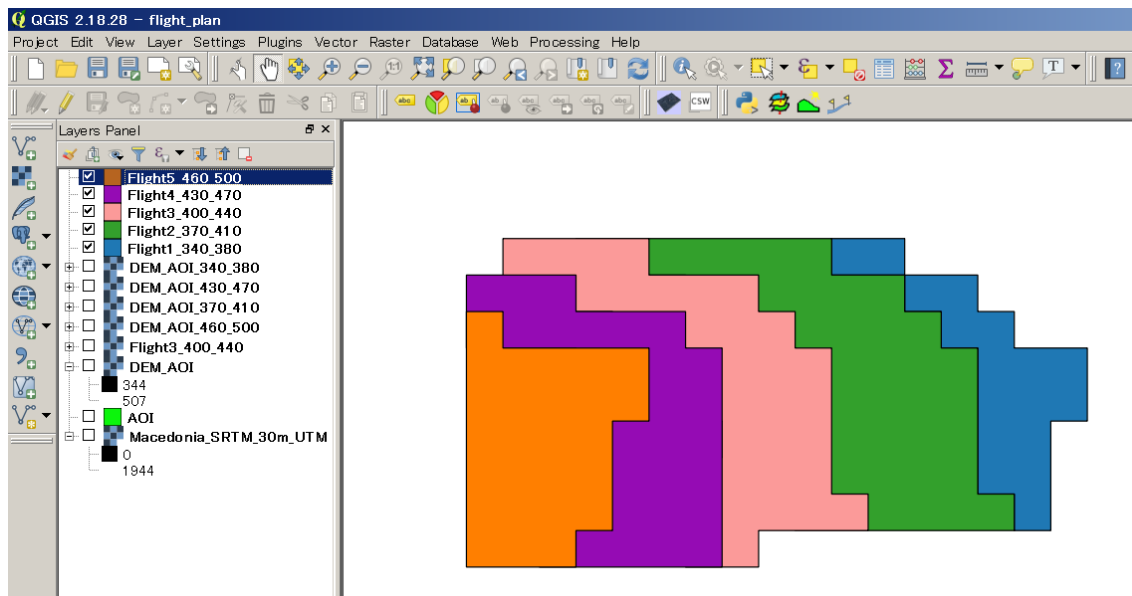
По обработката, се прикажува излезната датотека. Вклучете го долниот дел од Уредување со префрлување, долниот дел од Изберете функција(и) и изберете полигони различни од 340м до 380м и кликнете на копчето Избриши избрано.



Вклучете го **Toggle Editing** копчето, и притиснете **Save**.

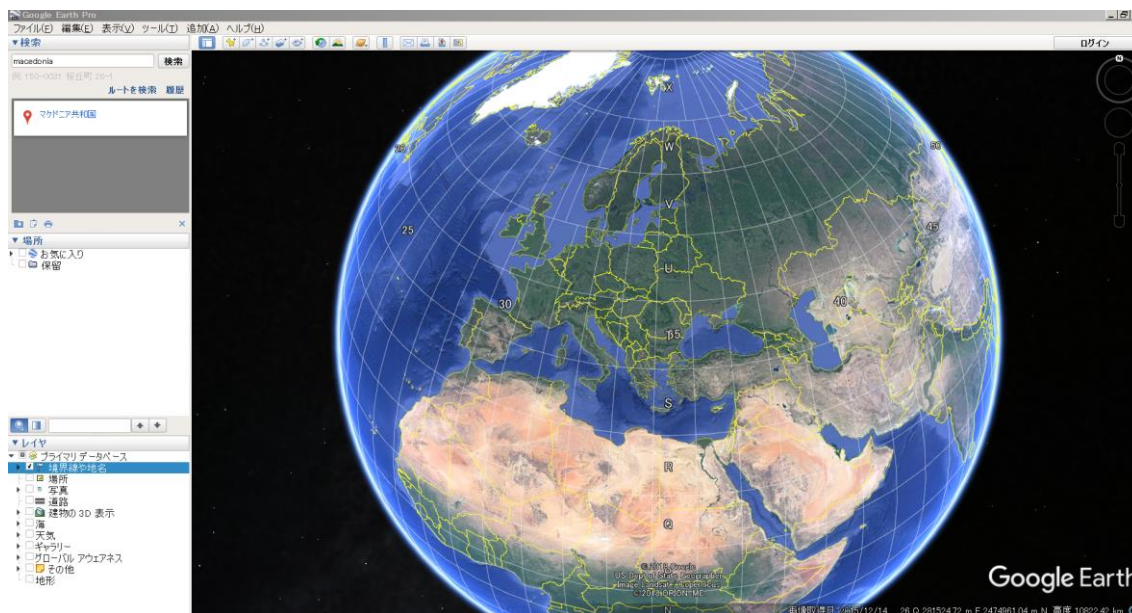


Повторете го овој процес за други области на летот.

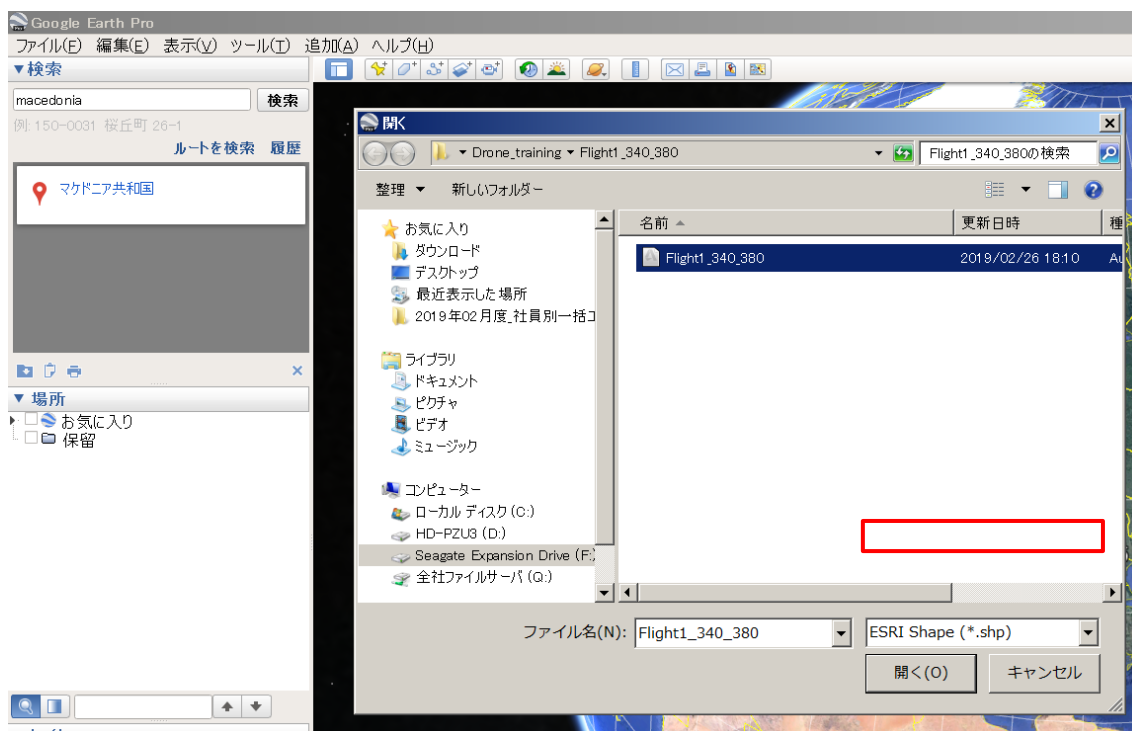


1-3: Креирајте KML-датотека од областа на летот

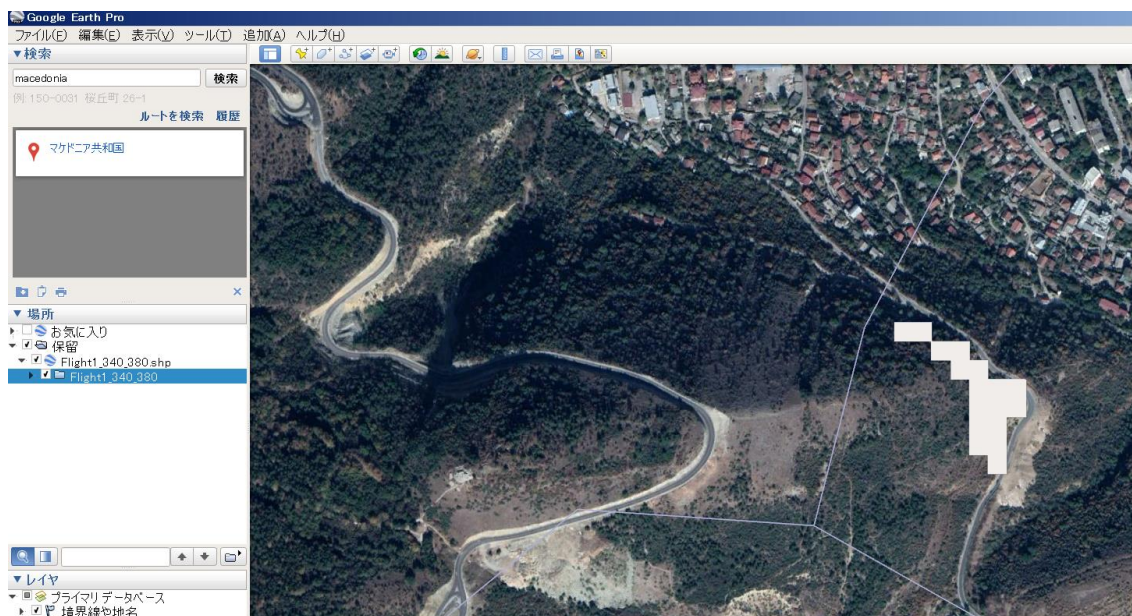
Отворете Google Earth Pro (инсталирајте Google Earth Pro ако не е инсталиран).



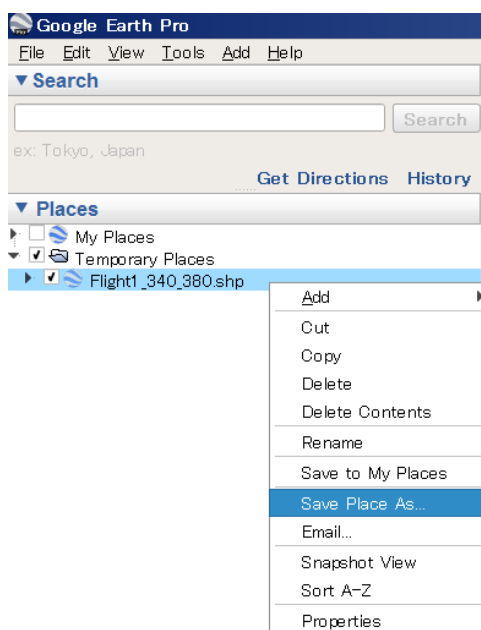
Одете во *File>Open*. Селектирај те ESRI Shape (*.shp) и изберете ја креираната датотека со областа на летот.



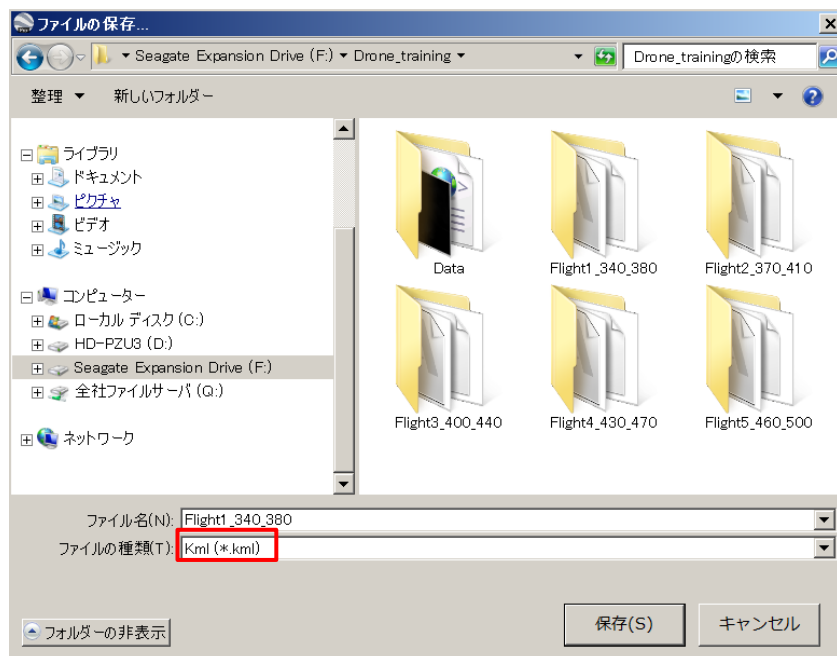
Датотеката од областа на летот се прикажува на прегледувачот.



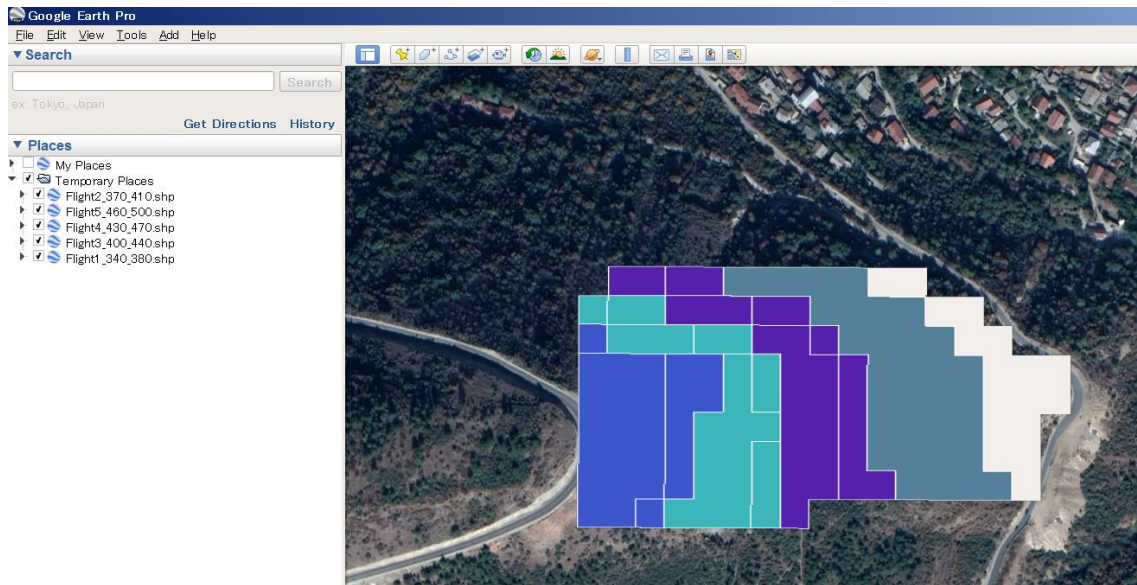
Десен клик на увезениот слој и изберете *Save Place As*.



Одете во излезната папка, изберете Kml (*.kml) како формат на датотека и наведете го името на датотеката. Кликнете **Save**.



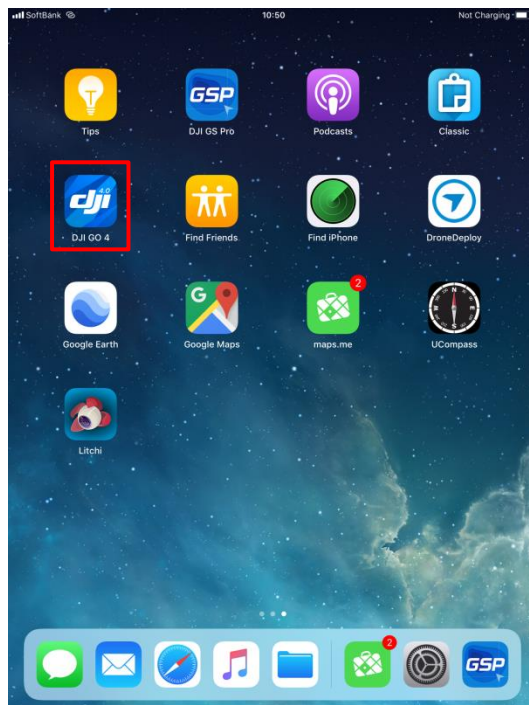
Повторете го овој процес за други области на летот.



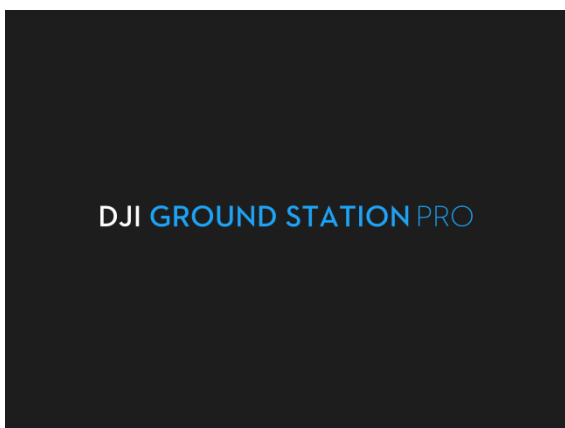
Чекор 2: Поставување план за лет за автоматско работење на UAV

2-1: Увезете датотека од областа на летот во DJI GS Pro

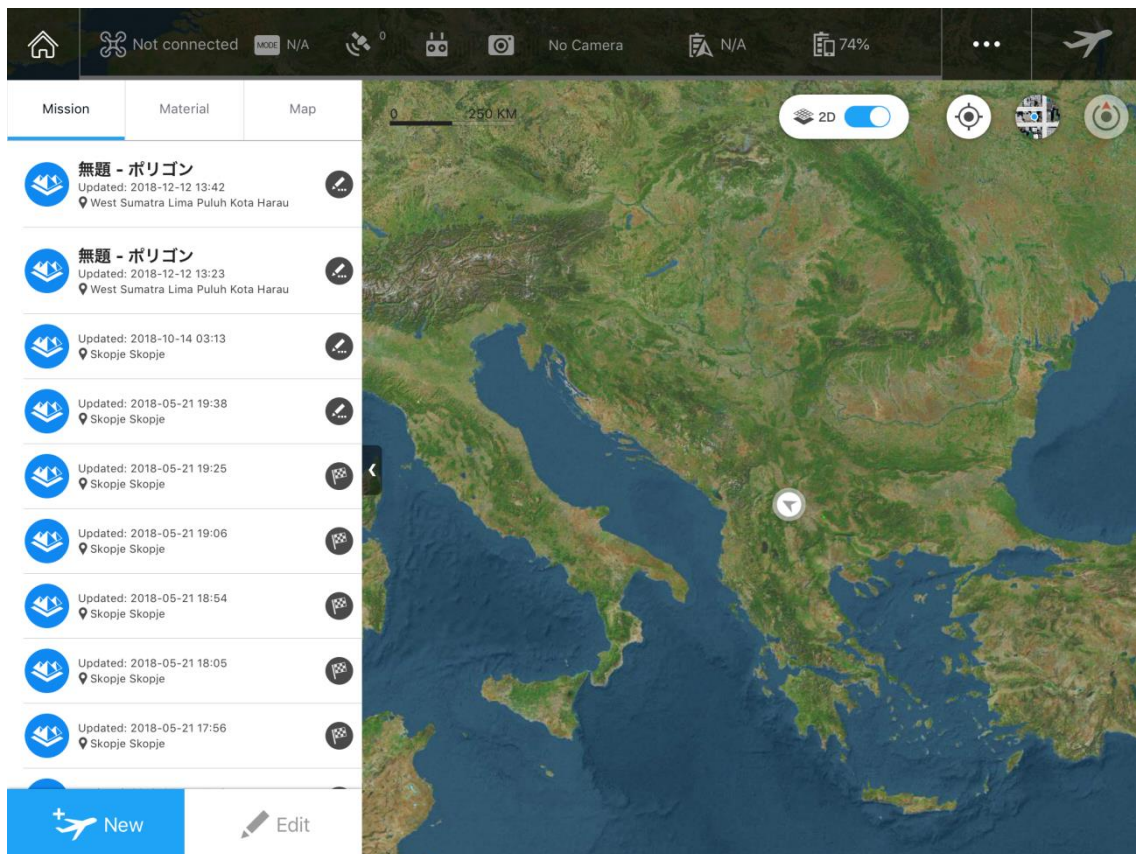
Вклучете iPad mini и допрете ја иконата DJI GS Pro за да го *стартувате*



DJI GS Pro.

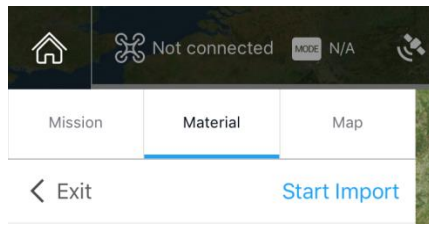
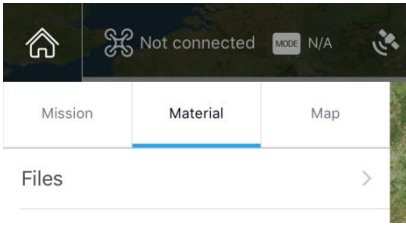


DJI GS Pro opens.

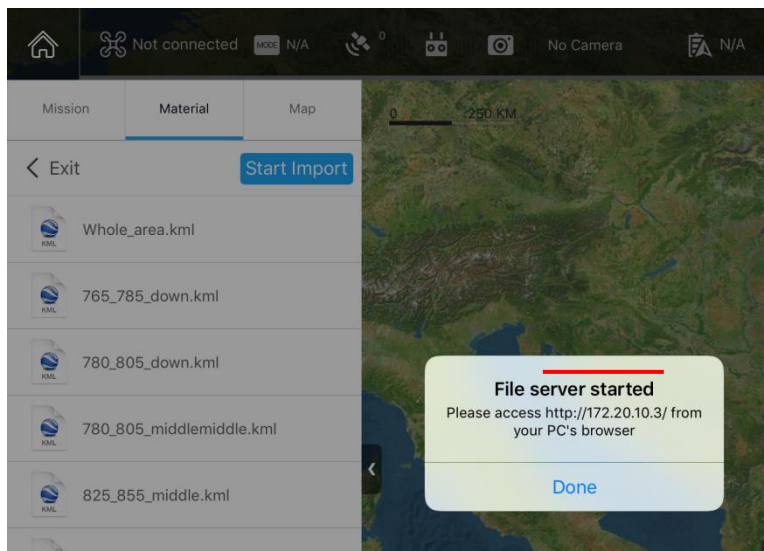


Физички поврзете го iPad mini со вашиот компјутер користејќи USB-кабел.

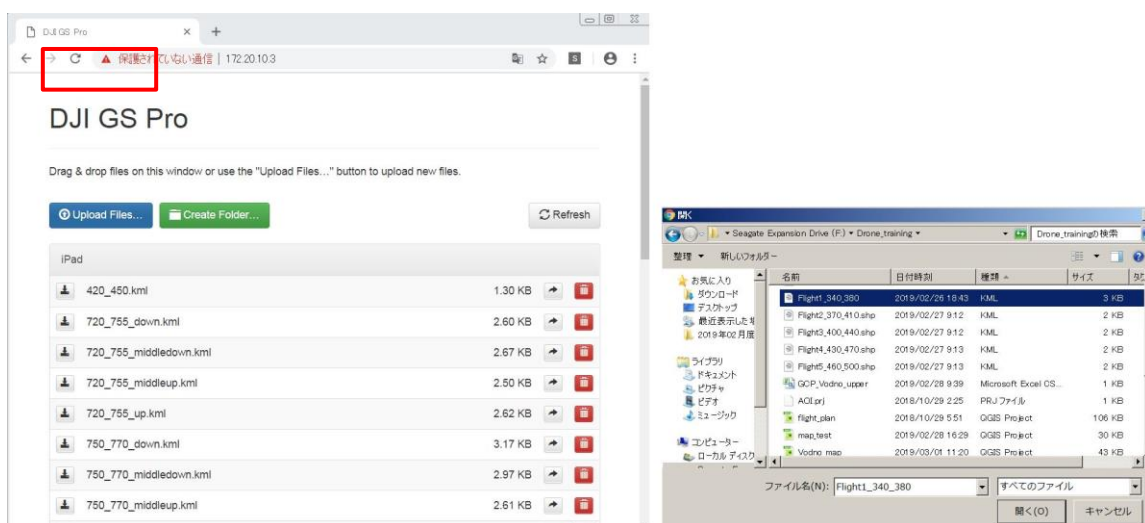
Move to *Material* > *Files*. Press **Start Import**.



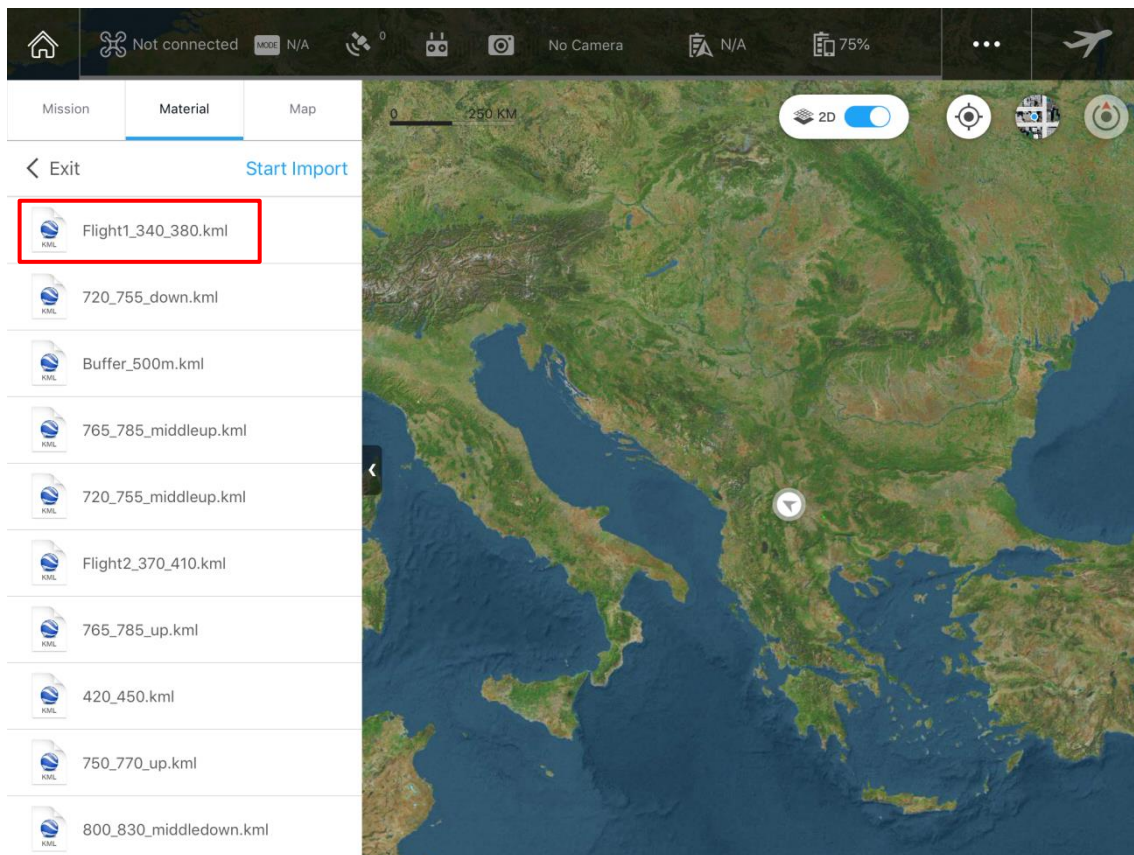
URL-то за пристап до серверот за датотеки се прикажува на панелот.



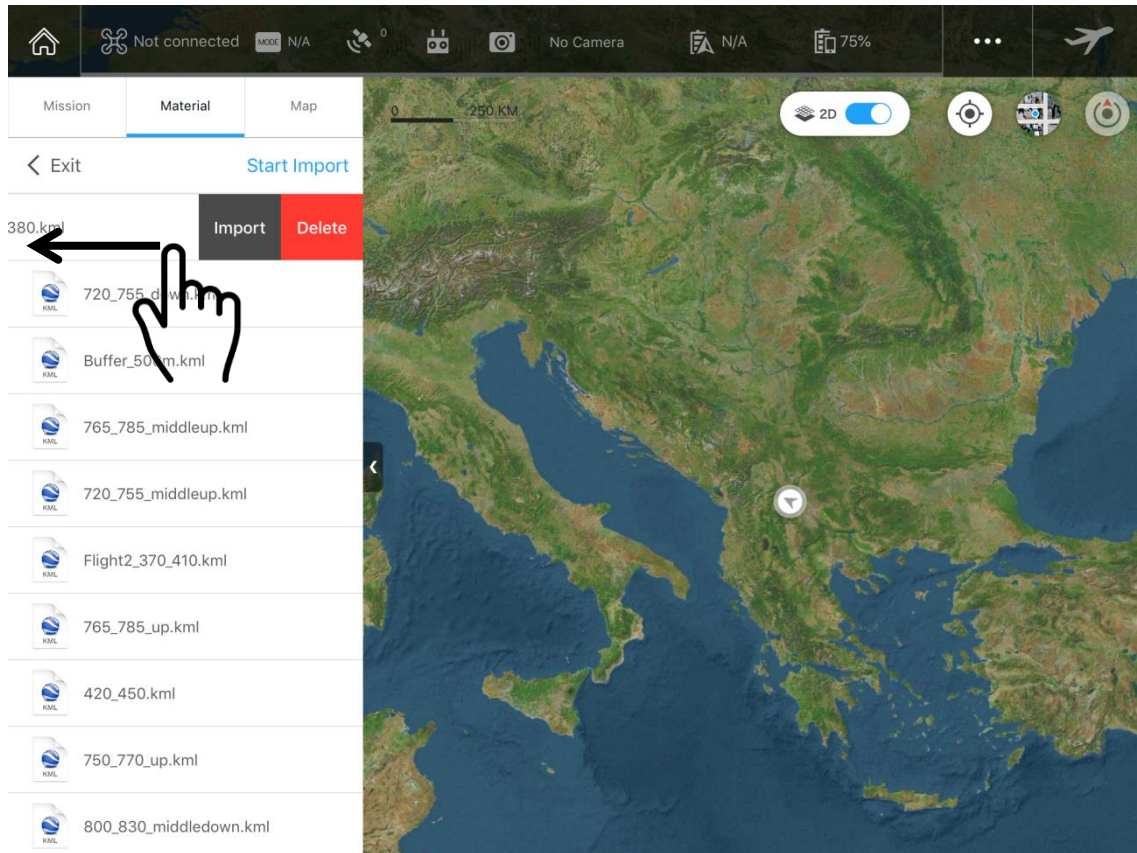
Отворете веб-прелистувач на компјутерот и внесете ја URL адресата. Потоа, се прикажува серверот за датотеки на DJI GS Pro. Кликнете Постави датотеки и изберете креирана KML-датотека за прикачување.



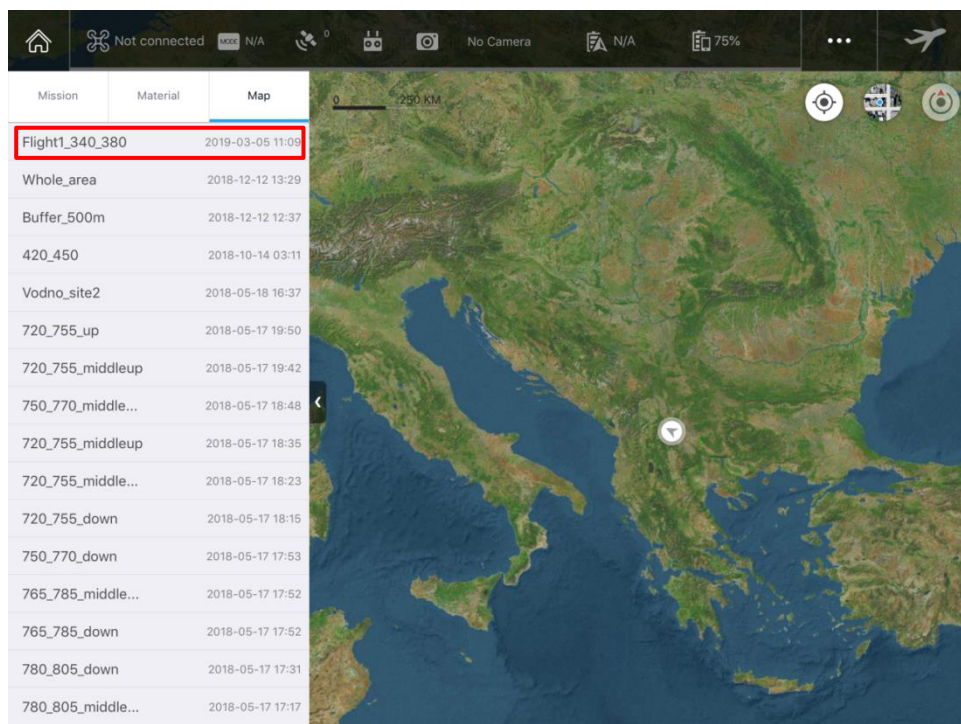
KML file к биде префрлено во to DJI GS Pro.



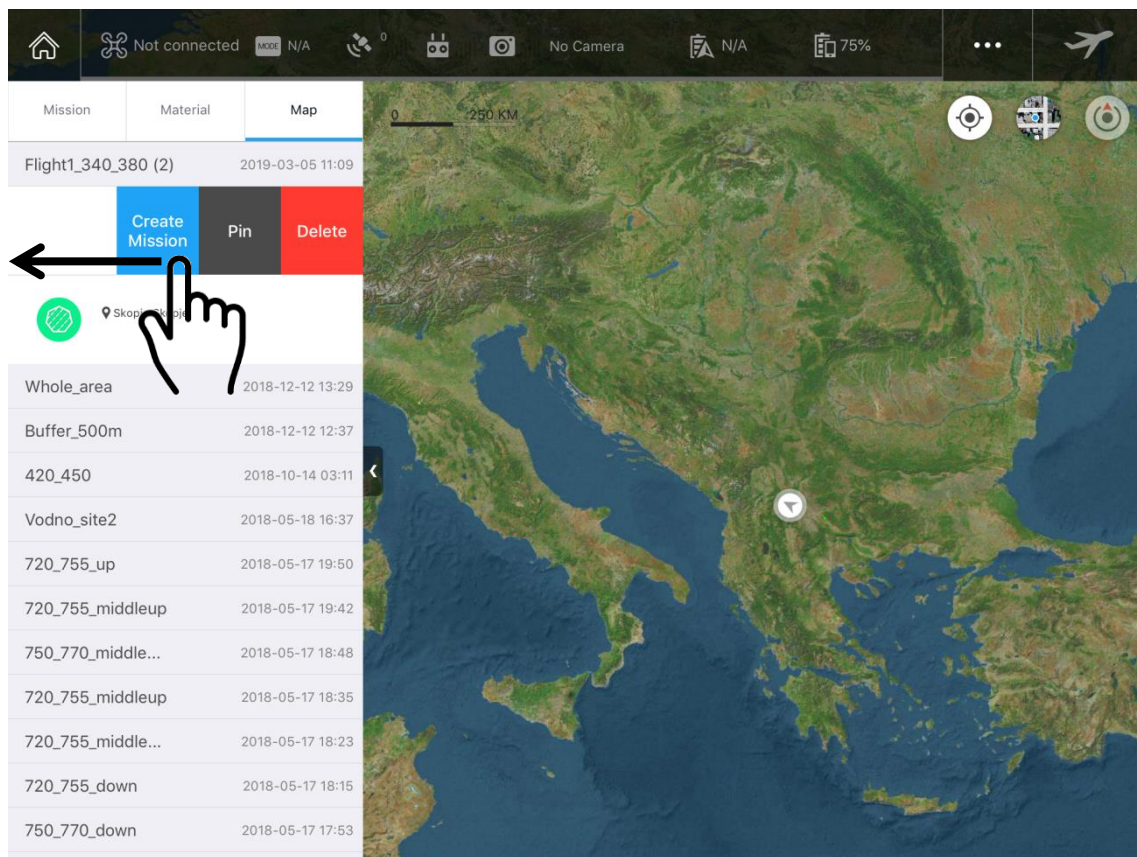
Повлечете ја поставената KML-датотека во левата насока и допрете **Import**.



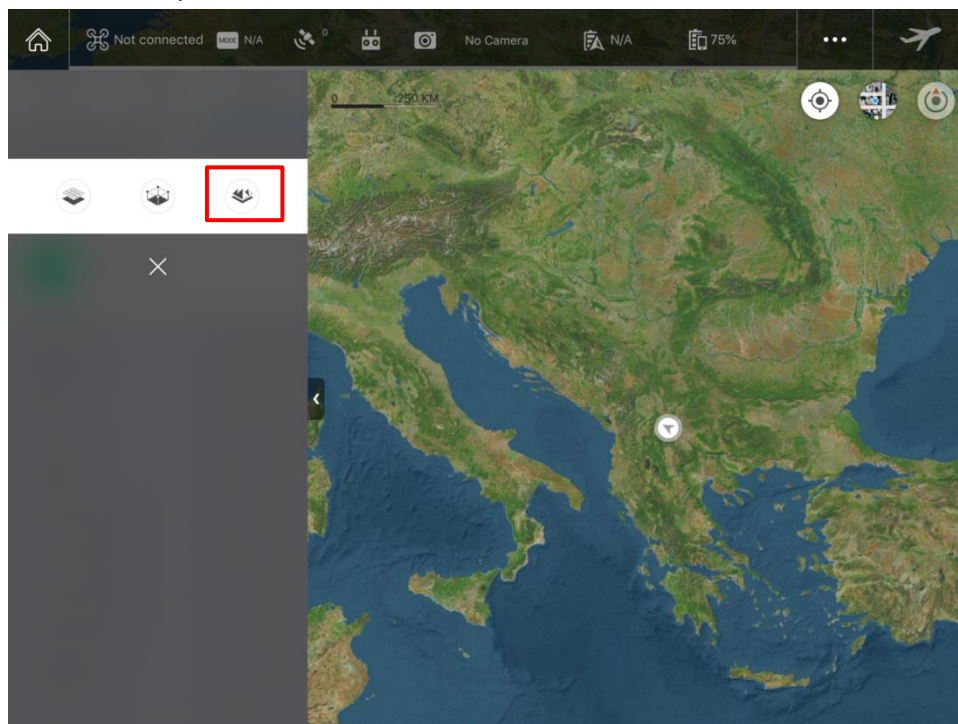
KML file is imported.



Повлечете ја увезената датотека KML во левата насока и допрете **Create Mission**.

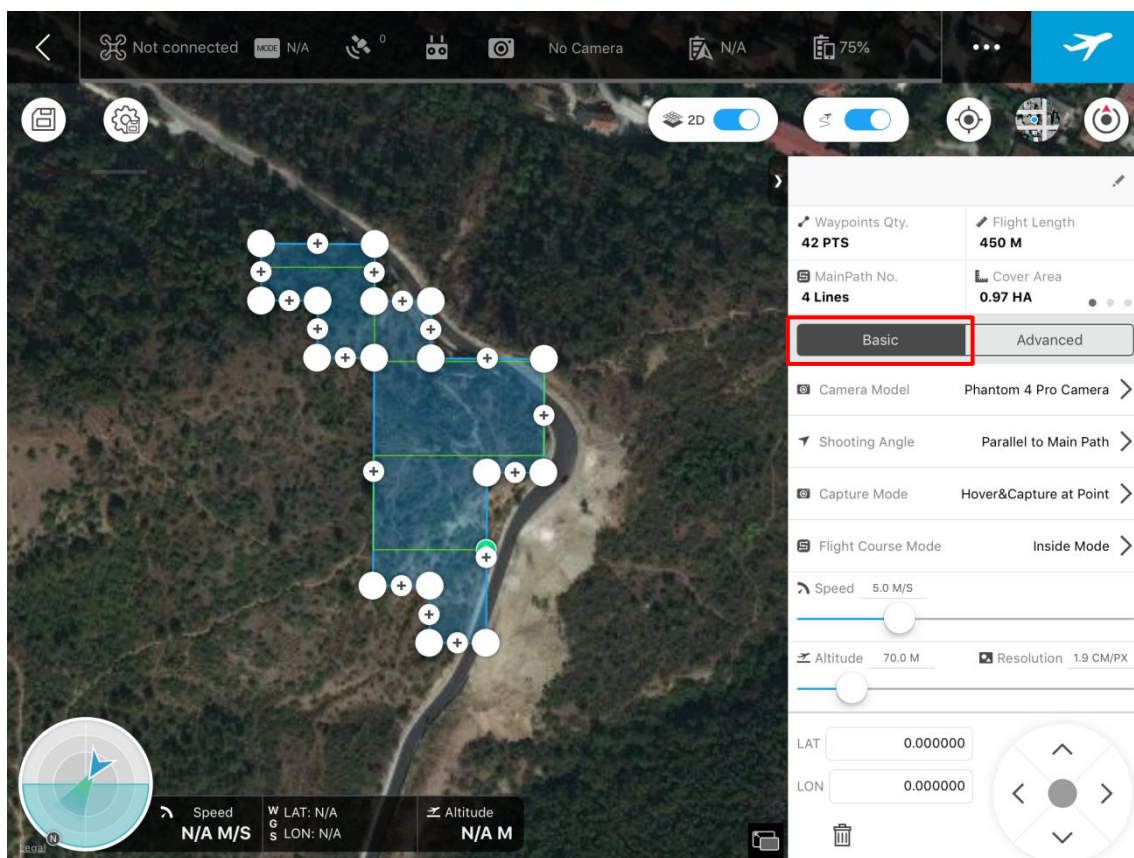


Select 3D Map.



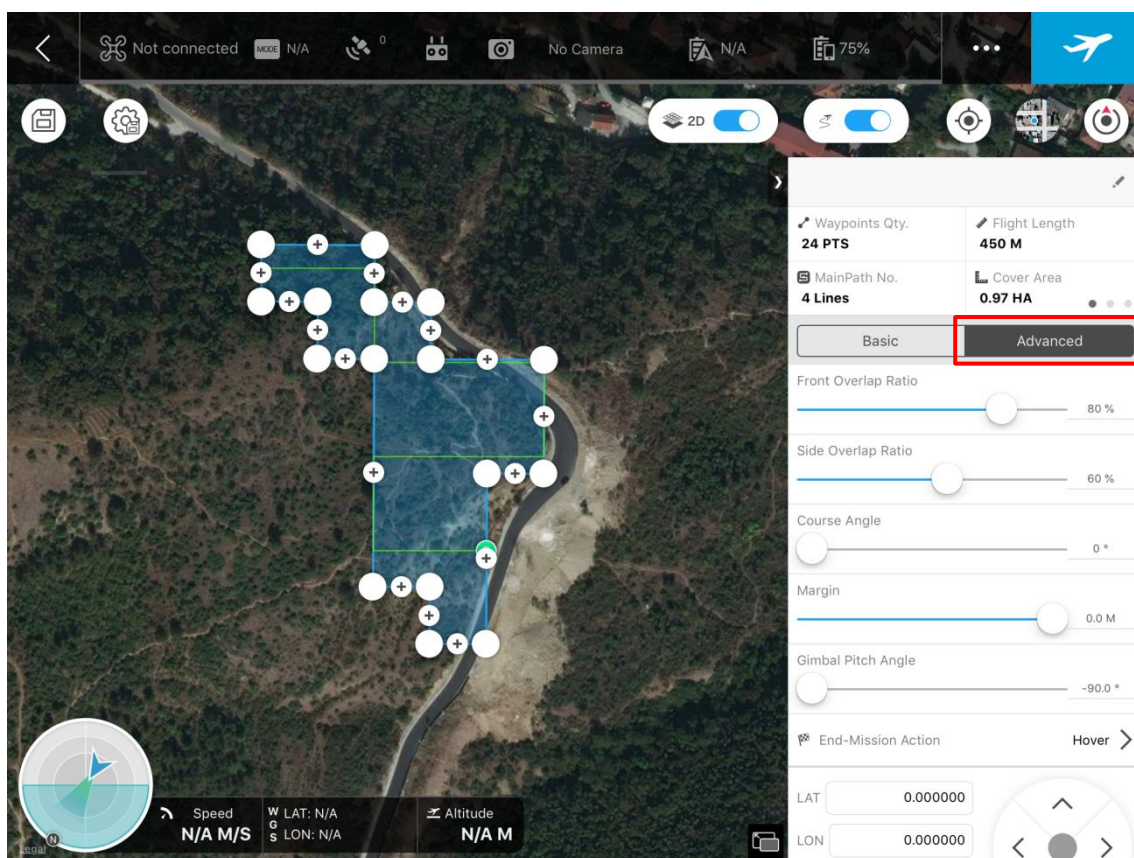
Областа на летот се прикажува на гледачот. Изберете Basic и поставете ги параметрите на летот на следниов начин.

- Модел на камера: Phantom 4 Pro Camera
- Агол на снимање: паралелно со главната патека
- Режим на фотографирање: Лебди и снимај во точка
- Режим на курс за летање: внатрешен режим
- Брзина: 5m/s
- Надморска височина: 70,0м



Изберете Напредно и поставете ги параметрите на летот на следниов начин.

- Сооднос на предно преклопување: 80%
- Сооднос на странично преклопување: 60%
- Агол на курсот: Лебди и фати во точка
- Режим на курс за летање: Поставете го аголот на патеката за да ја минимизирате должината на летот
- Маржа: 0,0 М
- Агол на висина на Гимбал: -90,0°
- Акција на крајната мисија: лебди



Чекор 3: Обработка на воздушна фотографија на UAV

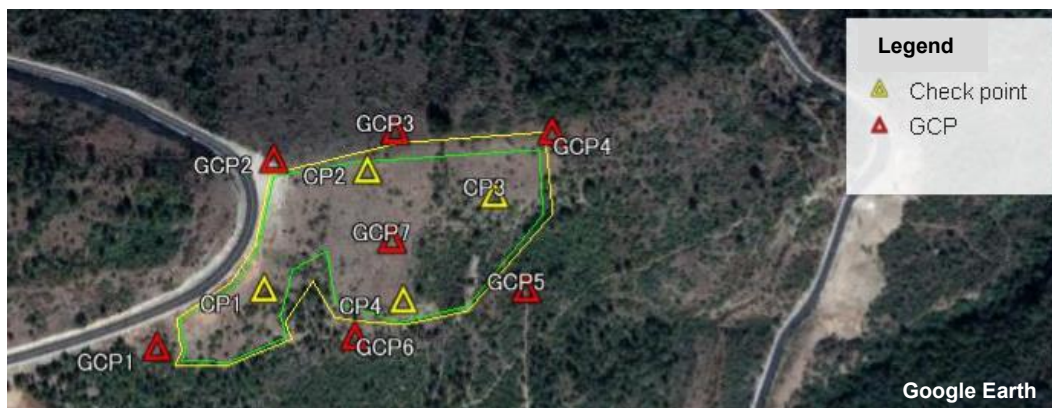
3-1: Складирање на воздушни фотографии од UAV во компјутерот
Фотографиите на UAV добиени на терен треба да се складираат на компјутерот. Физички поврзете го Phantom 4 Pro (или користете MicroSIM и читач на картички) со вашиот компјутер и увезете ги датотеките со воздушни фотографии.

3-2: Подготовка на GCP датотека

На планината Водно беше спроведено истражување на копнената контролна точка (GCP) за мерење на точната позиција на целната област со помош на RTK GPS истражување. Зоната 7 на Државниот координативен систем на Македонија се користеше како координатен систем на ГКП. На планината Водно се стекнати вкупно 11 точки од кои 7 GCP и 4 контролни точки (CPs) *како што е наведено подолу.*




RTK GPS survey conducted in Mt. Vodno



Location of GCPs and CPs in Mt. Vodno

Изведените географски координати на GCP и CP беа составени како табела наведена во извештајот од истражувањето на GCP.



TRADE COMPANY FOR GEODETIC WORKS
 "GEO POINT" DOOEL-Skopje
 St.Londonska no.19, part 19
 Telephone: 02 / 3 071-360
 Telephone: 071 / 387-567
 email: geopoint@t-home.mk

Deliverables of GCP survey from Vodno

According to the Target areas and schedule of GCP survey from the Contract from 7th of May, 2018 where sites of survey and designed GCP locations are defined we are preparing you the following data for Vodno Mountain made on 9th of May, 2018:

List of survey equipment used in the GCP survey

Surveying was made with the South GPS S82T Instrument.

Raw GPS data

Raw GPS data for North site (Vodno Mountain): 2.5 ha (See attachment 1)
 Raw GPS data for South site (Vodno Mountain): 1.5 ha (See attachment 2)

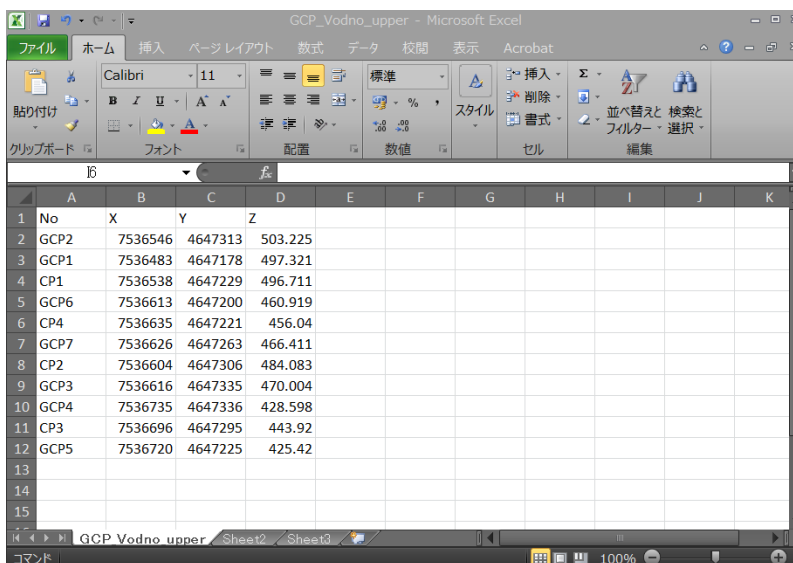
Geographic coordinates of GCPs summarized as a table

By using EPSG 6316 (Macedonia State Coordinate System zone 7) for the geographic coordinates of GCPs we summarized this tables: X Y

Table 1: Geographic coordinates of GCPs for Vodno Mountain, North site

VODNO 1			
	Y	X	Z
GCP2	7536545.696	4647313.135	503.225
GCP1	7536482.888	4647177.900	497.321
CP1	7536537.777	4647229.134	496.711
GCP6	7536613.206	4647199.813	460.919
CP4	7536635.450	4647221.116	456.040
GCP7	7536626.316	4647263.115	466.411
CP2	7536604.456	4647305.649	484.083
GCP3	7536616.286	4647335.325	470.004
GCP4	7536735.301	4647336.121	428.598
CP3	7536695.626	4647294.682	443.920
GCP5	7536719.530	4647225.256	425.420

Копирајте ја табелата со GCP и залепете на листот Microsoft Excel. Зачувајте ја табелата како CSV или текстуален формат.

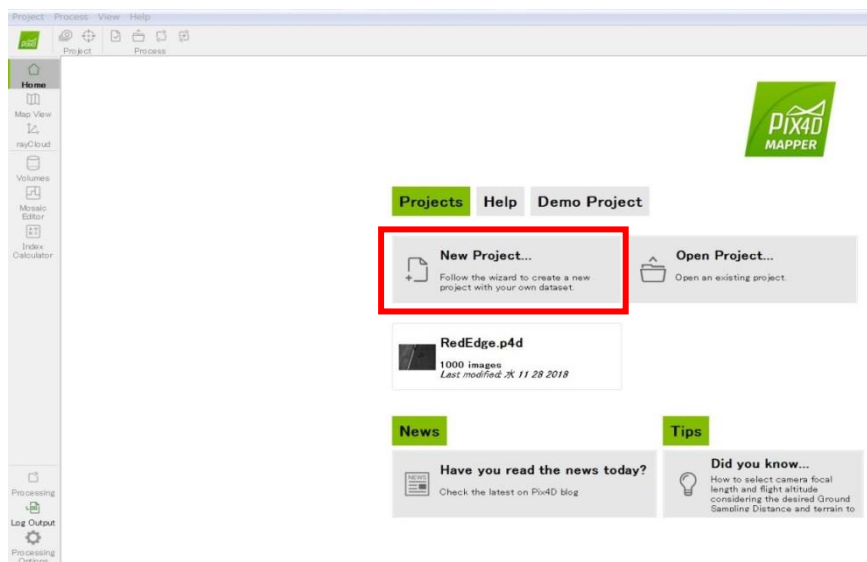


The screenshot shows a Microsoft Excel spreadsheet with the following data:

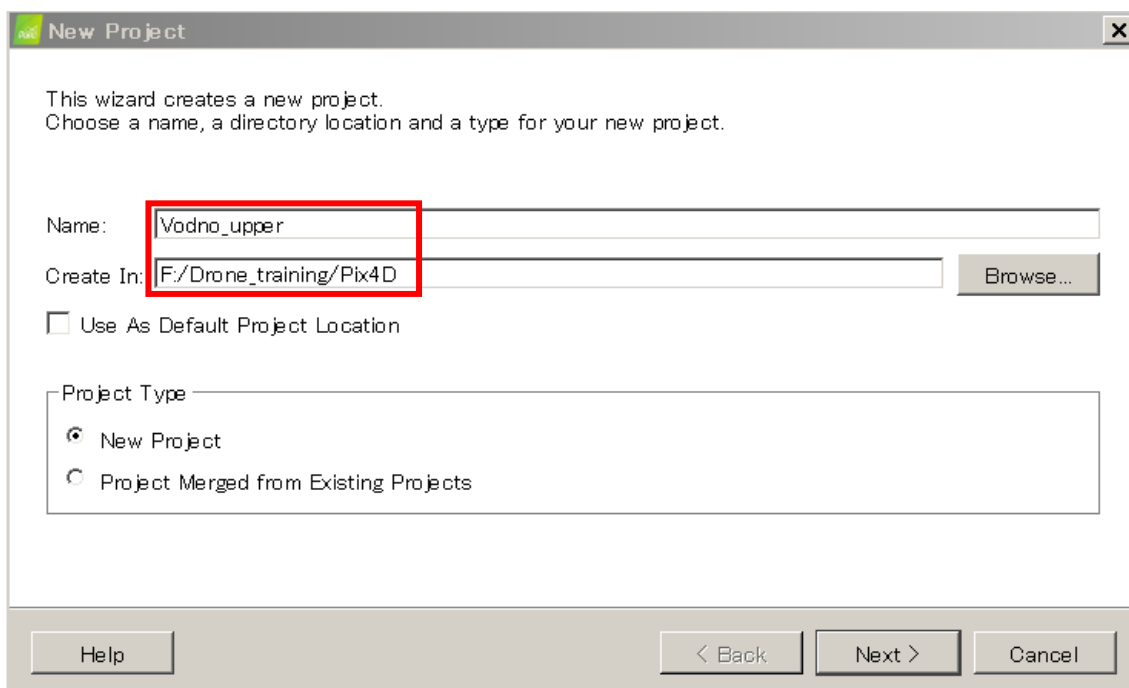
No	X	Y	Z
GCP2	7536546	4647313	503.225
GCP1	7536483	4647178	497.321
CP1	7536538	4647229	496.711
GCP6	7536613	4647200	460.919
CP4	7536635	4647221	456.04
GCP7	7536626	4647263	466.411
CP2	7536604	4647306	484.083
GCP3	7536616	4647335	470.004
GCP4	7536735	4647336	428.598
CP3	7536696	4647295	443.92
GCP5	7536720	4647225	425.42

3-3: Постапување нов проект и увоз на воздушни фотографии на UAV во софтверот Pix4D

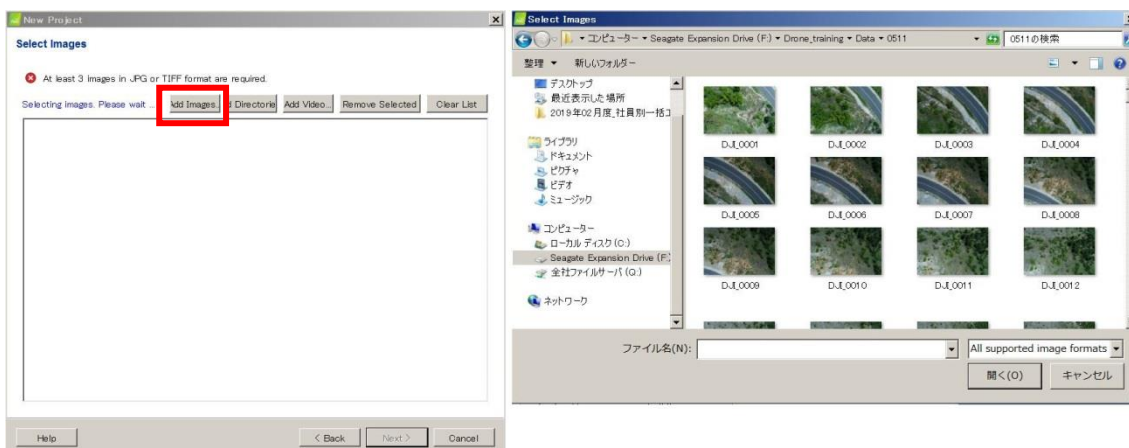
Отворете го софтверот Pix4D и изберете **New Project**.



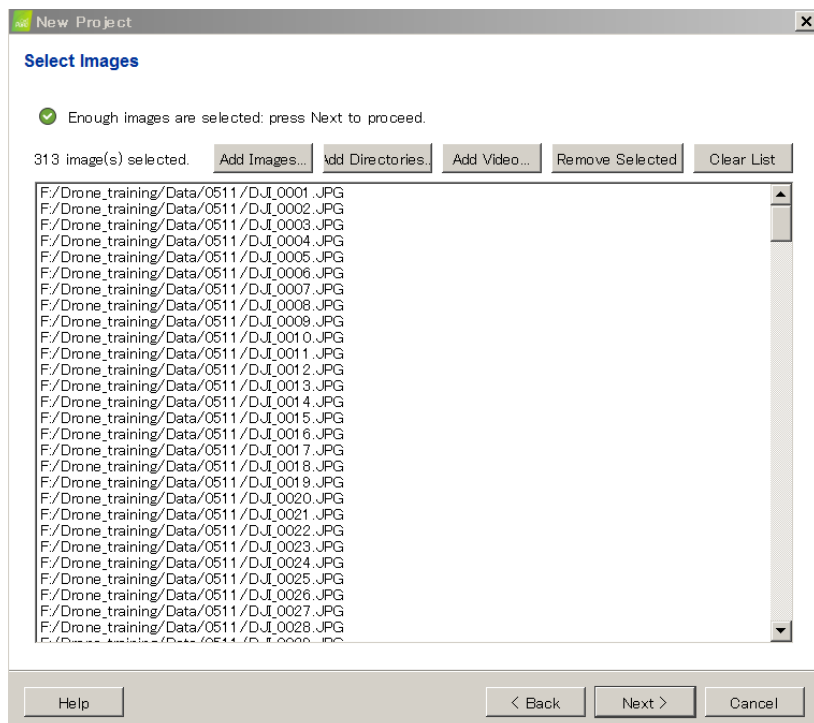
Се отвора панелот за нов проект. Наведете го името на проектот и работната папка и изберете **Next >**.



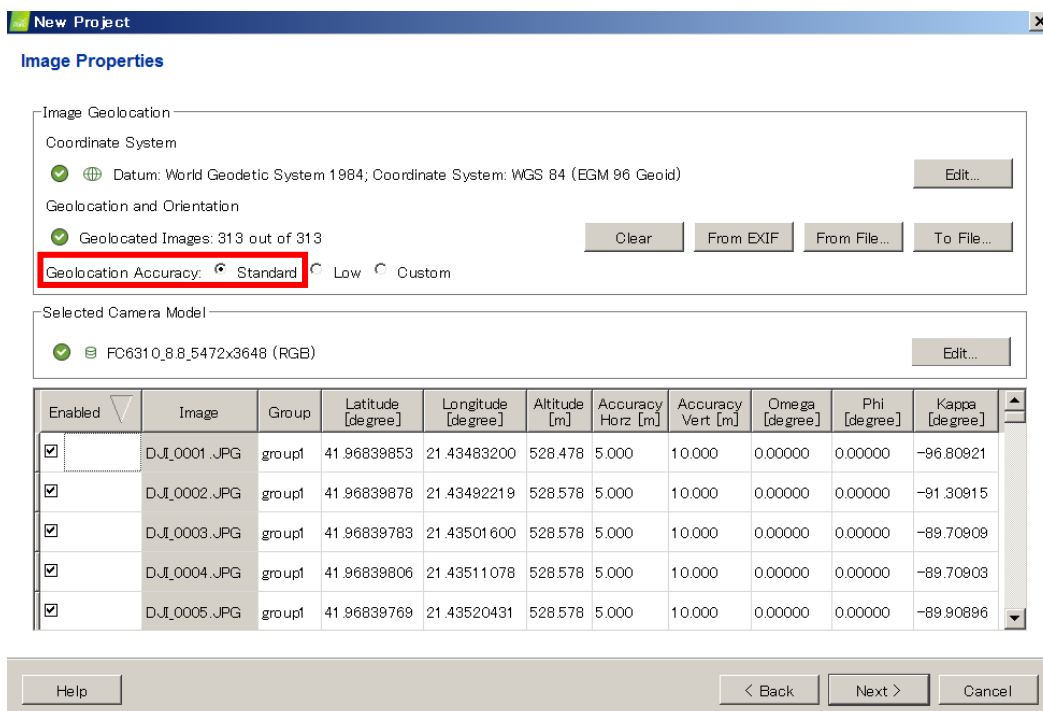
Изберете **Додај слики**, одете во папката со фотографии од UAV на компјутерот и изберете ги сите фотографии за обработка.



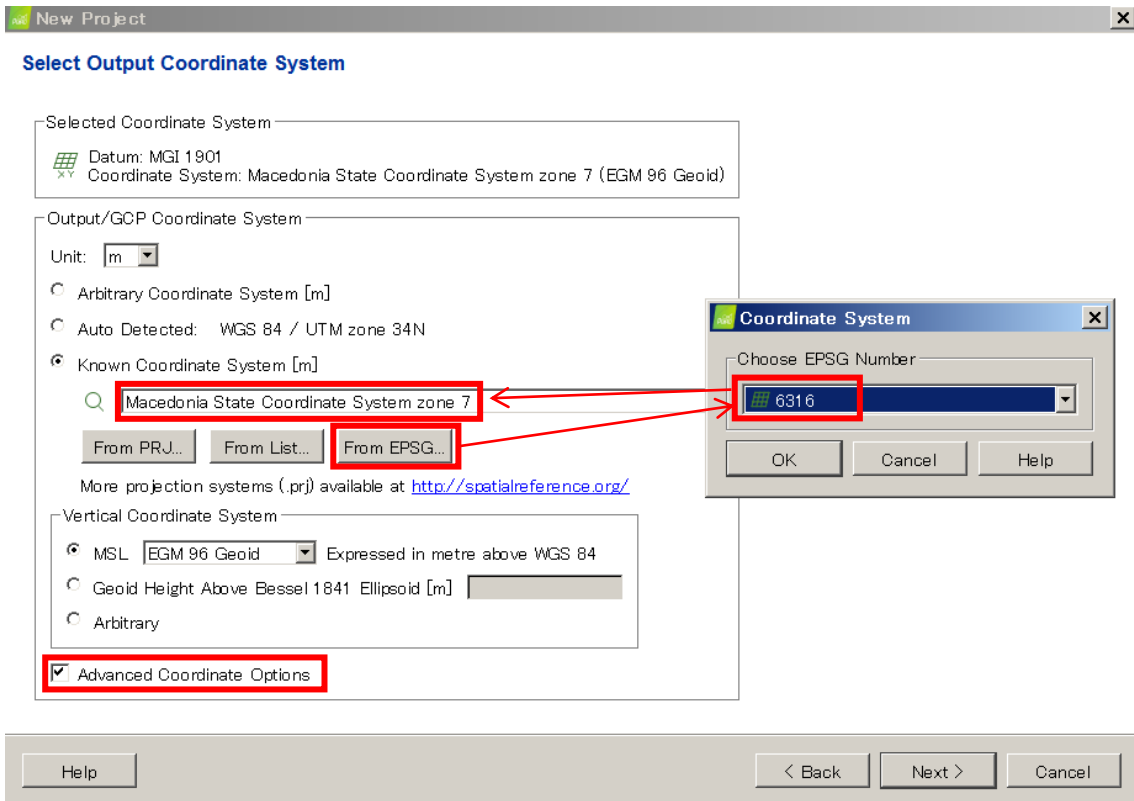
Се отвора панелот *Select Images*. Потврдете дека сите фотографии се избрани и изберете **Next >**.



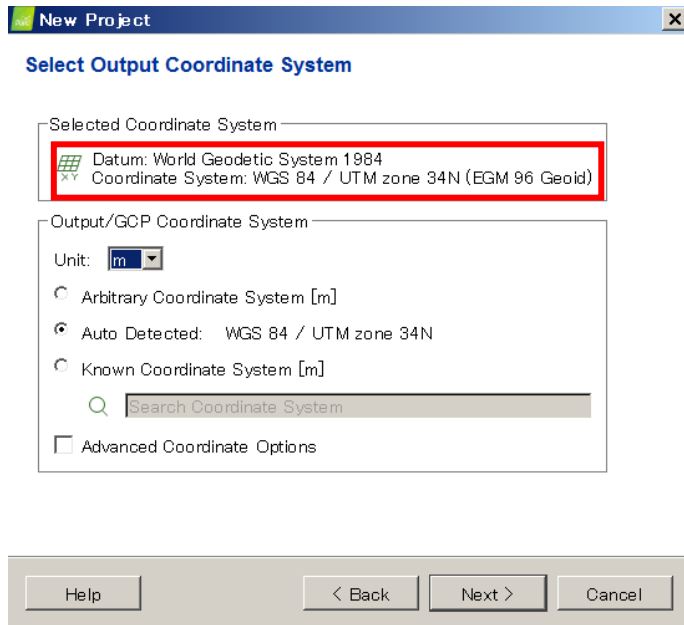
Се отвора панелот за својства на слика. Потврдете дека информациите за геолокацијата на сликата и моделот на камерата се автоматски увезени. Потврдете дека точноста на геолокацијата е избрана како **Standard** и селектирајте **Next >**.



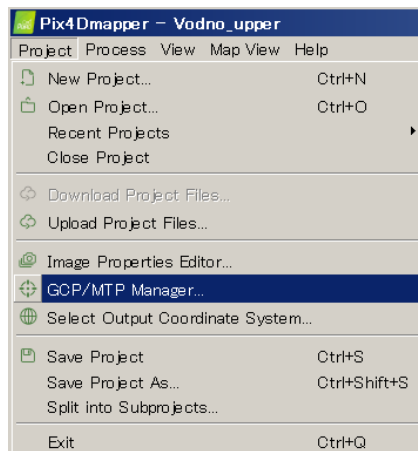
Се отвора панелот *Select Output Coordinate System*. Во оваа вежба се користат GCP воспоставени од зона 7 на Државниот координативен систем на Македонија. Изберете *Advanced Coordinate Options*, кликнете *From EPSG* копчето и изберете „6316“ како EPSG број за зоната на Државниот координатен систем на Македонија 7. Изберете **Next >**.



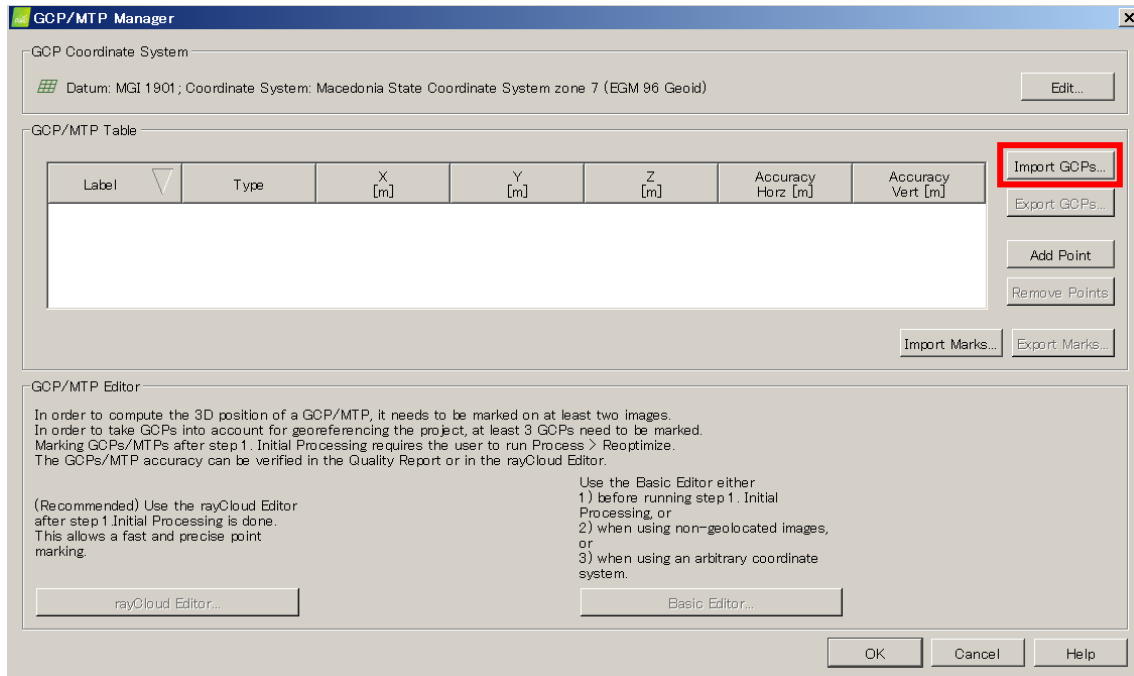
Во случај да не се користат GCP, користете ја стандардната податок во Светскиот геодетски систем 1984 и координатен систем во WGS 84 / зоната UTM 34N.



Move to *Project>GCP/MTP Manager*

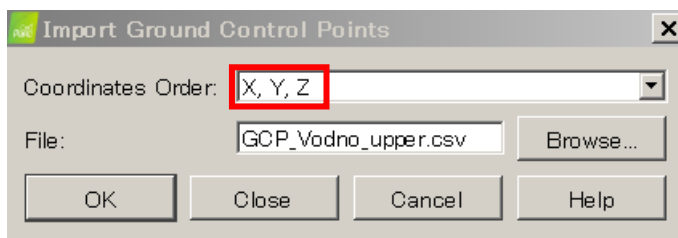


Се отвара панелот GCP/MTP Manager. Click **Import GCPs** button.

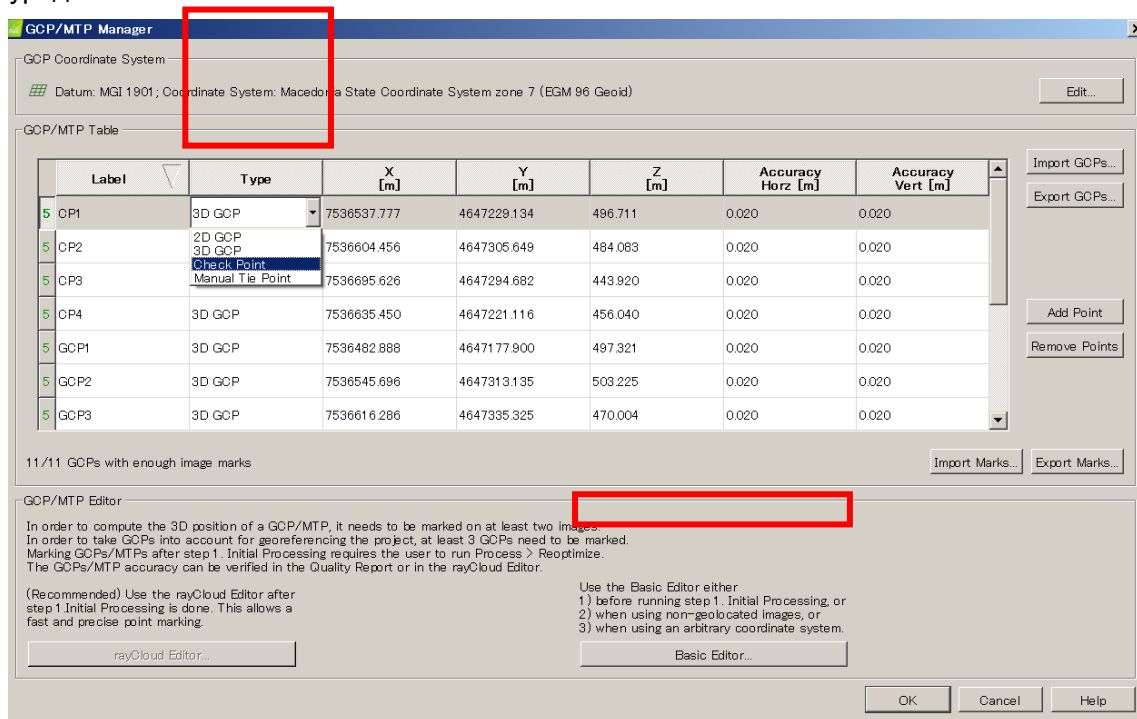


Се отвара панелот *Import Ground Control Points*. Селектирај те *Coordinates Order* as

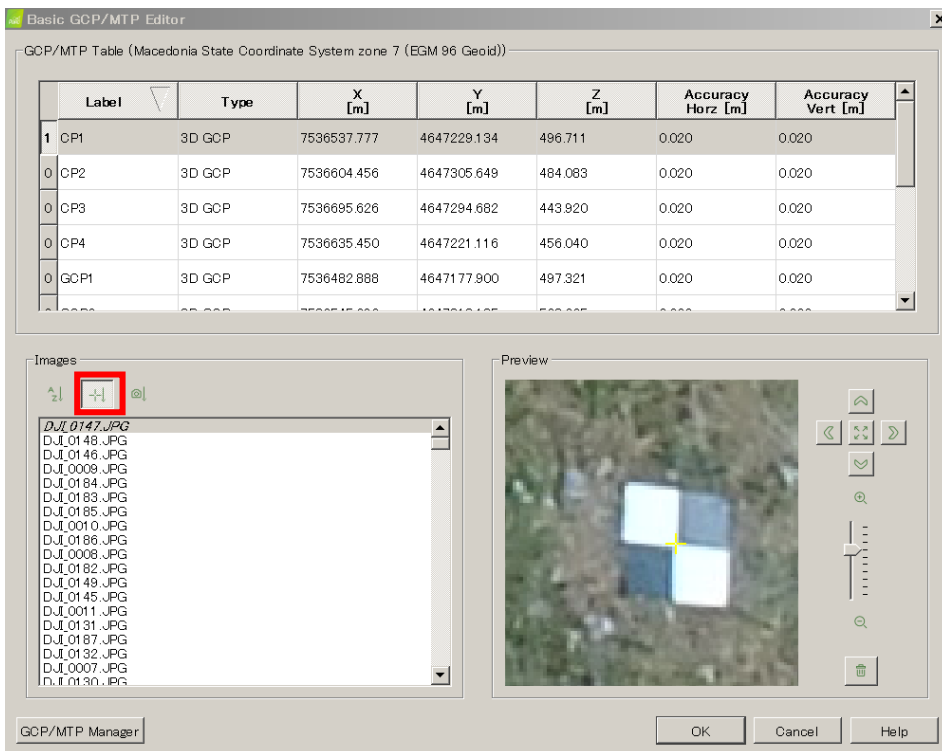
X, Y, Z. Browse the CSV or text file of GCPs. Кликнете **OK** за превземање на GCPs.



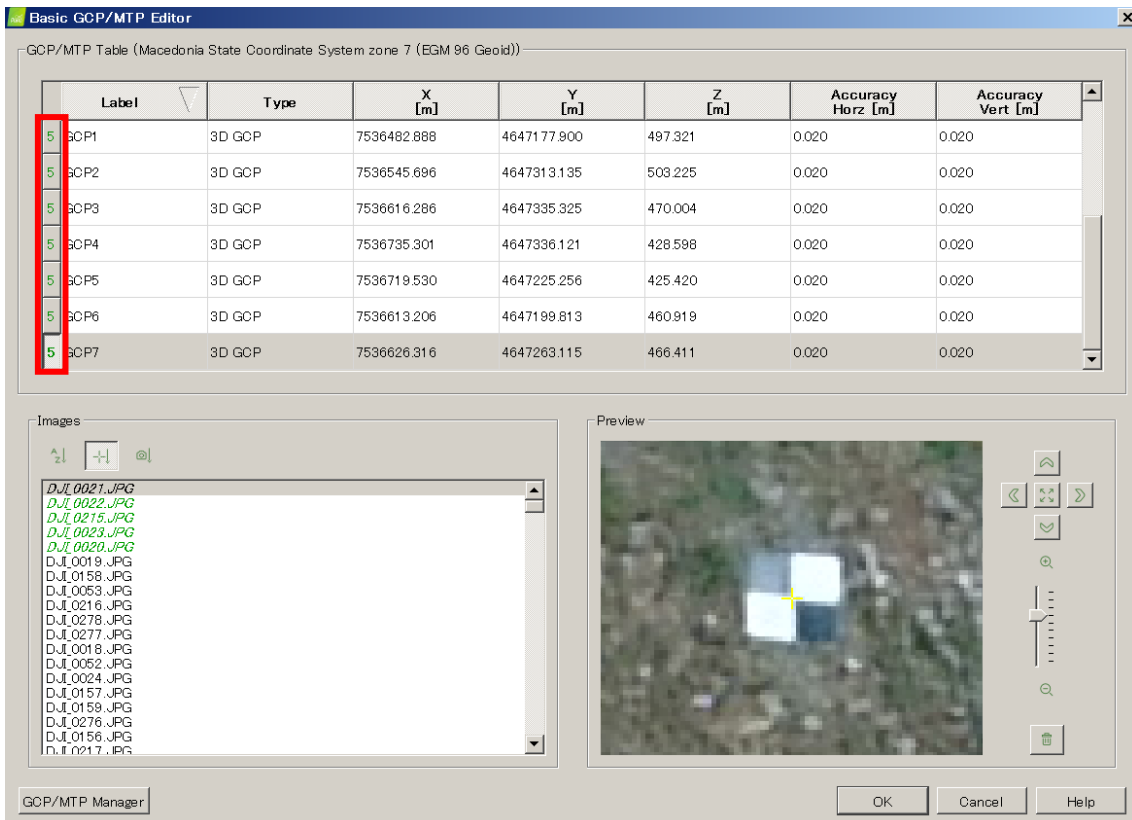
GCP се увезуваат во GCP/MTP Manager. Кога контролните точки (CP) се достапни, изберете Check Point од паѓачкото мени на Type. Кликнете на копчето Основен уредник.



Се отвора Основниот панел за уредувач на GCP/MTP. Потврдете дека е избрано копчето Сортирање слики по растојание до GCP. Изберете слика од врвот на листата. Во Преглед, зумирајте го избраниот GCP и означете го центарот на воздушниот фото сигнал. Обележете најмалку 4 или 5 фотографии за секој GCP.



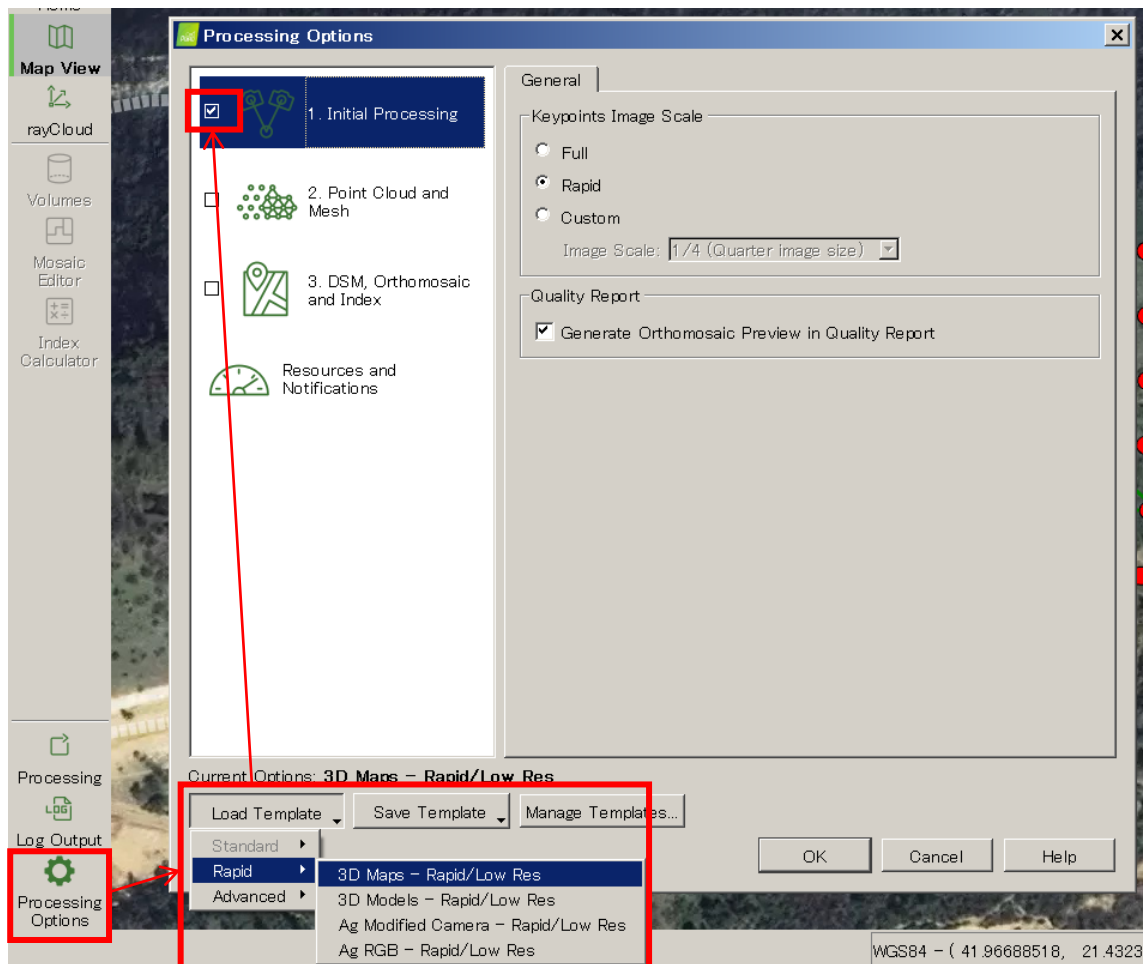
По завршувањето на обележувањето, бројот на ознаки е прикажан во табелата. Кликнете на ОК за да го завршите обележувањето.



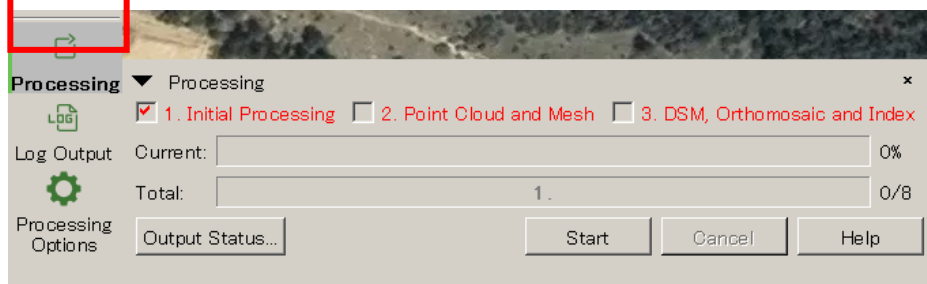
3-4: Извршете ја почетната обработка (брза) за брзо да проверите дали добиените фотографии од UAV може да се користат за правење стерео модели

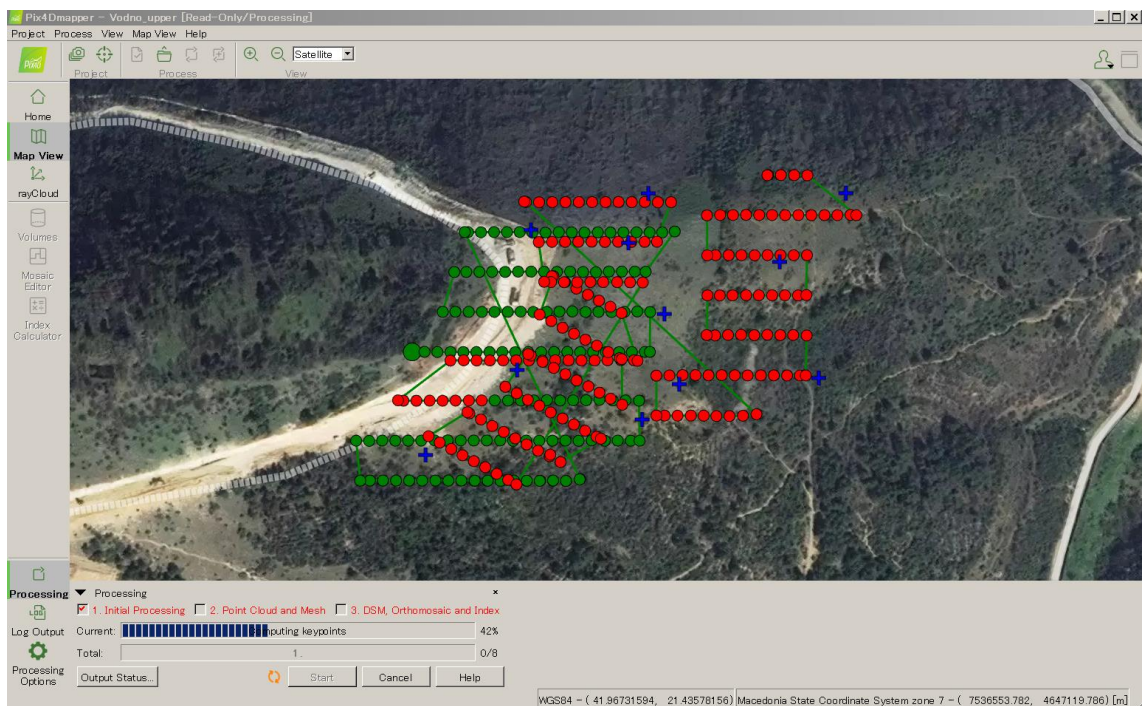
Прво, се врши првична обработка во брз режим за брзо да се провери дали стекнатите фотографии од UAV може да се користат за изградба на стерео модели.

Кликнете на Опции за обработка. Изберете Load Template>Rapid>3D Maps – Rapid/Low Res. Изберете само 1. Почетна обработка. Кликнете **ОК**.



Кликнете на **Обработка**. Кликнете на **Start** за да започнете со обработка.





По обработката, проверете го извештајот за квалитет за да го потврдите просечното растојание за земање примероци од земја (GSD), резултатот од проверката на квалитетот и бројот на преклопувања. Во проверката на квалитетот, има грешка во геореференцирањето во овој пример. Проверете ги информациите за копнените контролни точки и идентификувајте дека CP2 има големи локациски грешки во X, Y и Z. Вратете се во GCP/MTP Manager и повторно означете ја локацијата на CP2 и повторно извршете ја почетната обработка.

Quality Report – Vodno_upper

Home PDF Back Forward Online Support

Quality Report

Generated with Pix4Dmapper version 4.3.31

! **Important:** Click on the different icons for:

- ?** Help to analyze the results in the Quality Report
- i** Additional information about the sections

💡 Click [here](#) for additional tips to analyze the Quality Report

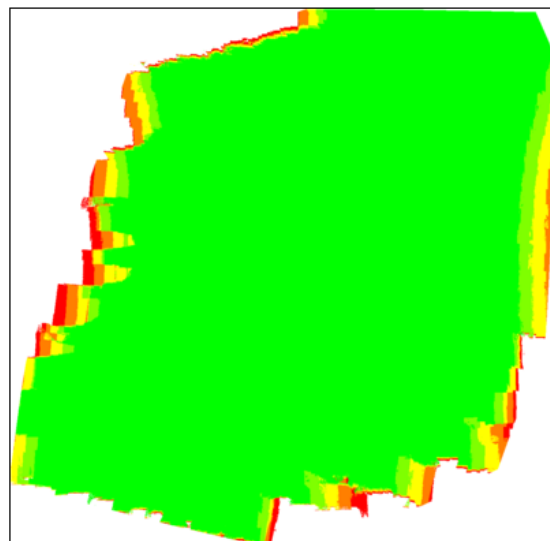
Summary i

Project	Vodno_upper
Processed	2019-02-28 12:06:39
Camera Model Name(s)	FC6310_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.84 cm / 0.72 in
Area Covered	0.100 km ² / 10.0008 ha / 0.04 sq. mi. / 24.7252 acres
Time for Initial Processing (without report)	13m:32s

Quality Check i

? Images	median of 5248 keypoints per image	✔
? Dataset	313 out of 313 images calibrated (100%), all images enabled	✔
? Camera Optimization	0.13% relative difference between initial and optimized internal camera parameters	✔
? Matching	median of 2093.23 matches per calibrated image	✔
? Georeferencing	yes, 11 GCPs (11 3D), mean RMS error = 5.324 m	⚠

? **Overlap**



Number of overlapping images: 1 2 3 4 5+

Ground Control Points



GCP Name	Accuracy XYZ [m]	Error X [m]	Error Y [m]	Error Z [m]	Projection Error [pixel]	Verified/Marked
GCP2 (3D)	0.020/0.020	0.005	-0.000	-0.003	0.084	5 / 5
GCP1 (3D)	0.020/0.020	-0.003	0.002	-0.001	0.044	5 / 5
CP1 (3D)	0.020/0.020	0.001	-0.004	0.008	0.166	5 / 5
GCP6 (3D)	0.020/0.020	-0.004	0.005	0.001	0.115	5 / 5
CP4 (3D)	0.020/0.020	0.009	0.008	0.008	0.070	5 / 5
GCP7 (3D)	0.020/0.020	-0.009	-0.009	-0.002	0.058	5 / 5
CP2 (3D)	0.020/0.020	-11.830	-29.654	14.075	0.132	5 / 5
GCP3 (3D)	0.020/0.020	-0.007	0.006	-0.011	0.063	3 / 5
GCP4 (3D)	0.020/0.020	-0.007	0.001	0.001	0.047	5 / 5
CP3 (3D)	0.020/0.020	0.012	-0.006	0.010	0.081	5 / 5
GCP5 (3D)	0.020/0.020	0.003	0.001	-0.011	0.121	5 / 5
Mean [m]		-1.075347	-2.695527	1.279383		
Sigma [m]		3.400859	8.524897	4.046417		
RMS Error [m]		3.566821	8.940903	4.243856		

По обработката, се потврдува дека има доволно точност за да се премине на следниот чекор. Премести во Project>Save Project за да го зачувате проектот пред да преминете на следниот чекор.

Quality Report - Vodno_upper
✕

🏠 PDF ⏪ ⏩
💬 Online Support

Quality Report

Generated with Pix4Dmapper version 4.3.31

Important: Click on the different icons for:

- ? Help to analyze the results in the Quality Report
- i Additional information about the sections

💡 Click [here](#) for additional tips to analyze the Quality Report

Summary i

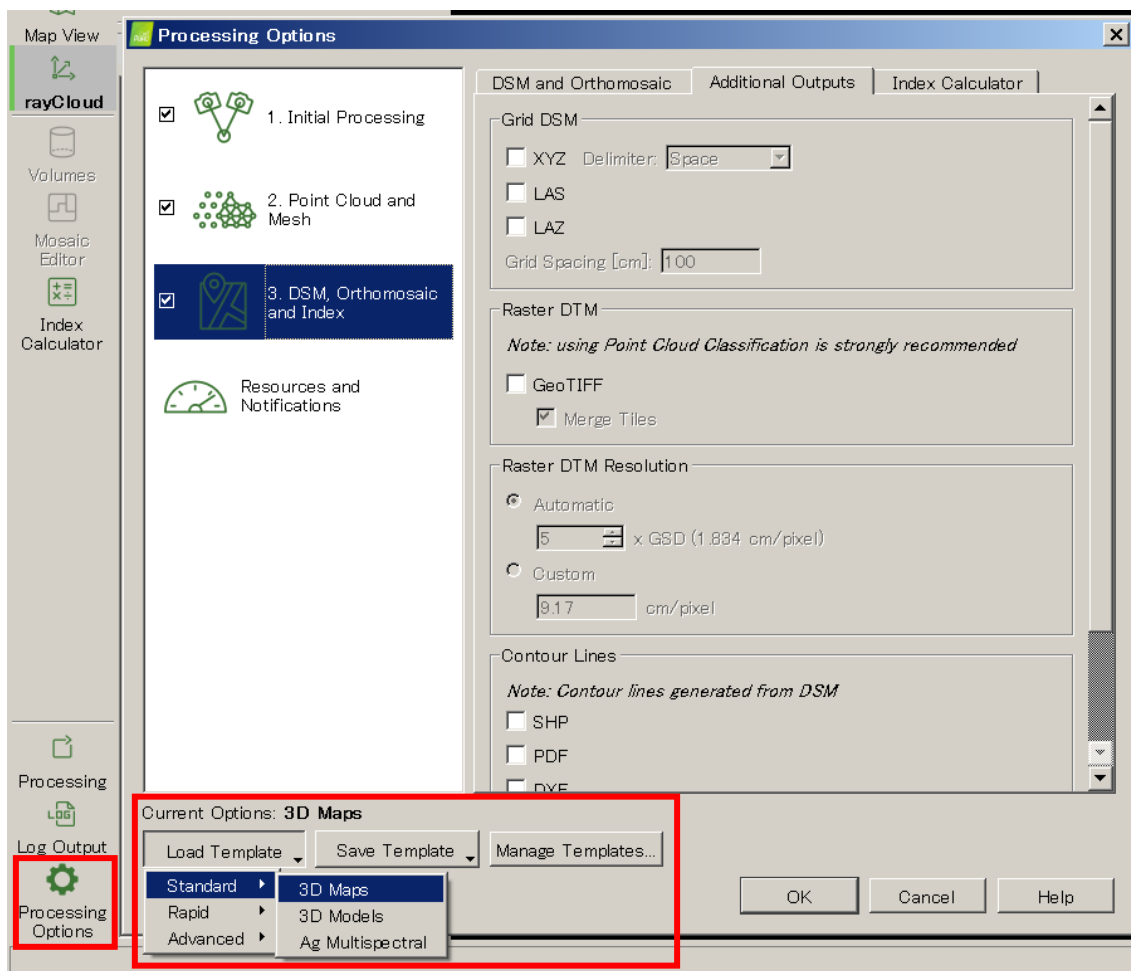
Project	Vodno_upper
Processed	2019-02-28 13:07:04
Camera Model Name(s)	FC6310_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.83 cm / 0.72 in
Area Covered	0.100 km ² / 10.0038 ha / 0.04 sq. mi. / 24.7328 acres
Time for Initial Processing (without report)	11m:41s

Quality Check i

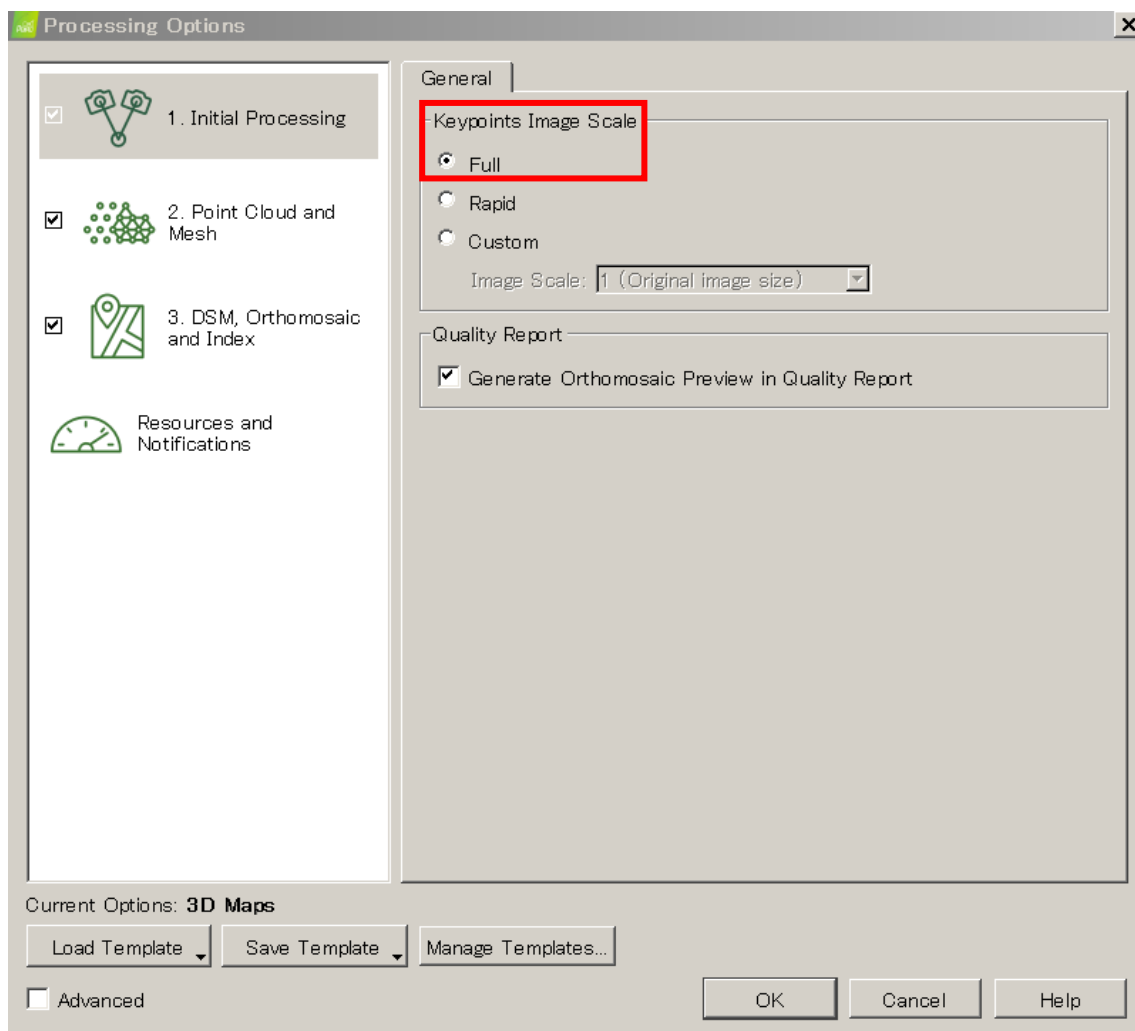
? Images	median of 5248 keypoints per image	✔
? Dataset	313 out of 313 images calibrated (100%), all images enabled	✔
? Camera Optimization	0.13% relative difference between initial and optimized internal camera parameters	✔
? Matching	median of 2093.23 matches per calibrated image	✔
? Georeferencing	yes, 11 GCPs (11 3D), mean RMS error = 0.005 m	✔

3-5: Извршете ја почетната обработка (целосна) за да направите стерео модели
Првичната обработка во целосен режим се врши за да се изградат стерео модели.

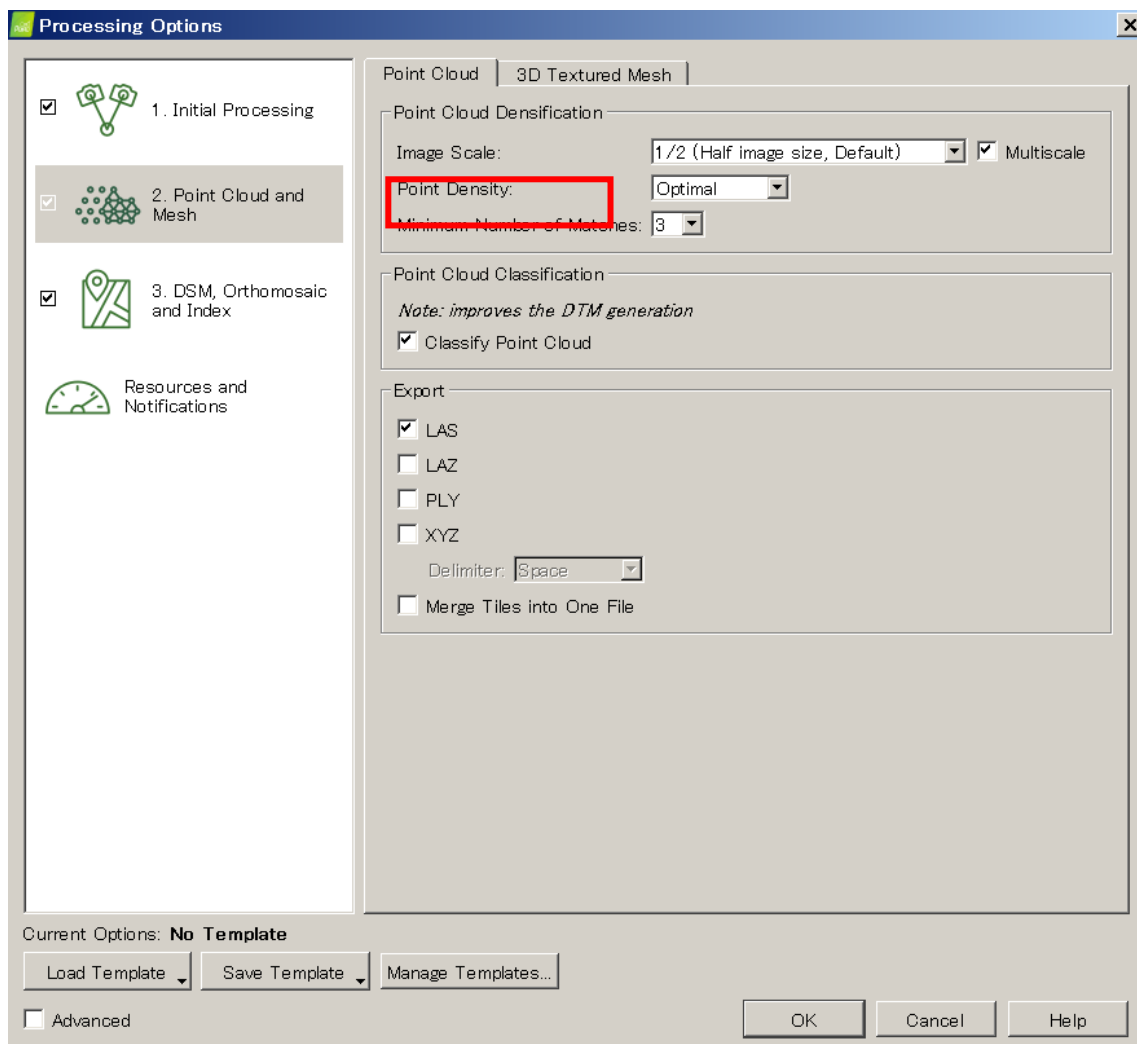
Изберете Опции за обработка и изберете **Load Template > Standard > 3D Maps**.



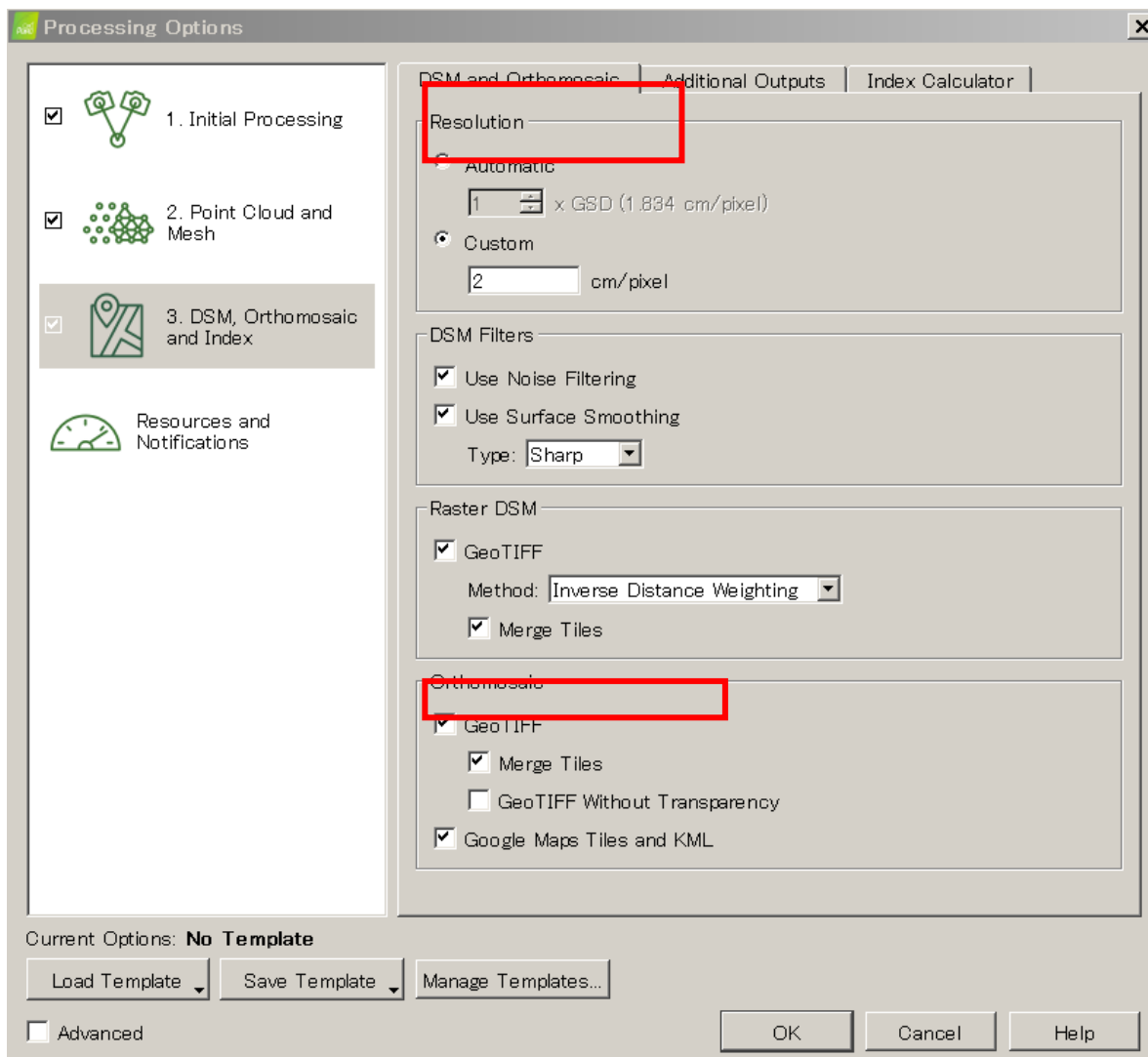
Изберете 1. Initial Processing и потврдете дека Целосно е избрано како *Keypoints Image Scale*.



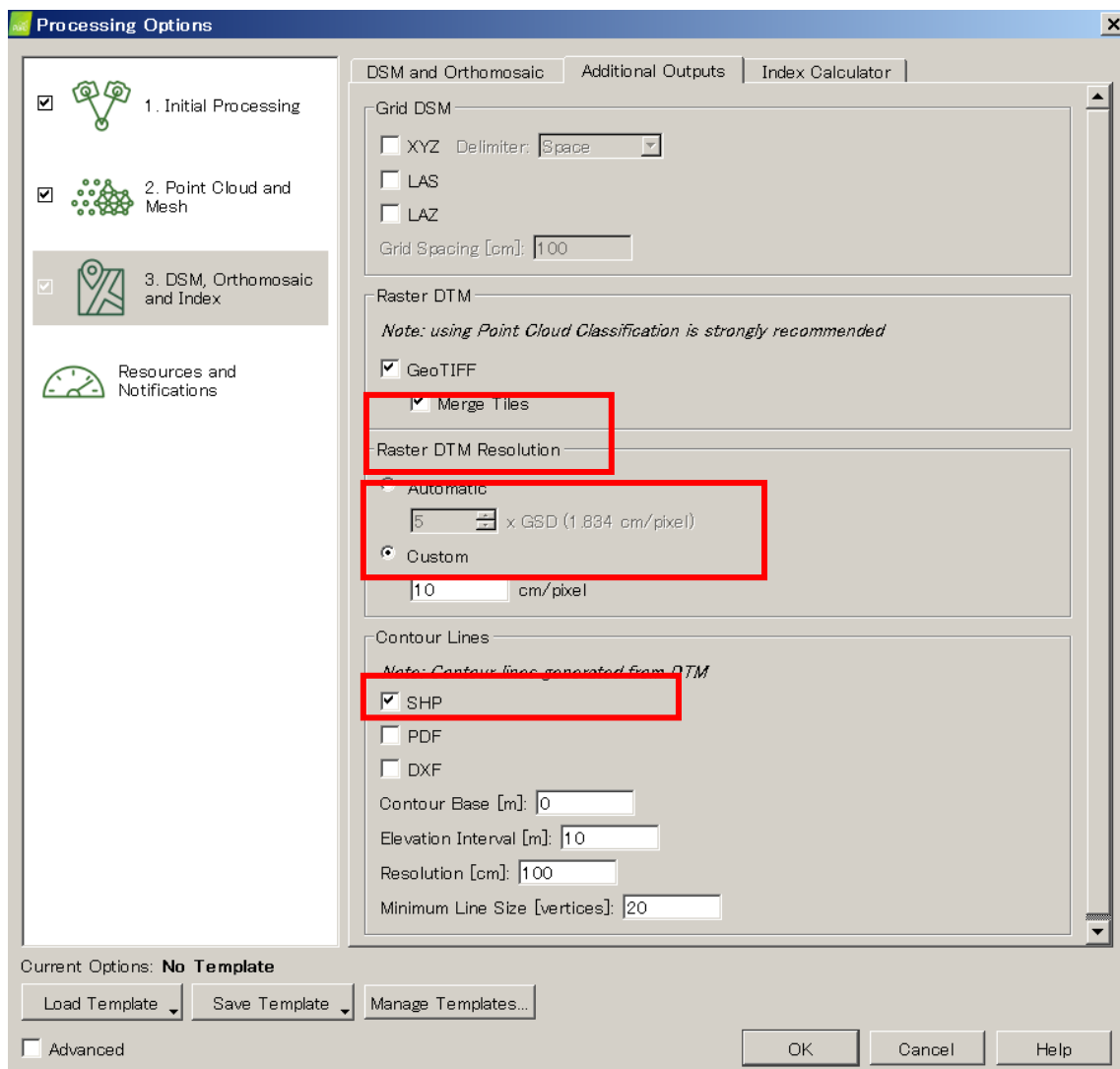
Во Опции за обработка изберете 2. Point Cloud and Mesh. Под табот Point Cloud Изберете Класифицирај Облак со точки. (Класификацијата на облакот за точки е неопходна за да се генерира DTM.)



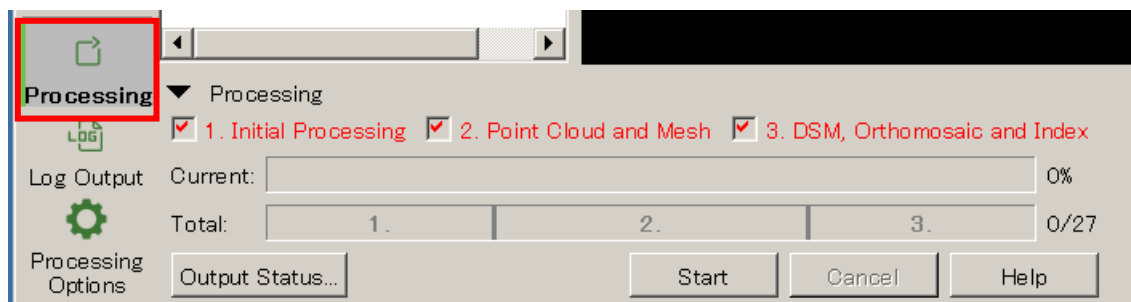
Изберете 3. DSM, Orthomosaic и Index и под табулаторот DSM и Orthomosaic, внесете 2cm/pixel како резолуција на DSM и orthomosaic. Изберете плочки и KML на „Карти на Google“ по потреба.



Во картичката Дополнителни излези, внесете 10cm/pixel како резолуција на DTM. Во Contour Lines, изберете SHP (shapefile) како формат на датотека на контурните линии. Наведете го интервалот на височина [m]. Во овој пример, се користи интервал од 10 m.



Кликнете на Обработка. Потврдете дека се избрани сите три обработувања. Кликнете на Start за да започнете со обработка.



По обработката. Проверете го извештајот за квалитет.

The screenshot shows a web-based Quality Report interface. At the top, the title is 'Quality Report - Vodno_upper'. Below the title, there are navigation icons (home, PDF, back, forward) and an 'Online Support' link. The main content area is titled 'Quality Report' and includes a Pix4D logo and version information: 'Generated with Pix4Dmapper version 4.3.27'. A yellow warning box contains an 'Important' message: 'Click on the different icons for: Help to analyze the results in the Quality Report (question mark icon), Additional information about the sections (info icon)'. Below this, a tip box suggests clicking a 'here' link for additional tips. The 'Summary' section features a table with project details. The 'Quality Check' section contains a table with five rows, each representing a different check item, all of which have passed, indicated by green checkmarks.

Quality Report Generated with Pix4Dmapper version 4.3.27

Important: Click on the different icons for:

- Help to analyze the results in the Quality Report
- Additional information about the sections

Click [here](#) for additional tips to analyze the Quality Report

Summary

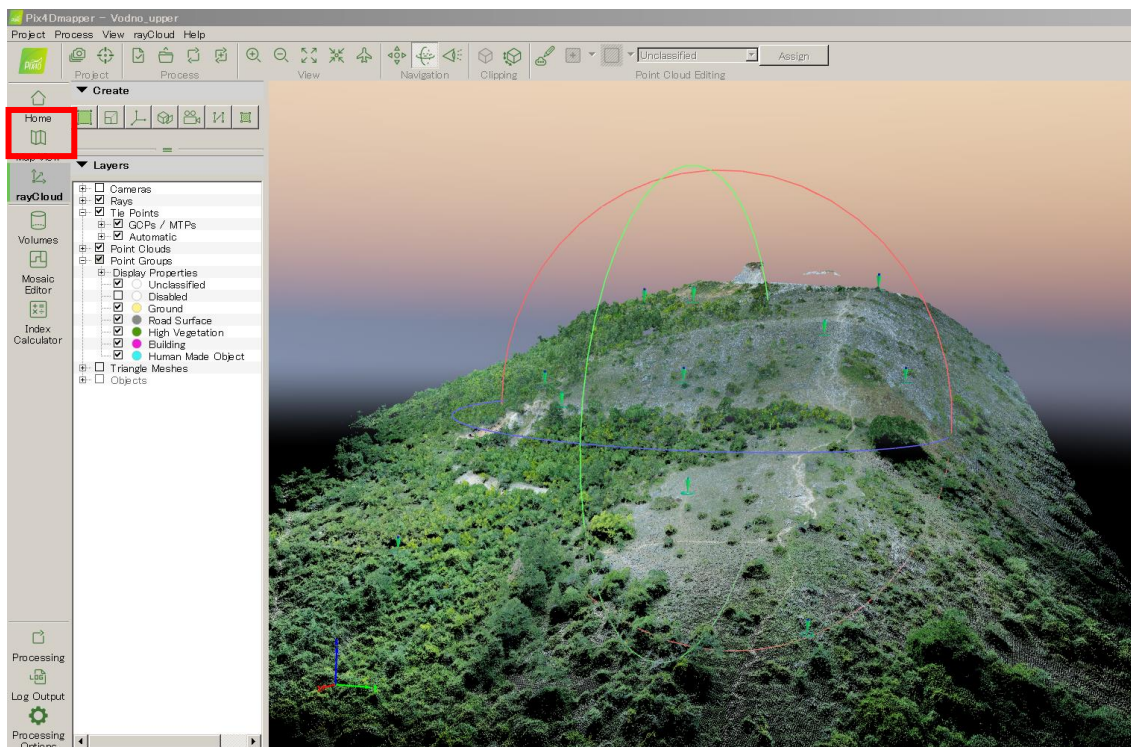
Project	Vodno_upper
Processed	2018-10-12 19:34:57
Camera Model Name(s)	FC6310_8.8_5472x3648 (RGB)
Average Ground Sampling Distance (GSD)	1.43 cm / 0.56 in
Area Covered	0.069 km ² / 6.8997 ha / 0.03 sq. mi. / 17.0583 acres
Time for Initial Processing (without report)	12m:18s

Quality Check

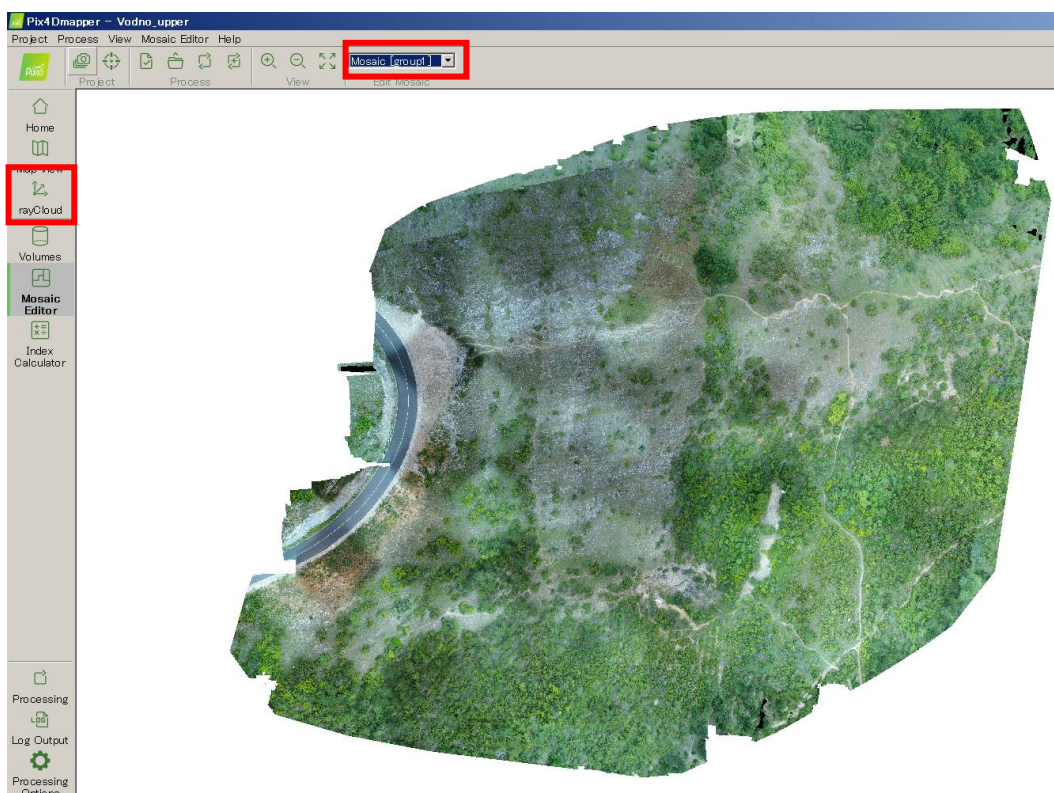
Images	median of 4851 keypoints per image	✓
Dataset	394 out of 394 images calibrated (100%), all images enabled	✓
Camera Optimization	0.05% relative difference between initial and optimized internal camera parameters	✓
Matching	median of 1721.69 matches per calibrated image	✓
Georeferencing	yes, 7 GCPs (7 3D), mean RMS error = 0.002 m	✓

Display Automatically after Processing Close

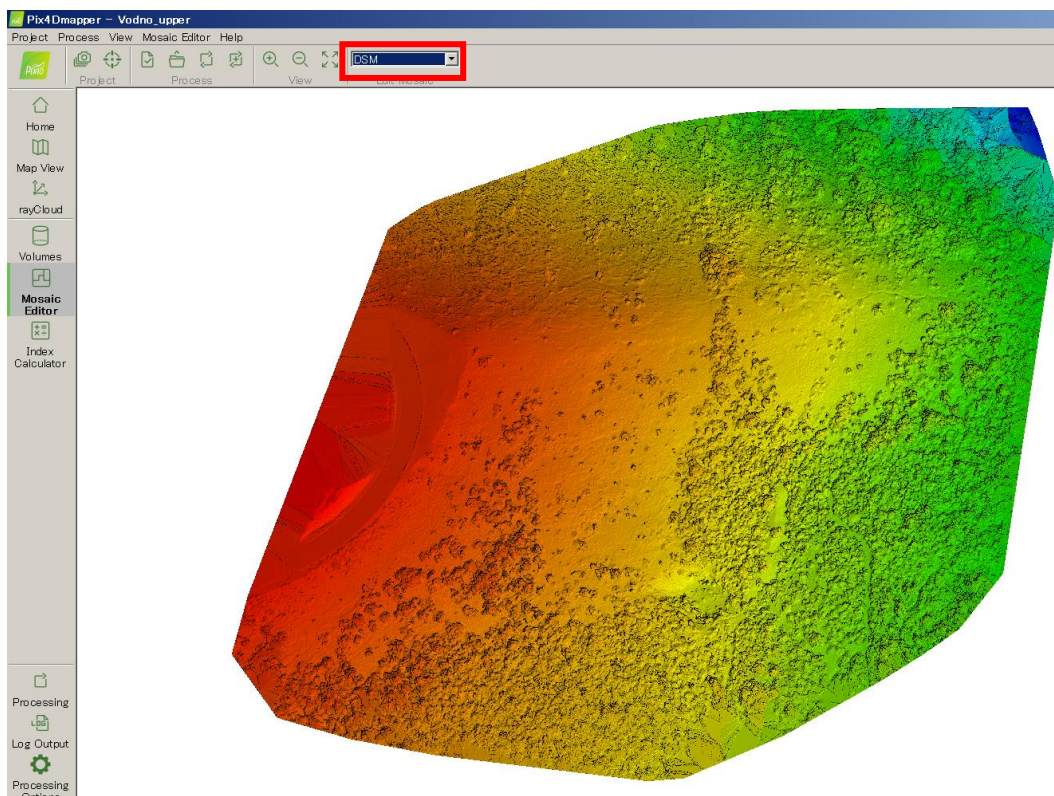
Кликнете на rayCloud и проверете ги генерираните облаци на точки.



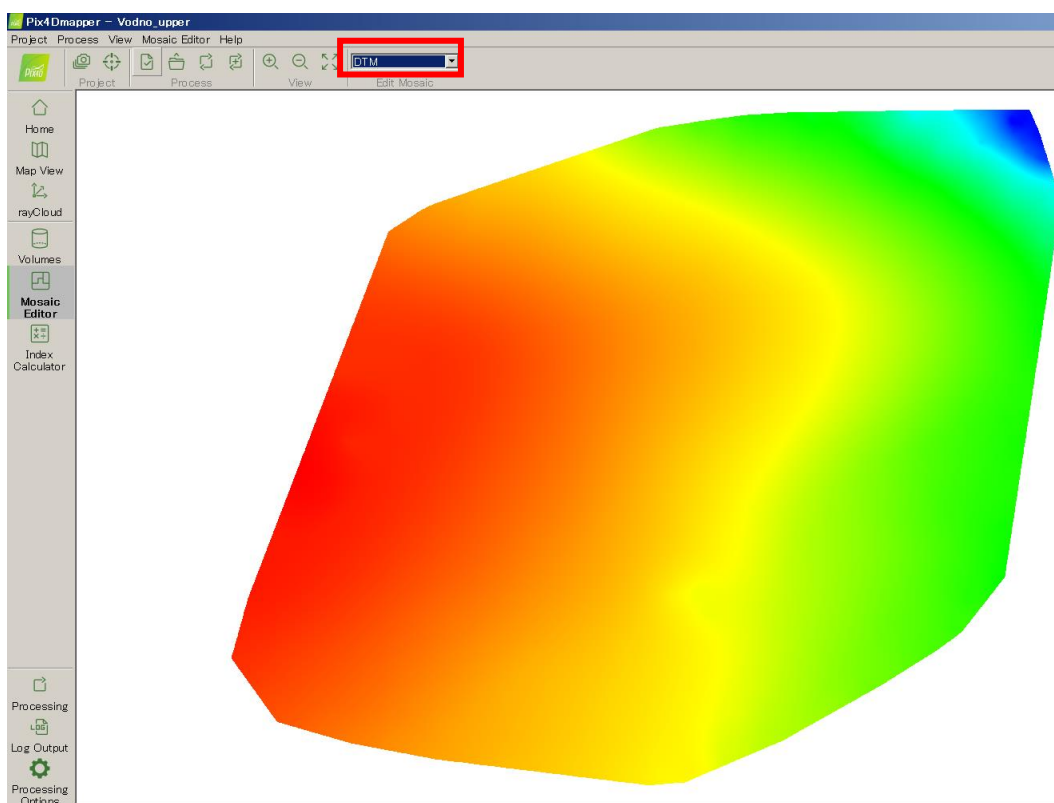
Кликнете Мозаик Уредувач и изберете Мозаик од паѓачкото мени. Проверете го генерираниот ортомозаик.



Изберете DSM од паѓачкото мени. Проверете го генерираниот DSM.



Изберете DTM од паѓачкото мени. Проверете го генерираното DTM.

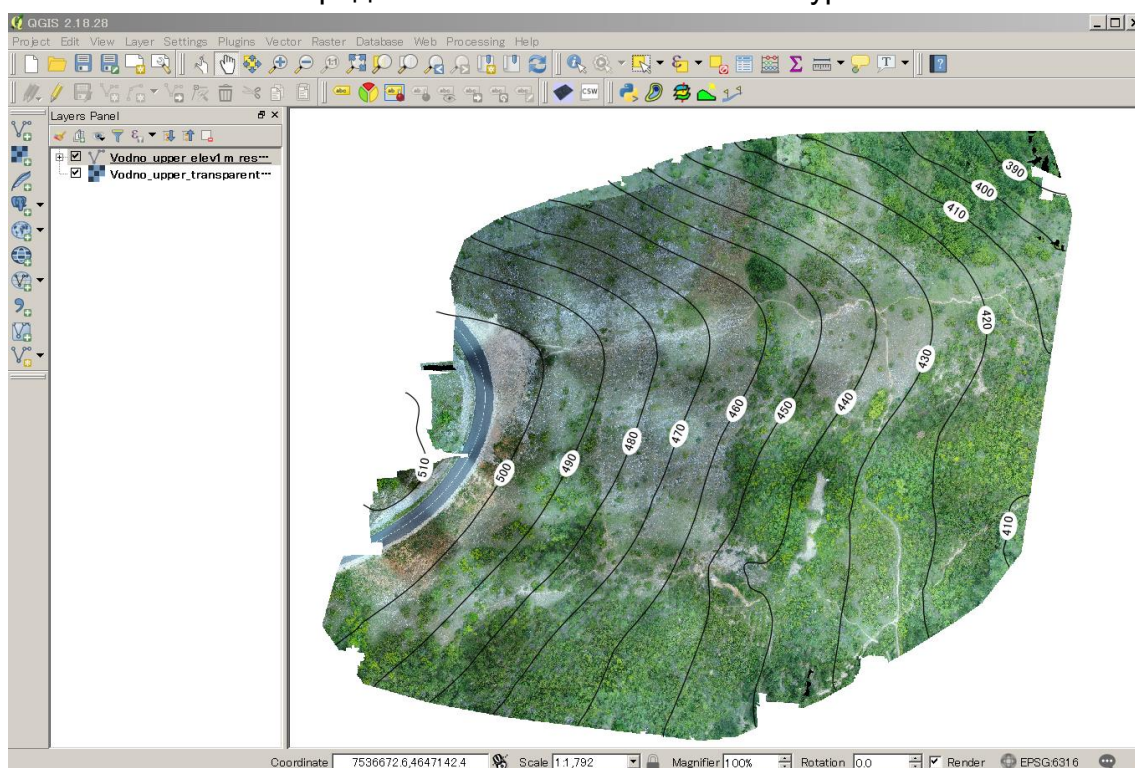


Чекор 4: Подготовка на топографска карта

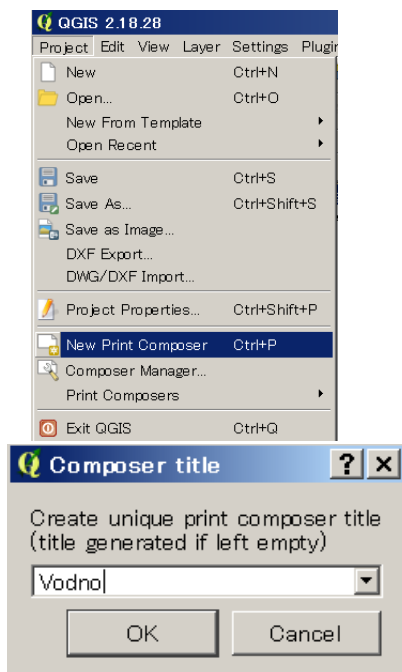
4-1: Подготовка на карта со користење на софтвер QGIS

Во овој чекор, креираните ортомозаични и контурни линии се користат за креирање на топографска карта.

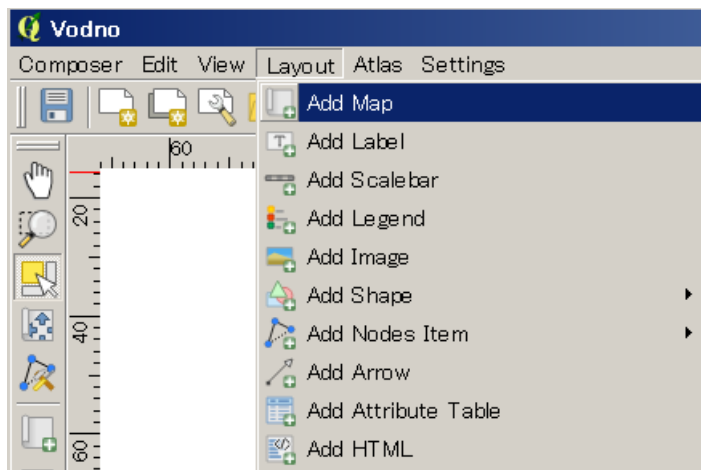
Ортомозаикот се чува во папката со проектот Pix4D под 3_dsm_ortho > 2_mosaic, а контурните линии под 3_dsm_ortho > extras > контури. Отворете QGIS и увезете ги ортомозаичните и контурните линии. Обележете ги висинските вредности на контурните **линии.**



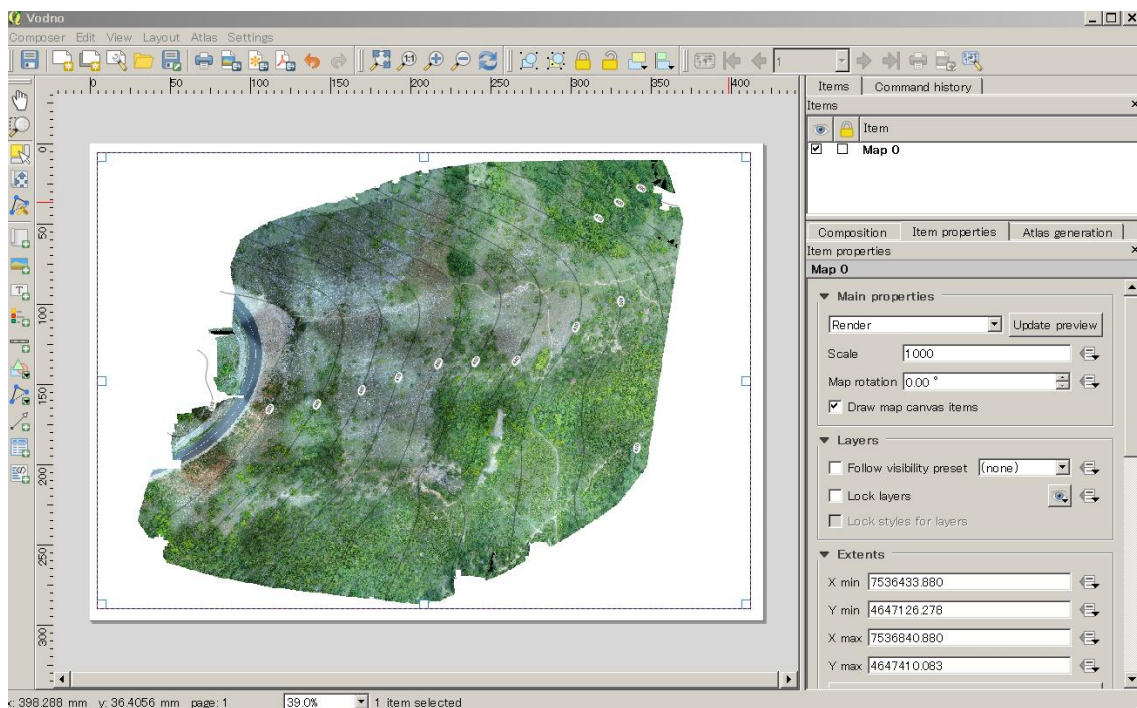
Премести во Проект > Нов композитор за печатење. Се отвора таблата со наслов на композиторот. Дефинирајте го името на датотеката со мапа.



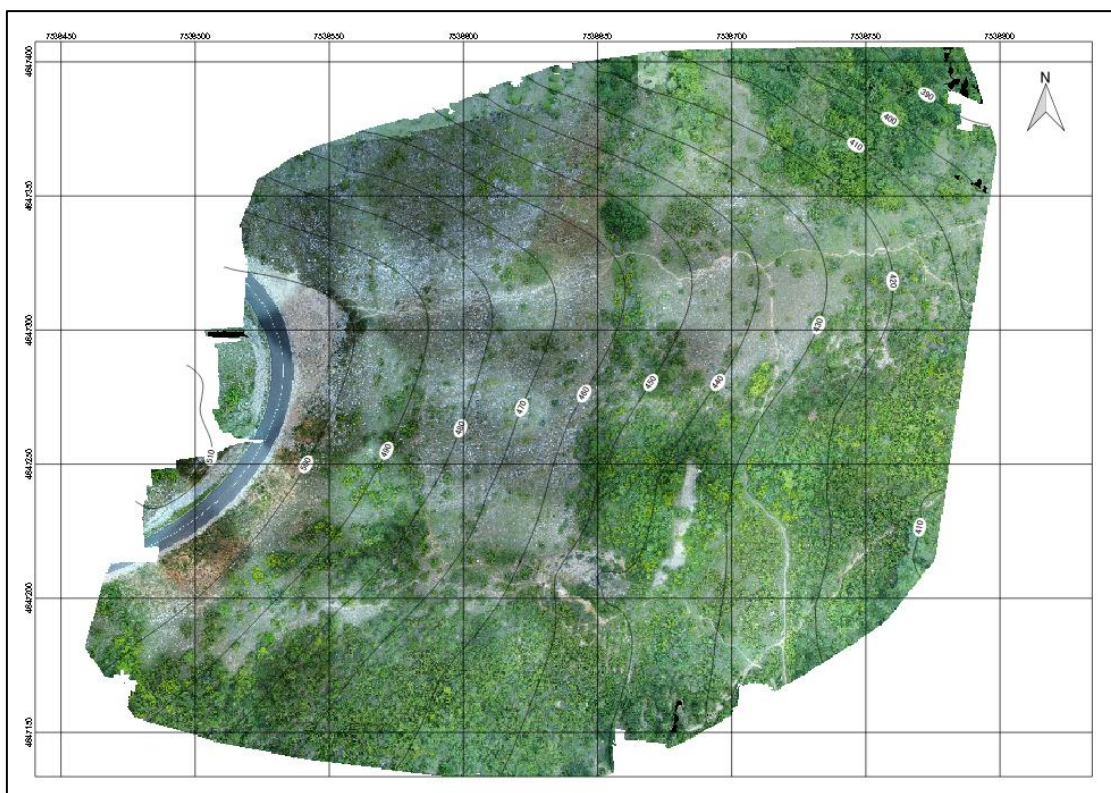
Се отвора композиторот за печатење. Премести во Распоред > Додај карта.



Во белата област, нацртајте обем за да додадете Карта.



Поставете ја големината на страницата, скалата, мрежата, координатите на мрежата и стрелката на север. Извезете ја картата како PDF или формат на слика.

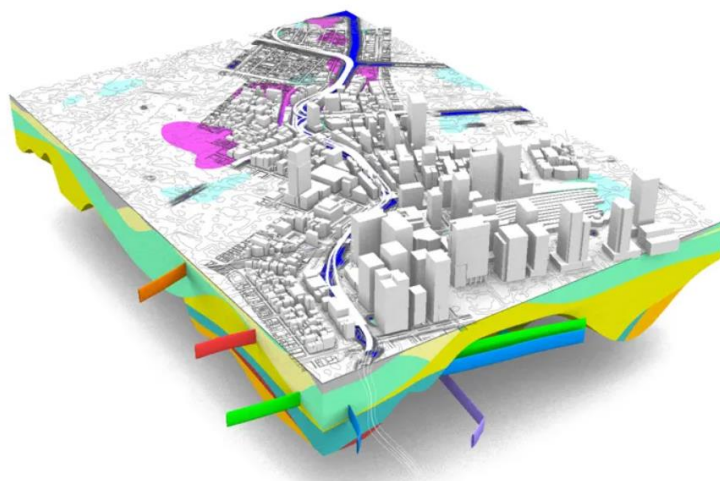


Project on Capacity Building for Ecosystem Based Disaster Risk
Reduction through Sustainable Forest Management in Macedonia

Manual for Civil Engineering Information Model



August 2023



JICA Expert Team

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1 Introduction

1.1 Background

In recent years, the development of hardware equipment and software has been remarkable at the civil engineering sector, and the efficiency and sophistication of construction production systems are being promoted by introducing them from the planning, survey, and design stages.

In this project, individual training has already been conducted on the basic flight photography technology of UAV (drone), data processing, and basic operation technology of total station. In addition to these knowledge necessary for maintenance management, series of techniques necessary for the design, construction, maintenance management of erosion control structures using drone photography data is needed. Therefore, this manual is created summarizing the related activities for civil engineering data processing technologies.

1.2 Civil engineering information: CIM

There is a model used in the construction field called BIM (Building Information Modeling), which was originally born in the United States. This is an initiative aimed at improving the efficiency and sophistication of a series of construction production systems by sharing information among related parties, centering on 3D models. From this background of BIM, civil engineering information CIM was also born.

Recently, in addition to aggregating information in a 3D model, it has been developed about as a means of utilization for asset management that looks at the entire construction life cycle and project management for individual operations and construction, and information that overlooks at the entire life cycle. Management and visualization of information using 3D models have been practiced (<http://cimjapan.com/about/index.html>).

In Japan, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has released the "Implementation Policy for Promoting the Full Use of ICT" that has been applied to CIM operations (and construction) from April 1, 2018 on its website. There are seven items in total in this policy, and four of them are recommended to be selected and implemented.

- i. Construction of CIM model for contract documentation
- ii. Trial of information sharing and online electronic delivery among related parties

- iii. Giving attribute information
- iv. Calculation of quantity, construction cost and construction period by CIM model
- v. Efficient review by CIM model
- vi. Effective use of CIM model during construction stage
- vii. Others [Set items according to workloads characteristics]

1.3 CIM Model

A BIM/CIM model is an overall information model that combines "attribute information" and "reference materials" with a "three-dimensional model" that expresses structures, etc. in three-dimensional shapes.

3D model

Information that expresses the shape and structure of a target structure in three dimensions. The presence or absence of attribute information does not matter when simply expressed as a "three-dimensional model".

Attribute information

Information added to a three-dimensional model or its part. Specifically, the name, shape, dimensions, physical properties, physical property values (strength, etc.), quantity, and other information that can be added to the 3D model.

Reference information

Materials that supplement BIM/CIM models or materials for structures that do not create 3D models. This includes materials that are not machine-readable, such as two-dimensional drawings.

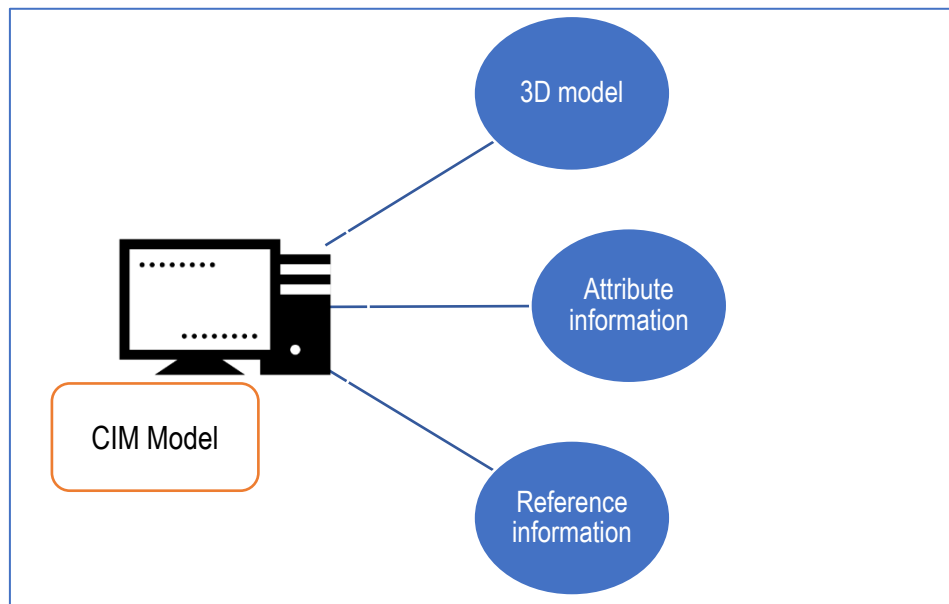


Figure 1: Diagram of CIM model and outputs

2 Effectiveness of CIM

2.1 Improvement of productivity

Front loading

Front-loading can be applied with workload to the previous stage of the process and conduct intensive study. Intensive examination and verification at the design stage has the effect of preventing specification changes and rework that may occur in the later stages. As a result, it is expected to improve quality and shorten the construction period.

For example, by using BIM/CIM models at the design stage, it is possible to grasp the connection between structures and check the interference of reinforcing bars in three dimensions, improve the accuracy of checking, and reduce rework due to design errors and interference. Many cases are thought to be preventable. It is also effective in preventing rework at the construction stage, such as reviewing rational temporary construction methods and confirming construction procedures.

In this way, by combining BIM/CIM with front-loading, advanced studies can be performed in the previous stage, which leads to front-loading of work and reduction of the workload in the post-process.

Concurrent engineering

Concurrent engineering is to improve efficiency by proceeding with multiple projects and tasks at the same time. In concurrent engineering, an important point is cooperation among stakeholders through active information sharing. BIM/CIM can be used as this tool.

By utilizing BIM/CIM models, various types of information can be centralized, making it possible to simultaneously consider each process, such as 2D drawing creation, construction planning, and landscape consideration, which was previously considered in respective stages. It is now possible to perform multiple processes in parallel, which previously could not be done at the same time, and as a result, it can be expected to shorten the overall construction period.

2.2 Consensus building and information sharing

In general, as the business process shifts from planning to maintenance, changes and corrections become difficult. The reason is that the more the process progresses in the second half, the more people involved, such as local residents, landowners, and local government officials.

Accurate and easy-to-understand communication of business etc. is an important point in order to quickly reach consensus among a wide range of stakeholders. Using simulations based on BIM/CIM models in the scene of consensus building makes it possible to communicate more accurately and in an easy-to-understand manner compared to conventional methods centered on 2D data.

In addition, by sharing the BIM/CIM model as a database among the parties concerned, it becomes easy to share the latest information even when information is added, corrected, or changed, and the parties concerned can respond quickly.

In this way, the use of BIM/CIM can be expected to facilitate smooth information sharing, quick decisions, and smooth consensus building. The specific effects obtained at each construction stage.

3 CIM stages

3.1 Design stage

Examples of BIM/CIM utilization scenes at the design stage include explanations with local stakeholders, consultations, quantity calculations, and design verification. Utilizing BIM/CIM models in the design review process will lead to more efficient review work and improved quality.

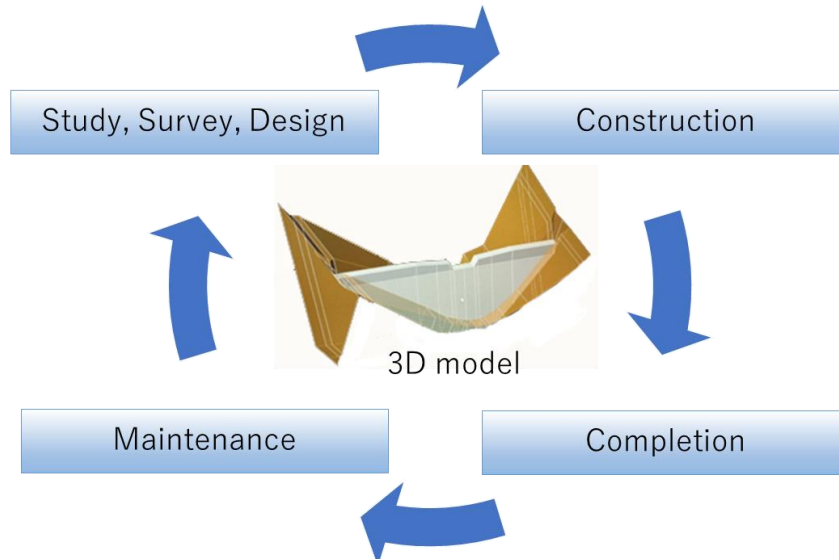


Figure 2: Several stages in BIM/CIM

Conventionally, coherence checking of rebar placement in 2D drawings was a time-consuming task. By utilizing the BIM/CIM model, it is possible to visually express the rebar interference of the complicated dense bar arrangement. Verification is possible. As a result, it is expected to improve the efficiency of verification work and the quality of design deliverables.

Using the BIM/CIM model also makes it easier to check how to deal with obstacles. It is now possible to check existing structures, telephone poles, etc., which were difficult to check at the design stage.

3.2 Construction stage

BIM/CIM utilization scenes at the construction stage include stakeholder consultations, explanations to residents, safety education and safety management for those involved in construction, and design changes.

Conventionally, 2D drawings were used in consultations on construction plans,

but because it was difficult to express each construction scene, it took time to confirm construction procedures. By using BIM/CIM models, construction procedures can be visualized in 3D, promoting the understanding of the parties involved, and can be expected to facilitate and expedite consensus building.

Furthermore, by utilizing BIM/CIM models when calculating quantities associated with design changes, efficiency in design changes can also be expected. Since the site data can be reflected in the BIM/CIM model in real time, it is possible to automatically calculate the quantity in a short time. As a result, it is expected to be able to grasp the amount of work and significantly shorten the time to create reports to the ordering party, and it can also prevent correction errors due to design changes.

3.3 Maintenance stage

In the stage of maintenance management, BIM/CIM can be used to grasp points in inspection work, refer to necessary materials, and consider repair policies.

When inspecting a target structure, it is possible to intuitively and easily grasp the positions of important inspection points by using a BIM/CIM model that is linked to damaged areas and repair history information. As a result, it leads to more efficient inspection work (see the figure below).

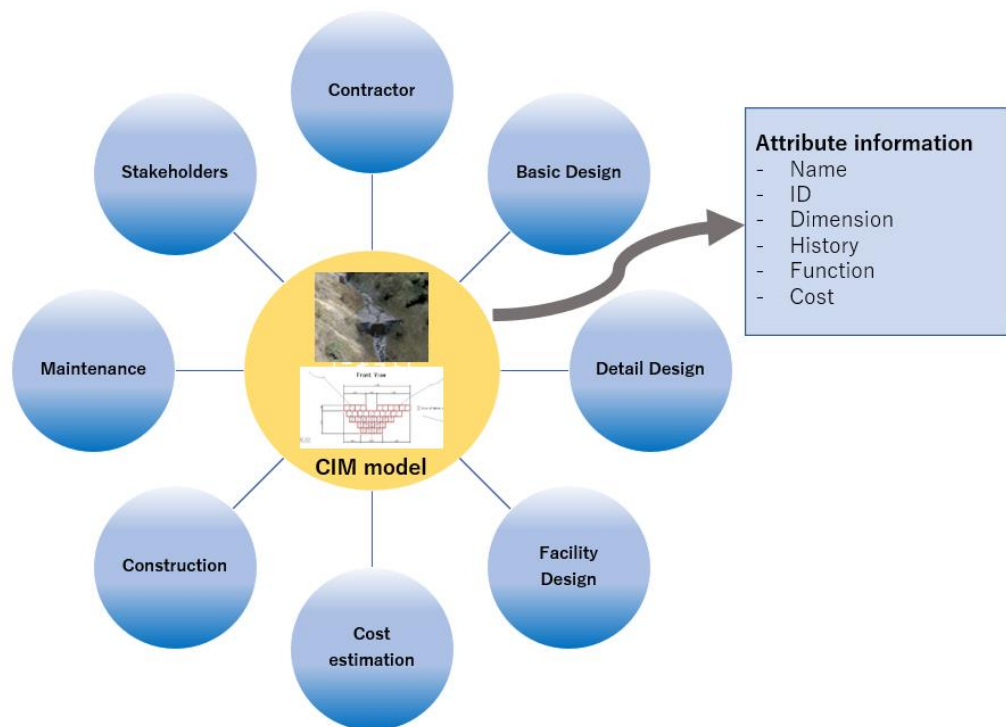


Figure 3: Conceptual diagram of CIM

In addition, by using BIM/CIM models, the information necessary for maintenance can be quickly obtained locally. In maintenance management work, there are many reference materials such as structure ledgers, completion drawings, inspection and repair records, etc., and this information was managed and stored separately in different formats such as paper media and electronic data. As a result, when repairs become necessary, past data (inspection history, repair history, etc.) cannot be obtained immediately, which has the disadvantage of delaying repair work. By using BIM/CIM models, information can be centrally managed, so materials can be searched efficiently, such as being able to immediately refer to necessary materials on site.

4 Data Process

4.1 Data acquisition

Drone flight

Drone flight plan should be made based on the target area, necessary quality, and drone's camera sensor specs. Following figure shows overall plan of the drone flight plan.

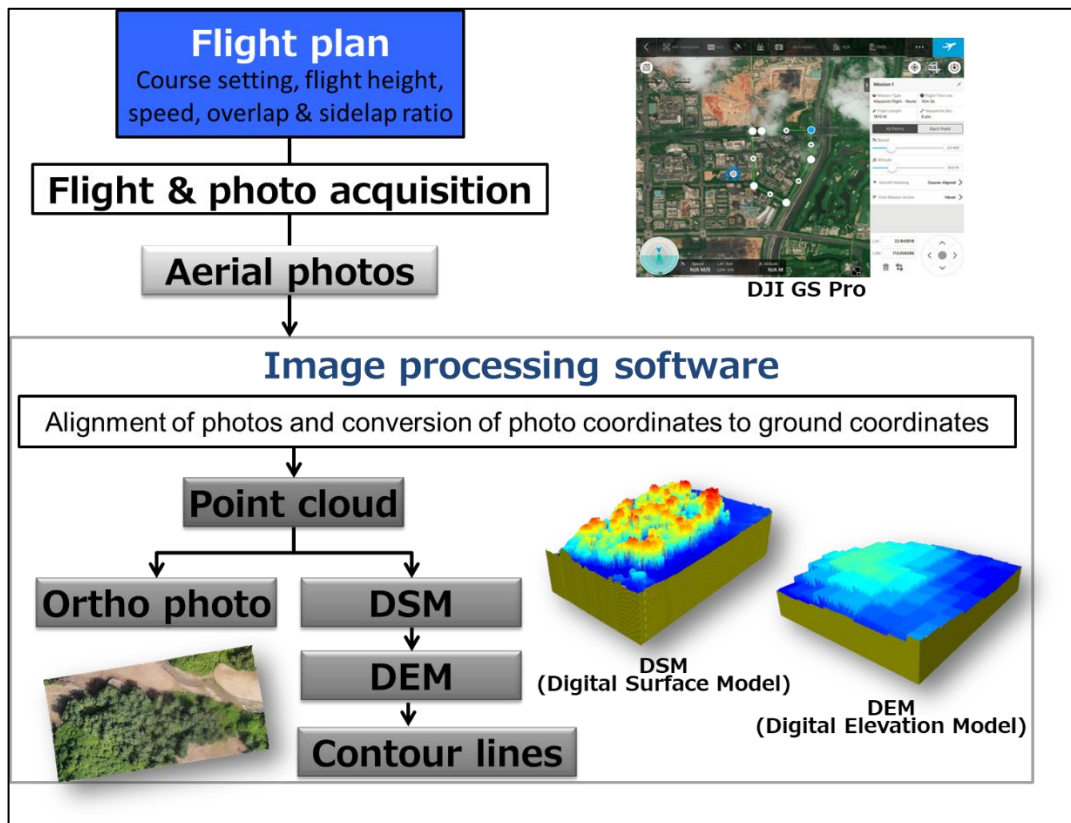


Figure 4: Drone flight plan

In this project, two types of drones were purchased, Phantom 4 pro and EVO II PRO. The basic specification of Phantom 4 pro is shown in the following figure.

Camera sensor specs and ground sampling distance (GSD)

Required GSD for mapping

Map scale	GSD
1:250	Within 0.02m
1:500	Within 0.03m



PHANTOM 4 PRO Camera			
Sensor type	1"		
Sensor resolution (Pixel)	4864	3648	
Sensor size X,Y (mm)	13.2	8.8	
Focal length (mm)	9.16		
(35mm Focal length)	24		
Flight height (m)	GSD	Foot print size(m)	
	(cm)	Left-Right	Front-Back
80	2.1	115.3	76.9
75	2.0	108.1	72.1
70	1.8	100.9	67.2
60	1.6	86.5	57.6
50	1.3	72.1	48.0

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Figure 5: Specification of Drone Camera

Depending on the conditions for the expected quality of imageries, and time for flight and analysis, reasonable flight plan should be created.

4.2 Data processing

The software, Pix4D, was purchased in this project because this is widely used for creating 3D models and it is handy to create 3D models from drone imageries. The manual of the software is attached which should be referred before using the software. It should be noted that the implementing this software requires larger parts of PC's RAM and time consuming. Appropriate time should be allocated for this data process in the planning.

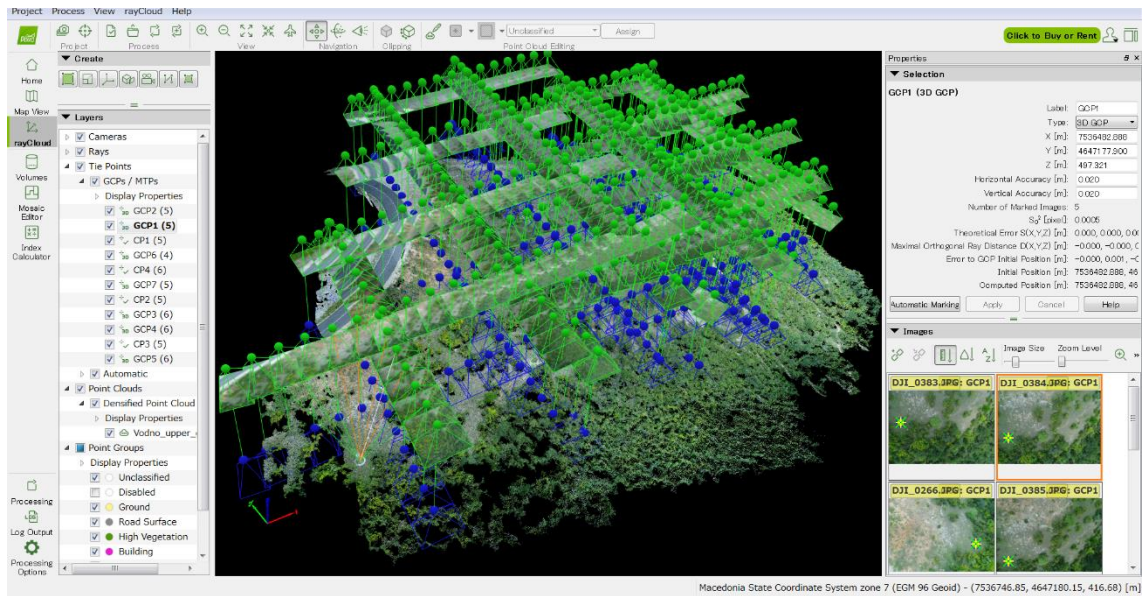
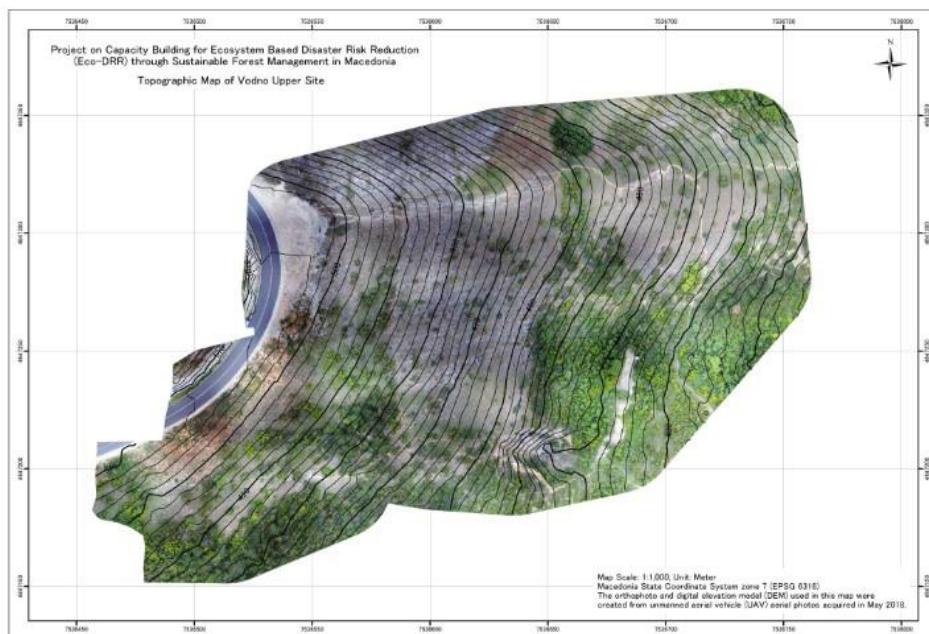


Figure 6: Data processing with Pix4D

JICA UAV Training October 2018

Example of UAV product Orthophoto map



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Figure 7: Orthophoto map processed from Drone imageries

4.3 Data upload to GFIS

The following items are uploaded to for GFIS in PENF based on the examples in the data of check dam construction in Japan

Table 1: Data of check dam uploaded to GFIS

Location	Municipality
	Village
	Watershed/River
	Northting
	Easting
Construction	Date/Month/Year
	Overall area
	Construction company
	Supervisor

The examples of the data uploaded to GFIS are shown below;

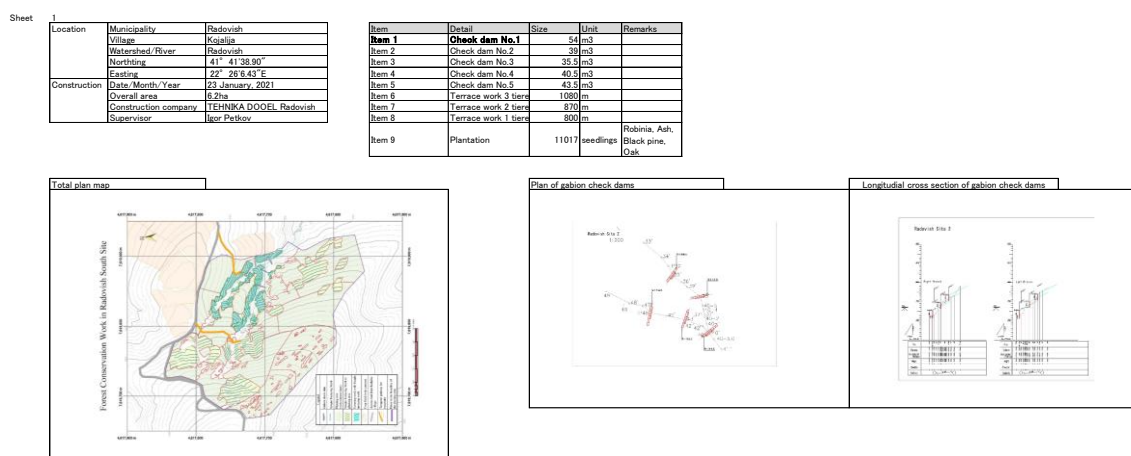


Figure 8: Example of overall plan of check dams uploaded to GFIS

Sheet 2

Location	Municipality	Radovish
	Village	Kogalija
	Watershed/River	Radovish
Construction	Northing	41 69414
	Easting	22 435119
	Date/Month/Year	23 January, 2021
	Overall area	6.2ha
	Construction company	Tehtnika
	Supervisor	Igor Petkov

Item	Detail	Size	Unit	Remarks
Item 1	Check dam No.1	54	m ³	
Item 2	Check dam No.2	39	m ³	
Item 3	Check dam No.3	35	m ³	
Item 4	Check dam No.4	40.5	m ³	
Item 5	Check dam No.5	43.5	m ³	
Item 6	Terrace work 3 tiers	1080	m	
Item 7	Terrace work 2 tiers	870	m	
Item 8	Terrace work 1 tier	305	m	
Item 9	Plantation	11017	seedlings	Robinia, Ash, Black pine, Oak



Figure 9: Example of Check dam data information uploaded to GFIS

5 Attachment

- Manual of UAV Flight Plan for Mountainous Area and Aerial Photo Processing to Build Topographic Data
- Forest Conservation work introduction and the survey for the work
- Manual of Pix4D



Manual for preparing North Macedonia Eco-DRR Hazard Map

2023

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1 Concept of Hazard Mapping

In the Eco-DRR concept, along with the conservation of forests and implementation of hard measures through forest planning and mountain control planning in upstream areas, soft measures are necessary to facilitate the evacuation of residents in downstream areas in case of a disaster, for which the role of hazard maps is important.

On the other hand, rainfall phenomena due to climate change have become more pronounced in recent years, causing damage from landslides and flooding even in areas where no disasters have occurred in the past. In particular, damage caused by "flash floods", in which water levels rise rapidly in response to rainfall and cause flooding, and landslides, has become more serious.

For example, the disaster in the village of Stajkovci, north of Skopje, on the afternoon of August 6, 2016, saw 93 cm of rain fall in one hour, which is reportedly more than the average rainfall for the entire month of August. In the surrounding area, homes, cars, and streets were destroyed, and tragically, 22 people lost their lives and many others were injured. The torrential rains partially interrupted the Skopje Ring Road in front of the Stajkovci-Creshovo intersection. Also, the road from Singelic to Stajkovci was filled with vehicles and destroyed furniture.

Singelic, Stajkovci, Creshovo, and Aracinovo were most affected by this storm, and Indzikovo and Brnjarci in Gazi Baba were also flooded. At this time, there was extensive property damage, and in the most affected areas, both yards and homes were flooded and there was no electricity, food, or water for a while. This led to the coordination of the competent authorities in cooperation with the military and police to recover the situation.

This project aims to prepare a manual for hazard map preparation so that both local governments and residents can be prepared for disasters in the event of heavy rains that may occur in various regions of North Macedonia in the future. CMC and R-CMC will play a central role in the preparation of related data, which will enable each municipality to prepare hazard maps that are suitable for their respective territory. Fig. 1 illustrates the process of completing a hazard map and the responsibilities of each party.

It is important for each Municipality to print and distribute flood hazard maps to properly inform residents of evacuation methods, etc.. When residents have not consulted the hazard maps even though these have been prepared and distributed, or if the information on inundation depths and evacuation sites, etc., provided in hazard maps is too difficult to understand, it is likely that residents will not take proper evacuation actions. Therefore, it is desirable to create hazard maps with the minimum necessary information that would lead to life-saving actions.

In order to enable residents to take more appropriate evacuation actions, it has been tried to enhance the contents of the hazard map preparation guide to make it more residents-oriented.

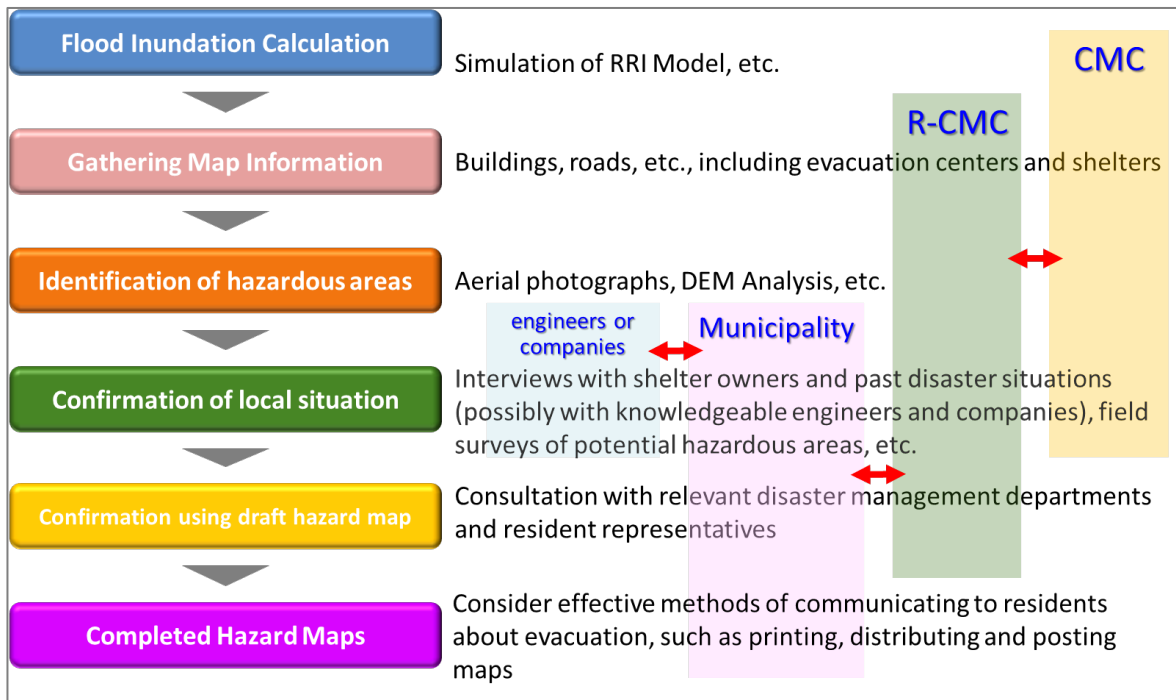


Fig. 1 Flow of Hazard Map preparation

In the future, when printing and distributing hazard maps in each municipality, personnel in charge can refer to the Hazard Maps prepared in the model site of Radovish and this "Hazard Map Preparation Manual", and can also utilize open source data and field survey as needed to improve the hazard maps and enable residents to evacuate more appropriately.

2 Potential risks in North Macedonia

During the mapping process in the model site of Radovish, it was decided to narrow down the scope of the risks to be represented through interviews and workshops with the local government and residents, and thus the scope was narrowed down to inundation areas and steep cliffs in proximity of residential areas.

Simulation results were used for the inundation area, and interpretation of aerial photos were used for the steep cliffs.

The project has conducted topographic interpretation of the upper Radovish River basin. The resulting dataset will be provided to the Municipality and R-CMC from CMC headquarters to show that there are other risks such as landslides and rockfalls in uninhabited areas.

Looking at the distribution of the geological structure in North Macedonia, it can be divided into four major categories, but as for hydrogeological area, it can be considered as three categories (Fig. 2). Therefore, when creating hazard maps, it would be easier to utilize them for evacuation of residents if geologically possible sediment transport phenomena are assumed and appropriate risks are expressed. For example, in Category II, which includes Radovish site, and Category I, which includes Lisiche site, falling rocks and collapses occur, but landslides are unlikely to occur. On the other hand, in Category III, landslides are expected to occur. If a landslide is located near a residential area, it is important to be careful and it should be noted and addressed in hazard maps.

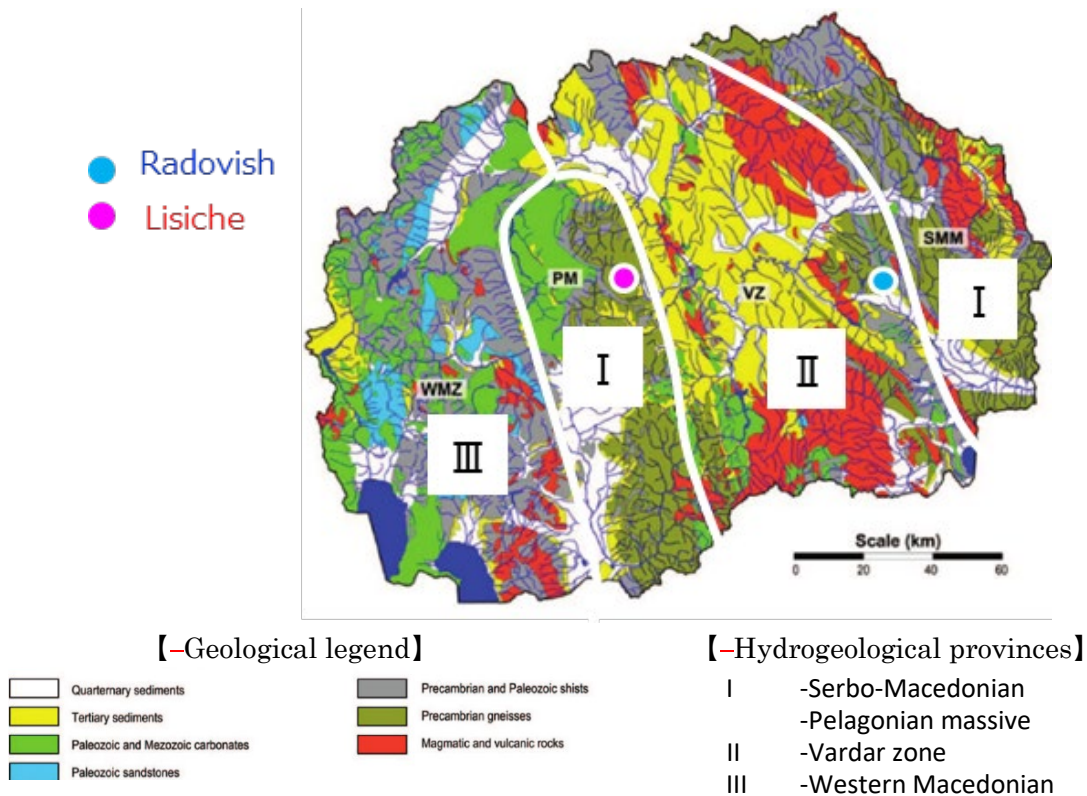


Fig. 2 Geological structure and hydrogeological divisions of North Macedonia

3 How the Hazard Mapping should be established

In Japan, hazard maps have generally been used to predict damage caused by natural disasters and map the extent of that damage, but nowadays they are used for a wide range of purposes, including evacuation and disaster education as well as land use studies.

Due to recent disaster conditions, climate change, increased municipal awareness for evacuation, and the need to provide more concise information, we believe that hazard maps should be created to make it easier for residents to evacuate.

Although the map lists various risks, the expression "risk map" makes it difficult to understand that it is a map that should be used in case of evacuation of residents, so it is better to use the name "hazard map" here to make it well known.

In addition, since this hazard map is a tool to provide information to residents to promote appropriate evacuation based on the risk of inundation, CMC (or R-CMC) that conducts the inundation risk modelling and the Municipality's disaster prevention department that conducts evacuation studies shall have a firm grasp of the contents of the studies and work together to provide, prepare, and utilize the hazard map data. This manual also states that CMC (or R-CMC) should actively provide, create, and utilize hazard map data in cooperation with CMC and the Municipality disaster prevention departments and other organizations that are responsible for evacuation.

It is also expected that hazard maps will be improved incrementally based on future improvements in knowledge (e.g., fine-scale hydrological modeling based on recent LiDAR acquisitions) and experience from CMC and municipalities after disasters and drills.

Ideally, in the medium term, the hazard maps should reflect the regional and local disaster preparedness plans, and vice versa, the regional and local disaster preparedness plans should incorporate elements from the hazard maps and foresee how the hazard maps will be distributed and used.

4 How the manual for hazard map preparation should be

There are few precedents of hazard maps voluntarily created and utilized by local governments, and only those created with financial support from the EU, UNDP, and other organizations have been made public.

It is very important to familiarize oneself with local flood damage characteristics and community conditions through the process of utilization in order to achieve appropriate evacuation against disasters. In light of the above, this manual for flood hazard map preparation should not prescribe in detail the methods and contents of preparation and utilization, but rather provide the concept of preparation and recommended examples to help each municipality prepare flood hazard maps and promote utilization of such maps.

On the other hand, it is necessary to make the maps easy to read not only for residents but also for commuters and tourists visiting the area, etc. Therefore, it was decided to standardize the minimum rules for display methods, such as flood depth thresholds, color schemes, etc.

In accordance with the “Floods Directive,” the EU has created a standard exchange format for some datasets related to floods when they are reported from each country to the EU, but the use of the EU format is not mandatory for maps for the general public and other purposes. As a result, the EU formats have not been used in this case.

Each R-CMC can prepare its own hazard map based on the revised manual, taking into account local conditions, etc., and should continue to work on further improvement of the manual by providing feedback to CMC on their efforts, sharing information, and reflecting the results in the manual.

5 Analysis of disaster and social characteristics in the region

When creating hazard maps, it is necessary to fully understand in advance the scale and frequency of damage caused by flooding and landslides from the perspective of the residents of each community as a characteristic of the community. It is especially important to consider and analyze social characteristics, such as the status of local communities, and to be able to link them to evacuation.

In creating hazard maps, it is necessary to consider the characteristics of the local community and consider evacuation methods, including wide-area evacuation, and to focus on "which disasters to emphasize" and "which disasters to overlay".

Radovich, the model area for this study, is a mountainous city formed on an Alluvial fan outlet with a catchment area of several tens of km². Therefore, flash flooding was considered to be the most important disaster affecting the local residents, and we also focused on small-scale collapses, intersections between waterways and roads, and underpasses where water can accumulate during rainfall events. For this reason, inundation depths based on the RRI model were represented on hazard maps, and field surveys were conducted to confirm the locations assumed from the map information, and these points are represented on the maps. On the other hand, in the case of a city such as Strumica, which is also bordered by mountains but located in a river floodplain, it is necessary to assume not only flash floods, in which the water level rises rapidly, but also floods that affect the city as the water level rises gradually. This combination of different disasters should be considered and taken into account in the map representation.

In addition to selecting evacuation sites that will not be affected by disasters, the Municipality's information, such as information on land ownership, should be obtained and used in the planning of evacuation sites. At this time, it should also be noted that regional divisions within a city are often formed by ethnic and religious differences. Care should be taken to ensure that the residents who congregate at evacuation sites in the event of a disaster are a homogeneous group.

6 Methods of Hazard Map Preparation

The composition and design of the hazard map should be devised by each R-CMC according to the actual conditions of the region, but the map should be easy to read not only for local residents but also for commuters, tourists, and others visitors to the region, so that anyone can quickly determine the actions to be taken.

Hazard maps can be created using the free and open-source GIS software “QGIS”, as is for the maps developed on the model site of Radovish.

Information to be superimposed should be managed layer by layer. Sources should be organized and expressed for each item, and those that are not available should be researched and included through field survey. For each item, a summary should be written in a box with details below it, and who is responsible for handling each item should also be organized.

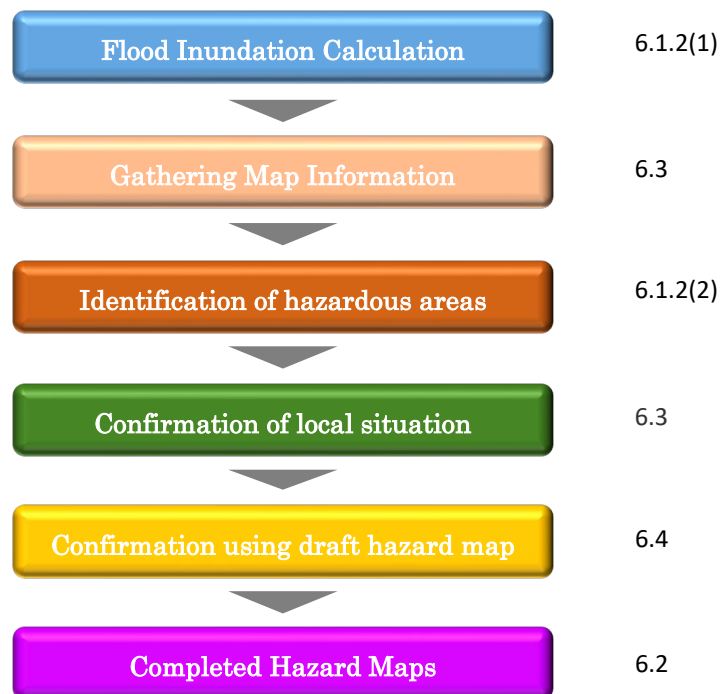


Fig. 3 Workflow for Hazard Mapping

6.1 Composition

This section is written for CMC and R-CMC to work with.

Compose a hazard map by selecting the data considered necessary for the target area.

In the model site of Radovish, where collapses and sediment deposition are observed in the upper reaches of rivers, but not around urban areas, and flash floods are the highest risk to be considered in light of the past disaster history, the inundation area has been simulated.

6.1.1 Collection of information to be expressed in hazard maps

When simulation results are not available, it is recommended to interview local engineers who have information on the past disaster history and companies engaged in civil engineering projects, especially those involved in post-disaster restoration, to describe the extent of past damage on the map. When conducting these interviews, it is also recommended that a person from the Municipality's disaster management department accompany the engineers.

Table 1 The tasks required to create it and the division of roles

Tasks	Municipality	R-CMC	CMC
Flood Inundation Calculation	—	—	Perform data collection, set and calculations
Gathering Map Information	—	Obtain POI information and share with CMC	Provide information such as topographic data and calculation result data
Identification of hazardous areas	—	Aerial photo interpretation DEM analysis, etc.	Aerial photo interpretation DEM analysis, etc.
Confirmation of local situation	On-site check and information sharing	On-site check and information sharing	Advising
Confirmation using draft hazard map	-Conduct workshops, etc. with residents -Confirmation of distribution and publication methods	-Workshop support -Consultation and instruction on effective evacuation	Advising
Completed Hazard Maps	Printing and distribution	—	—

6.1.2 Display Contents

The contents to be displayed were the results of flood inundation simulation and issues that would hinder the evacuation of residents. Of these, it is important to be sure to survey and organize onsite the points of concern during disasters that may hinder evacuation.

Table 2 Parts required for hazard maps and their sources

	Tasks	Source	remarks
RRI	Rainfall	1% probability rainfall with rainfall intensity formula	Blinkov and Jagev(2004)
	DEM	SRTM (about 90m mesh)	
	Land cover data	USGS land cover (GLCNMO) https://globalmaps.github.io/glcnm.html	
	Soil type data	FAO Harmonized World Soil Database v 1.2 https://www.fao.org/soils-portal/data-hub/soil-maps-and-databases/harmonized-world-soil-database-v12/en/	
GIS Data	Disaster Facility 1-7	- OpenStreetMap: selected feature classes - Orthophoto	-
	POI 8-16	- OpenStreetMap (POI)	Be flexible and remove those that are not in the region, etc.
	Secondary Hazard 17-20	- Evacuation roads - DEM	- Determine and select a location based on hydraulic model and DEM interpretation of the conditions expected during evacuation.
	Suitability of disaster Facility 21-26	- Hydrologic model	- Confirmation by field survey
	Places of worship and other POIs 27-36	OpenStreetMap (POFW)	
		OpenStreetMap (POI)	
	Transport and Waterways 37-44	OpenStreetMap (Roads)	
		OpenStreetMap (Waterways)	
	Evacuation and Primary Hazard 45-51	- OpenStreetMap (Road / various feature classes)	
		- OpenStreetMap (Waterways / "river" feature class)	
- Secondary hazards			
- Hydrologic modelling			
- Evacuation shelter			
- Evacuation area			
- Orthophoto			
- DEM			
- Erosion map of North Macedonia			
- Other data as necessary			
Landuse 52-63	OpenStreetMap (Landuse)	- Digitize from the topographic map	
Other things you can't get from open source		Consider how to express the information in a clear manner and add it in GIS	Municipality, added by interviewing local engineers and civil contractors as needed

(1) Flood inundation area

The creation of flood inundation areas to be expressed in hazard maps is presented in this section. Two cases are presented here: one in which simulations can be performed and one in which they cannot.

This section is written for CMC and R-CMC to work with.

Determine the extent of flood inundation to be represented on hazard maps.

1) Flood inundation simulation

RRI (Rainfall runoff Inundation model) is a “Two-dimensional model capable of simulating rainfall-runoff and flood inundation simultaneously”. For example, in the catchment, the model calculates using 2D diffusion, while in the river, it calculates using 1D diffusion.

Also, at a grid cell in which a river channel is located, the model assumes that both slope and river are positioned within the same grid cell.

In this model, river discharge, water level and inundation for output data are calculated by using rainfall, DEM, land cover and river cross section for input data.

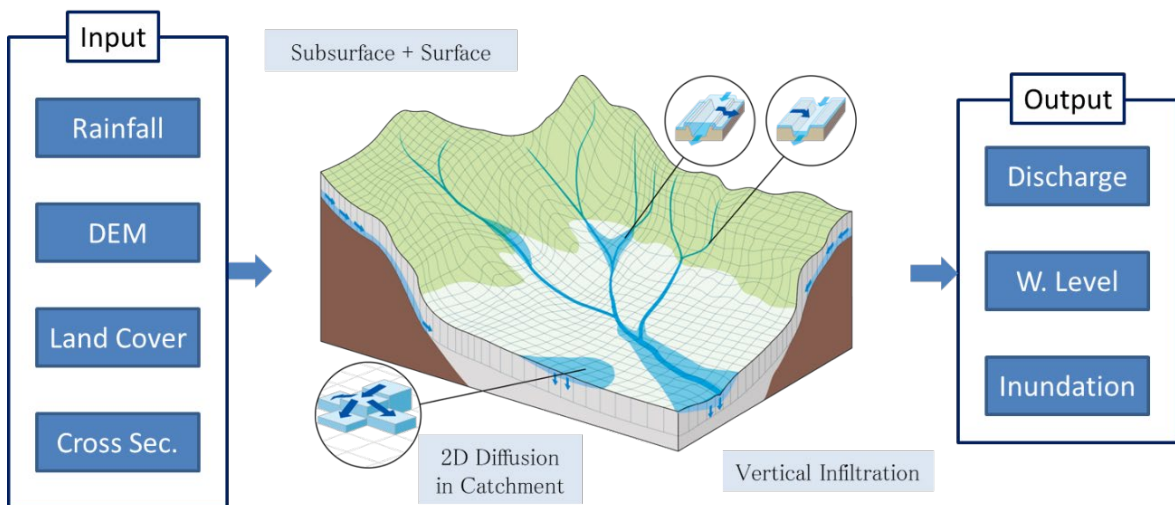


Fig. 4 Outline of RRI model

2) To be prepared from hearing information on past inundation conditions

If inundation simulation results as shown above are not available, we show how to establish the assumed inundation area by mapping information where inundation has occurred in the past.

In the field, the following points should be investigated for inclusion in the hazard map. Fig. 5 illustrates the results of the interviews in the field. When inputting the data into the GIS, the inundation depth should be input along with the location information.

In addition, information should be collected so that damage locations can be expressed as information to be transferred as lessons learned for future evacuations.

Specifically, it is advisable to identify the break points (e.g., the point where the floodwaters begin to overflow and the overflow points downstream) and the damaged houses (houses where people died or were injured). If it is known how the inundated water flowed during the flood, the direction of flow should be illustrated.

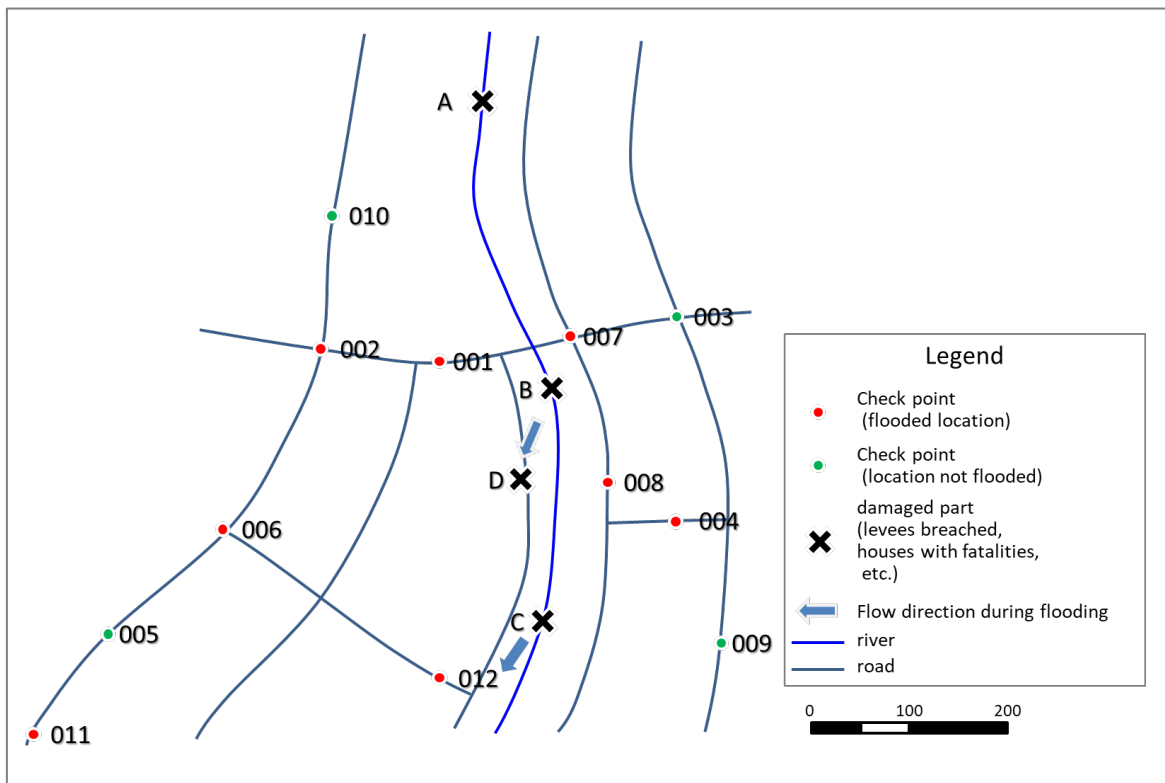


Fig. 5 Graphical example of the results of hearings in the field

[Contents of the interviewed information]

- (1) Sites that were inundated during past disasters
(8 red points in the example in Fig. 5)
- (2) Locations that were not inundated during past disasters
(4 green points in the example in Fig. 5)
- (3) Breached points
(In the example in Fig. 5, x marks A, B, and C)
- (4) Damaged houses
(In the example in Fig. 5, the x mark D)
- (5) Direction of flow at the time of flooding
(In the example in Fig. 5, the right bank side of B and C marked with X)

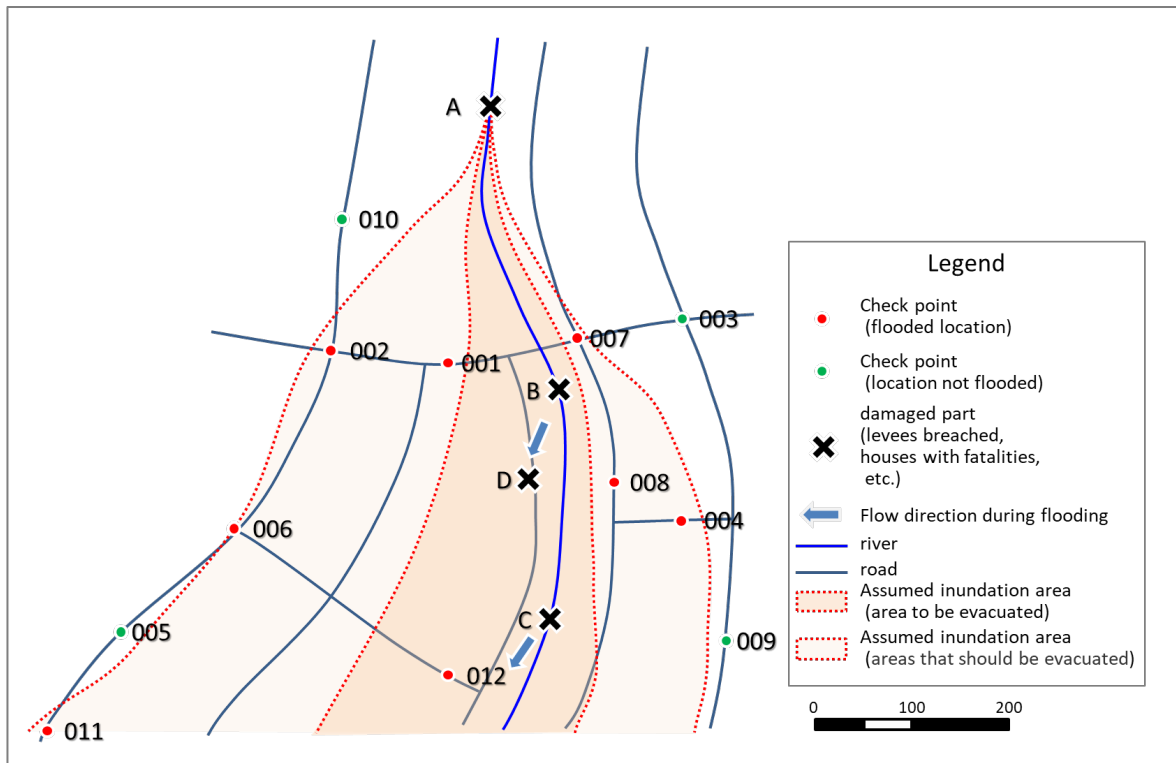


Fig. 6 Example of assumed inundation area based on past disaster results

Based on the information on inundation depth and non-inundation at each checkpoint, create a projected inundation area. It is recommended to use dark colors for areas that must be evacuated and light colors for areas that should be evacuated. For example, the depth of water deeper than 20 cm during past inundation should be expressed in dark colors, and the depth of water between 0 and 20 cm should be expressed in light colors, in accordance with the expected evacuation at the local level.

In determining the boundaries of these areas, linear structures such as roads and obvious slope change points are referred to DEM data and microtopography confirmed by field surveys to indicate the assumed inundation area.

3) For areas with no history of past flooding

For areas that have not experienced flood inundation in the past, it is best to conduct simulations; however, if information is not available, the following points should be expressed as follows. The purpose of hazard maps is to identify danger areas in advance, and to evacuate at an early stage to save lives first.

- Set and illustrate the assumed flood inundation initiation points.
(e.g., points of change in riverbed gradient, topographic constrictions, and areas that are expected to be blocked by structures in the event of flooding)
- For the area downstream of the inundation initiation point, consider horizontal evacuation and indicate the distance from the river as a buffer.
(Color gradient is shown every 100 m at a certain distance in the direction perpendicular to the direction of the river channel flow)
- Check the topographic map by DEM to find the area of land that is lower than the surrounding area, and conduct a field survey of the surrounding area to indicate the areas that may be affected by inundation.
- On the other hand, if there is a strong building or other structure that allows vertical evacuation, indicate multiple locations.

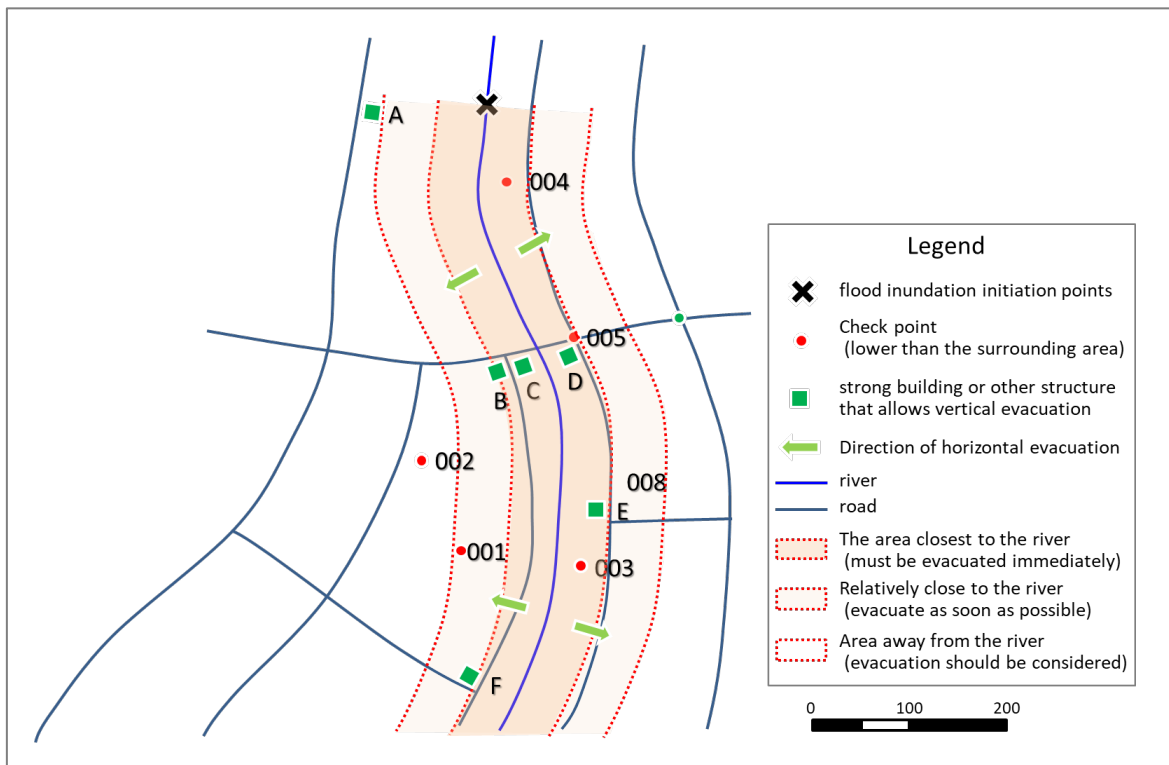


Fig. 7 Example of showing flooding hazard area in an area with no past disasters

(2) Points to be noted in case of disaster

This section is written for R-CMC to work with.

The following are some of the things to keep in consideration regarding aerial photography, DEM analysis, etc. when working with GIS.

Be sure to confirm the following target areas on site and reflect them on the map. At this time, it is recommended that information such as photographs and past disaster history be retained and stored in GIS data as necessary. It is also advisable to link photographs with GPS information that indicates location, and to use mobile devices such as tablet for field survey, so that GIS information can be stored to enhance the accuracy of the locations photographed.

- ① Locations where roads and small streams intersect (bridge height, span of piers, box culverts, drainage capacity, drainage channel maintenance status, etc.)
- ② Whether the road was built according to the stream terrain (to allow identifying which roads should not be used during evacuation, etc.)
- ③ History of past disasters (whether they have occurred frequently or not, with photos and clear descriptions of the situation)
- ④ Sites suitable for evacuation (These are assumed to be temporary evacuation sites where evacuees do not stay for a long period of time, because the water level is expected to rise and decline relatively quickly, and because the social structure and the way of thinking in North Macedonia indicate that it is not such culture of storing food and water supplies or accommodating a large number of people for long periods of time).

6.2 Outputs of hazard maps

This section is written for the Municipality and R-CMC to work with.

Choose a format that effectively encourages residents to use the system.

6.2.1 Poster format

The purpose of a poster version is displaying at facilities that receive public, for using by community leaders, and for using by persons involved in disaster prevention and management. It is covering the whole area of urban settlements.

Large A1 size hazard map

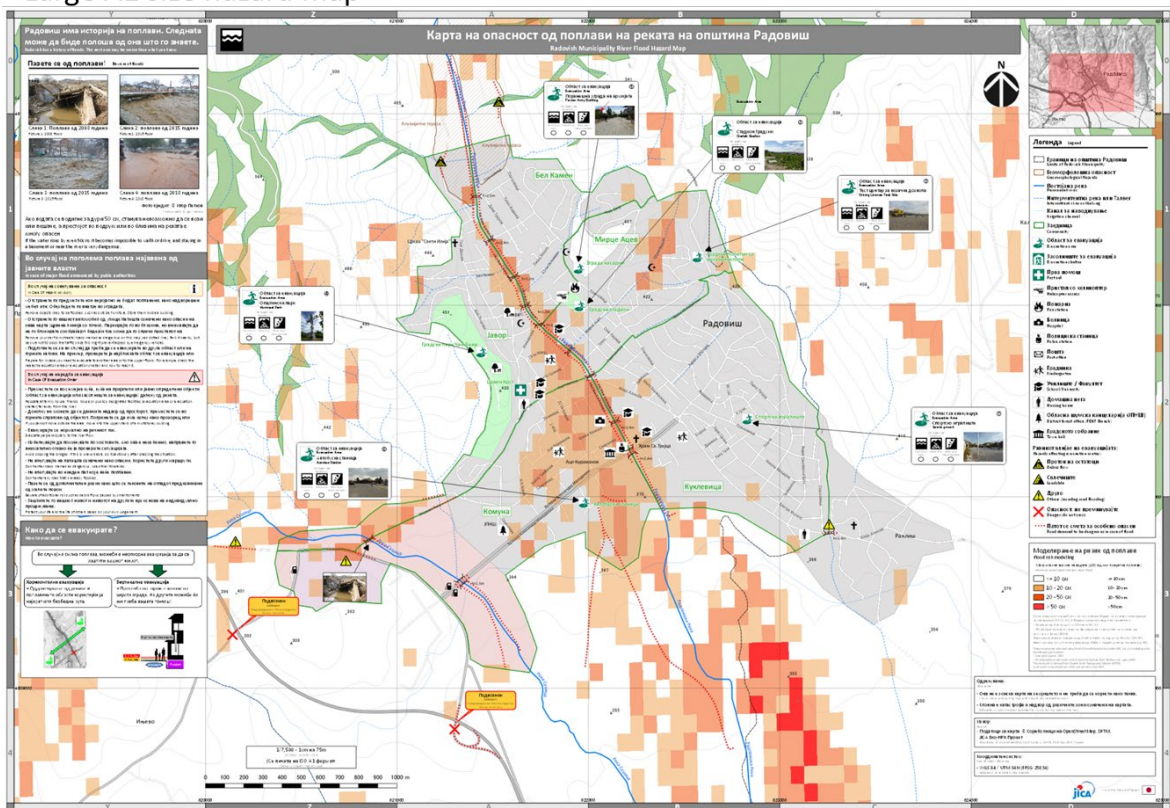


Fig. 8 Example of hazard mapping in poster format (example from Radovish)

6.2.2 Pocket version

The purpose of a pocket version is distribution to residents to improve the awareness of disaster risk and encourage appropriate evacuation when necessary. Due to its size, it is covering a narrower area than the poster of the hazard map. Essential information is included, such as temporary evacuation areas and contact information.

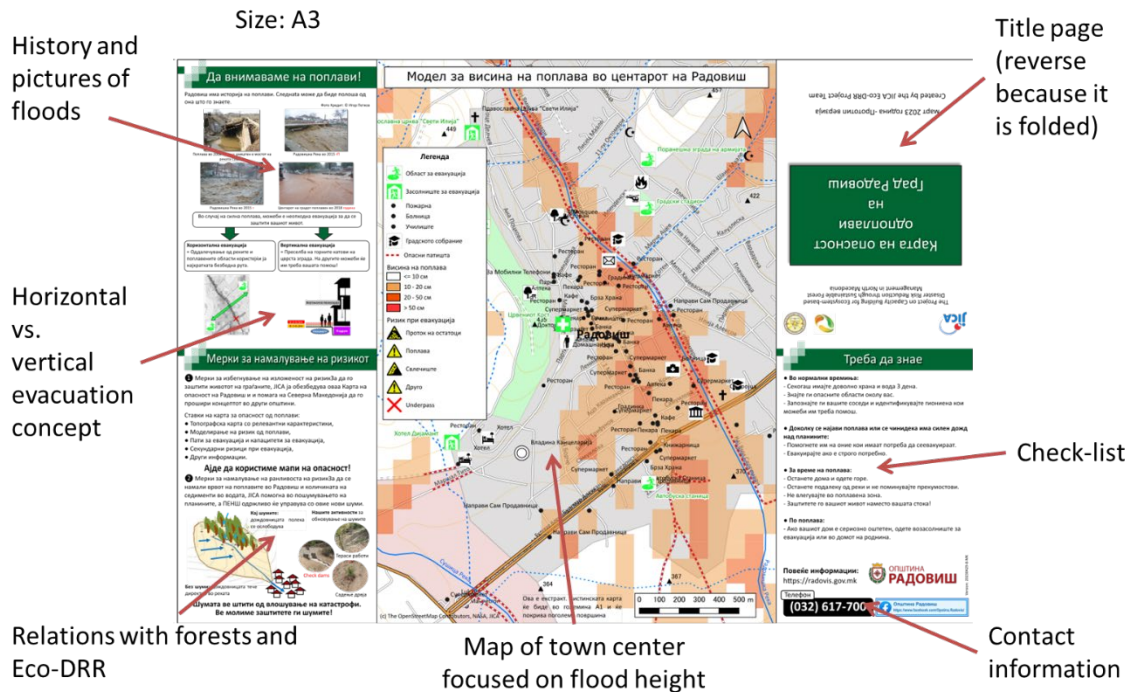


Fig. 9 Example of portable hazard map creation: recto (example of Radovich)

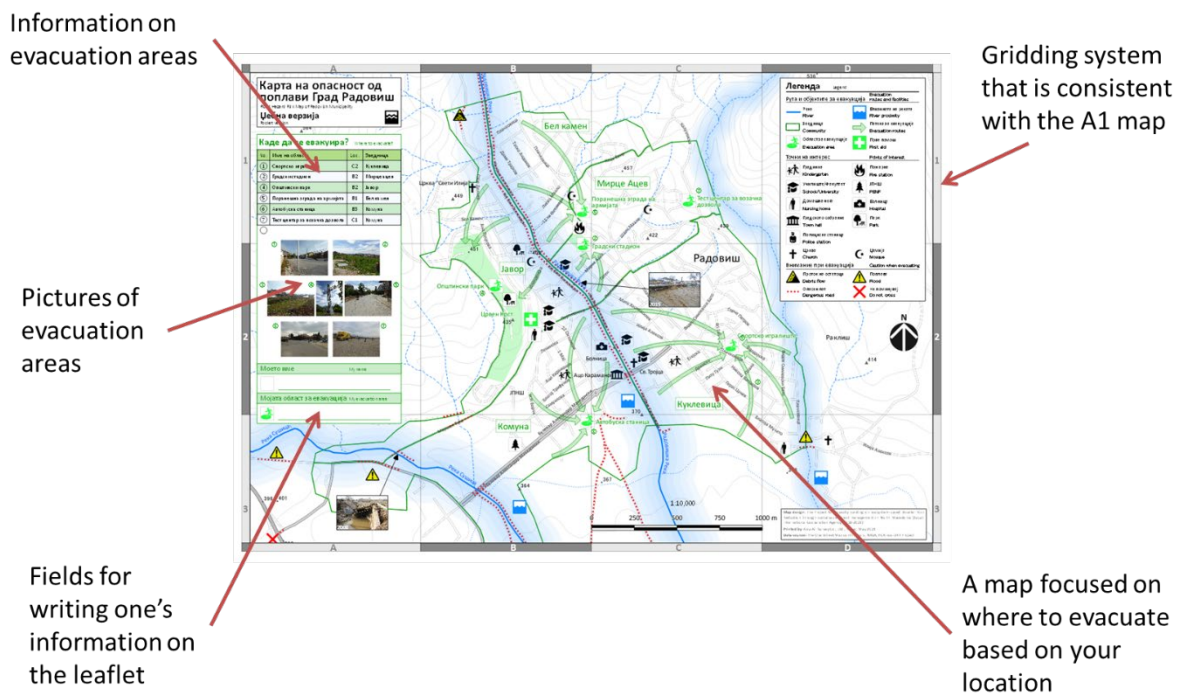


Fig. 10 Example of portable hazard map preparation: verso (example of Radovich)

6.2.3 Information board

Information boards can be useful to reinforce the perception of risks linked with a specific place (e.g. near a river), and to suggest evacuation to the nearest appropriate facility. In the case of Radovich municipality, installing such near the Radovich River, close to the Town Hall was proposed.

Size: A0



Fig. 11 Example of bulletin board type hazard map preparation (example of Radovich)



Fig. 12 Installation image of signboard-type hazard map

Such information boards may be supplemented by signs indicating the safe route to the closest evacuation area or shelter.

6.3 Data used

This section is written for the CMC and R-CMC to work on and confirm with the Municipality.

Use GIS vector data for the background of hazard maps and some map features.

For the background and some map features, vector data derived from OpenStreetMap¹ was used, which could be downloaded through <https://www.geofabrik.de/>, a site that provides easily usable downloads. As a result, no usage fee is due, and the only requirement is to acknowledge the OpenStreetMap contributors (such acknowledgment has been included in the hazard maps of the Radovish model site presented at the workshop and provided to the Municipality). In case the Municipality further disseminates the results in the form of a vector database, it shall also contribute back achieved data improvements (e.g. additional streets, buildings or rivers that were digitized to produce the map) to OpenStreetMap, as per the terms of the OpenDatabase License 1.0.

Over the long term, CMC may want to discuss with the Agency for Real-estate Cadastre (AREC), which is the national mapping agency of North Macedonia, to understand if topographic data thereof is suitable for use in hazard maps, and if the data usage fee is reasonable for end-user organizations.

The 63 map symbols used in this study or expected to be used in other regions in the future and their source data are listed in Table 3 through Table 10, with details provided in Appendix. A symbolization of the above data has been proposed, which can be easily reused. Symbology is attached as Appendix.

The condition of the site to be used as a shelter will be determined after conducting interviews with the owner and past disaster situations (in some cases, interviews with engineers and companies with knowledge of the situation), and field surveys of potential hazardous areas.

¹ <https://www.openstreetmap.org/>

Table 3 Map Symbol and Source datasets (Disaster Facility)








No	Feature Group	Name for Map Symbol (Feature Class Name)	Map Symbol	Source dataset(s)	Process
1	Disaster facility	Evacuation Area Област за евакуација	 Градски стадион Height: 8mm	- OpenStreetMap: selected feature classes (e.g. POI / "park", "pitch", "sports_centre" feature classes) - Orthophoto	- Select from database, identify on orthophoto (e.g. large stabilized areas) - Check through field survey - Discuss with land owner, etc. - Discuss with municipality
2	Disaster facility	Evacuation Shelter Засолниште за евакуација	 Хотел Дијамант Height: 8mm	- OpenStreetMap: selected feature classes (e.g. POFW / "christian_orthodox")	- Select from database - Discuss with owner, etc. - Discuss with municipality
3	Disaster facility	Tsunami Evacuation Area (Not used in Radovich) Областа за евакуација од цунами	 Општински парк h=40m Height: 8mm	-	<Not applicable in Radovich>
4	Disaster facility	Tsunami Evacuation Building (Not used in Radovich) Зграда за евакуација од цунами	 градското собрание h=9m Height: 8mm	-	<Not applicable in Radovich> Note: similar research of flood evacuation buildings could be made (e.g. inventory of strong buildings of 2 floors or more)
5	Disaster facility	First Aid Прва помош	 Црвениот крст Height: 8mm	- OpenStreetMap (POI / "first_aid" and "doctors" feature classes)	- Select from database - Complete/correct through field survey - Discuss with representatives, etc.
6	Disaster facility	Helicopter Access Пристап со хеликотер	 Height: 8mm	- OpenStreetMap (POI / "heliport" feature class)	- Select from database - Identify on orthophoto, etc. (large bare and stabilized areas without surrounding obstacles) - Check through field survey - Discuss with land owner, etc.
7	Disaster facility	Temporary car park (Not used in Radovich) Привремен паркинг	 Height: 8mm	- Orthophoto - OpenStreetMap (POI / "parking" feature class)	<Not investigated in Radovich> - Identify large and stable areas on orthophoto, etc. - Check through field survey - Discuss with land owner, etc.

Table 4 Map Symbol and Source datasets (POI)

No	Feature Group	Name for Map Symbol (Feature Class Name)	Map Symbol	Source dataset(s)	Process
8	POI	Hospital Болница	 Height: 8mm	- OpenStreetMap (POI / "hospital" feature class)	- Select from database - Confirm through field survey
9	POI	Doctor доктор	 Height: 8mm	- OpenStreetMap (POI / "doctors" item)	- Select from database - Confirm through field survey
10	POI	Pharmacy аптека	 Height: 8mm	- OpenStreetMap (POI / "pharmacy" feature class)	- Select from database NB) There are many pharmacies in Radovich, and to avoid overloading the map we have not represented them
11	POI	Post office Пошта	 Height: 8mm	- OpenStreetMap ("post_office" item)	- Select from database - Confirm through discussion with local experts
12	POI	Telephone телефонска говорница	 Height: 8mm	- OpenStreetMap (POI / "telephone" feature class) Note) There are no records in Radovich	- Select from database
13	POI	Police Station Полициска станица	 Height: 8mm	- OpenStreetMap (POI / "police" feature class)	- Select from database - Confirm through discussion with local experts
14	POI	Fire Station Пожарна	 Height: 8mm	- OpenStreetMap (POI / "fire_station" feature class)	- Select from database - Confirm through discussion with local experts
15	POI	Government and municipal offices Владата и општинските канцеларии	 Height: 8mm	- OpenStreetMap (POI / "town_hall" feature class)	- Select from database - Confirm through discussion with local experts
16	POI	Drinking Water Вода за пиење	 Height: 8mm	- OpenStreetMap (POI / "drinking_water" feature class) Note) There are no records in Radovich	- Select from database - Complete/Confirm through field survey - Discuss with the municipality: suitability for emergency water supply in case of disaster

* POI : Abbreviation of "Point of Interest", which generally refers to a "target", and in map databases, means a store or facility.

Table 5 Map Symbol and Source datasets (Secondary Hazard)

No	Feature Group	Name for Map Symbol (Feature Class Name)	Map Symbol	Source dataset(s)	Process
17	Secondary Hazard	General Caution Друго	 Height: 8mm	- Evacuation roads - Hydrologic model	- Select all places where an evacuation road crosses a flood area of 50cm or more - Confirm through field survey
18	Secondary Hazard	Tsunami (Not used in Radovich) Цунами	 Height: 8mm	-	<Not applicable in Radovich>
19	Secondary Hazard	Debris Flow Проток на остатоци	 Height: 8mm	- Evacuation roads - Geomorphologic hazard area	- Select all places where an evacuation road crosses a debris flow area - Confirm through field survey
20	Secondary Hazard	Steep Slope Failure / Landslide Свљечисте	 Height: 8mm	- Evacuation roads - Geomorphologic hazard area	- Select all places where an evacuation road crosses a slope failure area, rockfall area, or landslide area - Confirm through field survey

Table 6 Map Symbol and Source datasets (Suitability of disaster Facility)







No	Feature Group	Name for Map Symbol (Feature Class Name)	Map Symbol	Source dataset(s)	Process
21	Secondary Hazard	Danger, do not cross (e.g. Underpass) Опасност, не преминавайте (на пр. подвозник)	 Height: 8mm	- Evacuation roads - DEM - Hydrologic model	- Select places where an evacuation road is an underpass or a bridge, and past collapse or flooding has been confirmed or is suspected through field survey or interpretation of the hydrologic model / DEM - Confirm through field survey
22	Suitability of disaster facility	River Flood поплава на река	 Height: 8mm	- Hydrologic model	- The symbol is used to represent suitability of an evacuation area or shelter. Confirm that the feature is safe through flood model, field survey, and record of past disasters.
23	Suitability of disaster facility	Debris Flow проток на остатоци	 Height: 8mm	- Geomorphologic hazard area - DEM	- The symbol is used to represent suitability of an evacuation area or shelter. For each type of disaster, confirm that the feature is safe through geomorphological hazards, DEM reading, field survey, and record of past disasters.
24	Suitability of disaster facility	Storm Surge - Tsunami Бура наплив - цунами	 Height: 8mm	-	<Not applicable in Radovich>
25	Suitability of disaster facility	Landslide Селечиште	 Height: 8mm	- Geomorphologic hazard area	- The symbol is used to represent suitability of an evacuation area or shelter. For each type of disaster, confirm that the feature is safe through geomorphological hazards, DEM reading, field survey, and record of past disasters.
26	Suitability of disaster facility	Fire Disasters (not used in Radovich) Пожарни катастрофи	 Height: 8mm	-	<Not applicable in Radovich>

Table 7 Map Symbol and Source datasets (Places of worship and other POIs)

No	Feature Group	Name for Map Symbol (Feature Class Name)	Map Symbol	Source dataset(s)	Process
27	Places of Worship	Muslim (mosque) цамија	 Height: 8mm	OpenStreetMap (POFW / "muslim" and "muslim_sunni" feature classes)	- Select from database - Confirm/complete through field survey - Consider for inclusion as an evacuation shelter; discuss with guardian
28	Places of Worship	Christian (church) црквата	 Height: 8mm	OpenStreetMap (POFW / "christian" and "christian_ortodox" feature classes etc.)	- Select from database - Confirm/complete through field survey - Consider for inclusion as an evacuation shelter; discuss with guardian
29	POI	Kindergarten градинка	 Height: 8mm	OpenStreetMap (POI / "kindergarten" feature class)	- Select from database - Confirm/complete through field survey
30	POI	School Училиште	 Height: 8mm	OpenStreetMap (POI / "school" feature class)	- Select from database - Complete through field survey - Consider for inclusion as an evacuation shelter; discuss with guardian
31	POI	University / college универзитет	 Height: 8mm	OpenStreetMap (POI / "college" and "university" feature classes)	- Select from database - Complete through field survey - Consider for inclusion as an evacuation shelter; discuss with guardian
32	POI	Community centre Центар на заедницата	TBD Height: 8mm	OpenStreetMap (POI / "community_centre" feature class) Note) There are no records in Radovich	- Select from database - Confirm/Complete through field survey - Consider for inclusion as an evacuation shelter
33	POI	Nursing home домашна нега	 Height: 8mm	OpenStreetMap (POI / "nursing_home" feature class)	- Select from database - Confirm/Complete through field survey
34	POI	Park Парк	 Height: 8mm	OpenStreetMap (POI / "park" feature class)	- Identify through database - Confirm/Complete through field survey - Consider for inclusion as an evacuation area, discuss with responsible organization
	POI	District Forest Office (PENF)	 Height: 8mm	-	- This time it has been included manually since PENF is part of the disaster response system in Radovich. Proceed similarly with other organizations participating in the disaster response system.
35	POI	Other relevant point of interest	 Radius: 2 mm. Outline: none Fill: R: 000 G: 000 B: 000	OpenStreetMap (POI / various feature classes, Transport / various feature classes)	- Select features that are significant for disaster response or for understanding the location (e.g. landmark)

Table 8 Map Symbol and Source datasets (Transport and Waterways)



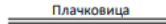





No	Feature Group	Name for Map Symbol (Feature Class Name)	Map Symbol	Source dataset(s)	Process
37	Transport	Primary road Примарен пат	 Outline: 0.3 mm R: 000 G: 000 B: 000 Fill: 1.46mm R: 255 G: 096 B: 017	OpenStreetMap (Roads / "primary" feature class)	- Select from database - Complete and correct the naming through discussion with local experts
38	Transport	Secondary road Секундарен пат	Булевар Александар Македонски  Outline: 0.25 mm R: 000 G: 000 B: 000 Fill: 1.0mm R: 242 G: 166 B: 077	OpenStreetMap (Roads / "secondary" feature class)	- Select from database - Complete and correct the naming through discussion with local experts
39	Transport	Other road Друг пат	Плачковица  Outline: 0.10 mm R: 000 G: 000 B: 000 Fill: 0.86 mm R: 255 G: 255 B: 255	OpenStreetMap (Road / "tertiary", "residential", "unclassified", etc. feature classes)	- Select from database - Complete and correct the naming through discussion with local experts
40	Transport	Path, footway, track Патека	 Outline: 0.10 mm R: 000 G: 000 B: 000 Fill: 0.86 mm R: 255 G: 255 B: 255	OpenStreetMap (Road / "path", "footway", "track1", "track2", etc. feature classes)	- Select from database - Complete and correct the naming through discussion with local experts
41	Transport	Stairs Скалите	 Outline: 0.10 mm R: 000 G: 000 B: 000 Fill: 0.86 mm R: 255 G: 255 B: 255	OpenStreetMap (Road / "stairs" feature class)	- Select from database - Complete and correct the naming through discussion with local experts
42	Waterways	River (permanent) Река (постојана)	 Outline: none Fill: 0.6mm R: 001 G: 124 B: 255	- OpenStreetMap (Waterways / "river" feature class)	- Select from database - Complete and correct the naming through discussion with local experts
43	Waterways	River (intermittent), stream, thalweg Река (наизменично), поток, талвег	 Outline: none Fill: 0.66mm R: 001 G: 124 B: 255	- OpenStreetMap (Waterways / "stream" feature class) - Orthophoto - DEM	- Select from database - Supplement by digitizing on DEM, orthophoto, etc. - Confirm by local experts - Confirm through field survey
44	Waterways	Irrigation channel Канал за наводнување	 Outline: none Fill: 0.66mm R: 001 G: 124 B: 255	- OpenStreetMap (Waterways / "canal" feature class) - Orthophoto - DEM	- Select from database - Supplement by digitizing on DEM, orthophoto, etc. - Confirm by local experts

Table 9 Map Symbol and Source datasets (Evacuation and Primary Hazard)










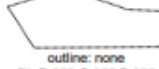




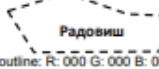


No	Feature Group	Name for Map Symbol (Feature Class Name)	Map Symbol	Source dataset(s)	Process												
45	Evacuation	Dangerous road Опасен пат	 Outline: none Fill: R: 1.0 mm R: 219 G: 030 B: 042	- OpenStreetMap (Road / various feature classes) - OpenStreetMap (Waterways / "river" feature class) - Secondary hazards - Hydrologic modelling	- Select roads that meet at least one of the following conditions: 1. bridges/culverts, 2. riverside, 3. dead-end road that lead to an area with flooding of 50cm or more 4/ subject to a secondary hazard - Discuss with local experts - Discuss with municipality												
46	Evacuation	Evacuation road (schematic)	 Outline: R: 000 G: 124 B: 098 Fill: R: TBC G: TBC B: TBC	- Hydrologic modelling - Evacuation shelter - Evacuation area	- Draw a symbolic representation of evacuation from risk areas towards evacuation areas and evacuation shelters based on a discussion with the municipality												
47	Evacuation	Evacuation road (actual) Патот за евакуација	 Outline: none Fill: R: 000 G: 124 B: 098	- OSM (Road) - Hydrologic modelling - Evacuation shelter - Evacuation area	- Select significant roads that allow escaping the risk area including but not only, to join evacuation areas and evacuation shelters (expert determination) Note) To avoid overloading the map, we have not represented actual evacuation roads												
48	Evacuation	Bridge Мост	 h=2.50m Length: 8mm, Height: 4 or 8mm Outline: 0.5 mm R: 000 G: 000 B: 000	- OpenStreetMap (Road / "bridge" feature class) - OpenStreetMap (Road / all feature classes) - OpenStreetMap (Waterways / "river" feature class)	- Select from database - Check/complete through field survey (e.g. name, length, height, width, material) - Determine the symbol orientation manually in QGIS												
49	Evacuation	Evacuation Area Област за евакуација	 Outline: XX mm R: XXX G: XXX B: XXX Fill: R: 200 G: 250 B: 204	- OpenStreetMap (Landuse / "park" feature class) - Orthophoto	- When the area is a park, use the available vector geometry of the park, or digitize it Note) This time, we have only used existing park data without digitizing extra data.												
50	Primary hazard	Geomorphologic hazard area Површина на геоморфолошка опасност	 Outline: 0.6 mm R: 145 G: 082 B: 045 Fill: R: 145 G: 082 B: 045	- Aerial photographs - Orthophoto - DEM - Erosion map of North Macedonia - Other data as necessary	*See training on landform interpretation												
51	Primary hazard	Modelled flood height Моделирана висина на поплава	<table border="1"> <tr> <td>0.00 - 0.10 m</td> <td>255 255 255</td> <td>T100%</td> </tr> <tr> <td>0.10 - 0.20 m</td> <td>242 160 77</td> <td>T50%</td> </tr> <tr> <td>0.20 - 0.50 m</td> <td>242 77 0</td> <td>T50%</td> </tr> <tr> <td>> 0.50 m</td> <td>255 50 50</td> <td>T50%</td> </tr> </table> T=Transparency	0.00 - 0.10 m	255 255 255	T100%	0.10 - 0.20 m	242 160 77	T50%	0.20 - 0.50 m	242 77 0	T50%	> 0.50 m	255 50 50	T50%	- Hydrologic modelling (100 years return period)	*See training on flood modelling - Reclassify the gridded data to match the 0, 10, 20 and 50cm class thresholds
0.00 - 0.10 m	255 255 255	T100%															
0.10 - 0.20 m	242 160 77	T50%															
0.20 - 0.50 m	242 77 0	T50%															
> 0.50 m	255 50 50	T50%															

Table 10 Map Symbol and Source datasets (Landuse)

No	Feature Group	Name for Map Symbol (Feature Class Name)	Map Symbol	Source dataset(s)	Process
52	Landuse	Urban area Градско подрачје	 outline: none fill: R: 145 G: 082 B: 045	OpenStreetMap (Landuse / "residential" feature class)	- Select from database
53	Landuse	Industrial area Индустријска област	 outline: none fill: R: 235 G: 219 B: 232	OpenStreetMap (Landuse / "industrial" feature class)	- Select from database
54	Landuse	Commercial area Комерцијален простор	 outline: none fill: R: 242 G: 218 B: 217	OpenStreetMap (Landuse / "commercial" feature class)	- Select from database
55	Landuse	Forest Шума	 outline: TBC fill: R: 173 G: 209 B: 258	OpenStreetMap (Landuse / "forest" feature class)	- Select from database
56	Landuse	Other land use Друго користење на земјиштето	 outline: none fill: R: 255 G: 255 B: 255	OpenStreetMap (Landuse / other feature classes)	- Select from database
57	Relief	Altitude point Висинска точка	 d=1mm outline=none fill: R: 000 G: 000 B: 000	- Topographic Map (AREC) - DEM	- Digitize from the topographic map and/or pick altitude of significant points (e.g. summit, river near a bridge, evacuation area or evacuation shelter etc.) from the DEM
58	Relief	Benchmark Репер за надморска височина	 w=1.4 mm h=2mm fill: R: 000 G: 000 B: 000	- Topographic Map (AREC)	- Digitize from the topographic map
59	Relief	Triangulation point with altitude Триаголна точка со надморска височина	 h=4mm	- Topographic Map (AREC)	- Digitize from the topographic map
60	Relief	Contour line (10m equidistance) Контурна линија (10m еквидастанца)	 outline: none fill: 0.1 mm R: 243 G: 186 B: 072	- SRTM 1" gridded data (NASA)	- Generate and smoothen contour lines in QGIS
61	Administrative	Limits of Municipality Моделната височина на општина	 outline: R: 000 G: 000 B: 000 fill: None	- OpenStreetMap (Place / "town" feature class)	- Select from database - Discuss with the municipality
62	Administrative	Limits of Community Граници на заедницата	 outline: R: 000 G: 124 B: 098 TBC fill: none	-	- Discuss with the municipality Note) This time we obtained a paper map of communities which we digitized
63	Mapping	North Arrow Северна стрелка	 h=25mm	-	-

The spatial accuracy is that of general-purpose GPS such as those incorporated in smartphones, and digitalization based on free spatial imagery such as Bing Maps. In North Macedonia, both are assumed to be generally 10m or better.

In addition, data should be translated to both Macedonian (Cyrillic) and English. A translation table of generic items is attached as Appendix ○○. Translation to Albanian shall also be considered in municipalities where it is a widespread language. The database underlying to the hazard maps of the model site in Radovish has been prepared to be multilingual, but Albanian has not been filled as it is less spoken in this municipality.

In addition to the background, various information was collected through field survey and discussion with local experts, and this information has been added to the dataset, either by adding missing items of the OpenStreetMap layers (e.g. additional churches, doctors, nursing homes, etc.), or by creating new layers (e.g. punctual risk, bridge with hazard-related information, etc.)

6.4 Design

This section is written for R-CMC to work on and confirm with the Municipality.

Consider using colors and designs that make it easier for users to make decisions.

The final appearance of the hazard map will be determined through discussions and workshops with representatives of disaster prevention-related departments and residents using the draft hazard map. This will ensure that there are no differences from the local situation and that a more user-friendly and easier-to-understand format is established.

The Municipality will consider effective ways to communicate with residents about the evacuation, including printing, distributing, and posting a completed version of the map.

6.4.1 Inundation depth of flooded area

It is desirable to standardize the minimum rules for flooding depth thresholds, color schemes, and other display methods among regions and disasters. In particular, in setting the thresholds for inundation depth, the following thresholds were used to indicate the risk of evacuation behavior in the event of flooding and the risk to people in robust buildings: less than 10 cm, 10 cm to 20 cm, 20 cm to 50 cm, and 50 cm or greater.

The color schemes are currently defined in "JIS Z 9103 Safety colors" and "ISO 22324 Societal security - Emergency management - Colour-coded alerts". The following is a summary of the current thinking on safety colors.

- The color scheme was changed from no color to yellow to orange to red in the direction of deeper inundation to indicate a higher degree of danger.
- In areas where the inundation depth exceeds 3 meters, even two-story buildings may be inundated, and evacuation is desirable in principle.

- In areas where the depth of inundation is less than 50 cm, a certain degree of danger exists, so a color scheme indicating caution (yellow) should be used.

6.4.2 Pictogram design

In this hazard map, mainly pictograms from “JIS Z 8210 – Guidance symbols” were used. The selection is attached as Appendix ○○.

In case necessary symbols did not exist in JIS Z 8210, custom symbols have been created or reused from copyright-free banks.

7 Consideration of the situation of use

Since the situations in which flood hazard maps are utilized vary from normal times to emergencies, and vary from region to region, this section summarizes the situations in which residents and others utilize flood hazard maps in terms of (1) when, (2) where, and (3) by whom. Municipalities need to make sufficient assumptions in advance for residents' study before a disaster occurs. We also discussed the possibility of creating portable hazard maps for residents to carry with them at all times. On the other hand, it is important for residents to be able to use what they understand in advance in case they need to check the map urgently in the event of a disaster, so the hazard map was created with these two points in mind.

7.1 Before disaster strikes

Municipalities should expose hazard maps in various situations so that people can be aware of them on a regular basis before a disaster occurs.

- Sign boards are placed in areas where damage will occur and where people will congregate.
- Distribute a portable version to each individual
- Posting in elementary schools and high schools

In addition, each family should be educated to talk about where they should take emergency shelter in the event of a disaster and where to assemble after a certain amount of time to ensure their safety.

7.2 In case of emergency

Carry a hazard map with you so that you can implement what you have discussed at home under normal circumstances so that you can evacuate safely in the event of a disaster. In doing so, pay special attention to the following points.

- Where are the hazardous areas between your house and the evacuation site?
- When is the best time to evacuate?



Appendix





Прирачник за изработка на Еко-НРК
карта за опасности за Северна
Македонија

2023

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1 Концепт за мапирање на опасности

Во концептот за Еко-НРК, покрај зачувувањето на шумите и спроведување на тврди мерки преку планирање на шумите и планирање на контрола во планините во возводните области, потребни се и меки мерки за да се олесни евакуацијата на жителите од низводните области во случај на катастрофа, поради што картите на опасности играат важна улога.

Од друга страна, поради климатските промени, дождовните феномени се сè поизразени во последно време и предизвикуваат штети од свлечишта и поплави дури и во области каде што немало такви катастрофи во минатото. Особено сериозни станаа штетите предизвикани од „поројни поплави“, кога нивото на водата брзо расте поради обилните врнежи и предизвикува поплави и свлечишта.

На пример, при катастрофата во село Стајковци, северно од Скопје, во попладневните часови на 6 август 2016 г. паднаа 93 см дожд за еден час, што е повеќе од просечните врнежи за цел месец август. Домови, автомобили и улици беа уништени во околните места, 22 лица трагично го загубија животот, а многу други беа повредени. Поројните дождови делумно го прекинаа и сообраќајот на скопската обиколница пред раскрсницата кај Стајковци-Црешево. Исто така, патот од Синѓелиќ до Стајковци беше полн со возила и уништен намештај.

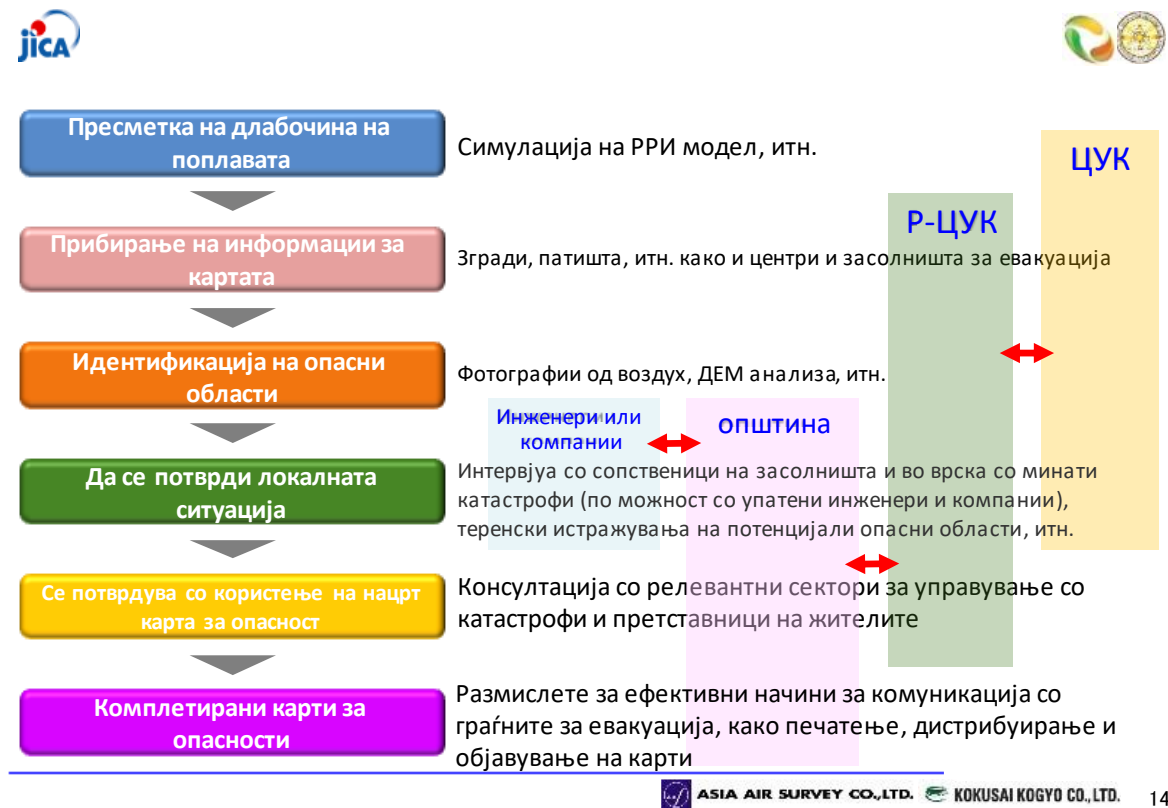
Синѓелиќ, Стајковци, Црешово и Арачиново беа најпогодени од невремето, а поплавени беа и Инциково и Брњарци во Гази Баба. Штетата на имотот беше огромна, а во најпогодените области дворовите и домовите беа поплавени и немаше електрична енергија, храна и вода извесен период. Ова доведе до координација на надлежните власти во соработка со војската и полицијата за санирање на ситуацијата.

Целта на овој проект е да подготви прирачник за изработка на карта за опасности така што локалните власти и жителите ќе можат да бидат подготвени за катастрофи во случај на поројни дождови што може да се случат во различни региони во Северна Македонија во иднина. ЦУК и Р-ЦУК ќе имаат централна улога во подготовката на податоците, што ќе им помогне на сите општини да изработат карти на опасност соодветни за нивната територија. На Слика 1 е прикажан процесот на изработка на карта за опасност и задолженијата на сите страни.

Важно е секоја општина да испечати и дистрибуира карти за опасност од поплави, за правилно да ги информира жителите за методите на евакуација и сл. Доколку жителите не ги консултираат картите за опасност, иако тие се изготвени и дистрибуирани или ако информациите за длабочината на водата и местата за евакуација наведени во картите се тешки за разбирање, тогаш е веројатно дека жителите нема да преземат соодветни активности за евакуација. Затоа пожелно е да се направат карти за опасност со минимум потребни информации што ќе резултираат со постапки за спасување на животот.

За жителите да можат да преземат посоодветни активности за евакуација, се

обидовме содржината на водичот за изготвување на карти со опасности да биде ориентирана кон жителите.



Слика 1. Како тече изработката на карти со опасности

Во иднина, кога ќе се печатат и дистрибуираат карти за опасности во секоја општина, задолжениот персонал може да се раководи според картите подготвени за модел локацијата во Радовиш и овој Приричник за изработка на карти за опасност, а може да се користат и податоци од отворени извори и од теренски истражувања, по потреба, за да се подобрат картите и жителите да можат посоодветно да се евакуираат.

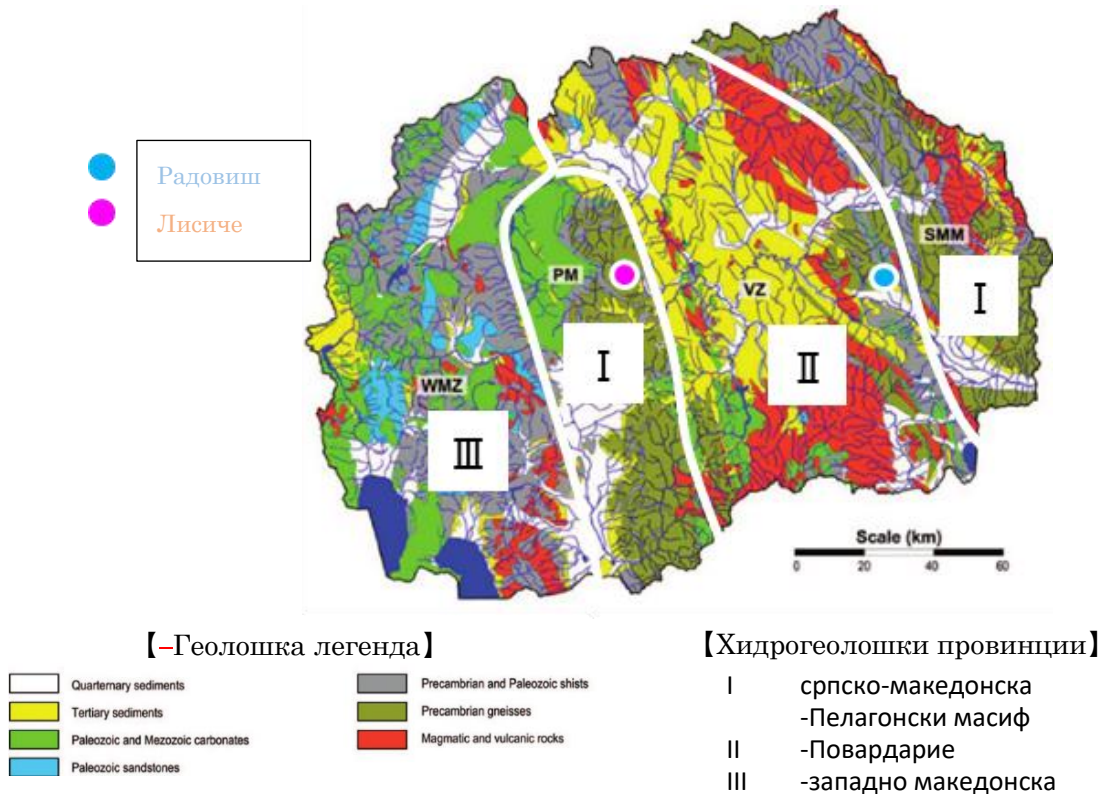
2 Потенцијални ризици во Северна Македонија

За време на процесот на мапирање на модел локацијата во Радовиш, преку интервјуа и работилници со локалните власти и жителите одлучено беше да се намали опсегот на ризиците што ќе бидат претставени, па така опсегот беше сведен на плавни области и стрмни падини во близина на населби.

За плавната област се користеа резултати од симулации, а за стрмните падини се толкуваа фотографии направени од воздух.

Проектот направи топографско толкување на горниот тек на Радовишка река. Добиените податоци ќе бидат доставени до општината и до Р-ЦУК од ЦУК, за да се види дека постојат и други ризици, како свлечишта и одрони на карпи во ненаселени места.

Кога ќе се погледне распореденоста на геолошката структура во Северна Македонија, може да се подели во четири главни категории, но како хидрогеолошка област, може да се сметаат за три категории (Слика 2). Затоа, кога се прават карти за опасности, ќе биде полесно да се користат за евакуација на жителите ако се претпостави геолошки можен транспорт на седименти и ако се изразат соодветните ризици. На пример, во Категорија II, што ја опфаќа локацијата во Радовиш, и Категорија I, што ја опфаќа локацијата Лисиче, се случуваат одрон и колабирање на камења, но е малку веројатно дека ќе дојде до свлечишта. Од друга страна, во Категорија III, се очекува да дојде до свлечишта. Доколку свлечиштето се наоѓа во близина на населба, важно е да бидеме внимателни и тоа треба да се наведе во картите за опасност.



Слика 2: Геолошка структура и хидрогеолошки поделби во Северна Македонија

3 Како да се реализира мапирањето на опасности

Во Јапонија картите за опасности генерално се користат за да се предвидат штети предизвикани од природни катастрофи и го мапираат обемот на тие штети, но денес се користат за разновидни намени, како што се евакуација и едукација за катастрофи и студии за користење на земјиштето.

Поради неодамнешните катастрофи, климатските промени, зголемената свест на општините за евакуација и потребата да се обезбедат поконцизни информации, веруваме дека треба да се изработат карти на опасности за да им биде полесно на жителите да се евакуираат.

Иако на картата се наведени различни ризици, под изразот „карта на ризици“ е тешко да се сфати дека картата треба да се користи во случај на евакуација на жителите, па затоа е подобро да се користи името „карта на опасности“, за да биде појасно.

Исто така, бидејќи картата со опасности е алатка што им дава информации на жителите за да се промовира соодветна евакуација согласно ризикот од поплави, ЦУК (или Р-ЦУК) што го спроведува моделирањето за ризици од поплави и секторот за спречување на катастрофи во општината, којшто врши студии за евакуација, добро ќе

ја запознаат содржината на студиите и ќе соработуваат за да ги обезбедат, подготват и користат податоците од картата со опасности. Во прирачникот, исто така, е наведено дека ЦУК (или Р-ЦУК) треба активно да обезбедува, изготвува и користи податоци од картите со опасности во соработка со ЦУК и со општинските сектори за спречување катастрофи и други организации одговорни за евакуација.

Исто така се очекува картите со опасности да се подобруваат врз основа на новостекнатите знаења во иднина (на пр. детално хидролошко моделирање според најновите Лидар податоци) и на искуството на ЦУК и на општините по катастрофите и вежбите.

Во идеална ситуација, на среден рок, картите со опасности треба да бидат одраз на регионалните и локалните планови за подготвеност за катастрофи и обратно, регионалните и локалните планови за подготвеност за катастрофи треба да содржат елементи од картите со опасности и да предвидат како картите ќе се дистрибуираат и користат.

4 Како треба да се изработат карти со опасности

Постојат неколку карти на опасности што локалните власти доброволно ги изработиле и ги користат, а само оние изработени со финансиска поддршка од ЕУ, УНДП и други организации се достапни за јавноста.

Многу е важно да се запознаеме со локалните карактеристики на штетите предизвикани од поплави и со условите во заедницата преку процесот на користење за да има соодветна евакуација при катастрофи. Затоа овој прирачник за изработка на карти за опасности од поплави не може во детали да ги пропише методите и содржината за нивна подготовка и користење, туку да обезбеди концепт за изработка и препорачани примери што ќе им помогнат на општините да изработат карти за опасности од поплави и да ја промовираат нивната употреба.

Од друга страна, неопходно е картите да бидат лесни за читање, не само за жителите, туку и за посетителите и туристите што се во посета на областа, итн. Затоа одлучивме да ги стандардизираме минималните правила за методите за прикажување, како праг за длабочина на поплавина, палетата на бои, итн.

Во согласност со Директивата за поплави, ЕУ создаде стандарден формат за размена на податоци поврзани со поплави кога секоја земја доставува извештај до ЕУ, но користењето на ЕУ форматот не е задолжителен за картите наменети за граѓаните и за други цели. Поради ова, во нашиот случај не се користат ЕУ форматите.

Секој Р-ЦУК може да изработи свои карти на опасности врз основа на ревидираниот прирачник, земајќи ги предвид локалните услови, итн. и треба да работи на натамошно подобрување на прирачникот така што ќе дава повратни информации до ЦУК за нивните активности, ќе споделува информации и ќе ги вклучи резултатите во прирачникот.

5 Анализа на катастрофи и на општествените карактеристики во регионот

При изработка на карти на опасности потребно е однапред да се разбере обемот и зачестеноста на штетите предизвикани од поплави и свлечишта од перспектива на жителите на секоја заедница, како карактеристика на заедницата. Од особена важност е да се земат предвид и да се анализираат општествените карактеристики, како статусот на локалните заедници, и тие да можат да се поврзат со евакуацијата.

При изработка на картите потребно е да се земат предвид карактеристиките на локалната заедница и да се разгледаат методите на евакуација, вклучително и на евакуација на широко подрачје, и да се фокусира на тоа „кои катастрофи да се потенцираат“, а „кои катастрофи да се изостават“.

Радовиш, модел локацијата во оваа студија, е планински град на наносен конус со сливно подрачје од десетици километри квадратни. Затоа се смета дека поројните поплави се катастрофи што најмногу ги погодуваат локалните жители, а се фокусиравме и на пропаѓања од помал обем, на пресеците меѓу водни и копнени патишта и на подвозници каде што може да се акумулира вода при врнежи. Од оваа причина, на картите за опасност се претставени длабочините на поплавите врз основа на моделот РРИ, а беа спроведени теренски истражувања за да се потврдат претпоставените локации согласно информациите од картите, и овие точки се наведени на картите. Од друга страна, кога станува збор за град како Струмица, кој исто така е опкружен со планини, но се наоѓа во речна поплавна рамница, треба да се претпостави дека ќе има не само поројни поплави, кога нивото на водата брзо се зголемува, туку и поплави што ќе го погодат градот кога нивото на водата се зголемува постепено. Оваа комбинација на различни катастрофи треба да се земе предвид при нивно претставување на картата.

Покрај селекција на места за евакуација што нема да бидат погодени од катастрофи, при планирање на локациите за евакуација треба да се добијат информации од општината, како на пример податоци за сопственост на земјиштето. Треба да се напомене и дека регионалните поделби во еден град често се засноваат на етнички и религиозни разлики. Треба да се внимава жителите што ќе се соберат на местата за евакуација во случај на катастрофа да бидат хомогена група.

6 Методи за изработка на карта за опасност

Составот и дизајнот на картата за опасности треба да ги одреди секој Р-ЦУК согласно состојбите во регионот, но картата треба да биде лесна за читање не само за локалните жители, туку и за туристите и другите посетители во регионот, така што секој да може брзо да одлучи какви активности треба да се преземат.

Картите за опасности може да се направат со користење на бесплатниот и отворен ГИС софтвер QGIS, како што беше направено и за картите за модел локацијата во Радовиш.

Вклучените информации треба да се управуваат слој по слој. Изворите треба да бидат организирани и наведени за секоја точка, а оние што не се достапни треба да се истражат и да се вклучат преку теренско истражување. За секоја точка треба да се напише резиме во квадратче со детали под неа, а треба да се организира и кој е задолжен за секоја точка.



Слика 3. Редослед на мапирање на опасности

6.1 Состав

Овој дел е напишан за да го користат ЦУК и Р-ЦУК.

Да се состави карта со опасности преку селекција на податоците што се неопходни за целната област.

На модел локацијата во Радовиш, каде што се забележани пропаѓања и наноси

на седименти во горниот тек на реките, но не и околу урбаните области, и каде што поројните поплави се најголемиот ризик со оглед на историјата со катастрофи, симулирана е поплавената област.

6.1.1 Прибирање информации што ќе бидат наведени на картата

Кога не се достапни резултати од симулација, се препорачува да се интервјуираат локални инженери кои имаат информации за минати катастрофи и компании што реализираат градежни проекти, особено оние вклучени во санација по катастрофи, за да го опишат обемот на минатите штети на картата. Кога ќе се водат овие интервјуа се препорачува да биде присутно и лице од општинскиот сектор за управување со кризи.

Табела 1 Задачи потребни за да се изработи карта и поделба на задолженија

Задачи	Општина	Р-цук	цук
Пресметка на длабочина на поплава	—	—	Врши прибирање на податоци и пресметки
Прибирање информации за картата	—	Да се добијат информации за ТИ и да се споделат со ЦУК	Да обезбеди информации, како топографски податоци и податоци од пресметките
Идентификација на опасни области	—	Толкување на слики од воздух ДЕМ анализа, итн.	Толкување на слики од воздух ДЕМ анализа, итн.
Потврдување на локалната ситуација	Проверка на терен и споделување информации	Проверка на терен и споделување информации	советување
Потврда со копристење на нацрт картата	-да се одржат работилници со жителите -да се потврдат методите за дистрибуција и публикација	- поддршка за работилници -консултација и инструкции за ефективна евакуација	советување
Комплетирани карти за опасности	Печатење и дистрибуција	—	—

6.1.2 Прикажана содржина

Содржината што ќе биде прикажана е резултат на симулацијата на поплава и проблемите што ќе ја попречат евакуацијата на жителите. Важно да се истражат и организираат на лице место проблематичните точки при катастрофи што би можеле да ја попречат евакуацијата.

Табела 2 Делови потребни за картите за опасности и нивните извори

	Задачи	Извор	забелешки
РРИ	врнежи	1% веројатност за врнежи со формула за интензитет на врнежи	Блинков и Јагев (2004)
	ДЕМ	SRTM (околу 90m мрежа)	
	Податоци за земјишна покривка	USGS земјишна покривка (GLCNMO) https://globalmaps.github.io/glcnm.html	
	Податоци за вид на почва	Усогласена светска база на податоци за почвата на ФАО в 1.2 https://www.fao.org/soils-portal/data-hub/soil-maps-and-databases/harmonized-world-soil-database-v12/en/	
ГИС податоци	Објект при катастрофи	- OpenStreetMap: одбрани класи	-
	1-7	- ортофото	Бидете флексибилни и отстранете ги оние што не се во регионот, итн. - Утврдете и одберете локација според хидрауличниот модел и толкувањето на ДЕМ на условите што се очекуваат при евакуација. - Да се потврди со теренско истражување.
	ТИ	- OpenStreetMap (ТИ)	
	8-16		
	Секундарна опасност	- Патишта за евакуација	
	17-20	- ДЕМ	
	Прикладност на објект при катастрофи	- хидролошки модел	
	21-26		
	Верски објекти и други ТИ	OpenStreetMap (ВО)	
	27-36	OpenStreetMap (ТИ)	
Транспорт и водни патишта	OpenStreetMap (патишта) OpenStreetMap (водни патишта)		
37-44			
Евакуација и примарна опасност	- OpenStreetMap (пат/различни класи)		
45-51	- OpenStreetMap (водни патишта/класа „река“)		
	- секундарни опасности		
	- хидролошко моделирање		
	- засолниште за евакуација		
	- место за евакуација		
	- ортофото		
	- ДЕМ		
	- ерозиска карта на Северна Македонија		
	- други податоци по потреба		
Користење на земјиште	OpenStreetMap	- да се дигитализира од топографска карта	
52-63	(користење на земјиште)		
Други работи што не може да се добијат од отворен извор	Размислете како јасно да ги искажете информациите и додадете ги во ГИС	Општината, преку интервјуирање на локални инженери и градежни компании по потреба	

(1) Поплавена област

Во овој дел се зборува за тоа како да се искажат поплавените области на картите за опасност. Наведени се два случаи: еден каде што може да се направат симулации и друг каде што тоа не е можно.

Овој дел е напишан за да го користат ЦУК и Р-ЦУК.

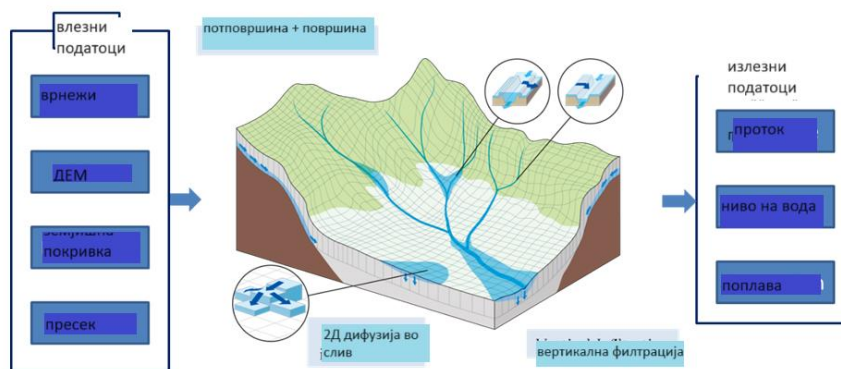
Да се утврди обемот на поплавена област што ќе се прикаже на картата за опасности.

1) Симулација на поплава

РРИ (модел на врнежи истекување поплавување) е „двдимензионален модел кој може да симулира истовремено врнежи-истекување и поплавување“. На пример, во сливот, моделот пресметува со употреба на 2Д дифузија, додека во реката користи 1Д дифузија.

Исто така, во ќелија од мрежата каде што се наоѓа речен канал, моделот претпоставува дека падината и реката се позиционирани во истата ќелија.

Во овој модел, речниот проток, нивото на водата и поплавата се излезни податоци и се пресметуваат со користење на влезни податоци за врнежи, ДЕМ, земјинска покривка и пресек на реката.



Слика 4: Пресек на РРИ модел

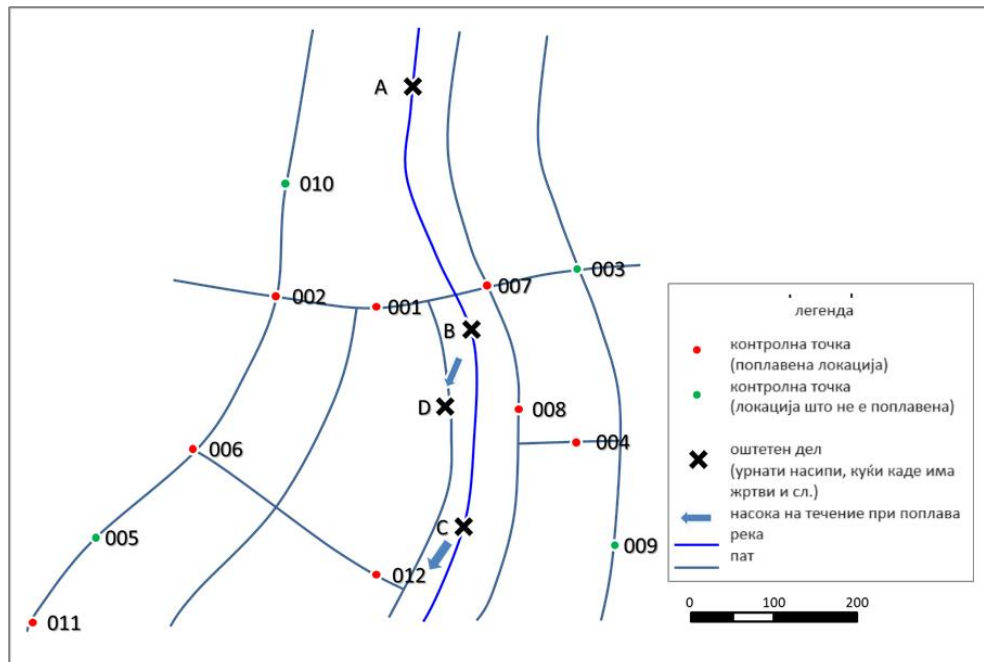
2) Се подготвува согласно информации за претходни услови при поплави

Доколку не се достапни резултати од симулација на поплава како погоре, ќе ви покажеме како да ја утврдите претпоставената поплавена област преку мапирање на информации онаму каде што имало поплави во минатото.

На терен треба да се истражат следните работи за да бидат вклучени на картата за опасности. Слика 5 ги илустрира резултатите од интервјуата на терен. Кога се внесуваат податоци во ГИС, длабочината на поплавата треба да се внесе заедно со информациите за локацијата.

Исто така, треба да се приберат информации така што оштетените локации може да се изразат како информации што ќе се пренесат како научени лекции за идни евакуации.

Поконкретно, пожелно е да се идентификуваат точките на прелевање (на пр. точката каде што водата почнува да се прелева и местата низводно каде што има излевање) и оштетените куќи (куќи каде што луѓе загинале или биле повредени). Доколку е познато како плавната вода се движела за време на поплавата, треба да се илустрира и насоката на течење.

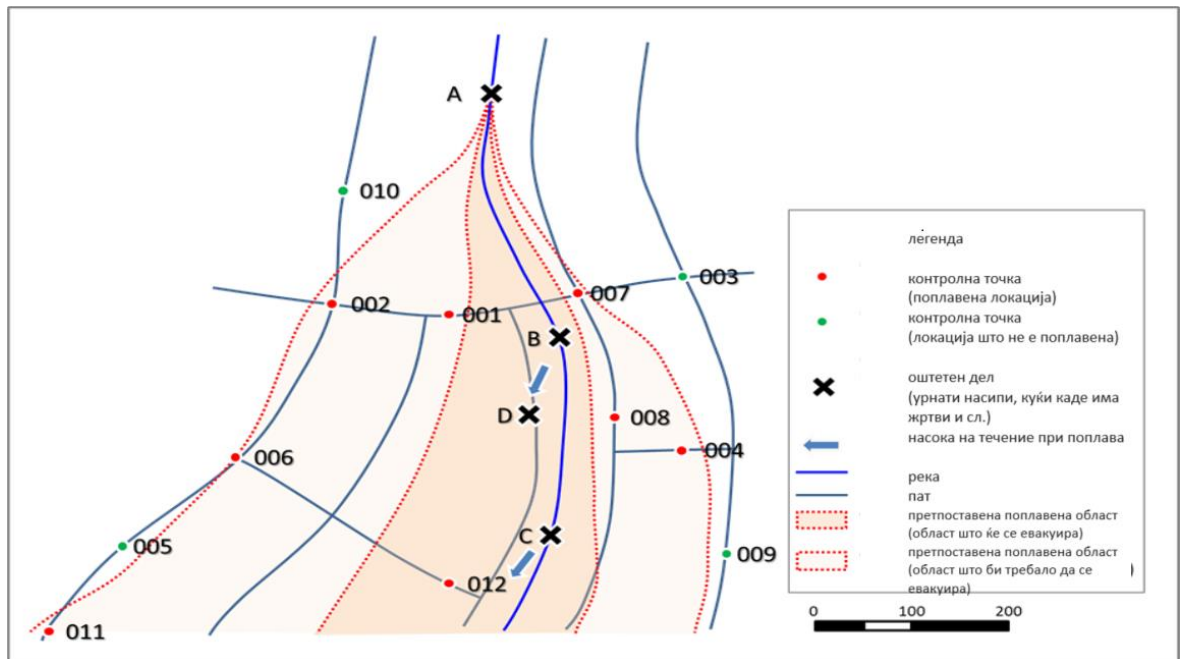


Слика 5. Графички пример за резултатите од разговорите на терен

[Содржина на интервјуата]

- (1) Локации што биле поплавени при претходни катастрофи
(8 црвени точки во примерот на слика 5)
- (2) Локации што не биле поплавени при претходни катастрофи
(4 зелени точки во примерот на слика 5)
- (3) Точки на прелевање
(во примерот на слика 5, x ги означува A, B и B)
- (4) Оштетени куќи
(во примерот на слика 5, x знак Г)
- (5) насока на течење при поплава

(во примерот на слика 5, десниот брег на Б и В означено со X)



Слика 6. Пример за претпоставено поплавено подрачје врз основа на претходни катастрофи

Врз основа на информациите за длабочина на поплавата и за непоплавени места на секоја контролна точка, направете проектирано поплавено подрачје. Се препорачува да се користат темни бои за областите што мора да се евакуираат и светли бои за области што би требало да се евакуираат. На пример, длабочина на водата поголема од 20 см при претходни поплави треба да се претстави со темни бои, а длабочина на вода меѓу 0 и 20 см треба да се претстави со светли бои, согласно очекуваната евакуација на локално ниво.

Кога се утврдуваат границите на овие подрачја, линеарни објекти како патишта и очигледни промени на падините се споредуваат со ДЕМ податоците и микро топографија потврдена со теренско истражување за да се обележи претпоставеното поплавено подрачје.

3) За подрачја без историја на поплави во минатото

За подрачја што немале поплави во минатото, најдобро е да се направат симулации; но, доколу не се достапни информации, следните работи треба да се искажат на следниот начин. Целта на картите за опасности е однапред да се идентификуваат опасните подрачја и да се евакуира во рана фаза за да се спасат животи.

-Да се одредат и илустрираат претпоставените точки каде што би почнала

поплавата.

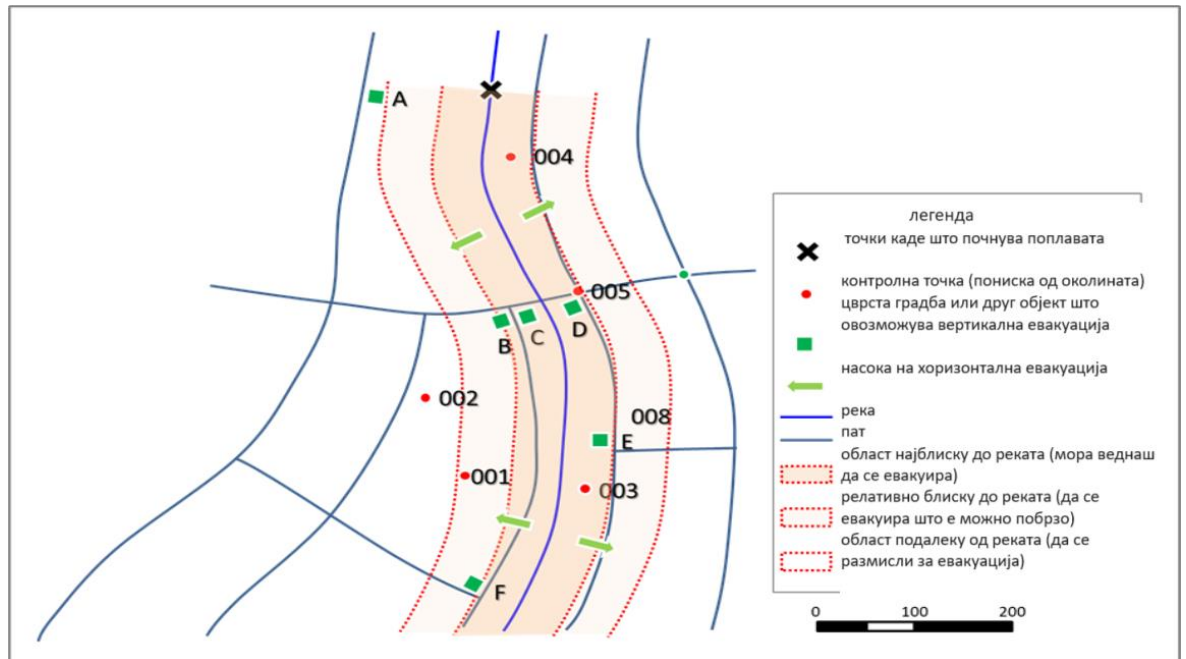
(на пр. точки каде што се менува нагибот на речното корито, топографски стеснувања и подрачја што се очекува да бидат блокирани од објекти во случај на поплави)

-За подрачјето низводно од почетната точка на поплавата, размислете за хоризонтална евакуација и наведете ја далечината од реката како тампон-зона.

(Нијанса на боја се покажува на секои 100 м на одредена далечина во насока вертикална во однос на течението на речниот канал)

-проверете ја топографската карта со ДЕМ за да ја најдете земјата што е пониска од околината и спроведете теренско истражување на околниот терен за да се обележат подрачјата што може да бидат погодени од поплава.

-Од друга страна, доколку постои цврста зграда или друг објект што овозможува вертикална евакуација, наведете повеќе локации.



Слика 7. Пример како да се прикаже подрачје каде има опасност од поплави во област без претходни катастрофи

(2) Работи што треба да се наведат во случај на катастрофа.

Овој дел е наменет за употреба на Р-ЦУК.

Овие работи треба ги имате предвид во однос на фотографирање од воздух, ДЕМ анализа итн. кога се работи со ГИС.

Потврдете ги следните целни подрачја на терен и прикажете ги на картата. Во оваа фаза се препорачува информации како фотографии и историја за минати

катастрофи да се зачуваат како ГИС податоци по потреба. Се препорачува и фотографиите да се поврзат со ГИС информации што ја посочуваат локацијата и да се користат мобилни уреди, како таблет, за теренско истражување, за да се зачуваат ГИС информациите за да се подобри точноста на фотографираниите локации.

- ① Локации каде што се пресекуваат патишта и мали потоци (висина на мост, ширина меѓу два столба на мост, плочести пропусти, дренажен капацитет, состојба на дренажен канал, итн.)
- ② Дали патот е изграден според теренот на потокот (за да може да се утврди кои патишта не треба да се користат при евакуација, итн.)
- ③ Историја на минати катастрофи (дали се случувало често или не, со фотографии и јасен опис на ситуацијата)
- ④ Локации погодни за евакуација (се претпоставува дека ќе бидат привремени локации за евакуација каде што евакуираните лица нема да останат долг период бидејќи се очекува нивото на водата да се зголеми и да се намали релативно брзо, и бидејќи општествената структура и начинот на размислување во Северна Македонија укажуваат на тоа дека не постои култура на складирање храна и вода ниту на сместување голем број на луѓе на подолг период).

6.2 Формат на картите за опасности

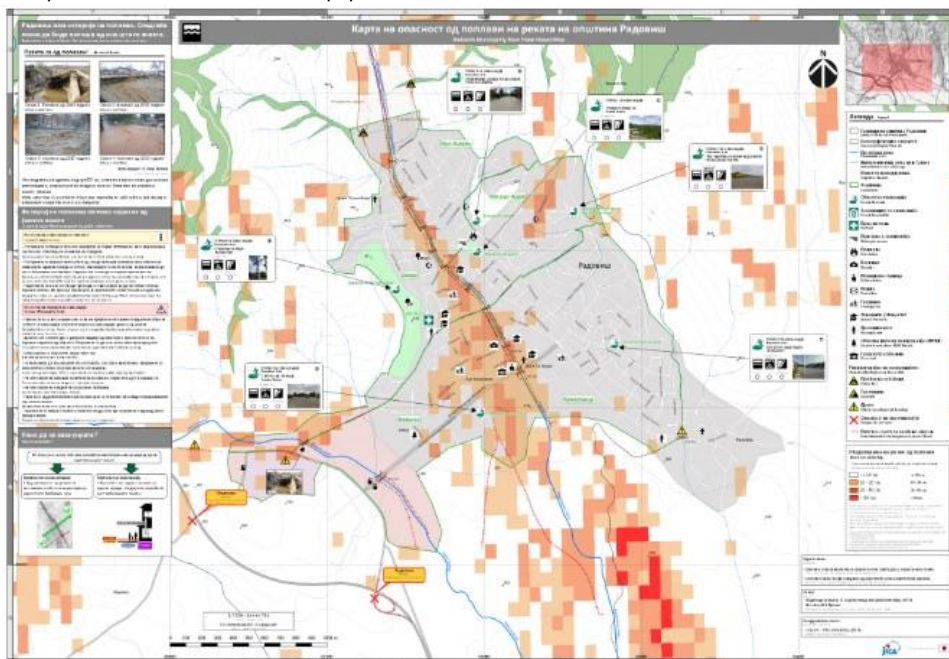
Овој дел е наменет за општината и Р-ЦУК.

Одберете формат што ефективно ќе ги поттикне жителите да го користат системот.

6.2.1 Формат на постер

Целта на форматот постер е тој да се изложи во објекти каде што се собираат граѓаните, да го користат лидерите во заедницата и лицата вклучени во спречување и управување со катастрофи. Ја опфаќа целата област на урбани населби.

Карта за опасности во голем формат A1

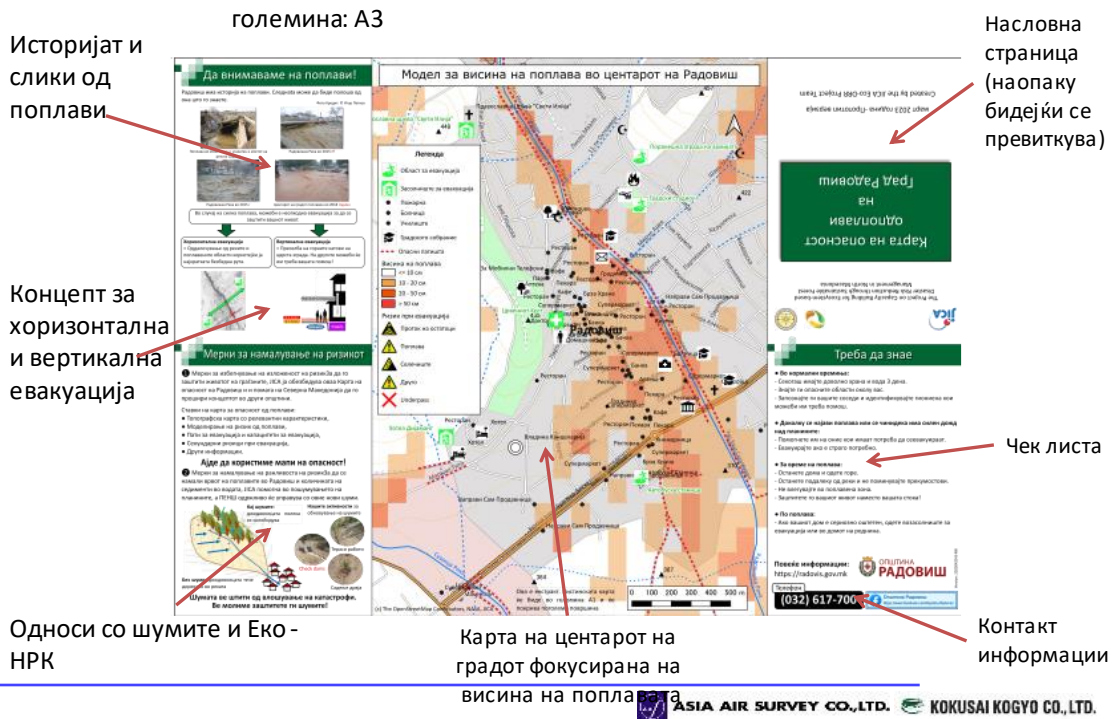


ASIA AIR SURVEY CO.,LTD. KOKUSAI KOGYO CO.,LTD.

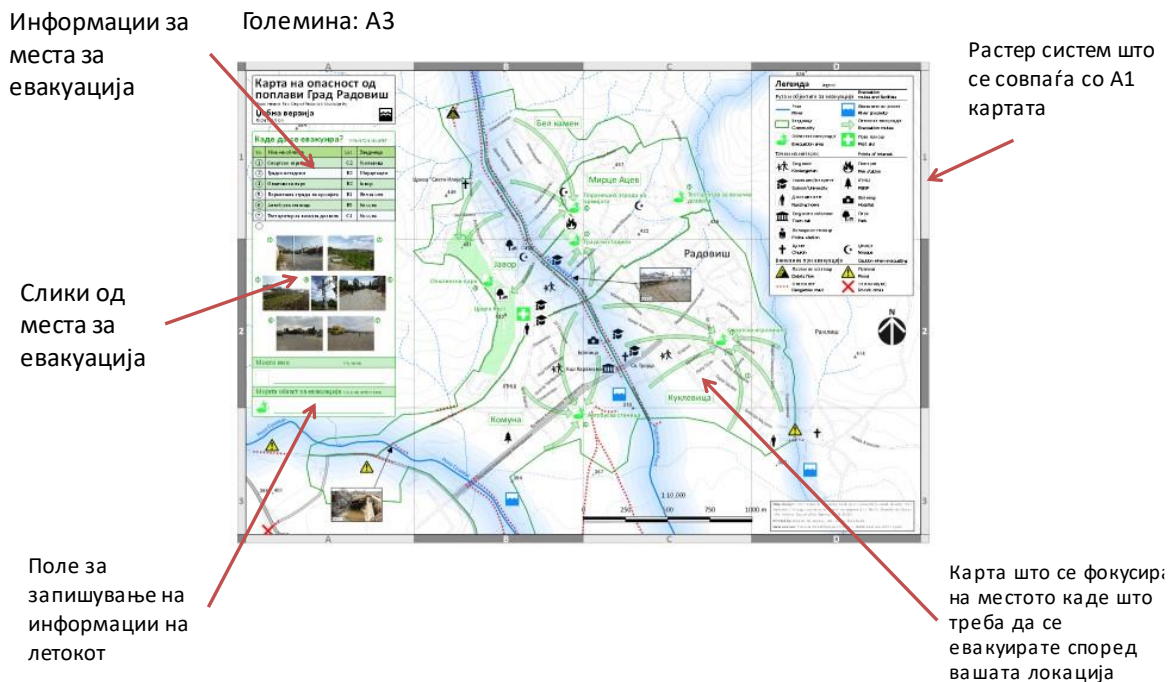
Слика 8. Пример за карта на опасности во формат на постер (пример од Радовиш)

6.2.2 Џебна верзија

Целта на џебната верзија е да се дистрибуира до жителите за да се зголеми свеста за ризикот од катастрофи и да се поттикне соодветна евакуација кога има потреба. Поради големината опфаќа помала површина отколку постерот. Вклучени се неопходни информации, како привремени локации за евакуација и контакт информации.



Слика 9. Пример како се изработува џебна карта за опасности – предна страна (пример од Радовиш)



Слика 10. Пример како се изработува џебна карта за опасности – задна страна (пример од Радовиш)

6.2.3 Информативна табла

Информативните табли може да бидат корисни за да се подобри перцепцијата за ризици на одредено место (на пр. во близина на река) и да се предложи евакуација до најблиската соодветна локација.

Во случајот со Општина Радовиш, се предложи таква табла да се постави во близина на Радовишка Река, во близина на Општината.

Size: A0



Слика 11. Пример како да се изработи карта на опасности во формат на информативна табла (пример од Радовиш)



Слика 12. Поставена карта на опасности на информативна табла

Информативните табли може да се надополнат со знаци за безбеден пат до најблиската локација за евакуација или засолниште.

6.3 Користени податоци

Овој дел е наменет за употреба на ЦУК и Р-ЦУК и да се потврди со општината.

Треба да се користат ГИС векторски податоци за позадината и некои елементи на картите со опасности.

За позадината и за некои елементи на картите се користени векторски податоци добиени од OpenStreetMap¹, што може да се симне на <https://www.geofabrik.de/>, вебсајт што нуди производи лесни за користење. Нивното користење е бесплатно, единствен услов е да се наведе дека се користени OpenStreetMap (ова е направено на картите за опасности за модел локацијата во Радовиш што беа презентирани на работилница и доставени до општината). Доколку општината ги дисеминира резултатите во вид на векторска база на податоци, ќе придонесе и за подобрување на податоците (на пр. дополнителни улици, објекти или реки што биле дигитализирани за да се изготви картата) на OpenStreetMap, согласно условите од Лиценца 1.0 на OpenDatabase .

Понатаму, ЦУК можеби ќе разговара со Агенцијата за катастар на недвижности (АКН), државната агенција за мапирање на Северна Македонија, за тоа дали нејзините топографски податоци се погодни за користење на картите за опасност и дали надоместокот за користење на податоците е прифатлив за организациите што се крајни корисници.

Шеесет и трите симболи на картите што се користени во оваа студија или се очекува да бидат користени во други региони во иднина и нивиот извор се наведени во Табела 3 до Табела 10, со детали наведени во Прилогот. Предложени се симболи за горенаведените податоци што би можеле лесно да се реупотребат. Симболите се наведени во Прилогот.










Состојбата на локацијата што ќе се користи како засолниште ќе се утврди откако ќе се направи интервју со сопственикот и ќе се разгледаат претходните катастрофи (во некои случаи, интервјуа со инженери и компании запознати со ситуацијата) и со теренско истражување на потенцијално опасни подрачја.

¹ <https://www.openstreetmap.org/>

Табела 3 Символ на картата и извор на податоци (инфраструктура при катастрофи)

бр	група	назив на симболот на картата (назив на класа)	символ на карта	извор на податоци	процес
1	инфраструктура при катастрофи	Место за евакуација	<p>Градски стадион</p> <p>висина: 8m</p>	<p>- OpenStreetMap: одбрани класи (на пр. ТИ/парк, стадион, спортски центар)</p> <p>- ортофотото</p>	<p>- се избира од базата на податоци, се идентификува на ортофотото (на пр. големи стабилизирани области)</p> <p>- се проверува преку теренско истражување</p> <p>- се разговара со сопственикот на земјата, итн.</p> <p>- се разговара со општината</p>
2	инфраструктура при катастрофи	Засолниште за евакуација	<p>Хотел Дијамант</p> <p>висина: 8m</p>	<p>- OpenStreetMap: одбрани класи (на пр. ВО/православен)</p>	<p>- се избира од базата на податоци</p> <p>- се разговара со сопственикот, итн.</p> <p>- се разговара со општината</p>
3	инфраструктура при катастрофи	(Не се користи во Радовиш) Место за евакуација од цунами	<p>Општински парк h=40m</p> <p>висина: 8m</p>	-	<не е применливо во Радовиш>
4	инфраструктура при катастрофи	(Не се користи во Радовиш) Зграда за евакуација од цунами	<p>градско собрание h=9m</p> <p>висина: 8m</p>	-	<p><не е применливо во Радовиш></p> <p>забелешка: може да се направи слично истражување за објекти за евакуација при поплави (на пр. попис на цврсти градби со 2 или повеќе ката)</p>
5	инфраструктура при катастрофи	(Варијанта се користи во Радовиш) Прва помош Црвен Крст	<p>Црвен крст</p> <p>висина: 8m</p>	<p>- OpenStreetMap (ТИ/прва помош и доктори)</p>	<p>- се избира од базата на податоци</p> <p>- се комплетира/коригира преку теренско истражување</p> <p>- се разговара со претставници итн.</p>
6	инфраструктура при катастрофи	Пристап со хеликоптер	<p>висина: 8m</p>	<p>- OpenStreetMap (транспорт/хелидром)</p>	<p>- се избира од базата на податоци</p> <p>- се идентификува на ортофотото, итн. (големи долини и стабилизирани области без пречки во околината)</p> <p>- се проверува преку теренско истражување</p> <p>- се разговара со сопственикот на земјата, итн.</p>
7	инфраструктура при катастрофи	(Не се користи во Радовиш) Привремен паркинг	<p>висина: 8m</p>	<p>- ортофотото</p> <p>- OpenStreetMap (ТИ/паркинг)</p>	<p><не е разгледувано во Радовиш></p> <p>- да се идентификуваат големи и стабилни области со патен пристап на ортофотото, итн..</p> <p>- се проверува преку теренско истражување</p> <p>- се разговара со сопственикот на земјата, итн..</p>

Табела 4 Символ на картата и извор на податоци (ТИ)







8	ТИ	Болница	 Висина: 8mm	- OpenStreetMap (ТИ/болница и клиника)	- Се избира од базата на податоци - се потврдува преку теренско истражување
9	ТИ	Доктор	 Висина: 8mm	- OpenStreetMap (ТИ/доктори)	- Се избира од базата на податоци - се потврдува преку теренско истражување
10	ТИ	Аптека	 Висина: 8mm	- OpenStreetMap (ТИ/аптека)	- Се избира од базата на податоци НБ) Во Радовиш има многу аптеки и не ги прикажавме да не се преоптовари картата
11	ТИ	Пошта	 Висина: 8mm	- OpenStreetMap (пошта)	- Се избира од базата на податоци - Се потврдува преку разговор со локални експерти
12	ТИ	Телефонска говорница	 Висина: 8mm	- OpenStreetMap (ТИ/телефон и телефон за итни ситуации) Забелешка) Во Радовиш нема	- Се избира од базата на податоци
13	ТИ	Полициска станица	 Висина: 8mm	- OpenStreetMap (ТИ/полиција)	- Се избира од базата на податоци - Се потврдува преку разговор со локални експерти
14	ТИ	Територијална против пожарна станица	 Висина: 8mm	- OpenStreetMap (ТИ/противпожарна станица)	- Се избира од базата на податоци - Се потврдува преку разговор со локални експерти
15	ТИ	Владини и општински канцеларии	 Висина: 8mm	- OpenStreetMap (ТИ/градско собрание)	- Се избира од базата на податоци - Се потврдува преку разговор со локални експерти
16	ТИ	Вода за пиење	 Висина: 8mm	- OpenStreetMap (ТИ/вода за пиење) Забелешка) Нема податоци за Радовиш	- Се избира од базата на податоци - Се комплетира/потврдува преку теренско истражување - се разговара со општината: снабдување со вода во случај на катастрофа

* ТИ: кратенка од „Точка од интерес“, што генерално се однесува на „цел“, а во базите на податоци за карти значи продавница или објект.

Табела 5 Символ на картата и извор на податоци (секундарна опасност)

17	Секундарна опасност	Друго	 висина: 8mm	- Патишта за евакуација - Хидролошки модел	- Се одбираат сите места каде што пат за евакуација поминува низ област каде што поплавата е 50 см или повеќе - се потврдува преку теренско истражување
18	Секундарна опасност	(Не се користи во Радовиш) Цунами	 висина: 8mm	-	<не е применливо во Радовиш>
19	Секундарна опасност	Наноси	 висина: 8mm	- патишта за евакуација - област со геоморфолошка опасност	-се одбираат сите места каде што пат за евакуација поминува низ место со наноси - се потврдува преку теренско истражување
20	Секундарна опасност	Пропаѓање на стрмна падина / Свлечиште	 висина: 8mm	- патишта за евакуација - област со геоморфолошка опасност	- се одбираат сите места каде што пат за евакуација поминува низ област со пропаѓање на падина, одрон на карпи или свлечиште - се потврдува преку теренско истражување



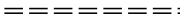
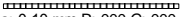



Табела 6 Символ на картата и извор на податоци (Прикладност за објект за користење при катастрофи)

21	Секундарна опасност	Опасност, не поминувајте (на пр. подвозник)	 висина: 8mm	- патишта за евакуација - ДЕМ - хидролошки модел	- се одбираат места каде што патот за евакуација е подвозник или мост и каде што поранешни рушења или поплави се потврдени или претпоставени преку теренско истражување или толкување на хидролошки модел/ДЕМ - се потврдува преку теренско истражување
22	прикладност на објект за користење при катастрофи	Поплава на река	 висина: 8mm	- хидролошки модел	- симболот се користи за да се прикаже прикладноста на област или засолниште за евакуација. Треба да се потврди дека објектот е безбеден преку модел на поплава, теренско истражување и евиденција за претходни катастрофи.
23	прикладност на објект за користење при катастрофи	Наноси	 висина: 8mm	- област на геоморфолошка опасност - ДЕМ	- Симболот се користи за да се прикаже прикладноста на област или засолниште за евакуација. За секој вид на катастрофа треба да се потврди дека објектот е безбеден преку геоморфолошки опасности, ДЕМ читања, теренско истражување и евиденција за претходни катастрофи.
24	прикладност на објект за користење при катастрофи	Бранови при бура - цунами	 висина: 8mm	-	<Не е применливо во Радовиш>
25	прикладност на објект за користење при катастрофи	Свлечиште	 висина: 8mm	- област на геоморфолошка опасност	- Симболот се користи за да се прикаже прикладноста на област или засолниште за евакуација. За секој вид на катастрофа треба да се потврди дека објектот е безбеден преку геоморфолошки опасности, ДЕМ читања, теренско истражување и евиденција за претходни катастрофи.
26	прикладност на објект за користење при катастрофи	(Не се користи во Радовиш) Катастрофа при прожар	 висина: 8mm	-	<Не е применливо во Радовиш>




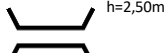



Табела 7 Символ на картата и извор на податоци (верски објекти и други ТИ)

27	Верски објект (ВО)	Црква	 Висина: 6mm	OpenStreetMap (ВО/христијански и православен, итн)	- Се избира од базата на податоци - Се комплетира/потврдува преку теренско истражување - Да се разгледа можноста да се користи како засолниште за евакуација, да се разговара со управителот
28	Верски објект (ВО)	Џамија	 Висина: 6mm	OpenStreetMap (ВО/муслимански и сунитски)	- Се избира од базата на податоци - Се комплетира/потврдува преку теренско истражување - Да се разгледа можноста да се користи како засолниште за евакуација, да се разговара со управителот
29	ТИ	детска градинка	 Висина: 8mm	OpenStreetMap (ТИ/детска градинка)	- Се избира од базата на податоци - Се комплетира/потврдува преку теренско истражување
30	ТИ	Училиште	 Висина: 8mm	OpenStreetMap (ТИ/училиште)	-Се избира од базата на податоци - Се комплетира/потврдува преку теренско истражување - Да се разгледа можноста да се користи како засолниште за евакуација, да се разговара со управителот
31	ТИ	Универзитет	 Висина: 8mm	OpenStreetMap (ТИ/колеџ и универзитет)	- Се избира од базата на податоци - Се комплетира/потврдува преку теренско истражување - Да се разгледа можноста да се користи како засолниште за евакуација, да се разговара со управителот
32	ТИ	Центар на заедницата	 Висина: 8mm	OpenStreetMap (ТИ/центар на заедницата) Забелешка) Не е евидентиран во Радовиш	- Се избира од базата на податоци - Се комплетира/потврдува преку теренско истражување - Да се разгледа можноста да се користи како засолниште за евакуација, да се разговара со управителот
33	ТИ	Дом за стари лица	 Висина: 8mm	OpenStreetMap (ТИ/дом за стари лица)	-Се избира од базата на податоци - Се комплетира/потврдува преку теренско истражување
34	ТИ	Парк	 Висина: 8mm	OpenStreetMap (ТИ/парк)	- Се идентификува од базата на податоци - Се комплетира/потврдува преку теренско истражување - Да се разгледа можноста да се користи како област за евакуација, да се разговара со одговорната организација
35	ТИ	Подружница (ЈП Национални шуми)	 Висина: 8mm	-	- Овој пат е вклучен рачно бидејќи ЈПНШ е дел од системот за одговор на катастрофи во Радовиш. Слично да се постапи и со други организации што учествуваат во системот за одговор на катастрофи.
36	ТИ	Друга релевантна точка од интерес	 супермаркет Радиус: 2 mm. Контура:нема Исполнетост: R: 000 G: 000 B: 000	OpenStreetMap (ТИ/различни класи, транспорт/различни класи)	- Да се одберат карактеристики што се важни за одговор на катастрофа или за разбирање на локацијата (на пр. знаменитост)

Табела 8 Символ на картата и извор на податоци (транспорт и водни патишта)

37	Транспорт	Примарен пат	 контура: 0,3 mm R: 000 G: 000 B: 000 Исполнетост: 1,46mm R: 255 G: 096 B: 017	OpenStreetMap (патишта/примарни)	- Се избира од базата на податоци - Да се комплетира и коригира називот преку разговори со локални експерти
38	Транспорт	Секундарен пат	Булевар Александар Македонски  контура: 0,25 mm R: 000 G: 000 B: 000 Исполнетост: 1,0mm R: 242 G: 166 B: 077	OpenStreetMap (патишта/секундарни)	- Се избира од базата на податоци - Да се комплетира и коригира називот преку разговори со локални експерти
39	Транспорт	Друг пат	Плачковица  контура: 0,10 mm R: 000 G: 000 B: 000 Исполнетост: 0,86 mm R: 255 G: 255 B: 255	OpenStreetMap (патишта/терцијарни, резиденцијални, некласифицирани, непознато, итн)	- Се избира од базата на податоци - Да се комплетира и коригира називот преку разговори со локални експерти
40	Транспорт	Патека	 контура: 0,10 mm R: 000 G: 000 B: 000 Исполнетост: 0,86 mm R: 255 G: 255 B: 255	OpenStreetMap (патишта/патека, пешачка патека, патека степен 1, патека степен 2 итн.)	- Се избира од базата на податоци - Да се комплетира и коригира називот преку разговори со локални експерти
41	Транспорт	Скали	 контура: 0,10 mm R: 000 G: 000 B: 000 Исполнетост: 0,86 mm R: 255 G: 255 B: 255	OpenStreetMap (патишта/скали)	- Се избира од базата на податоци - Да се комплетира и коригира називот преку разговори со локални експерти
42	Воден пат	Река (постојана)	 контура: нема Исполнетост: 0,6mm R: 001 G: 124 B: 255	- OpenStreetMap (водни патишта/река)	- Се избира од базата на податоци - Да се комплетира и коригира називот преку разговори со локални експерти
43	Воден пат	Река (повремена), поток, талвег	 контура: нема Исполнетост: 0,66mm R: 001 G: 124 B: 255	- OpenStreetMap (водни патишта/поток) - ортофото - ДЕМ	- Се избира од базата на податоци - Да се надополни со дигитализација на ДЕМ, ортофото, итн. - да се потврди од локални експерти - да се потврди со теренско истражување
44	Воден пат	Канал за наводнување	 контура: нема Исполнетост: 0,66mm R: 001 G: 124 B: 255	- OpenStreetMap (водни патишта/канал) - ортофото - ДЕМ	- Се избира од базата на податоци - Да се надополни со дигитализација на ДЕМ, ортофото, итн. - да се потврди од локални експерти

Табела 9 Символ на картата и извор на податоци (евакуација и примарна опасност)

45	Евакуација	Опасен пат	 <p>Контура: нема исполнетост: 1,0 mm R: 219 G: 030 B: 042</p>	<ul style="list-style-type: none"> - OpenStreetMap (патишта/различни класи) - OpenStreetMap (водни патишта/река) - секундарни опасности - хидролошко моделирање 	<ul style="list-style-type: none"> - да се избераат патишта што исполнуваат најмалку еден од следните услови: 1 мостови/пропушти 2. кеј на река 3. слепа улица што води до место со поплава од 50 см или повеќе 4. подлежи на секундарна опасност - да се разговара со локалните експерти
46	Евакуација	Пат за евакуација (шематски)	 <p>Контура: R: 000 G: 124 B: 098 f: 20% исполнетост: R: 000 G: 160 B: 000 T: 20%</p>	<ul style="list-style-type: none"> - хидролошко моделирање - засолниште за евакуација - област за евакуација 	<ul style="list-style-type: none"> - да се нацрта симболична слика на евакуација од ризични области кон области за евакуација и засолништа за евакуација врз основа на разговор со општината
47	Евакуација	Пат за евакуација (вистински)	 <p>Контура: нема исполнетост: R: 000 G: 124 B: 098</p>	<ul style="list-style-type: none"> - OSM (патишта) - хидролошко моделирање - засолниште за евакуација - област за евакуација 	<ul style="list-style-type: none"> - да се одберат значајни патишта што овозможуваат да се избега од ризичната област и да се стигне до области и засолништа за евакуација и друго (да одлучат експерти) Забелешка) За да не се препотвараат картата, не прикажаме вистински патишта за евакуација
48	Евакуација	Мост	 <p>должина: 8mm, висина: 4 или 8mm Контура: 0,5 mm R: 000 G: 000 B: 000</p>	<ul style="list-style-type: none"> - OpenStreetMap (патишта/сите класи) - OpenStreetMap (водни патишта/река) 	<ul style="list-style-type: none"> - да се избере од базата на податоци - да се провери/комплетира преку теренско истражување (пр. име, должина, висина, ширина, материјал) - Рачно да се утврди поставеноста на симболот во QGIS
49	Евакуација	Место за евакуација	 <p>Контура: нема исполнетост: R: 200 G: 250 B: 204</p>	<ul style="list-style-type: none"> - OpenStreetMap (користење на земјиште/парк) - ортофото 	<ul style="list-style-type: none"> - Кога местото е парк, да се користи достапната векторска геометрија на паркот или да се дигитализира Забелешка) Овој пат користевме само постоечки податоци за паркот без да дигитализираме дополнителни податоци.
50	примарна опасност	Област со геоморфолошка опасност	 <p>Контура: 0,6 mm R: 145 G: 082 B: 045 исполнетост: R: 145 G: 082 B: 045</p>	<ul style="list-style-type: none"> - фотографии од воздух - ортофото - ДЕМ - карта на ерозија на Северна Македонија - други податоци по потреба 	<ul style="list-style-type: none"> *Да се види обука за толкување на релјефот
51	примарна опасност	Моделирана висина на поплава	<p>0,00 - 0,10 m 255 255 255 T:100% 0,10 - 0,20 m 242 160 77 T:50% 0,20 - 0,50 m 242 77 0 T:50% > 0,50 m 255 50 50 T:50%</p> <p>T=Прозирност</p> 	<ul style="list-style-type: none"> - хидролошко моделирање (период на повторување од 100 години) 	<ul style="list-style-type: none"> *да се види обука за моделирање на поплави - да се рекласифицираат податоците за да се совпадат со праговите од 0, 10, 20 и 50 см

Табела 10 Символ на картата и извор на податоци (користење на земјиште)

52	користење на земјиште	Градско подрачје	 контура: нема Исполнетост: R: 145 G: 082 B: 045	- OpenStreetMap (користење на земјиште/резиденцијално)	- Се избира од базата на податоци
53	користење на земјиште	Индустриска област	 контура: нема Исполнетост: R: 145 G: 082 B: 045	- OpenStreetMap (користење на земјиштето/индустриско)	- Се избира од базата на податоци
54	користење на земјиште	Комерцијален простор	 контура: нема Исполнетост: R: 145 G: 082 B: 045	- OpenStreetMap (користење на земјиштето/комерцијално)	- Се избира од базата на податоци
55	користење на земјиште	Шума	 контура: 0,2mm R 35 G 152 B 35 Исполнетост: R 173 G 209 B 158	- OpenStreetMap (користење на земјиштето/шума)	- Се избира од базата на податоци
56	користење на земјиште	Друго користење на земјиштето	 контура: нема Исполнетост: R 255 G 255 B 255	- OpenStreetMap (користење на земјиштето/други класи)	- Се избира од базата на податоци
57	релјеф	Висинска точка	 370 d=1mm контура=нема Исполнетост: R 000 G 000 B 000	- Топографска карта (АКН) - ДЕМ	- се дигитализира од топографската карта и/или се бира висина на важни точки (пр. врв, река во близина на мост, место или засолниште за евакуација) од ДЕМ
58	релјеф	Репер за надморска височина	 370 w=1.4 mm h=2mm Исполнетост: R 000 G 000 B 000	- Топографска карта (АКН)	- се дигитализира од топографската карта
59	релјеф	Точка за триангулација со надморска височина	 370 h=4mm	- Топографска карта (АКН)	- се дигитализира од топографската карта
60	релјеф	Контурна линија (10m еквилистанција)	 контура: нема Исполнетост: 0,1 mm R 243 G 186 B 072	- SRTM 1" податоци на координатна мрежа (НАСА)	- се генерираат и измазнуваат контурни линии во QGIS
61	административно	општински граници	 Радовиш контура: R: 000 G: 000 B: 000 Исполнетост: нема	- OpenStreetMap (место/град)	- Се избира од базата на податоци - се разговара со општината
62	административно	граници на заедницата	 Јавор контура R: 000 G: 124 B: 098 ДУ Исполнетост: нема	-	- се разговара со општината (Забелешка) овој пат користевме хартиена карта на заедниците што ја дигитализиравме
63	мапирање	Северна стрелка	 N h=25mm	-	-

Просторната прецизност е како на ГПС за општа употреба, на пример оние вградени во паметни телефони, а дигитализацијата се заснова на бесплатни просторни слики, како Bing Maps. Се претпоставува дека во Северна Македонија и двете се генерално прецизни до 10 м или повеќе.

Исто така, податоците треба да се преведат на македонски (кирилица) и на англиски јазик. Табела со превод на општите поими е прикачена како Прилог ○○. Може да се размисли и за превод на албански јазик во општините каде што тој е широко распространет. Базата на податоци за картите за модел локацијата во Радовиш е повеќејазична, но не е вклучен албански бидејќи тој јазик не се зборува многу во општината.

Покрај позадината, различни информации беа прибрани преку теренско истражување и дискусија со локалните експерти, и овие информации беа додадени во базата, преку додавање на она што недостасуваше во слоевите на OpenStreetMap (на пр. дополнителни цркви, ординации, домови за стари, итн.) или преку креирање на нови слоеви (на пр. **точен ризик**, мост со информации за опасности, итн.)

6.4 Дизајн

Овој дел е наменет за користење на Р-ЦУК и да се потврди со општината.

Треба да се користат бои и дизајн што ќе им олеснат на корисниците да донесат одлука.

Конечниот изглед на картата со опасности ќе се утврди низ дискусии и работилници со претставници од секторите за спречување катастрофи и со жителите, со користење на нацрт картата. На овој начин ќе се осигура дека нема разлики со локалната ситуација и дека форматот е лесен за користење и разбирање.

Општината ќе разгледа кои се ефикасни начини за комуникација со жителите за евакуација, како што е печатење, дистрибуција и објавување на комплетираната верзија на картата.

6.4.1 Длабочина на водата во поплавената област

Пожелно е меѓу регионите и за катастрофите да се стандардизираат минималните правила за праг на длабочина на водата, палетите бои и други методи на прикажување. Поконкретно, при одредување на прагот за длабочина на водата, се користеа следните прагови за да се наведе ризикот од евакуација во случај на поплава и ризикот по луѓе во цврсти градби; помалку од 10 см, од 10 до 20 см, од 20 до 50 см и 50 см или повеќе.

Палетите на бои се дефинирани во „ЈИС 3 9103 Бои за безбедност“ и ИСО 22324 Општествена безбедност – управување во вонредни ситуации – аларм во разни бои“. Подолу е дадено резиме на актуелните размислувања за боите за безбедност.

- Боите се менуваат од безбојна, во жолта, во портокалова, во црвена како што се зголемува длабочината на поплавата за да се означат поголем степен на опасност.
- Во области каде што длабочината на поплавата е поголема од 3 метри, може да се поплават дури и двокатни објекти, и евакуацијата е во принцип пожелна.
- Во области каде што длабочината на поплавата е помала од 50 см, постои одреден степен на опасност, па затоа треба да се користат бои што означуваат претпазливост (жолти).

6.4.2 Дизајн на пиктограм

Во оваа карта за опасности се користат претежно пиктограми од „ЈИС 3 8210 – симболи за насоки“. Прикажани се во Прилог ○○.

Доколку во ЈИС 3 8210 ги нема потребните симболи, креирани се симболи по мерка или се употребени некои од банки без авторски права.

7 Ситуации во кои се користат картите

Бидејќи ситуациите во кои се користат картите за опасности се разликуваат, од нормално време до вонредни ситуации и варираат од регион до регион, во овој дел се наведени ситуациите кога жителите и други корисници ги користат картите за опасност во поглед на (1) кога, (2) каде и (3) од кого. Општините треба да предвидат доволно време однапред за жителите да ги проучат пред да се случи катастрофа. Дискутирајте и за можноста за изработка на џебни карти што граѓаните ќе можат да ги носат со себе во секое време. Од друга страна, важно е граѓаните однапред да разбираат што ќе користат доколку треба итно да ја консултираат картата во случај на катастрофа, па картата за опасности беше изработена имајќи ги предвид овие две работи.

7.1 Пред да се случи катастрофата

Општините треба да ги изложуваат картите за опасност во различни ситуации за луѓето да бидат запознати со нив пред да се случи катастрофа.

- Знаци се поставуваат на места каде што ќе има штети и каде што луѓето ќе се собираат.
- Да се дистрибуира џебна верзија на сите поединечно
- Да се постават во основни и средни училишта

Исто така, сите семејства треба да се едуцираат дека треба да разговараат за тоа

каде ќе се засолнат во случај на катастрофа и каде да се соберат по одреден временски период за да бидат безбедни.

7.2 Во вонредна ситуација

Носете карта со опасности со вас за да може да го реализирате она што сте го разговарале дома во нормални околности, за да можете безбедно да се евакуирате во случај на катастрофа. Притоа треба да обрнете внимание на следните работи.

- Каде се опасните места меѓу вашиот дом и локацијата за евакуација?
- Кога е најдобриот момент за евакуација?



Прилог



**FIELD SURVEY ON SOCIO-ECONOMIC AND OTHER ISSUES
- FINAL REPORT -**



Author: Vasko Popovski, M.A.

September 2018

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ACRONYMS

CMC – Crisis Management Centre

DRM – Disaster Risk Management

DRR – Disaster Risk Reduction

Eco-DRR – Ecosystem-based disaster risk reduction

FMU – Forest Management Unit

JICA – Japan International Cooperation Agency

MCS – Mercalli Intensity Scale

MKFFIS – Macedonian Forest Fire Information System

PE – Public Enterprise

PEMF – Public Enterprise Macedonian Forests

TICA – Turkish Agency for International Cooperation

ToRs – Terms of Reference

1. EXECUTIVE SUMMARY

Forests occupies almost one third of dry land of the planet Earth and forest ecosystems are one of the most significant contributors for resilient societies and communities. They have various important functions, including preventing soil erosions, drainage of atmospheric and storm waters, recharging water resources, as well as decreasing of air pollution. In the Republic of Macedonia total forest area amounts to 1.091.857,59 ha or one third of the land of the country, from which 835.055,82 ha are totally forest covered area and 256.801,77 ha of the forest is non-covered forest area (bare lands). Nevertheless, due to the increased numbers of wild fires during the last decade which affected forest land around the country, as well as the significant illegal logging activities (e.g. during the period 2000 – 2012 in total 32,585 ha were subjected to illegal logging¹), the functions of forests in the country are deteriorating. Furthermore, since the 80% of the terrain in the country is mountainous and with hilly regions, natural hazards like erosions, flooding, and flash floods are high in the hazard profile of the country. In addition, the forest reduction is contributing to increased intensity and frequency of hazardous events, seriously affecting residential areas, critical infrastructure, farmlands and many more aspects of the society (e.g. deadly flash flooding events in the Village of Shipkovica/Tetovo and the village of Stajkovci/Skopje in 2015 and 2016).

Therefore, in order to answer the above mentioned challenges and within framework of its continuous support for strengthening of the disaster risk management system in the Republic of Macedonia, JICA is implementing the project “Capacity Building for Eco-DRR through Sustainable Forest Management” with main beneficiaries being the Crisis Management Center and the Public Enterprise Macedonian Forests. The main objective of the project is to expand the capabilities of the Macedonian Forest Fire Information System (MKFFIS) capable of responding to damage from floods and other such disasters, introduce and enhance a system for forest planning and management, and strengthen the afforestation and nursery techniques for enhanced forest functions, particularly for mitigating flood and landslide damage. Accordingly, one of the targeted areas is the village of Kodzhalija in the Municipality of Radovish, where forest conservation works in the forest management unit the will be conducted and forest management plan including zoning will be developed.

Current household level activities in the village of Kodzhalija affecting deforestation and degradation of forest, and how villagers perceive natural environment and disasters, is crucial for consideration of above intervention options for disaster risk reduction using Eco-DRR methods. Therefore, a field survey on socio-economic and other issues was conducted to produce basic data with its analysis of the village level and household level activities and their perception on natural environment and disasters. The objective of the assignment was to identify the socio-economic and environment of the Kodzhalija village near the micro-sites in Radovish through the analysis of generally available data (demography, environment, economic activities, presence of natural and other hazards etc.) in the related authorities such as municipality and statistical data, as well as the application of field research through an interview with the local population (questionnaire). Collected information will be utilized for future activities of the JICA Project; hazard map creation, collection of information and opinion about selection of planting trees based on the needs and their usage of wood materials etc.

The field survey has identified essential socio-economic and environment aspects of the village through the creation of the Village Profile and the conduct of the Village and Field Survey. Consequently, the Village of Kodzhalija is a traditional community of Yuruks with tradition, cultural habits and customs and specific dynamics. Based on the socio-economic profile of the village, as well as the other specifics of the community, it can be concluded that the population is significantly

¹ <http://respublica.edu.mk/blog/2017-11-23-09-42-20>

vulnerable to natural hazards and as a community they are poorly resilient to disasters. Luckily, based on the analysis of the natural hazards profile there are no significant impacts of hazards in the village.

The field survey had a good gender profile allowing the women respondents' voice and opinion on Eco-DRR topics and aspects to be heard and included in the analysis accordingly. Their contribution in the survey is very valuable insight into the community, because the women are most vulnerable to natural disasters. In addition, they possess knowledge and capacities that can be used for further strengthening of the community resilience.

On a village level, the knowledge on Eco-DRR is very low and the respondents. Also, they are not recognizing the forest as complex with preventive, protective and beneficial functions. On the contrary there are implementing practices that are devastating forest with extension of agricultural land and pastures or utilizing it through extensive legal and illegal logging. They are fully aware of the situation with deforestation in their area and by certain level they are actively supporting this activity through supplying the woods for heating almost in all cases "on their own" i.e. from illegal loggers. In addition, there is not enough available agricultural land for tobacco crop production, and there are more than enough indications that the business is expanding to forest land and the land owned by the state. Accordingly, one of the reasons for deforestation is increasing the land for tobacco crop production. As a final conclusion, it is necessary to emphasize that this document shall serve as a key review and assessment document that can provide necessary input for the Project and the national stakeholders for further advancing the Eco-DRR and resilience agenda in the Village of Kodzhaliya.

For the purposes of better understanding of the immediate outputs of this filed survey assessment, and the ultimately fast tracking the support to building a disaster resilient local community through an Eco system based DRR approach, following recommendations are formulated and presented not in an order of priority:

- Inclusion of the community in the local level activities by the project
- Community participation in disaster risk reduction activities
- Engagement of youth as agents of change
- Design and implementation of targeted Eco-DRR public awareness activities
- Afforestation of vulnerable areas
- Community infrastructure disaster risk mitigation works
- Strengthening the capacities of the competent local institutions for Eco-DRR
- Information sharing through timely and available public information
- Introduction of sustainable practices for resilient agriculture
- Introduction of energy efficient modalities of heating
- Implementation of best practices customized to a local context
- Gender mainstreaming in the project activities

2. INTRODUCTION

2.1 Background

Within the framework of the project “Capacity Building for ECO-DRR through Sustainable Forest Management” financed by JICA with main beneficiaries being the Crisis Management Center (CMC) and PE Macedonian Forests, forest conservation works in the forest management unit near the village areas of Kodzhalija will be conducted and forest management plan including zoning will be developed. Current household level activities affecting deforestation and degradation of forest, and how villagers perceive natural environment and disasters is crucial for consideration of above intervention options for disaster risk reduction using Eco-DRR methods. Therefore, a field survey on socio-economic and other issues will be conducted to produce basic data with its analysis of the village level and household level activities and their perception on natural environment and disasters.

2.2 Objectives of the Assignment

The main objective of the assignment is to identify the socio-economic and environment of the Kodzhalija village (target area) near the micro-sites in the Municipality of Radovish through the analysis of generally available data (demography, environment, economic activities, presence of natural and other hazards etc.) in the related authorities such as municipality and statistical data, as well as the application of field research through an interview with the local population (Questionnaire). Collected information will be utilized for future activities of the JICA Project, such as hazard map creation, collection of information and opinion about selection of planting trees based on the needs and their usage of wood materials etc.

Main deliverables within the assignment are following:

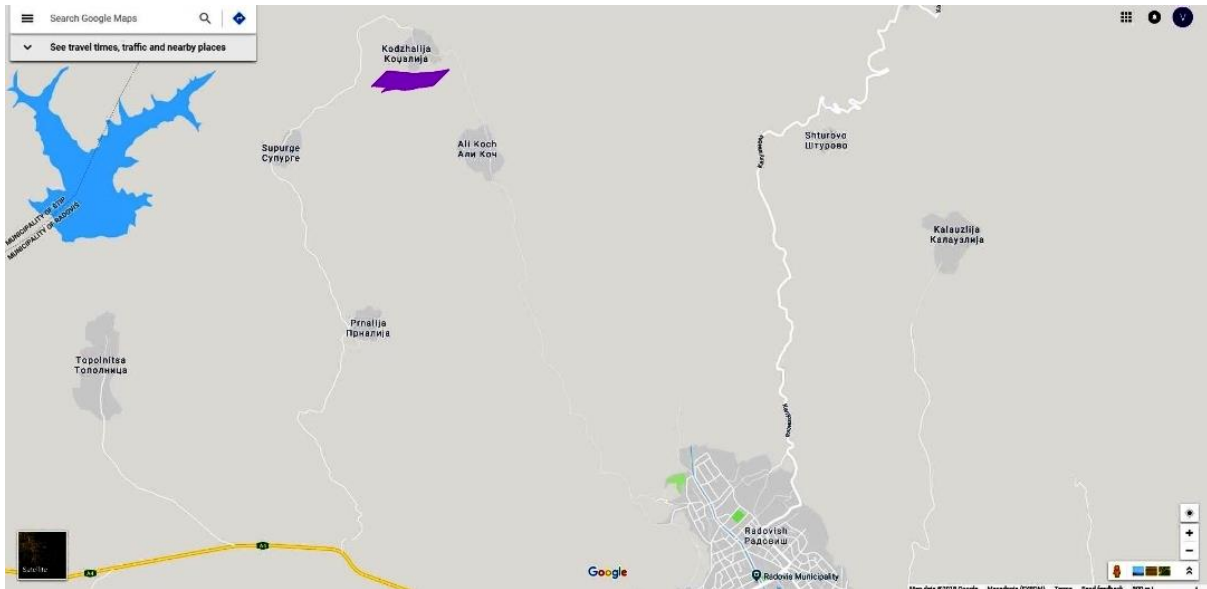
1. **Village Profile** - Collecting basic data of the region and municipality through existing documents such as statistics.
2. **Questionnaire** – It consists of Form for the Village Meeting and the Questionnaire for the household survey (50 households).
3. **Guideline** how to conduct the field survey.
4. **Draft Report** - Draft report shall be made in format of Microsoft Word and Excel. Submission shall be made by e-mail to the Project. Primary data and result of interviews shall be summarized as annex. Original sheets and data entered in the spread sheet shall also be attached.
5. **Final Report** – It is finalized based on the comments from the explanatory meeting to be held in the beginning of September 2018.

Accordingly the expected Scope of services for the execution of the activities for the filed survey and successful provision of main deliverables as per the ToRs is following:

- Drafting schedule and preparing of Questionnaire and Guidelines for its field application in Macedonian and English being supervised by JICA, CMC and PEMF experts.
- Collecting basic data of the region and municipality through existing documents such as statistics.
- Conducting survey targeting to two levels: group meeting at the village and household interviews in 50 households.
 - Discussing among participants will be encouraged in the village level meeting.
 - CMC and PEMF will set up a village level meeting with the assistance of local municipalities.
 - The Contractor is expected to compose one survey teams, composed by two persons, under the team leader.

2.3 Location of the target area

Location of the execution of the field survey is the Village of Kodzhalija in the Municipality of Radovich in the Southeast Planning Region. The village is located northeast from the City of Radovich at the distance of 9 km. Being nested on the southern slopes of the Plachkovica Mountain at the altitude of 860 m. above the sea level the village is part of the so called “Yuruks”² region in the Republic of Macedonia.



Map 1 – Location of the Village of Kodzhalija (purple colored area)



Map 2 – Satellite image of the Village of Kodzhalija

On the other side, all other activities including preparatory and report writing are being done, home-based in Skopje.

² <http://hybread.mk/juruci-skrienite-etnicki-zaednici-vo-makedonskite-planini/>

3. APPROACH AND METHODOLOGY

As mentioned above, the main objective of this assignment is to identify the socio-economic and environment aspects of the Kodzhalija village near the Project micro-sites in the Municipality of Radovich through the analysis of generally available data (demography, environment, economic activities, presence of natural and other hazards etc.) in the related authorities such as municipality and statistical data, as well as the application of field research through an interview with the local population (Questionnaire). Therefore with aim to implement this assignment, it was necessary to define the suitable approach and use of adequate methodology in the procedure. Accordingly, they are in line with the subject of the assignment, its characteristics and established implementation framework.

3.1 Approach to implement the Assignment

The approach to implement the assignment is based on the understanding of the conceptual disaster risk management framework in the country, essential notion of Eco-DRR, as well as the theoretical and practical aspects of implementation of field surveys. Accordingly, execution of the assignment is based on implementation of activities in logical sequences ensuring all aspects to be taken into consideration in effective and efficient manner as presented below:

- **Familiarization** with the Project, as well as other relevant information and documents in order to identify key elements that need to be included in the deliverables;
- **Compilation and desk review** of generally available information, documents and data (demography, environment, economic activities, presence of natural and other hazards, statistical data, etc.) for the purposes of preparation of the Village Profile;
- **Preparation** of the *Village Meeting Form*;
- **Preparation** of the *Questionnaire for the Field Survey*;
- **Preparation** of the *Guide for Surveyors for implementation of the Questionnaire for Field Survey on socio-economic and other issues*;
- **Preparation and submission** of the *Inception Report* that includes essential information on the implementation of the assignment (scope, objectives, early stages progress, work plan, risks and how to mitigate them, etc.);
- **Preparation and submission** of regular weekly reports;
- **Conduct** a *field survey* (including supervision) in the Village of Kodzhalija during the period 18 – 26 June 2018 for the purposes of practical implementation of the village level survey and the household level survey (Village Meeting + use of Questionnaire);
- **Entry** of collected data and their analysis;
- **Preparation** and submission of the *First Progress Report*;
- **Preparation** of the *Village Profile*;
- **Preparation** and submission of the *Draft Report*;
- **Preparation** of the *Second Progress Report*;
- **Presentation** of the Draft Report at the *Explanatory Meeting*;
- **Preparation and submission** of the *Final Report*.

For effective and efficient implementation of the assignment as per the ToRs requirement, a Team of experienced and knowledgeable persons was established (Vasko Popovski – Team Leader, Ljupco Milkovski and Lolita Arsova – Team Members). The Team has outstanding project management experience for support of the implementation of the assignment and to meet all Project technical and contractual expectations and demands. Roles and responsibilities in the project are following:

- Vasko Popovski, M.A. (Team Leader) – The Team Leader is responsible for overall implementation of the assignment, management of activities, coordination of the Team, reporting to

the Project, communication with the Project, desk review of base data and information, preparation of the Questionnaire and the Guidelines for field survey, education of the surveyors, facilitation of the village meeting, supervision of the field survey, as well as preparation of the draft and final reports.

- Ljupco Milkovski, (Team Member 1) and Lolita Arsova (Team Member 2) are responsible for learning of the content of the Questionnaire using the Guidelines, participation and surveying in the village meeting, implementation of the field survey through the use of the Questionnaire, entry of data, as well as translation of all forms in Macedonian language.

3.2 Methodological Framework

As mentioned earlier for the conduct of the assessment beside the proposed approach it is necessary to define the right methodological framework of the assignment. The methodological approach is ideally balanced between the research framework, practical aspects and objectives to be achieved with inclusion of methods and tools that supports this effort. Consequently, based on the characteristic of the assignment, following research methods are established and applied during the whole duration of the assignment:

- *Content Analysis* - content of all submitted and available information, data and documents, as well as reports was reviewed and analyzed.
- *Comparative Analysis* was used during the desk review phase.
- *Qualitative Research Design* - during the field survey, village meeting with interested villagers was held using a prepared form, as well as facilitated and structured as community group discussion.
- *Quantitative Research Design* – during the field survey, household survey of 50 households was held using a prepared Questionnaire.

3.2.1 Field Survey Tools (Village Meeting Form and Questionnaire)

The current household level activities affecting deforestation and degradation of forest, and how villagers perceive natural environment and disasters is crucial for consideration of above intervention options for disaster risk reduction using Eco-DRR methods. Therefore, a field survey on socio-economic and other issues was conducted to produce basic data with its analysis of the village level and household level activities and their perception on natural environment and disasters.

The Field Survey on socio-economic and other issue consists of two parts: village survey and household survey. Accordingly, as requested, the Team Leader has prepared two documents/tools for their practical implementation providing effective and efficient field data collection from the stakeholders and facilitating the preparation of the report. Their structures and contents were proposed by the Project, improved by the Team Leader and approved by the Project (14.06.2018). They are structured to elicit information and to provide a feedback mechanism for the Project and national counterparts that facilitates the understanding of the existing situation, gaps and opportunities, as well as contribute to further resilience of the Village of Kodzhalija and the Municipality of Radovich through sustainable Eco-DRR programming and project implementation ensuring the sustainability of interventions.

The **Village Meeting Form** (Annex II) was the main qualitative research design tool of the Field Survey aimed to collect data and information during the village meeting organized as a community group discussion. Its main purpose was to support discussions with the community members during the village meeting in a structured and orderly manner, as well as to successfully facilitate it. Therefore, it was prepared on a more general level of the village participation and it was consisted of several important areas for discussion and collection of information (e.g. characteristics and history of villages including water resources, village houses, demography; main products in terms of the quantity and the monetary value; usage situation of forest at village; traditional collaborative work,

customs, practices; ownership situations of agricultural land and pasture (including forest grazing); main agriculture practices and annual schedule of the work (Including bee keeping and main flower; outline of existing residents organization; any locations where soil erosion is severe and problematic in the village; water conditions in the village including water resource and wells; forest and land use history surrounding the village; illegal logging situations and disaster record surrounding village). In addition, collected information from the participating group of villagers was correlated with the desk reviewed data and the household survey data, aiming for improved reporting on the socio-economic and other issues on the community.

On the other side, the **Questionnaire for the household survey** (Annex III) is the main quantitative research design tool of the Field Survey aimed for implementation of the household survey of 50 households. The main aim of this survey is to collect data from the participating household representatives on their household level activities and their perception on the natural environment and disasters in the village area. Accordingly, the structure of the Questionnaire is consisted of three main sections:

- a) Household related questions (demographic and socio-economic profiling of the respondents e.g. sex, age, ethnicity, religion, education levels, employment status, main sources of income, average annual income and expenditures, women role in the household);
- b) Natural environment questions (e.g. forest resources and management related questions, forest and woods as resources, trees and benefits, afforestation, respondents consciousness about these aspects) and
- c) Disaster related questions (e.g. hazard profile of the village, measures and activities for protection from natural hazards and for better communication, mitigation measures and modality of protection of the crop from animals).

The questions in the Questionnaire are closed or semi-closed ensuring effective and efficient data collection and analysis. The Household Survey was conducted by the Team Members based on direct, face-to-face interviews with the selected respondents from the selected parts of the village. Macedonian language was used for preparation of the Questionnaire, as well as for the conduct of the interviews. The Household Survey was implemented during the period of 8 days, as requested by the ToRs and the contractual framework with the Project. In line with the ToRs, the team members performed the data entry immediately after the finalization of the household survey. All the data was entered in MS Excel that is used for data analysis and was main input for the preparation of the Draft Report. Accordingly, in the report visualization of the analysis in as charts is integrated.

3.2.2 Guide for Surveyors for implementation of the Field Survey on Socio-economic and other issues

The Guide for Surveyors for implementation of the Field Survey on Socio-economic and other issues - the Guide (Annex IV) includes guidelines, responsibilities and tasks that team members (field surveyors) were requested to follow during the Field survey on socio-economic and other issues in the village of Kodzhalija in the Municipality of Radovish (village and households surveys). Its content was structured to cover the main areas of the Field Survey, as well as to facilitate the surveying through provision of practical information and guidance to the team members in order to achieve full understanding of the assignments and actions that followed by the surveyors, as well as guarantying confidentiality and ensuring quality of the Field Survey. Accordingly it is consisted of several sections (e.g. role of surveyors, guidelines for conducting the survey, guidance's on the Village Meeting Form and the Questionnaire, clarifications and recommendations how to conduct the survey based on each question,). The Guide was prepared by the Team Leader and approved by the Project (14.06.2018). Accordingly, the team members had enough time to get familiar with it in order to implement the field survey in a professional manner and successfully. Additional benefit from this Guide is that it can be

easily replicated and scaled up for future field surveys by the national beneficiaries in other parts of the country.

3.3 Work Plan

For the purposes of implementation of services for the Field Survey of socio-economic and other issues in the village of Kodzhalija, on 04 June 2018, a contract was signed between the Contractor – Vasko Popovski, M.A. as a Team Leader of the Team and Asia Air Survey Co., Ltd. The deadline for implementation of the above mentioned services is until 30 September 2018. The Team for implementation of the services is composed of following members: Vasko Popovski, M.A. – team leader, Ljupco Milkovski – team member and Lolita Arsova – team member.

The enclosed Work Plan was prepared in accordance with ToRs (Annex I) and based on the First Progress Report dated 10.07.2018. It presented all necessary activities for execution of the assignment and achievement of the main deliverables, as well as reflected implementation of the planned activities in due time, without postponing or delaying activities.

FIELD SURVEY ON SOCIO-ECONOMIC AND OTHER ISSUES			May				June				July				August				September			
	Responsibility	Working Days	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
Phase I	PREPARATION		18																			
	Collection and analysis of basic data and information	Team Leader				X	X				X											
	Preparation of the Questionnaire for the field survey	Team Leader					X															
	Preparation of the Guidelines for the field survey	Team Leader	2				X															
	Learning contents of Questionnaire	Team members	1-1				X															
Phase II	FIELD SURVEY		33																			
	Conduct of the village meeting	Team Leader –Team members	1-1					X														
	Conduct of the village (household) survey	Team members	8-8					X	X													
	Supervision of the village (household) survey	Team Leader	8					X	X													
	Data entry of the results of the survey	Team members	3-3								X											
Phase III	REPORTING		15																			
	Preparation of the Draft Report	Team Leader	7								X	X										
	Submission of the Draft Report	Team Leader	1								X											
	Feedback from the Project	Team Leader	1											X	X							
	Explanatory meeting	Team Leader	1																	X		
	Finalization of the report	Team Leader	4																	X	X	
	Submission of the Final Report	Team Leader	1																		X	
TOTAL WORKING-DAYS FOR THE TEAM:		66																				

Table 1 – Work Plan for execution of the assignment dated 10.07.2018

This Work Plan includes also **preparatory activities** for execution of the assignment that were initiated immediately after signing of the contract and consisted of regular communication with the Project, preparation and delivery of required reports (weekly and Inception Report), as well as implementation of necessary operational and logistics activities for execution of the field survey.

➤ *Meeting with the Project* was held on 04.06.2016 when the Contract was signed and the aspects of implementation of the field survey were discussed.

➤ *Preparatory meeting at the Municipality of Radovish and site visit on 13.07.2018 with the national and local beneficiaries* – The objective of the meeting was to present to the municipal and village representatives the objective of the field survey, proposed work plan of activities and the organizational aspects and logistical support from the rural community (Mesna zaednica) from the village. Presentation of the field survey objectives and work plan were well received and all parties declared their support to the conduct of the field survey. During the meeting full support from the representative of the Rural Community (Mesna zaednica) of the Village of Kodzhalija, as well as representative of local level institutions (Regional Office of CMC, Municipality of Radovish, local branch of PE Macedonian Forest) was received and their coordination and support arrangements were agreed. After the meeting in the municipal building, a site visit was made to the village of Kodzhalija in order to see the place for the village meeting, getting familiar with the environment and the terrain in the village, as well as to make a plan for the necessary logistics. Local media informed publicly on the meeting and the objectives of the project http://radovis.gov.mk/portfolio_page/dzaika-sos-

koordi/

https://www.facebook.com/pg/Opstina.Radovish/photos/?tab=album&album_id=128818876128342

2



Photo 1&2 - Meeting with Municipal and National Stakeholders (13.06.2018) – Municipality of Radovish

➤ *Reporting* – During the period of reporting in this Draft Report, regular weekly reporting was done as requested by ToRs by e-mails, Inception Report was submitted on 16.06.2018 and the First Progress Report was submitted to the Project on 11.07.2018.

➤ *Communication* – For the purposes of effective and efficient implementation of the activities, regular communication, predominantly by e-mail was done with the Project.

➤ *Operational and logistics arrangements* – For the successful implementation of the field survey, it was necessary to timely plan and implement all operational and logistics arrangements that range from preparation of the field survey materials, transportation, accommodation, logistics, communication between the team members and with the responsible national and local staff, as well as familiarization with the field survey materials and developing internal procedures in the Team for conduct of the field survey and its supervision.

3.4 Risk and Assumptions

At the inception stage of the execution of the assignment, following risks and assumptions were identified and profiled, as well as management measures defined:

1) Availability of data and information – In addition to the collected documents, additional information and data is needed to be provided before and during the field survey for the purposes of data analysis and synthesis of information. Data will be collected from the municipality. **Medium Risk.**

Management Measure: As a result of the good cooperation and collaboration with the Project (Local Coordinator) and the national and local beneficiaries, the Team collected all available information and data.

2) Availability of key informants – Field Survey will take place in a period of 8 days, so the proper planning and appointment of surveys should be implemented. It is recommended the key households to be confirmed during the Village Meeting and to discuss the availability with villagers. **Medium Risk.**

Measure: The Team based on good planning and coordination with village representative and local beneficiaries implemented the household survey during the requested period.

3) Weather conditions – To consider the weather conditions for the execution of the field survey. To make plans on daily basis. **Low Risk.**

Measure: Weather conditions were considered and adequate planning of the activities of the survey was done.

4. VILLAGE PROFILE

Within the framework of this assignment, desk review of the village level information and data was a phase of the scope of work in which all available information and documents were reviewed for the purposes of better understanding of the village context better preparation of the assessment and the field survey exercise, provision of a baseline for comparison, as well as preparation of the Village Profile. However, regarding this desk review analysis it is necessary to mention that the reviewed information, data and documents are one form of evidence and they were correlated with the survey.

The Village Profile serves to identify the socio-economic and environment of Kodzhalija village near the micro-sites in Radovish through the analysis of generally available data (demography, environment, economic activities, presence of natural and other hazards, communal infrastructure etc.) in the related authorities such as municipality, national counterparts and statistical data. Also, it identifies the key elements to be included, as well as to understand the DRR context of the location. Furthermore, results of the review shall be summarized and included in the Draft Report and consequently in the Final Report. Accordingly, this information can support the data analysis especially for creation of the recommendations. Furthermore, the collected information will be utilized for future activities of the JICA Project: hazard map creation, collection of information and opinion about selection of planting trees based on the needs and their usage of wood materials etc.

During the reporting period various information and documents were collected and analyzed ranging from statistical data from the State Statistical Office, municipal data on education, urban planning and communal infrastructure in the village, forest layout from the PE Macedonian Forests – Regional Office Radovish, as well as the general municipal data on the hazard profile. In addition, municipal and regional data was collected and analyzed. The synthesis of these information and data will be included in the Draft Report.

a) General Characteristics (geography, climate, economic activities)

The Village of Kodzhalija is located in the Southeastern part of the Republic of Macedonia, within the territory of the Municipality of Radovish in the South East Planning region. It is located on the Southern slopes of the Plachkovica Mountain, on the Northwestern part of the Radovish-Strumica valley. The average altitude of the village is 860 m above the sea level. The territory of the village area is 16.8 km². The Village of Kodzhalija is located 9 km from the City of Radovish.

The climate is moderate continental climate. Due to the average altitude of 860 m, there are influences from the mountainous climate from the Plachkovica Mountain. The temperature is characterized on a seasonal basis with winter months being the coldest ones (January with average temperature of 1.4°C) and the summer months being the warmest ones (July – 23.5°C). Period with frost is with 139 days and days with snow there are 13 on average. Average rainfall is 423.8 mm and November is the month with biggest rainfall (49.7 mm), whether the month of August is with lowest rainfall (21.1 mm). Most dominant wind in the region is from West with average frequency of 196% and average speed of 2.5 m/sec³. It's present round the year, but is most frequent in January and December. It is followed by the Northwest wind which has greater average speed (3.2 m/sec) and by the East and Southeast winds.

The Village of Kodzhalija is part of the “Radovish – Strumica” water management area which is in the river basin of Strumica River. This area is very poor with water and the specific flow of the area is

³ “Conditions for Spatial Planning for preparation of the Urban Plan for the Village of Kodzhalija”, Technical No. Y23914, issued by the Spatial Planning Agency of the Republic of Macedonia, page 4.

$q=3/1/\text{sec}/\text{km}^2$ ⁴. There are no water accumulations in the vicinity of the village. Also, the hydrology is poor with several small streams and rivers in the area. There are four rivers: Bunar Derezi, 10 km long, flows from Kodzhalija to Radovish; Balari River, Kuchiska River and Bukova River.

In the vicinity of the village there are three archeological sites that are under regime of protection as per the relevant legislation:

- Vezhdalan/Marashardi – 1 km from the village, necropolis, late Roman period;
- Isarlak – late Middle Age;
- Kirsalam – 4.5 km from the village, Middle Age.

In the village there are no industrial capacities. Main economic activity in the village is agriculture – tobacco crop production, followed by animal husbandry. Only 8 legal entities are established out of which 3 are registered for transportation services in the road transport, 3 are registered as grocery stores and 2 are farms for animal husbandry. In the area of the village there are 286 ha of agricultural land and 130 ha of grazing land, as per the book on the Municipality of Radovish including data on the village of Kodzhalija.

b) Demographics

As per the Census of Population, Households and Dwellings in the Republic of Macedonia from 2002⁵, the total population of the village of Kodzhalija is 478 citizens as presented in the table below.

Ethnic Affiliation	Total
Macedonians	0
Turks	478
Roma	0
Albanians	0
Aromans	0
Serbs	0
Bosniaks	0
Others	0

Table 1 – Ethnic Affiliation in the Village of Kodzhalija as per the 2002 Census

The population in the village is Yuruks, a Turkish sub ethnic subgroup that came to these parts of the country from Anatolia, region of Konya during the XIV and XV centuries. In addition the Yuruks region (Yuruklak) is located on the western parts of Plachkovica Mountain, Northeast from the Lisec summit (1,754 m) until the region of Kriva Lakavica River on the Southwest, on the territories of the municipalities Radovish and Shtip. Yuruks villages are usually consisted of several parts (mahala) in which related families live. Main characteristic of this ethnic group is hardcore tradition that is characterized with homogenous structure, no mixture with other population and ethnic groups, same demographic structure in the villages, century long customs kept. Women have very traditional roles where they are responsible for household chores and supporting the agriculture works. Religion is Muslim for all the villagers.

⁴ “Conditions for Spatial Planning for preparation of the Urban Plan for the Village of Kodzhalija”, Technical No. Y23914, issued by the Spatial Planning Agency of the Republic of Macedonia, page 8.

⁵ <http://www.stat.gov.mk/Publikacii/knigaXIII.pdf>

Religion	Total
Orthodox	0
Muslim	478
Catholics	0
Protestants	0
Others	0

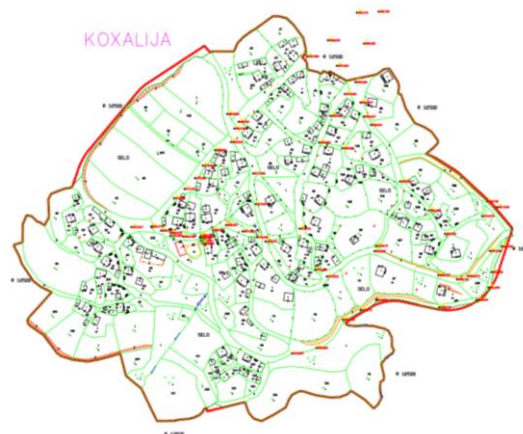
Table 2 – Total population by religion in the Village of Kodzhalija as per the 2002 Census

Demographic structure as per age groups show that the population in the village is relatively young with children (0 – 19) being almost half of the population – 229, followed by working active population. There are very few elderly people.

Age Group	Male	Female	All
Total:	250	228	478
0-4	24	25	49
5-9	32	38	70
10-14	43	30	73
15-19	21	16	37
20 - 24	18	14	32
25 – 29	32	23	55
30 – 34	24	21	45
35 - 39	15	12	27
40 – 44	8	8	16
45 - 49	1	7	8
50 – 54	7	6	13
55 – 59	7	11	18
60 – 64	7	9	16
65 – 69	5	5	10
70 - 74	2	-	2
75 - 79	4	2	6
80 - 84	-	1	1
85 and more	-	-	-

Table 3 – Total population by age groups and sex in the Village of Kodzhalija, 2002 Census

c) Urban Planning



Map 3 – Area of the Village of Kodzhalija (Urban Plan Scope)

In the Village of Kodzhalija there is no valid urban plan that will regulate the urban planning aspects of the location and its urban development. The first urban plan is in phases of development and adoption by the Municipality of Radovich. The scope of the urban plan is with a territory of 17,56 ha as presented in the map of the urban plan scope. There is a problem with illegal building construction, since there was no urban plan adopted; most of the villagers were constructing their houses on their own.

d) Communal and Social Infrastructure

In general communal infrastructure is consisted of road infrastructure, water and wastewater networks, waste disposal site, street lightning system, telephone and internet services and similar services. On the other side, the social infrastructure is understood as a functional system of education, provision of health services, cultural facilities, social services, media, sporting activities etc.

In the village of Kodzhalija the communal infrastructure is consisted of following:

- Road infrastructure (roads with asphalt pavement) – 608 m;
- Road infrastructure/streets with concrete pavement (bekathon tiles) – 322 m;
- Communal substructure (public electric light poles) – 40 pcs.
- Water supply network;
- Partial sewage network which is not connected for the whole village and it is not functional.
- There is no organized solid waste collection and disposal.
- Both mobile telephony providers have signals in the village with most of the village covered with 4G (at least for the Telekom).
- Fixed line telephony is from Macedonian Telekom.
- There is no organized cable TV network and most of the houses have satellite dishes for watching Turkish TV channels.

Educational infrastructure in the Village of Kodzhalija is consisted of one elementary school. Namely in the village there is a regional school branch from the Central School “Krste Petkov Misirkov” from Radovich. Education process is organized for students from 1st to 5th grade. The education is delivered on Turkish language. It is interesting fact that the number of students is increasing each year. For example, in 2015/2016 there were 72 students (37 male-35 female), then in 2016/2017 there were 100 students (49 male/51 female) and finally in the school year 2017/2018 in total 102 students were enrolled (46 male/56 female). This refers to increased birthrate in the village after the government funded program for subsidies for third or more children. The school building is new, constructed with support of TICA. It is ground floor building with classrooms for each grade and a court for sport activities. Students that are continuing with their education beyond 5th grade are visiting the central school “Krste Petkov Misirkov” in Radovich or municipal high schools. On a level of a school generation, one or two students are continuing with education further obtaining university diploma.

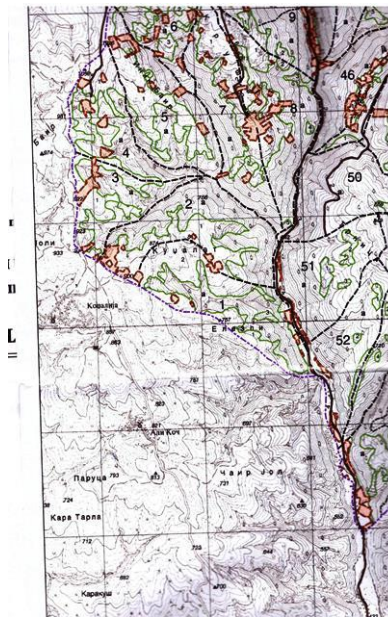


Photo 3 – Elementary School in the Village of Kodzhalija

With regards to the other aspects of social infrastructure and provision of social services, there are no other facilities in the village. The villagers are fulfilling their needs either through site visits (e.g. regular veterinary doctor visits to the village), visiting nearby village of Ali Koch (e.g. medical ambulance for health issues) or travelling to the City of Radovich.

e) Forest Management in the area of Kodzhalija

Forest management in the area of the Village of Kodzhalija is provided by the regional branch of the PE Macedonian Forest in Radovich. The Village of Kodzhalija is located in the part of the forest land that is not regulated and in close distance to the village on its North-Northeast side is the Forest Management Unit “Radovich – Oraovica River” which has three classes: 1a, 2a and 3a (presented in the map below).



Map 4 – Forest Management Unit “Radovich – Oraovica River”

In the table below, essential characteristics of the forest area in the village area is presented. In general, oak is the main tree with presence in the biggest part of the forest. There are 126.8 ha under forest (state owned), 99.7 ha of forest land (clear land) and 8.5 ha privately owned forest. So, the ratio between the state owned and privately owned forest is: 96% - 4%. As mentioned the forest is divided in three classes/areas and all of them are attacked by illegal logging with the class 1a being the most attacked. In addition, the quality of the forest is poor with bad quality of the stems, small heights, low crowns.

It is important to mention that based on the clarification given by the regional branch office of PEMF, within this forest management unit, the private forest areas are only identified and presented in the map above with red lines/circles. However in no case the PEMF through its regional branch is not managing these areas except for their identification. It is obligation of the private forests owners to do the forest management of their private forest areas.

As it was mentioned, there is significant level of illegal logging activities, deforestation and transformation of the forest land to agriculture land or grazing land. Especially transformation to a tobacco crop production land is intensive, because there is no available agricultural land in the village area for tobacco crop production. There are cases when villagers (approx. 15) are renting the agricultural land from the state or private owners in the area around the City of Radovich or beyond.

Final Report
Field Survey on Socio-Economic and Other Issues

Forest Management Unit "Radovich – Oraovica River"

No.	Class	Description of the area	Type of trees	Stems/ha	Wooden mass/ha m3	Wooden mass/forest m3	Actual Increase			Average Increase		Woods classification	Area/ha
							%	1 ha	Whole area	1 ha	Whole area		
1	1a	Altitude: 500-820m Exposition: South/Southeast Sharp inclined slopes Rocky and dry soil, without humus	ass. Quercus carpinetum orientalis									Heating 90.00 Waste 10.00	
			Quercus frainetto	1,630	16	634	3.13	0.50	20	0.32	13 m3		
			Carpinus orientalis	2,200	14	554	2.86	0.40	16	0.28	11 m3		
		Forest										39.60	
		Forest land										48.60	
		Total:										88.20	
2	2a	Altitude: 500-920m Exposition: East/Northeast Slopes with smaller torrents Rocky and dry soil, without humus	ass. Quercus carpinetum orientalis									Heating 90.00 Waste 10.00	
			Quercus frainetto	1,920	13	764	3.85	0.50	29	0.29	17 m3		
			Carpinus orientalis	2,060	13	764	3.85	0.50	29	0.29	17 m3		
		Forest										58.80	
		Forest land										30.00	
		Total:										88.80	
3	3a	Altitude: 600-970m Exposition: East/Southeast Forest land is on a hill with two sharp slopes Rocky and dry soil, without humus	ass. Quercus petraeae									Heating 90.00 Waste 10.00	
			Quercus petraea	1,350	32	909	1.25	0.40	11	0.58	16		
			Carpinus orientalis	1,820	11	312	2.73	0.30	9	0.20	6		
		Forest										28.40	
		Forest land										21.10	
		Total:										49.50	

f) Natural Hazards Profile

The natural hazards profile is the same as the regional profile for the Municipality of Radovich with floods (including torrential ones) being the number one, followed by wild fires, earthquakes, other natural hazard, predominantly the weather related ones (hail, storms, strong winds, torrential rains, etc.), landslides/erosions.

There is no record of disastrous events on the territory of the village in the past. However, every major hazardous event that has happened in the City of Radovich area has certain impact to the village area, but without major consequences. Main issues in the village area are torrential floods and weather related hazards. These events are especially micro located in their frequency and intensity and can hardly affect the main source of their income – tobacco crop production, which accordingly is increasing their vulnerability as population and seriously affecting the overall resilience of the community to disasters.

Torrential flooding is the major hazard both due to the characteristics of the terrain of the Plachkovica Mountain, as well as increased intensity and frequency of torrential rains. Most rainy periods are from November to March, whereas the driest months are August and September. However, due to the changing climate there are frequent events of powerful torrential rains during the other times of the year, especially the summer months.

The Village of Kodzhalija is in the Radovich seismic zone which is subject to frequent earthquakes that are caused by the local or distant epicentral hotspots. In this region until 1976 there were more than 77 registered earthquakes, from which 6 were with intensity of 6 or more. Epicenters are on the South or Southeast from Radovich in the valley, where one hotspot was registered in the Lakavica region. Based on the analysis, the biggest part of the Municipality of Radovich is exposed to seismic hazard with intensity of 8° as per the MCS, and the area of Plachkovica Mountain with intensity of 9° as per the MCS.

There are no technical – technological hazards in the village area, since there are no industrial capacities. However, the village is facing increasing air pollution. Namely, the landfill from the Buchim Mine is close to the village area, and when there are strong winds in directions to the village, air is polluted with high concentration of dust and heavy particles. Therefore, it is necessary to have a forest land as a type of a barrier.

5. FINDINGS FROM THE FIELD SURVEY ON SOCIO-ECONOMIC AND OTHER ISSUES

5.1 Village Level Survey (Village Meeting)

The village level survey (Village Meeting) was done as planned on 18.06.2018 (13:00 – 14:30) and was held at the central market store in the center of the village. Approximately 18 villagers were present and actively participated in the survey. The meeting was conducted in a form of a focus group and the discussion was guided and questions were asked as per the previously prepared and approved Village Meeting Form. All the topics from the form were covered and the villagers expressed their opinion and commented existing situations in the village. The meeting was managed by the procedures with the Team Leader as the main moderator and the team members as the minute takers. Accordingly, the Minute of the Village Meeting was prepared and is enclosed as Annex V.



Photo 4 - Some of the Village Meeting participants, the Team and representatives from the municipal institutions after the completion of the meeting (18.06.2018)

The outcome information from the meeting is valuable and provides additional aspect of the socio-economic and environmental aspects, as well as the natural hazard profile of the village. Accordingly, the information from this village survey is presented in the Draft Report and will be correlated with the Village Profile and the household survey and presented in the report.

i) **Village characteristics** – There are no evidence on the historical developments of the village and the history of the village can be traced up to XV century. Population is 478 as per the Census, with 50:50 men and women and in general is very young. Population is increasing due to the fact that many villagers extended their families with third or fourth child following the former government policy for subsidizing more children families. Another aspect is the decision of the Turkish Government not to enable dual citizenship after 2012. There are 135 households in the village. Main economic activity is agriculture – tobacco crop production (90% of families) and animal husbandry (8 households). There are 5 bee keepers and several private companies as presented in the profile of the village (8 legal entities are established out of which 3 are registered for transportation services in the road transport, 3 are registered as grocery stores and 2 are farms for animal husbandry.

Most of the villagers are unemployed with one of the family members registered as a farmer in order to be eligible for subsidies. Social infrastructure in the village is very limited: functional water supply network, not functional sewage system, elementary school, no health and veterinary facility. Communal infrastructure is poor with 50% street coverage, one main road to Radovish with asphalt

pavement, no internet distributor, two mobile operators, and mobile internet operational, no organized collection of solid waste and therefore they are illegally dumping it. Urban planning document is being prepared.

ii) Main village products – Main product is the tobacco – Prilep type and the annual average quantity is 200 t or in monetary terms the value of production is 800,000 EUR.

iii) Usage situation with forest – It was declared by the villagers that the forest around the village is 70% state owned and 30% privately owned. Forest is managed by the regional branch of PEMF. Woods is main resource for heating, as well as for construction, agriculture, animal husbandry. Main types are oak and beech. In the past they had acacia. Until now there are no organized afforestation activities implemented in the village area. In their opinion they should be regular afforestation activities and can provide many benefits. Animal husbandry breeders which are 8 households in the village or 6% of all households are opposing this idea and accordingly there could be a possible conflict between animal husbandry and tree planting activities. Their suggestion is to do a good awareness raising on the benefits of afforestation, as well as to communicate with the owners of grazing animals and to have a sensitization sessions in order to solve to possible issues.

iv) Traditional collaborative work, customs, practices – Agriculture is collaborative sector for all family members. Women are seen in their supporting the family role. Their life in the community is still very traditional and they predominantly stay at home doing household chores, almost without any contact with other persons.

v) Ownership situations of agricultural land and pasture - As stated above 70% of the ownership of the forest is state owned and 30% is privately owned. Most of the agricultural land surrounding the village is privately owned. Forest grazing is similar to forests and it is mostly state owned.

vi) Main agriculture practices and annual schedule of the work – Main crop is tobacco, whether other crops are planted only for family needs. Same situation with animal husbandry – sheep, cows, goats, poultry. Agriculture season is in the period May – October, whether the animal husbandry is all year activity. Main tobacco crop production activities are manual and semi-automatic. No understanding and implementation of any sustainable agricultural practices. Not all villagers are protecting the crop against breezing animals and when it is a case, they are using hedges. For protection of trees (e.g. walnuts, fruits) thorn trees, shrubs and wooden sticks from oak are being used. Tobacco crop production is a family business.

vii) Existing residents' organization – functional Rural Community (Mesna zaednica) for local community consultations – 6 members of the Council and 1 President. This body communicates with the municipal authorities in Radovish for all village related issues. If necessary, they are organizing joint community meetings where important issues are discussed and decisions are made.

viii) Soil erosions locations – Near place called Inik, several erosions, but no population or houses were affected. Small erosions sites happened around the village, especially after torrential rains. Numbers of erosions are increasing and land is sliding more frequently toward the village river. Near the dam in Topolnica, animals caused land sliding and two cows have drowned in the river. No mitigation measures or works have been implemented or are planned for implementation.

ix) Water conditions in the village – Organized village water supply system with filter station and one water reservoir. Main water source form the region in Plachkovica Mountain. Water treated with chlorine and controlled by authorities. Almost every house has a water meter. Every household is paying for used water. Last year there was water shortage situation. Several cases of poisoning with

water. No atmospheric water collection system. Not functional sewage system and waste water is discharged freely in three directions around the village.

x) **Illegal logging situations** – There is no organized logging in the forest close to the village. All logging is illegal and is being done mostly by the people outside the village/non-villagers. There is limited number of local illegal loggers. However, most of the villagers are getting their wood for heating from illegal logging. Main purpose for illegal logging is commercial and is being done very frequently around the year from spring to fall at most. Main tree subjected to illegal logging is Oak. There is no estimation of wooden mass being illegally logged. Negative impacts of illegal logging are significant decrease of the forest territory, increase of erosion, loss of greenery. There are guards from PE Macedonian Forests, but not very frequent patrols. No organized actions for prevention of illegal logging are done by Ministry of Interior and PE Macedonian Forests.

xi) **Disaster record surrounding village** - The main natural hazards are weather related hazards (torrential flood, drought, hail, thunderstorm, earthquake, snowfalls). Area of their village is not directly exposed to wild fires. No major disastrous events happened. There were several cases of death of villagers from thunders. Five years ago there were major damages on the tobacco crops due to hail and storms. Even though the houses and buildings are illegal and without construction permit or built based on the urban plan, the villagers are considering some civil construction essentials in order to mitigate the risk (e.g. distance between houses, etc.). The vulnerable categories of villagers are more vulnerable to disasters, but the exposure depends on the location of the houses and the built environment. No one is responsible for disaster risk reduction in the village. In addition, there is no guidance on this provided neither by the Government nor the municipality. No one in the village, even in their rural community (Mesna zaednica) has delegated responsibility in DRR. In general there is absence of disaster risk reduction notion and its mainstreaming in everyday life. No assessments or emergency plans. Community level information on hazards is shared orally amongst the villagers or through mobile phones. In certain cases they are organizing village meetings (e.g. last year water shortage situation). In the elementary school building they have emergency plans. As villagers they don't know what to do and how to protect themselves in the event of disasters.

5.2 Household Level Survey (Use of Questionnaire)

The Household Level Survey was implemented through the use of the Questionnaire approved by the Project with structure and content elaborated in the methodological framework section of this report.

The time framework for the survey was originally 8 days after the village survey held on 18 June 2018 (19 – 26 June), but since there was high enthusiasm of the villagers to participate in survey, for interviews with respondents were done immediately after the village meeting. The breakdown of interviews on a daily basis is presented in the table below.

Household survey	18.06	19.06	20.06	21.06	22.06	23.06	24.06	25.06	26.06	Total
Number of respondents	4	4	4	6	8	8	8	4	4	50

Table 2 – Number of respondents to the Household Survey on a daily basis

The neighborhood distribution, gender and age of the respondents were diversified in order to encapsulate different dynamics in the local community. Breakdown of respondents based on the village neighborhood distribution is balanced in line with the requirements the upper parts of the

village closer to the project intervention site to be more representative than others and it is presented in the table below:

	Number of Households	Percentage
Upper part of the village	19	38%
Central part of the village	15	30%
Lower part of the village and entrance to the village	16	32%
Total:	50	100%

Table 3 – Number of respondents to the Household Survey on a daily basis

In general, the villagers were open-minded towards the survey and the consecutive projects plans and implementation of activities and in 99% of cases, respondents participated in the survey, whether only one approached villager refused to participate in the survey due to his personal reasons. Another fact is that they were answering all questions, even the “sensitive” ones (e.g. income/expenditures). This was thanks to the willingness for cooperation by the respondents, as well as support provided by the local stakeholders (e.g. municipality, regional office of CMC).

In the text below, findings and analysis as per individual question from the Questionnaire is presented and summarized, as per the three sections of the Questionnaire:

- Household related questions;
- Natural environment related questions, and
- Disaster related questions.

I. HOUSEHOLD LEVEL RELATED QUESTIONS

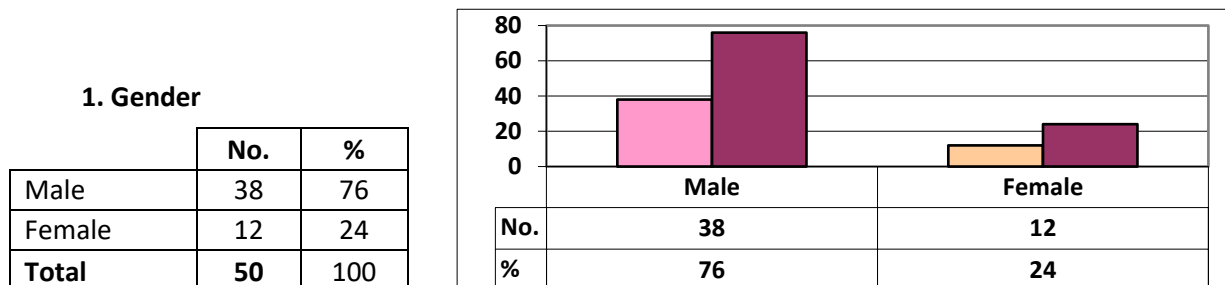


Chart 1: Analysis of the data according to the gender affiliation of the respondents

Question 1: Gender

Based on the available information on the population and cultural profiles and traditional characteristics of the local community in the Village of Kodzhalija, it was of highest importance to have an inclusive gender representation of the respondents in this survey. Therefore, from the very beginning of the organizational planning of the assignment, the Team has had a challenge how to ensure adequate participation of the women from the local community. This challenge had two dimensions, one connected with the language barrier and the second deriving from the cultural and traditional characteristics of local community. The former one is characterized with the level of knowledge of Macedonian language by the women in the village, since they are housewives in their traditional role to stay home and doing all the chores or to support the agricultural activities in the field. Based on this, in most of the cases they do not speak Macedonian language. The latter challenge derived from the cultural habits of the Village of Kodzhalija, where the local women are reserved in

establishing communication with external persons especially men. These challenges were overcome with support from the local beneficiaries. Accordingly, the Regional Office of CMC provided a female employee who knows Turkish language and provided support during the survey with translation of the interview to women respondents. As a result, Out of 50 households' respondents, 38 or 76% respondents were male and 12 or 24% were female.

Analysis of the processed data from the Question 1 on Gender is presented in the Chart 1: Analysis of the data according to the gender affiliation of the respondents. Out of 50 households' respondents, 38 or 76% respondents were male and 12 or 24% were female. This presents good gender balance of this survey with women voice and opinion on the Eco-DRR topics and aspects to be heard and included in the survey. Furthermore, during the survey, female respondents expressed awareness for the survey and the ongoing Eco-DRR project. They have shown solid knowledge of the thematic area that was covered by specific questions, as well as interest for improvement of the living conditions in their local community. Their contribution in the survey is very valuable insight into the community, because the women are most vulnerable to natural disasters. In addition, they possess knowledge and capacities that can be used for further strengthening of the community resilience.

2. What is your age group?

	No.	%
18 - 24	8	16
25 - 35	16	32
36 - 45	13	26
46 - 55	11	22
56 - 64	0	0
65 +	2	4
Total	50	100

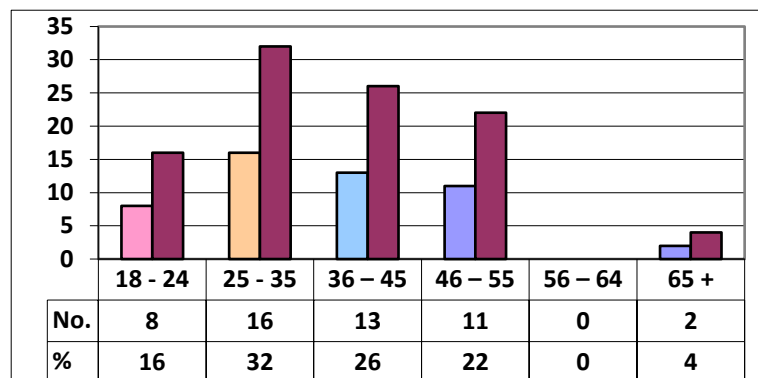


Chart 2: Analysis of data according to the age group of respondents

Question 2: What is your age group?

This question is in the group of households' related questions in the survey and aims to indicate the perception of the survey topic to the different age groups of the respondents, and accordingly the local community. The age structure of the selected category of citizens, in this case the Village of Kodzhaliya, refers to different level of consideration of the questions and topic from the Questionnaire and provision of multiperspective responses from their side. This different level of perception is additionally related to the education level, life and working experience, behavior and habits, level of awareness, and other elements that are characteristic for various age groups of population.

For the purposes of collecting data for the age group structure of the respondents, a six level categorization of the age groups was defined by the Team from 18 to 65 + years of age as presented in the table above. Detailed data on the age structure of the respondents is given in Chart 2: Analysis of data according to the age group of respondents. From collected and analyzed data can be seen the lowest participation is by the 65+ age group with only 2 respondents (4%), whether the biggest participation is by the age group 25 – 35 years with 16 respondents (32%). They are followed by 36 – 45 years of age group (13 informants or 26%) and 46 – 55 years of age group (11 informants or 22%). In addition, 8 respondents are young from 18 – 24 years of age (16%). As it can be seen most of the respondents are within the age group 25 – 35 years. This means that the younger part of the village population was interviewed and with this approach their general awareness on the importance of Eco-DRR is raised. Followed by implementation of full scale of local level activities in the following period,

they can become agents of change for resilience and sustainable development of the community. In addition, if we analyze age group of the female respondents, it can be found that most of the respondents are in the 36 - 45 years of age group with 6 informants (50% of total female respondents), followed equally by 18 – 24 and 25 – 35 years of age groups with 3 informants or 25% each. These insights can additionally improve the gender mainstreaming in the community, not only in environment and disaster aspects, but also in whole socio-economic aspects.

Furthermore, general finding is that the 80% of the survey respondents are between 25 and 55 years of age. If we correlate this age group with the work capability, full economic activity, experience and other similar indicators, we can expect qualitative fulfillment of the objectives of this survey, especially ones that are related to the economic and social aspects of the target community.

3. What is your ethnic affiliation?

	No.	%
Macedonians	0	0
Albanians	0	0
Turks	50	100
Bosniaks	0	0
Roma	0	0
Other	0	0
Total	50	100

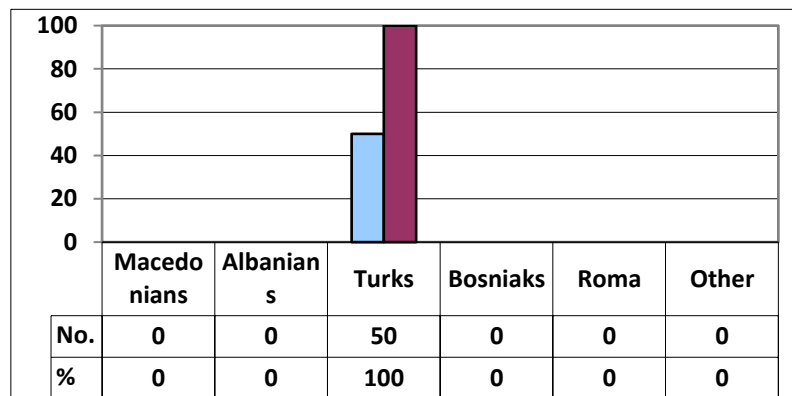


Chart 3: Analysis of data according to the ethnic affiliation of the respondent

Question 3: What is your ethnic affiliation?

Even before the survey has started, once the village profile data was reviewed, it was clear that the ethnic affiliation of the population in the Village of Kodzhalija is monolith and that the local population has Turkish ethnic affiliation. However, for the purposes of official confirmation one of the questions in the Questionnaire referred to it and the collected and analyzed data is presented in Chart 3: Analysis of data according to the ethnic affiliation of the respondent. Findings confirmed the reviewed profile data and out of 50 respondents, 50 have or 100% declared that have Turkish ethnic affiliation.

4. What is your religious background?

	No.	%
Orthodox	0	0
Muslim	50	100
Catholic	0	0
Other	0	0
Total	50	100

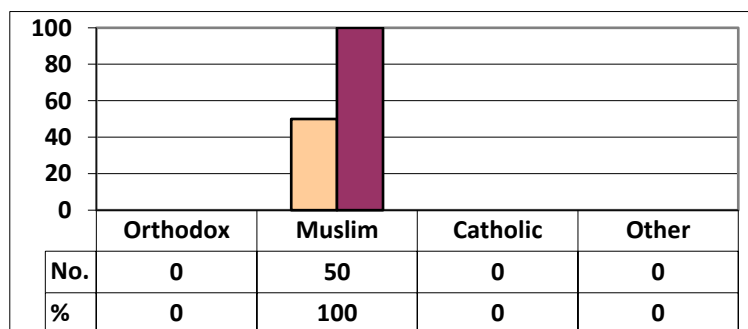


Chart 4: Analysis of data according to the religious background of the respondent

Question 4: What is your religious background?

Situation was similar regarding this question like in the previous one. Namely, the ethnic affiliation is closely related to the religious background and knowing that the local community is

consisted of Yuruks (Turkish sub-ethnic group that came from Anatolia, region of Konya during the XIV and XV centuries), it was expected the respondents to be with Muslim religious background. However, for the purposes of official confirmation one of the questions in the Questionnaire referred to it and the collected and analyzed data is presented in Chart 4: Analysis of data according to the religious background of the respondent. Findings confirmed the presumption and out of 50 households' respondents, 50 or 100% were with Muslim religious background.

5. What is the level of your education?

	No.	%
Elementary	7	14
Secondary	5	10
University and higher	6	12
Other	32	64
Total	50	100

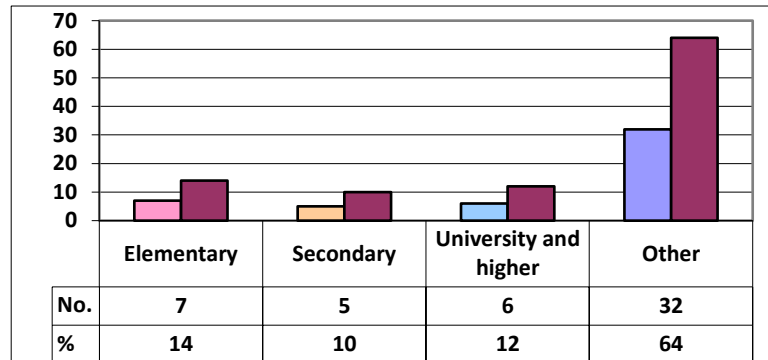


Chart 5: Analysis of data according to the level of education of the respondent

Question 5: What is the level of your education?

Main objective of this question is to collect essential data on the education background of the respondents, as an element that has a strong impact on the establishing of relations and connections from cultural and social aspects at the local community level. Moreover, the education level is in direct correlation with the understanding of basics of the Eco-DRR concept and general objectives and intentions of the Project for building capacities for mainstreaming of Eco based solutions in disaster risk reduction. The evidence for this should be from the survey itself and the provided answers by the respondents, where the level of education refers to the level of knowledge.

Consequently the data analysis relating to this question is presented in Chart 5: Analysis of data according to the level of education of the respondent. Based on the received responses it can be concluded that only 6 or 12% of the respondents have university or higher level of education, whether 5 informants or 10% are with secondary education. Elementary education has been passed by 7 respondents (14%). However, analysis of this question is bringing on the surface additional characteristic of the education situation in the village. Namely, highest numbers of respondents (32 or 64%) were evidenced in the "other" category, since they declared that have completed only fourth grade of the elementary school. The actual elementary education in the country has 9 grades, while the previous elementary education system had 8 grades. Now it is mandatory to complete secondary education, whether in the past it was mandatory to pass the elementary education. So, we can conclude that the respondents in most of the cases have not finalized elementary education and have so called "half-elementary education". This situation is same with the female respondents, where only 2 have secondary and high education, whether the other 10 are with only fourth grade of elementary education completed. Most probably the same situation can be projected to other villagers.

This condition can be related to the culture of the so called "closed community" that is typical for Yuruks and for this community. Access to education in their village is another layer of limited completion of education, since the only school in the community is from 1st to 5th grade (1st to 4th in the past) and predominantly the villagers were studying only there. Another restrictive element is from the cultural and traditional aspects, where the female children are not being sent to continue their education outside the territory of their local community, even in the closest municipal elementary and high schools in Radovich.

6. What is your employment status?

	No.	%
Employed	15	30
Unemployed	24	48
Student	0	0
Retired	1	2
No answer	10	20
Total	50	100

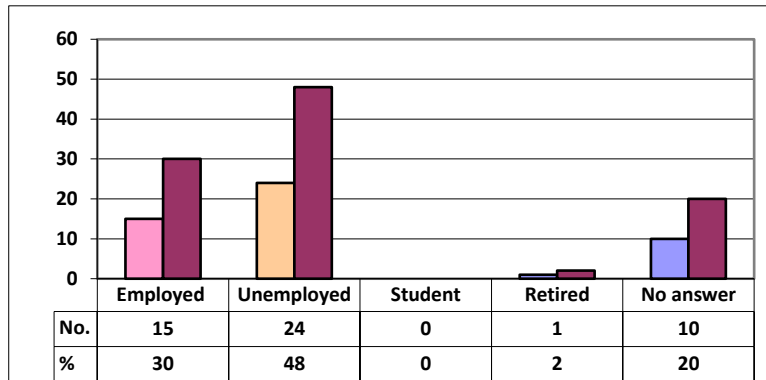


Chart 6: Analysis of data according to the employment status of the respondent

Question 6: What is your employment status?

This question regarding the employment status of the respondents is especially important for preliminary understanding of the economic situation in the local community. Therefore, in the Questionnaire there are few questions related to it, out of which one is for determination of the employment status of the respondents. Data analysis of it is presented in the Chart 6: Analysis of data according to the employment status of the respondent.

Out of 50 respondents, only 15 or 30% have declared that have continuous employment status, whether 24 or 48% are unemployed and 1 respondent or 2% is retired. No one from the respondents was student, and if we correlate this with the previous question on the level of education, it can be concluded that the overall education level in the Village of Kodzhalija is very low.

However, it is important to emphasize that even though the option “No answer” was not included in this question in the Questionnaire, the Team decided to include it in the data analysis since 1/5 of the respondents (10 informants or 20%) have not provided answers during the interviews. The reason for not providing an answer to this question can be related to the fact that part of the respondents were reserved to the usage of its data (e.g. possibility of tax calculation, additional taxes or losing of certain social services), despite the fact that the team members have clearly stated the objectives of the survey and data handling procedures.

6a. If you are employed, state your sector of employment.

	No.	%
Public sector	5	26
Private sector	6	32
Farmer (agriculture)	6	32
Animal husbandry	2	11
Self-employed (e.g. artisan)	0	0
Other	0	0
Total	19	100

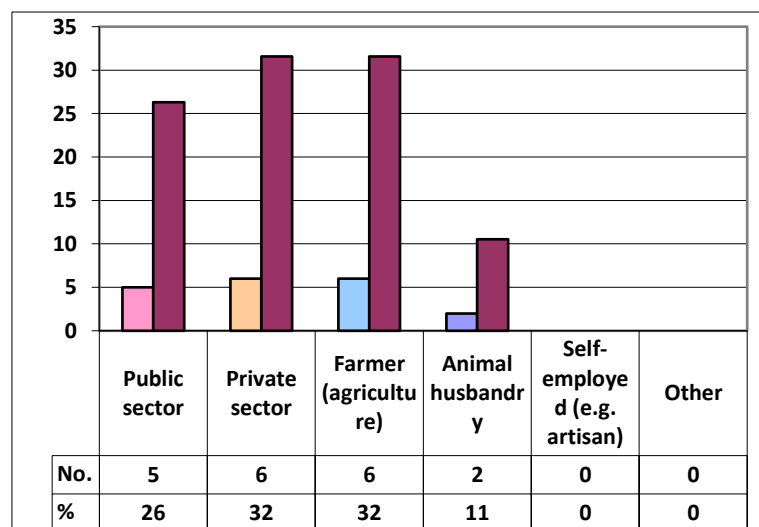


Chart 6a: Analysis of data according to the sector of employment of the respondent

Question 6a: If you are employed, state your sector of employment

The Questionnaire for the Field Survey aimed at better understanding of the economic situation of the respondents and therefore the additional question (6a - If you are employed, state your sector of employment) was formulate for understanding the main sectors of employment of informants. Aim of this question was to clarify the sector of employment and the sources of the household income if the respondent would have answered that is employed in the question no.6.

In total 19 persons answered this question which is more than the replies to employment in question no.6. This situation confirms the reservation of the respondents toward the public declaration of their employment status. Nevertheless, out of 19 responses, 5 respondents or 26% are employed in the public sector, 6 or 32% are employed in the private sector, 6 persons or 32% have declared themselves as registered farmers and 2 people (11%) are employed in the animal husbandry industry. In addition, with the field survey it was not requested to collect data on the specific areas of public or private sector employment of the respondents. Another characteristic is the small number of registered farmers even though the agriculture – tobacco is the main source of income for the community. As discussed during the village meeting and with the villagers, in most of the cases one of the members of the households is registered as a farmer for the purposes of getting the subsidies from the government and in some of the cases, they are women.

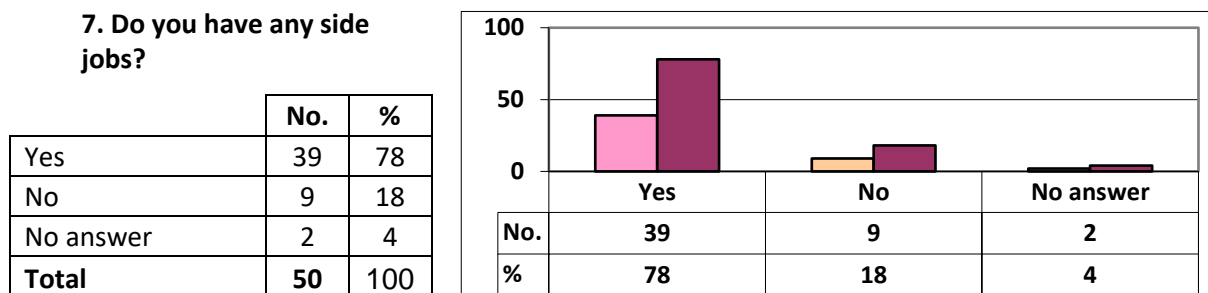


Chart 7: Analysis of data according to side jobs of the respondent

Question 7: Do you have any side jobs?

It is general consideration that many families from the agricultural productive areas (e.g. Southeast planning region) are involved in agricultural activities as side jobs in order to support their living existence with secondary income. Based on this, as well as previous experience with other related field surveys, the question on existence of the side jobs of the household was included in the Questionnaire. Results from answers of the respondents and its analysis are presented in Chart 7: Analysis of data according to side jobs of the respondent. Out of 50 households' respondents, 39 or 78% replied that they have side jobs, 9 or 18% replied that they don't have side jobs and 2 respondents or 4% have not provided any answer.

In addition, respondents provided comments on the type of the side jobs based on which it can be seen that primary side jobs are agriculture and animal husbandry. Main agricultural side job is tobacco crop production. This insight is confirmed with previously available information that during the last couple of years, local communities in region of Radovich are engaged in tobacco crop production due to the high prices per kilogram of tobacco, as well as due to the high subsidies that are paid by the government. In addition, if we consider the fact that in the micro region of the Village of Kodzhalija there is not enough agricultural land for tobacco crop production and the increased interest for starting or expanding the tobacco crop production, there are more than enough indications that the business is expanding to forest land and the land owned by the state. So, one of the reasons for deforestation is increasing the land for tobacco crop production.

8. Type of household

	No	%
Family household	50	100
Non-family household	0	0
Total	50	100

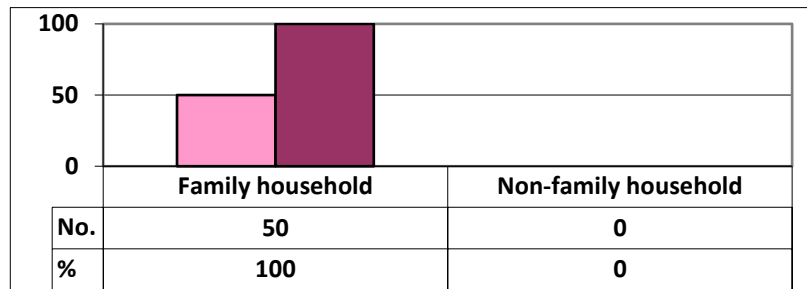


Chart 8: Analysis of data according to type of household of respondent

Question 8: Type of household

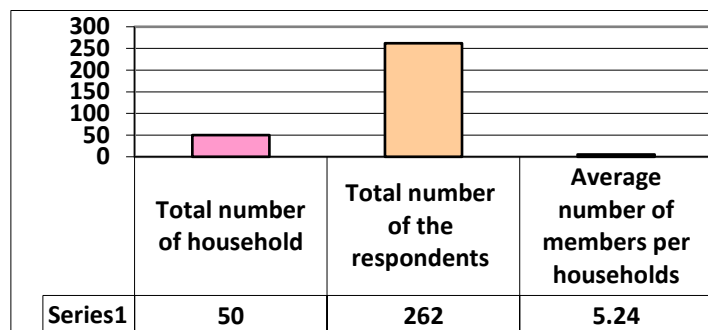
Question 9: Number of household members

Questions 8 and 9 were analyzed in their compliance since they referred to the type of the households and number of households members. Analysis of Question 8 on the type of the households is presented in Chart 8: Analysis of data according to type of household of respondent. All 50 households or 100% of household respondents declared that live in family households. As per the Guide, the *family households* consist of two or more individuals who are related by birth, marriage, or adoption, although they also may include other unrelated people.

In addition for getting data on the average structure of households in the Village of Kodzhalija, a question on the number of household members was stipulated. Accordingly, after its analysis, it can be concluded that in total 262 villagers were part of the respondents 50 households and the average number of members per households is 5.24, as presented in the graph below.

9. Number of household members

Total number of household	50
Total number of the respondents	262
Average number of members per households	5,24



Most of the respondents live in households with 5 members (parents and three children). This data can be correlated with the information from the Village Survey that due to the government subsidies for the third child, many families in the village decided to increase their families with third child. The household with the smallest number of members is with 2 members, where there are 2 respondents' families with 9 members.

10. What is your household main income source?

	No.	%
Employment	5	10
Regular monthly income (e.g. monthly salary, pensions, social)	5	10
Agriculture	37	74
Animal husbandry	1	2
Business	0	0
Artisan	0	0
Other	2	4
Total	50	100

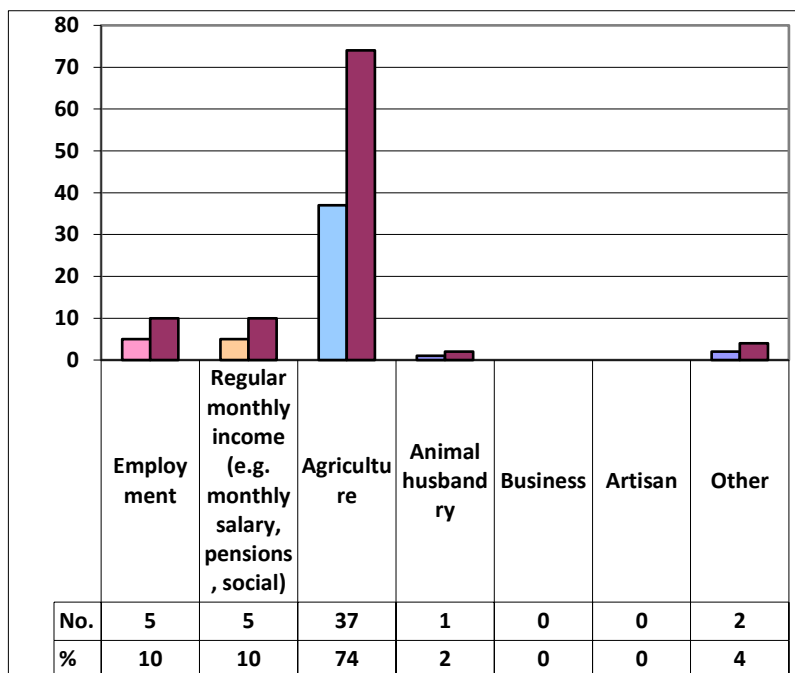


Chart 10: Analysis of data according to household main income source

Question 10: What is your household main income source?

In order to get to more detailed data on the economic conditions of the households, questions on the households incomes and expenditures were stipulated in the Questionnaire. In Chart 10: Analysis of data according to household main data source analysis of the question on main income source is presented. Accordingly, 10 respondents or 20% of participating households in the survey have the employment or regular monthly income (e.g. monthly salary, pensions, social benefits, etc.) as main source of income. Only one household or 2% has the animal husbandry as the source of income, whether the biggest number of households has the agriculture as main income source – 37 respondents or 74%.

Following the structure of the Questionnaire and the economic profile of the village, it is necessary to correlate this question’s answers with the respective answers from the question no. 7 (Do you have any side jobs?). Accordingly, it can be concluded that the main income source for the households in the community are not the employment or the regular monthly remuneration, but side jobs/side activities that are primarily agricultural with tobacco crop production.

11. Total Annual Household Income

	No.	%
Up to 144,000 Mkd	6	12
144,001 to 216,000 Mkd	9	18
216,001 to 288,000 Mkd	20	40
288,001 to 360,000 Mkd	2	4
360,001 to 432,000 Mkd	2	4
432,001 to 504,000 Mkd	7	14
504,001 to 576,000 Mkd	0	0
More than 576,001 Mkd	4	8
Total	50	100

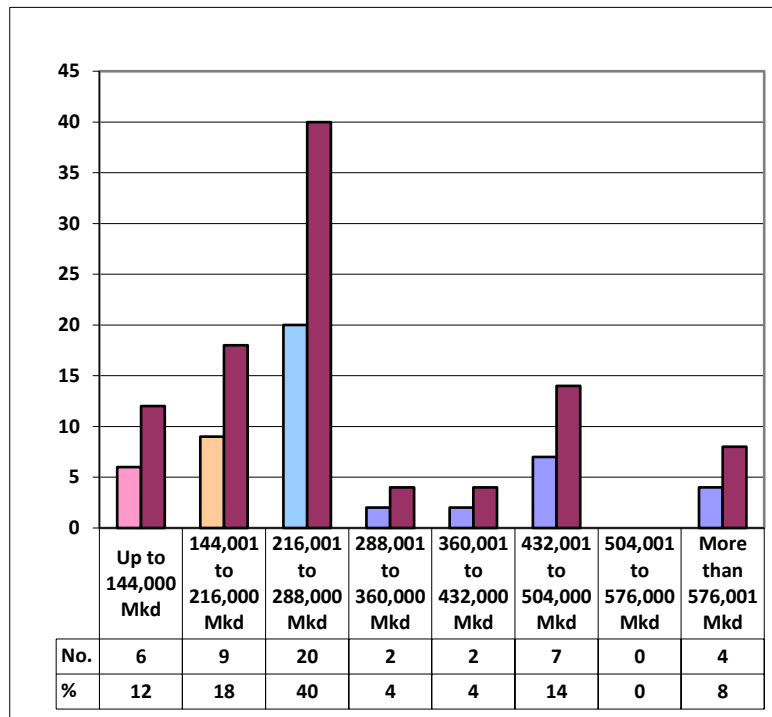


Chart 11: Analysis of data according to Total Annual Household Income

Question 11: Total Annual Household Income:

For the determination of the general understanding of the economic condition in the village, it was necessary to formulate a question on the total annual income of the households. This insight can give additional understanding on the vulnerability to disasters of households as well as the overall resilience of the community. Categorization of the annual household income was done based on the average monthly net wage for April 2018 as calculated by the State Statistical Office for the amount of 23,942 Macedonian Denars.⁶ Accordingly, the annual average projection was made in the span of 6 to 24 monthly salaries – 144,000 to more than 576,001 Macedonian Denars.

Results from the data analysis of this question are presented in the Chart 11: Analysis of data according to total annual household income. It is obvious that the most of the respondents' households, 35 or 70% have annual income in the range between 144,000 and 288,000 Macedonian Denars (between 6 and 12 average monthly salaries). In this group most represented (20 or 40%) are households with annual income between 216,001 and 288,000 Macedonian Denars. 22% of the households (11) have higher incomes (288,000 to 504,000 Macedonian Denars) and only 4 respondents' households (8%) have an annual income higher than 576,000 Macedonian Denars or 24 average monthly salaries.

If we correlate this question to previous questions on the economic condition in the village, the agriculture/tobacco crop production is probably the main contributor to the annual income to an average household in the Village of Kodzhalija. Furthermore, several of the responding households live in the condition of poverty since their annual income is below the 2013 threshold for poverty (147,578 Macedonian Denars per annum).⁷ These insights again support the understanding on the level of increased vulnerability of households to risk and hazards, as well as weak resilience of the community. In that sense, economic situation/factor is one aspect of the disaster vulnerability of the population. Accordingly, the understanding is that the individuals or the communities would not be

⁶ http://www.stat.gov.mk/KlucniIndikator_i_en.aspx

⁷ <https://tinyurl.com/ybfosulz>

more resilient if they have poor economic situation. It is defined also by IFRC: <http://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/what-is-vulnerability/>

12. Total Annual Household Expenditures

	No.	%
Up to 144,000 Mkd	5	10
144,001 to 216,000 Mkd	14	28
216,001 to 288,000 Mkd	19	38
288,001 to 360,000 Mkd	2	4
360,001 to 432,000 Mkd	1	2
432,001 to 504,000 Mkd	5	10
504,001 to 576,000 Mkd	0	0
More than 576,001 Mkd	4	8
Total	50	100

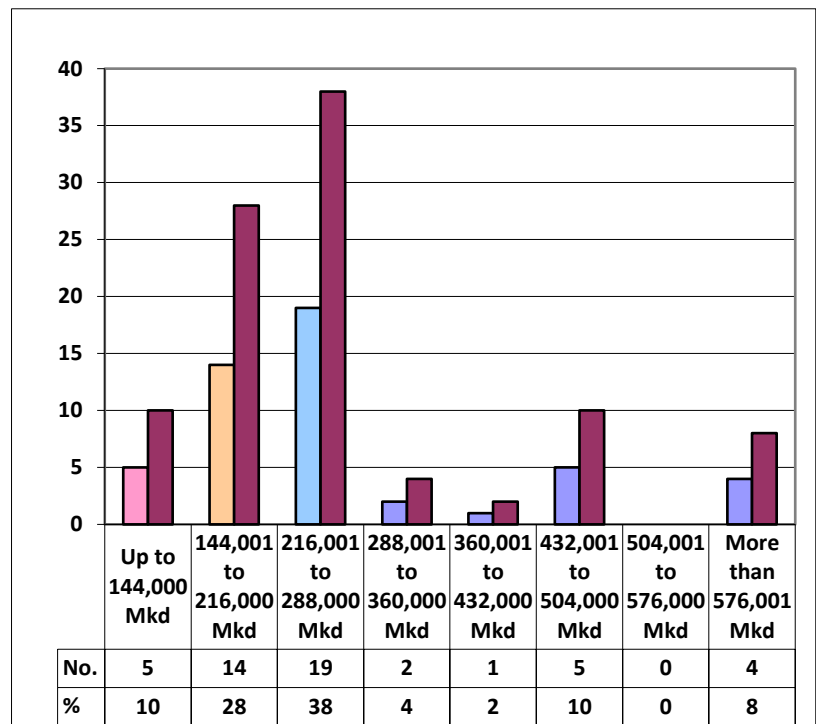


Chart 12: Analysis of data according to Total Annual Household Expenditures

Question 12: Total Annual Household Expenditures

Alongside the question on the total annual household income was the question on the total annual household expenditures, as an output of the household income. Main purpose of this question was to understand the economic power of an average household in the village, presenting the relation between the income and the expenditures, as well as the existence or not of generation of financial sources. Results are presented above in the Chart 12: Analysis of data according to Total Annual Household Expenditures.

Out of 50 households, 33 or 66% of respondents have the annual expenditures in the range from 144,000 to 288,000 Macedonian Denars or between 6 and 12 average monthly salaries. This result shows more than half of the population is below average economic power of the households where all needs and expenditures of the households on a monthly level in the amount between 12,000 and 24,000 Macedonian Denars. In addition, this information indicates that high percentages of the households need to implement additional working activities for supporting their economic existence and increasing their economic power. Also, it indicates the possibility of irregular response to their needs, for example supply of woods for heating of their houses through illegal channels and logging, based on the fact that the prices of woods are high and it is significant pressure to a family budget. In that sense it can be correlated with the question 17a on the supply of woods for heating in which the answers are that in most of the cases they are supplying the woods “on their own” which indicates illegal logging.

Total annual expenditures in the range between 432,001 and 594,000 Macedonian Denars, or between 18 and 21 annual monthly salary have been answered by only 5 households or 10% of the

respondents. Only 4 households or 8% have annual expenditures of more than 576,001 Macedonian Denars (more than 24 average monthly salaries). As a final conclusion on the analysis of this question, it can be understood that most of the households (76%) are dimensioning their total annual expenditures in the amount that is lower than the annual average in the Republic of Macedonia. In general, analysis on this question confirms that the households in this community have simple economic reproduction; the amount earned is used equally for spending with very low percentage of generating of funds.

13. Types of Total Household Expenditures

	No.	%
Consumption	50	28
Utilities	50	28
Education	19	11
Medical	33	19
Supporting activities	24	13
Others	2	1
Total	178	100

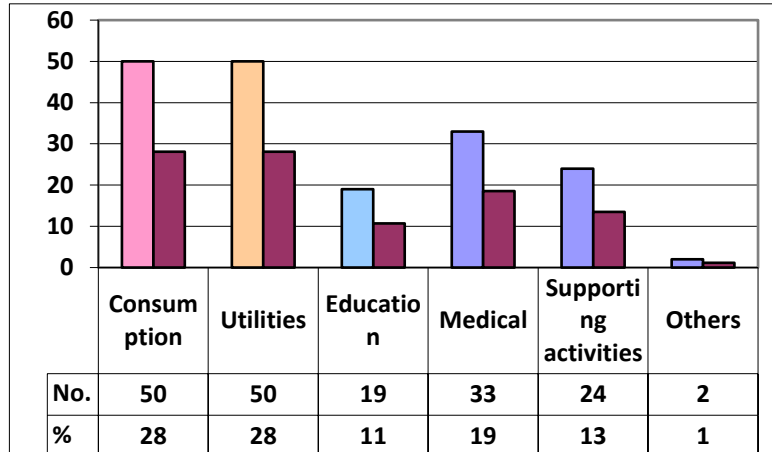


Chart 13: Analysis of data according to the Types of Total Household Expenditures

Question 13: Types of Total Household Expenditures

This question is in relation with the economic condition area in the village, especially connected with the household expenditures. It presents relevant indicators on the nature of the basic households' expenditures and the analysis is given in Chart 13. The Guide defined the basic terms of these expenses: *consumption* includes all types of expenses for the necessary needs of the household (e.g. food), *utilities* refer to all communal infrastructure and connectivity payments (e.g. water, wastewater, electric power, phone, internet, etc.), *supporting activities* includes transportation and similar (e.g. essential maintenance of the household), whether *others* refer to all not specified expenditures.

Out of 50 respondent households, 28% of their annual income is spent for covering the expenses for consumption and utilities, 19% for covering the health expenditures for their family members, 14% for supporting activities and others, while only 11% are paying the education expenses for their families' members. The last data refers to following: low level of education of respondents that was presented in the analysis of question 5, as well as low economic power of the families and their inability to allocate bigger funds for education that can be gained after 5th grade of elementary school, only outside their village, in the City of Radovish and beyond. Furthermore, this situation was mentioned by the villagers during the field survey. As a general conclusion, the type of expenditures in the community refers to simple covering of existential expenditures without many opportunities for household development or investment.

14. Women’s roles in the household (multiple choice)

	No.	%
Household activities (e.g. house chores, cooking, etc.)	50	40
Agriculture	47	38
Animal husbandry	5	4
Repairs and services in the household	0	0
Working and contributing to household income	23	18
Total	125	100

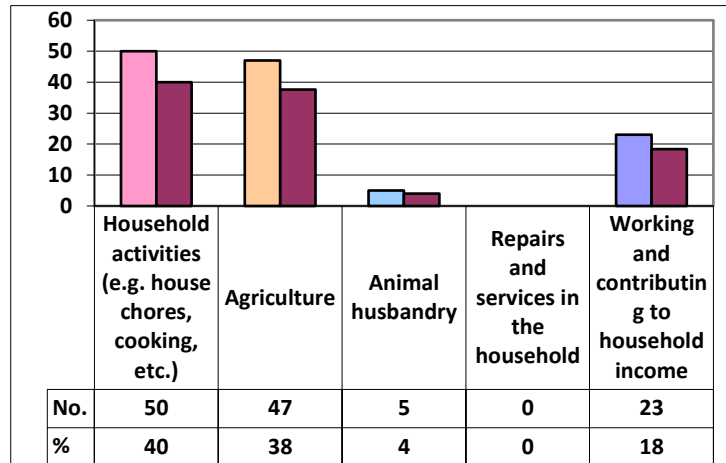


Chart 14: Analysis of data according to the Women’s roles in the household

Question 14: Women’s roles in the household (multiple choices)

This question is the last in the Section I of the Questionnaire – Household related questions and represents a modality for collection and analysis on information on the women’s roles in the household in that specific community. Women’s’ role in the household refers to understanding of the respondents for their predominant roles. This is additionally important because the community is very traditional and specific, inhabited by Yuruks, very conservative where the roles of women are defined by the tradition. Women are responsible for the household, doing all the chores, working in the agriculture alongside the men, with limited access to education, very rarely leaving the community. Somehow these traditional roles are given to the girls from their early childhood.

Analyzed data in the Chart 14 confirms these realities. 40% of the activities are dedicated to basic household activities, 38% are for supporting the household agriculture practices, 4% are involved in animal husbandry and 23 respondents or 18% are considering the fact that the women are contributing to the household income. Consequently, women have central roles in the households’ and supporting the tobacco crop production activities as it could have been seen during the field survey by the Team. Having in mind the traditional roles and insights form the data analysis of this question, it is necessary to implement customized approach in Eco-DRR on the local community level by strengthening the public awareness for women’s role and considering current different roles by gender.

II. NATURAL ENVIRONMENT RELATED QUESTIONS

15. Is there any forest/wooded land within the village area or in close proximity to the village?

	No.	%
Yes	31	62
No	11	22
Partial	8	16
Total	50	100

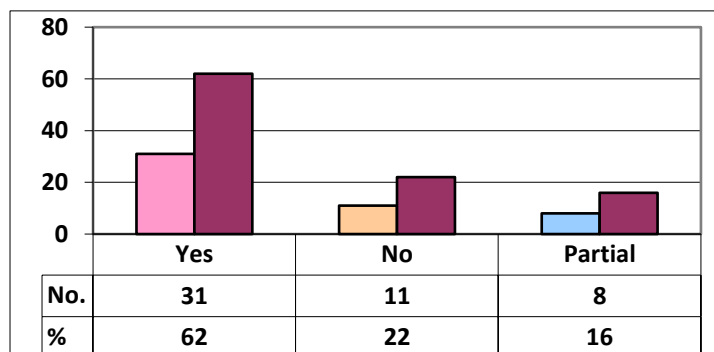


Chart 15: Analysis of data according to the amount of forest/wooded land within the village area or in close proximity to the village

Question 15: Is there any forest/wooded land within the village area or in close proximity to the village?

This is the first question in the second section of the Questionnaire that is consisted of questions regarding the natural environment in the village, as well as understanding and local community's perception on the natural environment issues including forest management. This section has 9 questions that are related both to the natural environment and to the disruptions to it and aims to collection of data and information for improvement of the eco-systems functions.

The first question is related to the knowledge of the respondents on existence of forest or wooded land in the village area or close. Analysis of respondents' information is presented in Chart 15. Out of 50 respondents, 31 or 62% replied that there is a forest or forest land in the village area. Contrary to this, 11 respondents or 22% replied that there is no forest in the area and 8 respondents or 16% replied that there is partial forest or forested area.

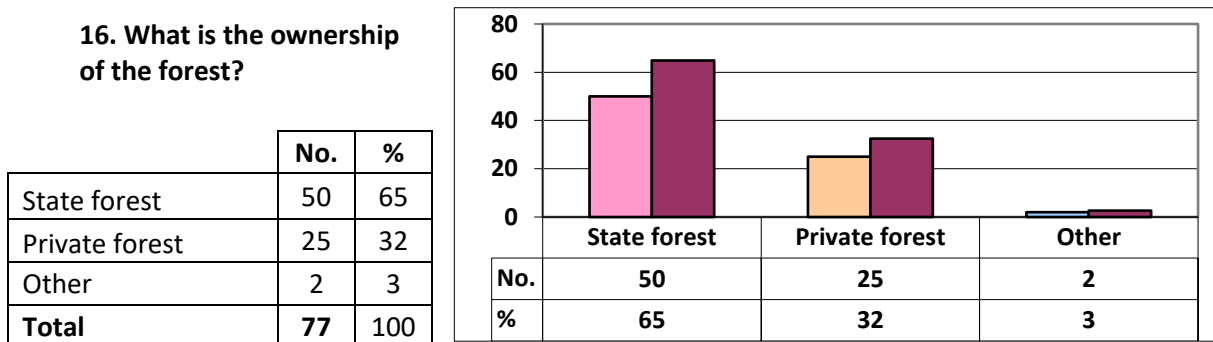


Chart 16: Analysis of data according to the ownership of the forest within the village area or in close proximity to the village

Question 16: What is the ownership of the forest?

Objective of this question was to present the respondents understanding on the ownership of the forest in the village area. Analysis from Chart 16 presents that according to respondents views, 65% replied that the forest is owned by the state, 32% replied that there is a privately owned forest and 3% that the forest is owned by different entity. In addition, some of the respondents insisted on checking both the state owned and privately owned forests boxes thinking that it is the best answer since it is acknowledging existence of two type of forests, whether the others thought that it is necessary to mention the approximate division between state and private forest (70% - 30%). This was also mentioned during the village meeting. However, if we consider the official data from the regional branch of PE Macedonian Forests, situation is different. Namely, there are 126.8 ha under forest (state owned), 99.7 ha of forest land (clear land) and 8.5 ha privately owned forest. So, the ration between the state owned and privately owned forest is significantly different: 96% - 4%.

17. Forest and wood as a resource is used for following purposes:

	No.	%
Agriculture	32	28
Animal husbandry	20	18
Civil construction activities	12	11
Heating, (if heating go to 17a & 17b)	50	44
Other	0	0
Total	114	100

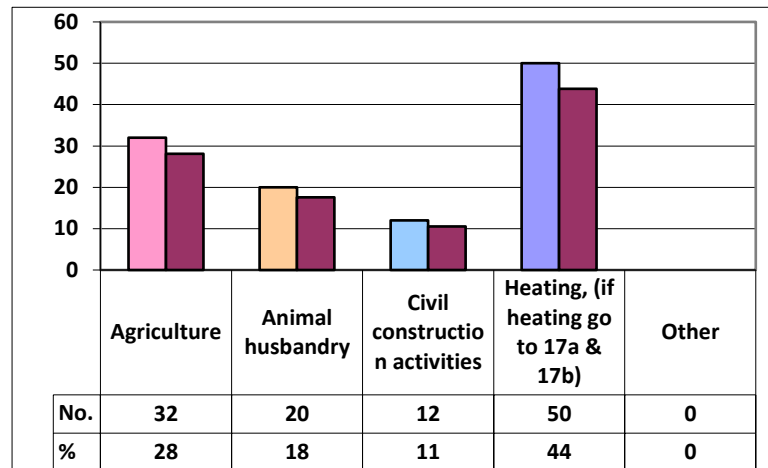


Chart 17: Analysis of data according to Forest and wood as a resource used for different purposes

Question 17: Forest and wood as a resource is used for following purposes

As per the available information from the relevant institutions that are part of the Eco-DRR project implementation, forest and wood are main resources that are frequently utilized by the population from the Village of Kodzhalija. Accordingly, it was needed through this survey to understand the main purposes of using forest and wood and therefore the question 17 was formulate to gather the respondents perceptions. Analyses in the relevant chart disclose that 32 respondents or 28% replied that they are using the forest and wood as resources for agriculture (for tobacco crop production, e.g. for agricultural fields, fences, for drying out tobacco leaves etc.). Additional 20 respondents or 18% replied that they are using them for animal husbandry, whether 11% of responses refer to using them as construction material. However, in the context of this survey, as well as the overall objective of the Eco-DRR Project, it is necessary to emphasize that most of the respondents replied that they are using forest and wood for heating (50 answers or 44%). This reply is in direct correlation with the forest and forested areas in the village area, their condition, as well as illegal logging and deforestation. Also, since all 50 respondents replied that they are using them for heating.

In order to further analyze this phenomenon, two more questions are related to this one: 17a and 17b for getting more detailed information on the source of provision of wood for heating and the average annual quantity of wood for heating per household.

17a. If you are using woods for heating, from where you are getting your woods?

	No.	%
PEMF Forests warehouses	4	8
Private companies	5	10
On your own	41	82
Other	0	0
Total	50	100

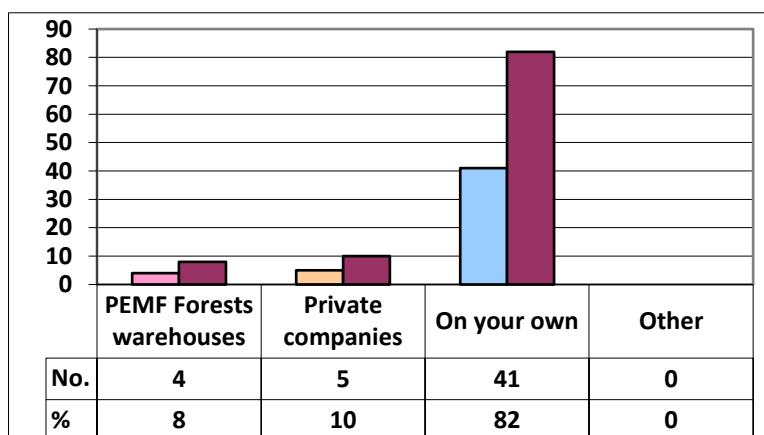


Chart 17a: Analysis of data

Question 17a: If you are using woods for heating, from where you are getting your woods?

This question is aimed to provide precise information on the sources for wood for heating for the local community. Accordingly, as per the analysis presented in Chart 17a, high 82% of respondents or 41 households are obtaining the wood for heating on their own, where only 18% or 9 families are buying the woods from PMEF forests warehouses or from licensed private companies. This analysis refers to the possibility of high level of illegal logging of the forests in the village areas, either state or privately owned. This possibility is further projected on mid-term and long-term basis expecting the illegal logging not only to continue, but also to scale up, considering, economical condition of the households, lack of any strategical or development planning for alternative sources for heating of houses, etc. Also, this question is correlated with the forest management plan data, meaning that the average growth of wood in the three sections of the forest close to Kodzhalija is 80m³ per 1 ha per year as presented in the table from the Forest Management Unit “Radovish – Oraovica River”, page 19. With this intensity of illegal logging and utilization of wood for heating, in very near future, these forest lands will be devastated.

17b. If you are using woods for heating, what amount of woods you are using on an annual basis:

	No.	%
to 3m ³	1	2
4 to 6m ³	2	4
7 to 9m ³	7	14
10 to 12m ³	20	40
More than 12m ³	20	40
Total	50	100

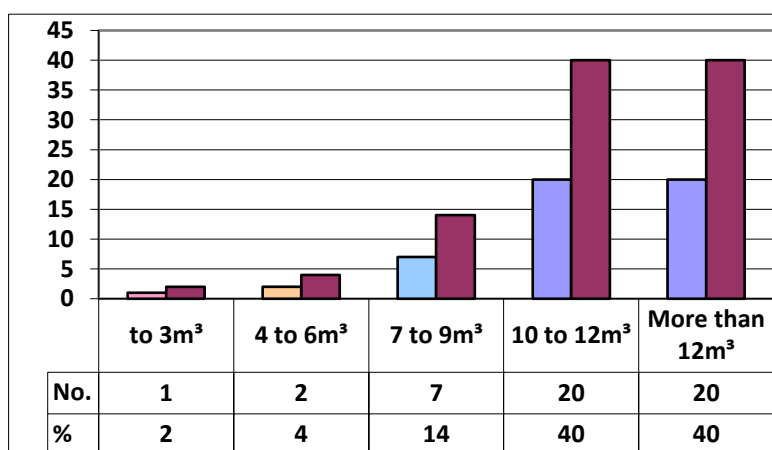


Chart 17b: Analysis of data according to what amount of woods you are using on an annual basis

Question 17b: If you are using woods for heating, what amount of woods you are using on an annual basis?

This question is connected with the previous two and aims to provide input data on the annual quantity of wood for heating purposes of the respondents from the average household in the village. Chart 17b presents the analyzed responses that high 80% of the respondents’ households in the village are using 10 or more m³ annually for heating purposes. If we correlate this with the previous question on how the wood for heating is obtained, it can be seen that the illegal logging is a serious risk for the forest and forested areas in the village area of Kodzhalija. This is also being reported in the data from the PEF, where all three forest sections in the village area are reported to be under illegal logging activities. In addition, since the main objective of the Project is to mainstreaming the Ecosystem based solutions through sustainable management with forests and utilizing their protective functions, these data and analysis have to be taken into consideration. In order to mitigate the risk of illegal logging it is recommended the Project to use its authority and the good cooperation with Macedonian partners to introduce innovative approach in communication with the local community, to include components for raising the general public awareness, change in behaviors and traditions of illegal logging of the local community, as well as inclusion and motivation of the community through implementation of the local level activities of the Project in the area.

18. What kind of trees are most usable for your households?

	No.	%
Oak	50	60
Beech	17	20
Acacia	0	0
Coniferous trees	0	0
Fruit growing trees	7	8
Other	10	12
Total	84	100

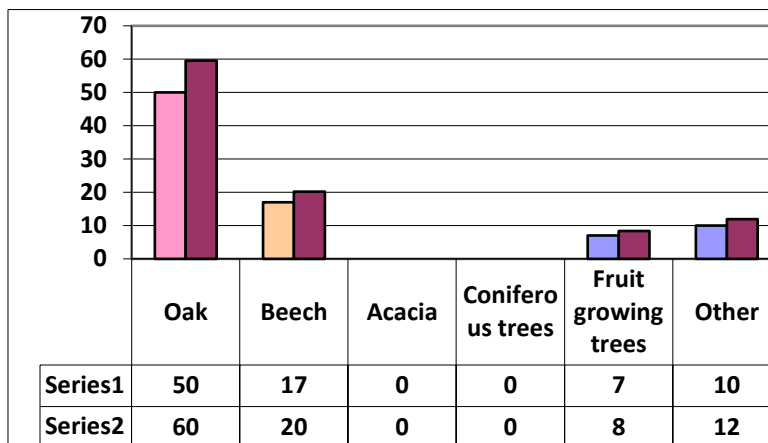


Chart 18: Analysis of data according to what kind of trees are most usable for your households?

Question 18: What kinds of trees are most usable for your households?

Taking into consideration the available information regarding the processes for intensive illegal logging activities and decrease of the forest fund in the Village of Kodzhalija, as well as the objectives of the Project aimed at increasing the forest areas with forestations, the Questionnaire includes a set of related questions. The chart 18 presents that for the most of the respondents (60%) most usable tree is oak, while only 20% declared the beech as a most usable tree. Another 8% selected the fruit growing trees and 12% have chosen the “other trees” option. If we correlate this analysis with question 17 and the purposes of use of the wood, we can understand the high level of respondents’ replies to choose the oak and beech, since they are the most favorable woods for heating purposes, construction material and find their use in agriculture and animal husbandry. Furthermore, this was mentioned by the villagers during the meeting and discussions, as well as it is visible in the village. Analyzing the additional comments provided by the respondents on the selection of other types of trees, many of them indicate the usefulness of the Hornbeam, but also are referring to some fruits – walnut or plum.

19. Should be the forest land in your village and surrounding area increased?

	No.	%
Yes	43	86
No	5	10
I don’t have opinion	2	4
Total	50	100

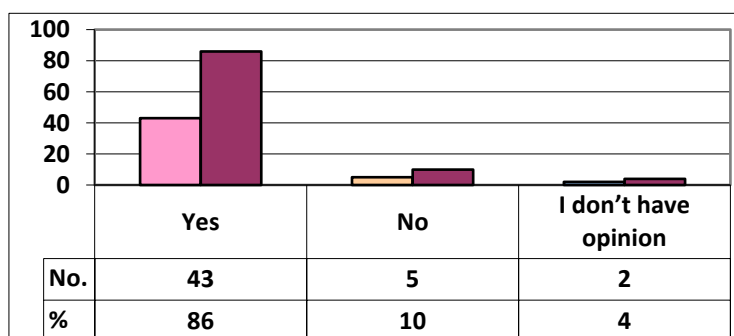


Chart 19: Analysis of data

Question 19: Should be the forest land in your village and surrounding area increased?

The question 19 refers to existence of the forest land in their village area. Analysis from Chart 19 presents that high number of respondents – 43 or 86% are considering that the forest area surrounding their village is needed to be increased, while only 10% replied negatively and only 2 respondents do not have any opinion regarding this issue. This distribution of respondents’ perception is completely in line with the main objectives of the Project and planned activities in the village area of Kodzhalija, since activities for forestation are being planned to be implemented contributing to significantly increasing the forest land around the village.

19a. If Yes, then with what kind of trees should be forested:

	No.	%
Oak	32	24
Beech	19	14
Acacia	30	23
Coniferous trees	25	19
Fruit growing trees	17	13
Other	10	8
Total	133	100

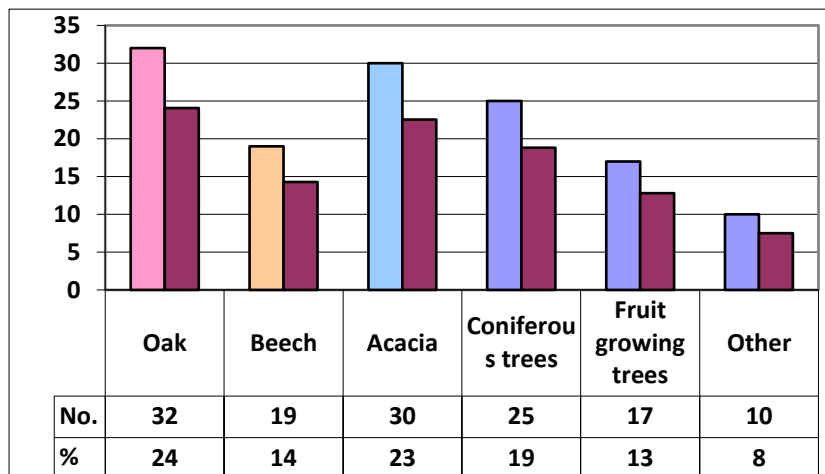


Chart 19a: Analysis of data

Question 19a: If yes, then with what kind of trees should be forested?

This question was optional, for the respondents that replied that the forest area around the village should be increased. They were invited to provide their opinion of what kind of trees should be forested, in order to give an insight of the Project in planning of the forestation activities. As per the analysis in Chart 19a it can be seen that 35% of the respondents have chosen the oak and beech, 17% selected the coniferous trees, 12% opted for fruits growing trees and 23% asked for inclusion of Acacia. This is contradictory with the responses to the question 18, where no respondent has selected the Acacia as a useful tree. For other types of trees, 15% of respondents opted hornbeam, walnut, pines, and ashes.

20. What kind of benefit you are expecting from the increased forest land? (multiple choice)

	No.	%
Wooden mass	33	21
Environmental benefits (e.g. decreased air pollution, etc.)	41	26
Protective function against natural hazards (e.g. erosion, torrential flooding, landslides, etc.)	40	26
Fruits	18	12
Flower nectar for honey bees	23	15
Other	0	0
Total	155	100

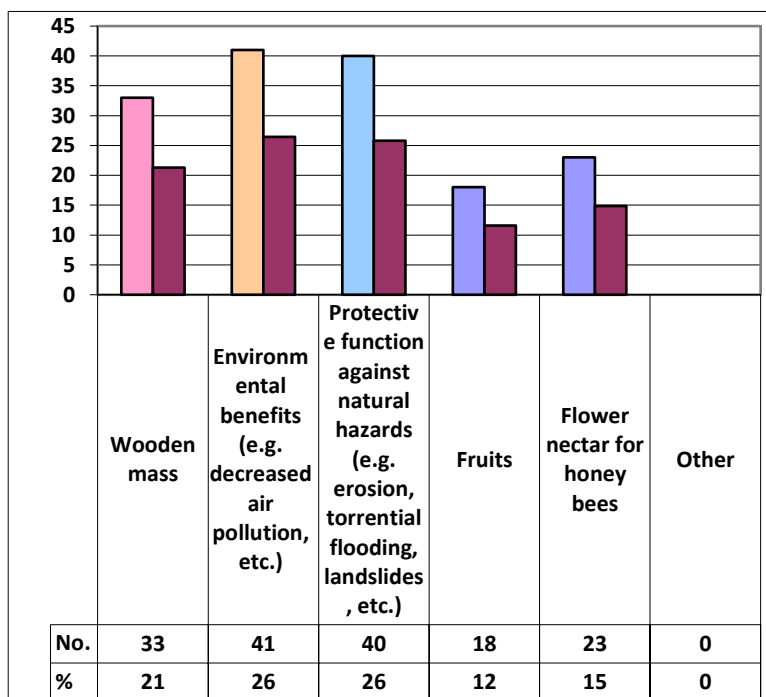


Chart 20: Analysis of the data according to what kind of benefit you are expecting from the increased forest land?

Question 20: What kind of benefit you are expecting from the increased forest land?

This is the last question from the natural environment section which had an objective to collect local community perceptions, opinions and suggestions for the needs of increasing the forest land, identification of the most useful trees, getting recommendation for the Project on the types of the trees in their forestation activities. Accordingly, the objective of this last question was to ask on people’s perceptions on the benefits that the increased forest land which are delivered to them.

The Chart 20 presents that more than half of the respondents or 52% through the increase of the forest land and forest fund expect environmental benefits (e.g. decreased air pollution especially in the context of the air pollution from the Buchim Mine landfill, etc.) and protective function against natural hazard (erosion, torrential flooding, landslides, etc.). This significant expectation from the local population is in direct relation with the objectives and results to be achieved by the Project. Further, 21% of the respondents expects increased wooden mass mainly for heating, construction activities and agriculture work. Smaller numbers of the respondents (12%) consider benefits in increased fruit production and 15% of respondents are in favor of increasing the forest land for increased provision of flower nectar for honey bees.

III. DISASTER RELATED QUESTIONS

21. Which natural hazards are present in your village area?

	No.	%
Floods (torrents)	27	16
Erosions	37	22
Wildfires	18	11
Landslides	42	25
Weather related hazards (e.g. storms, winds, hail, torrential rain, etc.)	45	27
Other	0	0
Total	169	100

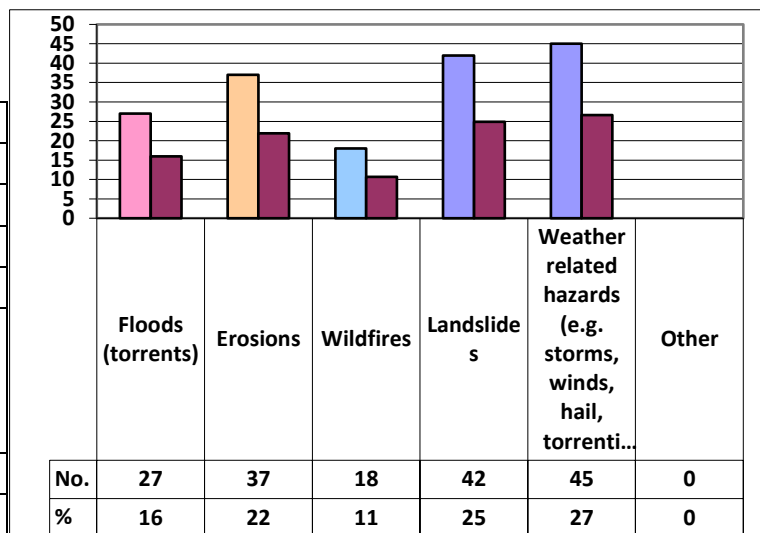


Chart 21: Analysis of data according to which natural hazards are present in your village area?

Question 21: Which natural hazards are present in your village area?

Last part of the Questionnaire is dedicated to understanding the disaster profile and local community set up, as well as collecting data on risks of natural disasters. Six disaster related were prepared. First question relates to understanding the hazard profile of the village area and respondents perceptions on the existence of the natural hazards in the local area that have the potential to become risks for the life and health of the villagers, their property and environment. The Chart 21 presents the results of the analyzed data and they indicate natural hazards that are typical for the broader region where the Village of Kodzhalija is located – Municipality of Radovish and the Southeast region of the country.

Highest number of respondents (27%) think weather related hazards (e.g. storms, strong winds, hail, torrential rain), followed by landslides (25%), erosions (22%), floods/torrents (16%) and wildfires (11%).

22. Have you or your household been affected by any of these natural hazards?

	No.	%
Yes	43	86
No	7	14
Total	50	100

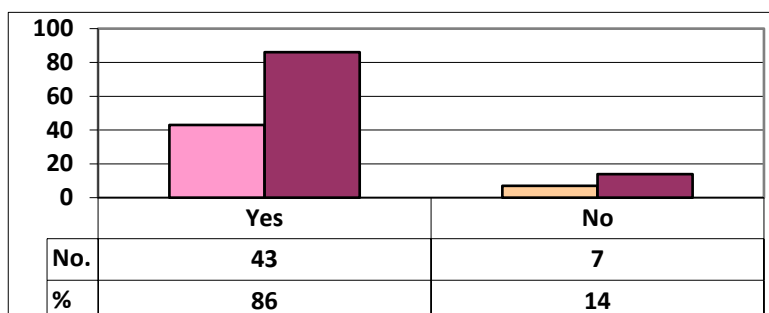


Chart 22: Analysis of data according to Have you or your household been affected by any of these natural hazards?

Question 22: Have you or your household been affected by any of these natural hazards?

Following question asked for personal or household experience of any natural hazard. Out of 50 respondents, 43 or 86% of them replied affirmatively that they or their household were affected by natural hazards and only 7 or 14% answered negatively – they were not affected. For the purposes of additional information collection, there was a possibility to mention the types of natural hazards that have caused damages and loses to him/her or to their households. However, not all the respondents provided this information and from those that provided this information it can be concluded that the meteorological hazards are number one hazards that have affected the village area (e.g. heavy rain, strong wind, hail, storms, frost, drought, torrential floods, landslides, etc.). This information is also in correlation with the information presented during the village meeting. In fact one similar event – torrential rain with flooding and hailstorm has happened during the field survey, hardly affecting the wider Radovish area on 19 June 2018.⁸



⁸ Pictures are taken from following websites and copyrights are with the publishers:

Municipality of Radovish: <https://tinyurl.com/yckzo9k4>

Kurir: <https://kurir.mk/republika/opstini/radovish-ploven-kako-venecija-za-nepoln-chas-poplaveni-domovi-i-objekti-foto/>

23. What is needed for the residents of the village to protect themselves from natural hazards? (multiple choice)

	No.	%
Assessment of risk and hazards	23	15
Early warning activities	31	21
Mitigation measures	35	23
Improved communication and timely information	16	11
Community emergency planning exercise	5	3
Improved road networks	36	24
Community based response	4	3
Other	0	0
Total	150	100

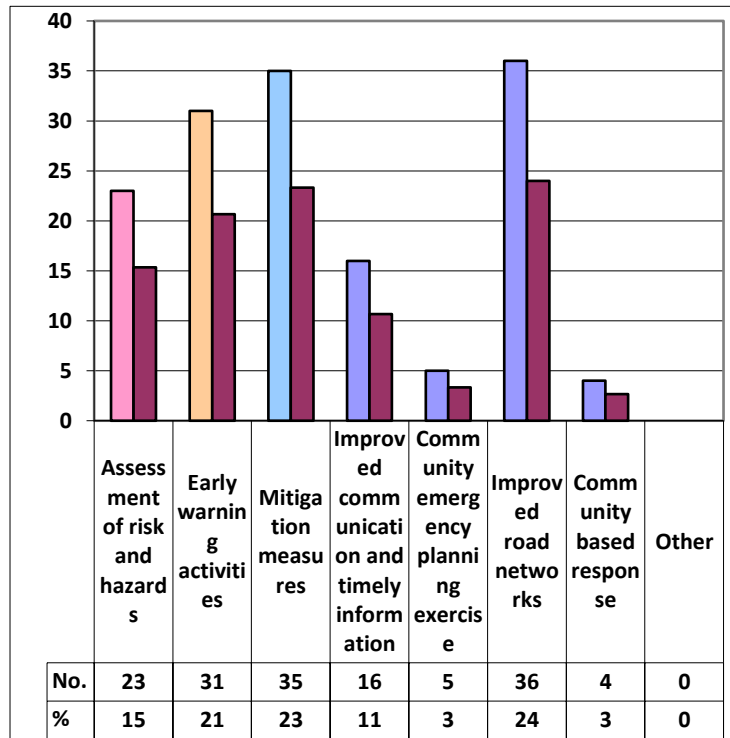


Chart 23: Analysis of data

Question 23: What is needed for the residents of the village to protect themselves from natural hazards?

This question referred to collecting valuable insights from the respondents on what is needed for protection from natural hazards. Answers were multiple choices oriented, and they had the possibility to select several answers. Chart 23 presents the results and most of the respondents or 24% think that they will be protected if there is improvement of the road network (which now is in poor condition, especially the roads within the village area). Mitigation measures are following with selection from 23% of respondents, followed by early warning (21%) and improved communication and timely information (11%), risk and hazard assessments (15%), community planning exercises (3%) and the community based response (3%). Accordingly it can be concluded that the infrastructure condition is necessary for protection, as well as implementation of preventive and mitigation measures. This was also emphasized during the village meeting, especially the poor condition of the communal infrastructure. Also, the timely information and notification is important especially for them that are away from the municipal center and living in a closed community.

24. What kind of means can make it easier to obtain information on potential disasters? (multiple choice)

	No.	%
Competent institutions on local level	40	28
Hazard maps	34	24
Public information; TV, Radio, Newspaper, SMS, email, Internet	38	27
Community education	30	21
Other	1	1
Total	143	100

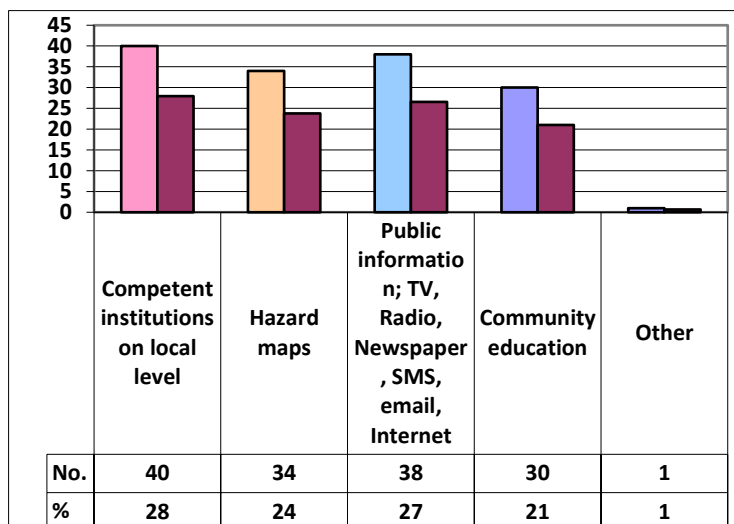


Chart 24: Analysis of the data what kind of means can make it easier to obtain information on potential disasters?

Question 24: What kind of means can make it easier to obtain information on potential disasters?

Being informed in a timely and professional manner is one of the highest importance in disaster risk reduction, both for prevention and mitigation and preparedness and response. Therefore one of the questions was on this topic – What kind of means can make it easier to obtain information on potential disasters? Its aim was to collect information from the villagers, to get their perceptions and opinions on the means of information sharing between the local community and the respective entities and how that information can be beneficial for the overall disaster risk reduction in the village area. Answers were multiple choices oriented, and the respondents had the possibility to select three answers.

As per the results from Chart 24, most of the respondents or 28% think that the easiest mean for sharing the information is to having the competent institutions on local level. They are followed by 24% of respondents that think that having hazard maps is useful for information on the existence of natural hazards in their local area. Same group of respondents – 21% consider community based education as a good information sharing mean and for improvement of the information and preparedness of the local community. 27% of respondents consider public information as beneficial and as a channel through which they can get easily obtain necessary information, early warnings, alerts and notification. Only 1% of respondents think that the information can be improved in another way. However, it is important to emphasize that most of the community has satellite dishes and watch Turkish TV channels, there is no cable TV network and Internet is predominantly mobile. Therefore it is recommended to discuss this information issue with the national and local counterparts how to disseminate information to such local communities. Also, since high number of respondents found the hazard maps to be very practical and beneficial way of information sharing, it is recommended to use the best practices and experience in Japan that could be adapted for the Macedonian national and local context.

25. Which disaster risk reduction measures should be used to mitigate the negative consequences of the natural hazard in your village? (multiple choice)

	No.	%
Improved communication and information from relevant authorities	27	18
Community based engagement for disaster risk mitigation	34	23
Campaigns on a volunteer basis	2	1
Afforestation of vulnerable areas	40	27
Community infrastructure disaster risk mitigation works	42	29
Other	1	1
Total	146	100

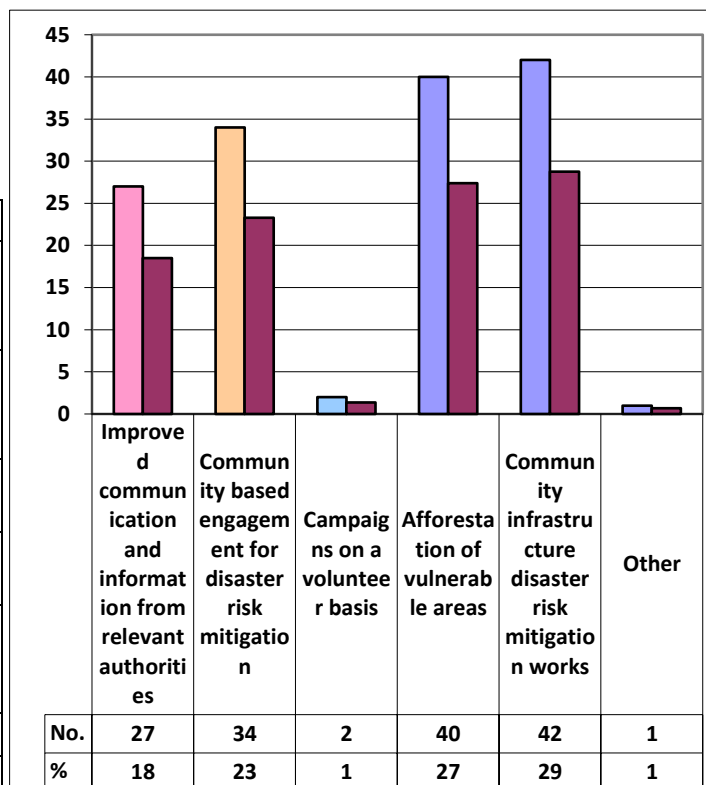


Chart 25: Analysis of data - Which disaster risk reduction measures should be used to mitigate the negative consequences of the natural hazard in your village?

Question 25: Which disaster risk reduction measures should be used to mitigate the negative consequences of the natural hazard in your village?

In order to collect comprehensive information from the local community on the DRR measures for mitigation of disaster effects, a separate question was formulated. Accordingly, the respondents provided their opinions and perceptions of the most beneficial and effective mitigation measures that could be implemented in their village. Answers were multiple choices oriented, and the respondents had the possibility to select three answers.

As per the Chart, 29% of respondents think that situation could significantly improve with implementation of community infrastructure disaster risk mitigation works (they are very much interested to participate in implementation of that kind of works within the Project as one of the modalities for additional income generation). They are followed by afforestation of highly risk areas in the village area (27%), community based engagement for disaster risk mitigation (23%), improved communication and information from relevant authorities (18%) and campaigns on a volunteer basis (1%). Summarized conclusion and recommendation to the Project is that more than half of the respondents (55%) will support the activities that are based on community based engagement for disaster risk mitigation, volunteer basis and afforestation of vulnerable areas. This can be used for the support if the implementation of the Project and its activities in the area. Furthermore, for additional motivation of the local population there is a strong need for implementation of activities for raising the public awareness and information on the long-term benefits from this project, for the villagers in the local area, but especially for the broader region and the City of Radovish, since the major negative effects are downstream.

26. How do you normally protect your agricultural crops/field from grazed animals?

	No.	%
Communicate with owners of the animals and warn it	44	60
Discuss it in the village meeting if it happens	17	23
Making fences and hedges for protections	12	16
Others	0	0
Total	73	100

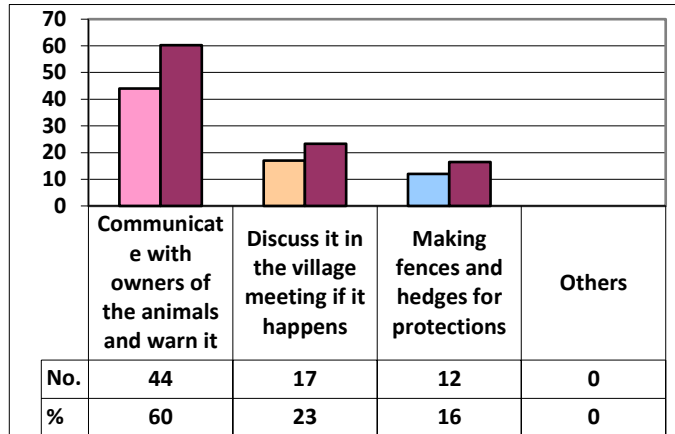


Chart 26: Analysis of data - How do you normally protect your agricultural crops/field from grazed animals?

Question 26: How do you normally protect your agricultural crops/field from grazed animals?

The last question from this section and from the Questionnaire in general was the question that relates to modality of protection of their crops/field from grazed animals. It aims was to collect information on the local practices since part of the local project activities will be in afforestation of land and how to protect the trees. Most of the respondents (60%) think that the most efficient measure is to communicate with the owners of the animals and warn them on the negative consequence. They are followed by villagers (23%) that think that this can be regulated through discussions in the village meetings (village meetings are functional modality of community level discussions and decision makings and the village is frequently using them for more important issues for the community at whole) or making fences and hedges for protection (16%).

6. CONCLUSIONS AND RECOMMENDATIONS

Within the framework of the project “Capacity Building for ECO-DRR through Sustainable Forest Management” implemented by JICA with main beneficiaries being CMC and PEMF, forest conservation works in FMU near the village areas of Kodzhalija will be conducted and forest management plan including zoning will be developed. Current household level activities affecting deforestation and degradation of forest, and how villagers perceive natural environment and disasters is crucial for consideration of above intervention options for disaster risk reduction using Eco-DRR methods. Therefore, a field survey on socio-economic and other issues was conducted to produce basic data with its analysis of the village level and household level activities and their perception on natural environment and disasters.

Accordingly, as per the objectives of the ToRs, it can be concluded that the field survey has identified essential socio-economic and environment aspects of the village through the creation of the Village Profile and the conduct of the Village and Field Survey. Consequently, the Village of Kodzhalija is a traditional community of Yuruks with tradition, cultural habits and customs and specific dynamics. In general the local community representatives fully supported the Field Survey and welcomed the implementation of the activities of the Project.

Based on the socio-economic profile of the village, as well as the other specifics of the community, it can be concluded that the population is significantly vulnerable to natural hazards and as a community they are poorly resilient to disasters. Luckily, based on the analysis of the natural hazards profile there are no significant impacts of hazards in the village.

The survey had a good gender balance with 12 (24%) out of 50 respondents allowing the women voice and opinion on Eco-DRR topics and aspects to be heard and included in the analysis accordingly. Female respondents have shown solid knowledge of the thematic area that was covered by specific questions, as well as interest for improvement of the living conditions in their local community. Their contribution in the survey is very valuable insight into the community, because the women are most vulnerable to natural disasters. In addition, they possess knowledge and capacities that can be used for further strengthening of the community resilience.

Knowledge on Eco-DRR is very low and they are not identifying the concept or practices. They are not recognizing the forest as complex with preventive, protective and beneficial functions. Contrary to this either they are devastating forest with extension of agricultural land and pastures or utilizing it through extensive legal and illegal logging. They are fully aware of the situation with deforestation in their area and by certain level they are actively supporting this activity through supplying the woods for heating almost in all cases “on their own” i.e. from illegal loggers. Furthermore, extensive use of wood for heating of houses is significantly contributing to increase of legal and illegal logging.

In addition, if we consider the fact that in the micro region of the Village of Kodzhalija there is not enough agricultural land for tobacco crop production and the increased interest for starting or expanding the tobacco crop production, there are more than enough indications that the business is expanding to forest land and the land owned by the state. Accordingly, one of the reasons for deforestation is increasing the land for tobacco crop production.

As a final conclusion, it is necessary to emphasize that this document shall serve as a key review and assessment document that can provide necessary input for the Project and the national stakeholders for further advancing the Eco-DRR and resilience agenda in the Village of Kodzhalija.

For the purposes of better understanding of the immediate outputs of this filed survey assessment, and the ultimately fast tracking the support to building a disaster resilient local community through an Eco system based DRR approach, following recommendations are formulated and presented not in an order of priority:

1. Inclusion of the community in the local level activities by the project – As mentioned the community received well the survey activities and is open minded and supportive for implementation of project activities. In order to build ownership on the activities, as well as to ensure sustainability, it is recommended to include them both in the phases of creation of mitigation measures through discussion on their indigenous techniques for risk reduction, as well as during the physical implementation of the works through their engagement in works either through a public works or through a cash generation programme. This will provide them with financial income strengthening their resilience.

2. Community participation in disaster risk reduction activities – Alongside the project activities, the community can be empowered to participate in additional set of disaster risk reduction activities (e.g. participatory community level risk and hazard assessments, sharing of knowledge and information, community preparedness and protection).

3. Engagement of youth as agents of change – The population of the village is relatively young and youth shall be used as generator of Eco-DRR knowledge and sharing of information in their families, households and social groups.

4. Design and implementation of targeted Eco-DRR public awareness activities – The local community is not aware of Eco-DRR concept and therefore it is needed to design a specific set of public awareness activities customized for their specific community. The objective should be to shift the focus on the forest as a resource of wood for heating to a forest providing preventive functions for the community, as well as including changing behaviors for disaster risk reduction.

5. Afforestation of vulnerable areas – There is a disproportion in the forested areas and the intensity of logging. So, in couple of years the forest will be significantly decreased. Therefore it is recommended to implement regular afforestation of identified vulnerable areas in order to keep the continuum of forest land. These activities should be done in collaboration between the local community, Project and the national and local beneficiaries. Accordingly, as identified, protective measures for the trees are required.

6. Community infrastructure disaster risk mitigation works – Identification and selection of community based infrastructure disaster risk mitigation works within the Project.

7. Strengthening the capacities of the competent local institutions for Eco-DRR – The portfolio of the Project activities should include measure and activities for further strengthening of the national and local level authorities for Eco-DRR.

8. Information sharing through timely and available public information

9. Introduction of sustainable practices for resilient agriculture – The agricultural production is not having too many sustainable practices. Therefore it is recommended to create a set of practices especially in the tobacco crop production (and animal husbandry) based on the Eco-DRR concept in order to improve the efficiency and sustainability of production, as well as to reduce the usage of wood in the production.

10. Introduction of energy efficient modalities of heating – Using of woods for heating is contributing to deforestation, therefore it is recommended to introduce other energy efficient modalities of heating that will not rely on woods (e.g. pellets).

11. Implementation of best practices customized to a local context – Since the Eco-DRR topic is relatively new in the national and local contexts, it is recommended to present and implement best practices from Japan that will be customized for the local context of the village of Kodzhalija.

12. Gender mainstreaming in the project activities – Women, together with other vulnerable categories of citizens (e.g. children, people with disabilities, elderly) are most vulnerable to natural disasters. In order to improve their resilience, it is recommended to mainstream gender in the activities, either through awareness activities, or through practical activities for prevention and preparedness.

ANNEX I: TERMS OF REFERENCE

1. Title of Service

Field Survey on Socio-Economic and Other issues for the Project on Capacity Building for Ecosystem based Disaster Risk Reduction through Sustainable Forest Management in Macedonia (hereinafter referred to the Project).

2. Background

In the Project on Capacity Building for ECO-DRR through Sustainable Forest Management (the Project), forest conservation works in the forest management unit (FMU) near village areas will be conducted and forest management plan including zoning will be considered. Current household level activities affecting deforestation and degradation of forest, and how villagers perceive natural environment and disasters is crucial for consideration of above intervention options for disaster risk reduction using Eco-DRR methods. Therefore, a field survey on socio-economic and other issues (hereafter referred as the Service) will be conducted to produce basic data with its analysis of the village level and household level activities and their perception on natural environment and disasters.

3. Objectives

To identify the socio-economic and environment of Kodzhalija village near the micro-sites in Radovish through the analysis of generally available data (demography, environment, economic activities, presence of natural and other hazards etc.) in the related authorities such as municipality and statistical data, as well as the application of field research through an interview with the local population (questionnaire). Collected information will be utilized for future activities of the JICA Project; hazard map creation, collection of information and opinion about selection of planting trees based on the needs and their usage of wood materials etc.

4. Scope of Service

- Drafting schedule and preparing of Questionnaire and Guidelines for its field application in Macedonian and English being supervised by JICA CMC and PEMF experts.
- Collecting basic data of the region and municipality through existing documents such as statistics.
- Conduct survey targeting to two levels: group meeting at the village and household interviews.
- Discussions among participants will be encouraged in the village level meeting.
- CMC and PEMF will set up a village level meeting with the assistance of local municipalities.
- The Contractor is expected to compose one survey teams, composed by two persons, under the team leader.

5. Target area: Kodzhalija village near the micro site(s) in Radovish,

6. Number of households

- 50 households. The number of households will be fixed by the Project before commencement of the field survey.

7. Duration of Contract

- From 1st of June, 2018 to 30 of September, 2018

8. Expected deliverables

The following Outputs of the Service shall be delivered by the Contractor to the Project. All rights of the Outputs shall be kept by the Project once it is delivered.

(1) **Questionnaire** - Questionnaire will be prepared by the Contractor based on the discussion with the Project and approved by the Project.

(2) **Guideline** - A guideline how to conduct the field survey should be prepared by the Contractor before commencing the field survey. This guideline should be approved by the Project.

(3) **Draft report** - Draft report shall be submitted to the Project no later than 31 of July or 21 days after the completion of the field works, whichever comes first. Draft report shall be made in format of Microsoft Word and Excel. Submission shall be made by e-mail to the Project. The Project will review the draft report and provide the comments. Deliverables are as follows: Draft report in English language and Primary data and result of interviews shall be summarized as annex. Original sheets and data entered in the spread sheet shall also be attached.

(4) **Final report** - Make amendments to the draft report based on feedback from the explanatory meeting on draft report and the comments from the Project. The explanatory meeting will be held in the beginning of September which to be announced by the Project. Final report shall be submitted to the Project later than 10 days after the day of the explanatory meeting. Final products to deliver: Report, hard copy and Report, digital (pdf) format.

9. Duration of the Survey

Expected working days of the team leader is 40 days and other two members for the field survey is 13 working days per person. This contract will be terminated on 30 of September 2018. There will be a preparatory meeting with the Radovich municipality and relevant organizations before starting of the field survey. The contractor shall be present in the meeting and obtain relevant information.

No.	Deliverable/Outputs	Estimated working days	Target Due Date
1	Team Leader	40	
1.1	Collection of existing information	7	TBD
1.2	Preparation of Questionnaire	7	June 10 th
1.3	Preparation of Guidelines	2	June 12 th
1.4	Village Meeting	1	June 18 th
1.5	Supervision of field survey	8	June 19 th to TBD
1.6	Reporting including data analysis and report preparation	15	Draft: 31 of July Final: Mid Sep.
2	Other two members	13 days/person	
2.1	Learning contents of questionnaire	1	TBD
2.2	Village Meeting	1	June 18 th
2.3	Field Survey	8	June 19 th to TBD
2.4	Data entry	3	TBD

10. Reporting

- Frequently communicating with the project team, at least once a week through e-mail or the written document.

-Progress reports should be informed on monthly basis to the Project.

- The first draft document should be handed by 31 of July or 21 days after the completion of the field works, whichever comes first.

- The final document should be accepted in by Final report shall be submitted to the Project later than 10 days after the day of the explanatory meeting.

- The document should be written both in English text and in Macedonian text.

11. Time frame of the survey

Commencement of the field survey should be the 18th of June of 2018. Other activities schedule is drafted as follows.

Schedule of Field Survey on Socio-Economic and Other issues

Final Report
Field Survey on Socio-Economic and Other Issues

Activity for Survey				
	June	July	August	September
(1) Preparation				
-1 Collection basic data through existing documents	■			
-2 Preparation of questionnaire	■			
-3 Finalizing questionnaire	■ June 8th			
-4 Preparation of field survey	■			
(2) Field survey				
-1 Preparatory meeting with Municipality etc	■ June 13/14			
-2 Conducting village level survey	■ June 18th			
-3 Conduction household level survey		■		
(3)Reporting				
-1 Making draft report		■		
-2 Submitting of draft report		■		
-3 Feedback from the Project			■	
-4 Explanatory meeting				■
-5 Finalizing report				■
-6 Submission of final report				■

12. Supervision by the Project

- ✧ Questionnaire should be finalized under the supervision of the Project.
- ✧ Field survey schedule must be informed to the Project at least 3 working days before it starts.
- ✧ Weekly report should be submitted to the Project until the draft report is submitted.

Other activities must be conducted based on the consent of the Project.

13. Contract Price

The cost breakdown sheet is attached herewith.

14. Ownership

Ownership and credit of the document as the output of this service procurement belong to the Project on Capacity Building for Ecosystem Based Disaster Risk Reduction through Sustainable Forest Management in Macedonia, and Crisis Management Center (CMC).

15. Payment

100% shall be paid after the final document is received and the quality of the final document is accepted by the Project.

16. Reference document

- Proposal by the Contract.

Prior to the developing the idea, the following documents shall be studied;

- Project Design Matrix (PDM)

17. Team composition:

Mr. Vasko Popovski, Team Leader

Mr. Ljupco Milkovski, Team Member

Ms. Lolita Arsova, Team Member

*Whenever interviewing by Ms. Arsova, other member(s) shall accompany with her.

18. Legal validity of the contract

This service procurement is concluded only when related parties sign the service procurement contract.

Attachments: List of Team Members and Cost Break down Sheet.

Annex II

**FIELD SURVEY ON SOCIO-ECONOMIC AND OTHER ISSUES
VILLAGE MEETING FORM**

Dear Participants,

Thank you for your participation in in this Village meeting as a preparation for Field Survey on Socio-Economic and Other Issues within the project “Capacity Building for Ecosystem based Disaster Risk Reduction through Sustainable Forest Management in Macedonia”. The purpose of this meeting is to explain the purpose of this assignment, as well as to discuss aspects related to the objective of the assignment.

Instruction: The Form is filled in form of Minutes of Meeting by the Team based on the discussions at the village meeting.

Date of the Village Meeting: _____

1. Characteristics and history of villages: (including water resources, village houses, demography)

- History of the village
- Demographic characteristics of the village
 - What is the population of the community?
 - As a percentage roughly, what is the breakdown of population by sex (male/female)
- Number of households
- Main economic activities and sources of income for villagers
- Employed/unemployed (as a percentage, roughly)
- Types of social infrastructure (e.g. schools, health institutions, etc.)

2. Main products in terms of the quantity and the monetary value.

- What are the main products from the village?
- Approx. quantity of production
- Approx. monetary value of products

3. Usage situation of forest at village

- Is there a forest near the village?
- Ownership of forests
- Resources from forest
- Types of trees
- Any afforestation activities? Incidental/regular?
- Should the forest area be increased? (trees/benefits)

4. Traditional collaborative work, customs, practices

- Any types of traditional collaborative work in the village?
- Specific customs and practices
- Role of women in the community/contribution to DRR

5. Ownership situations of agricultural land and pasture (including forest grazing)

- Ownership of the forests and land in the area of the village

6. Main agriculture practices and annual schedule of the work (Including bee keeping and main flower sources of the bee keeping,)

- What are the main agricultural crops
- Agricultural seasons (annual calendars of the main agricultural crops/animal husbandry/activities)
- Record of harvest
- What are the main agriculture practices? Any sustainable practices? For example, how to protect agricultural crop/forests from domestic animals such as fences, hedges, patrolling,

protection of forest fires.

- In the village, is there any hedge grow to protect crops/trees from animals? If so, what kind of trees are used (thorn trees, shrub)?
- How do you normally protect your agricultural crops from the animals?
- Agriculture is male, female or joint work?

7. Outline of existing residents organization

- What is the existing residents' organization of the village?
- Existence of so called Mesna zaednica (Rural Community)
- Is there any member from the village in the municipal councils or bodies?

8. Any locations where soil erosion is severe and problematic in the village

- Record of soil erosion events including area and population affected and damages
- Identification of severe erosion locations and area and population affected
- Any measures implemented or planned to be implement
- Have you had any problems of soil erosion caused by domestic animals (trails and heel erosion)?

9. Water conditions in the village? Water resource and wells.

- What is the main water source in the village?
- Who is the owner of water source and water supply system?
- Number of wells
- Water shortages (past/present)
- Water distribution network/Sewage/Atmospheric water network
- Existence of storm water channels

10. Forest and land use history surrounding the village

- Type of forests and type of lands

11. Illegal logging situations

- Purpose of illegal logging (commercial/private/other)
- Frequency of illegal logging (year round/seasonal)
- By villagers or non-villagers
- Types of trees subjected to illegal logging
- Estimation of wooden mass
- What are the negative impacts of illegal logging?
- Existing inspection from PE Macedonian Forests inspectors or private forests guards

12. Disaster record surrounding village

- What are the main natural hazards in the village?
- Disastrous events happened (type, when, area and population affected, human losses, damages)
- Are any groups in the village more affected than the others (e.g. elderly, women, children, disabled, etc.)?
- Is someone responsible for disaster risk reduction in the village?
- Existence of village level assessments or emergency plans
- Community level information on hazards
- Type of disaster risk reduction measures and works implemented for disaster risk mitigation in the past
- Ongoing or projected disaster risk reduction works for risk mitigation
- Have you had any land fires (agriculture /forest land) before? When is the fire prone season?

ANNEX III

**FIELD SURVEY ON SOCIO-ECONOMIC AND OTHER ISSUES
QUESTIONNAIRE**

Dear Participant,

Thank you for your participation in the **Field Survey on Socio-Economic and Other Issues** within the project “Capacity Building for Ecosystem based Disaster Risk Reduction through Sustainable Forest Management in Macedonia”. The purpose of this Questionnaire is to obtain appropriate input information related socio-economic, environment and other issues of Kodzhalija village through an interview with the local population (Questionnaire) on the household level activities and their perception on natural environment and disasters.

For that reason, we kindly request you to answer this questionnaire.

Instruction: The Questionnaire is filled by the Surveyor based on the answers given by the Surveyees.

Thank you for your cooperation!

Surveyor: _____

Date of surveying: _____

Questionnaire No. _____

II. HOUSEHOLD LEVEL RELATED QUESTIONS

1. Gender: Male Female

2. What is your age group?

- 18 - 24
- 25 - 35
- 36 – 45
- 46 – 55
- 56 – 64
- 65 +

3. What is your ethnic affiliation?

- Macedonians
- Albanians
- Turks
- Bosniaks
- Roma
- Other _____

4. What is your religious background?

- Orthodox
- Muslim
- Catholic
- Other _____

5. What is the level of your education?

- Elementary
- Secondary

- University and higher
- Other _____

6. What is your employment status?

- Employed
- Unemployed
- Student
- Retired

6a. If you are employed, state your sector of employment.

- Public sector
- Private sector
- Farmer (agriculture)
- Animal husbandry
- Self-employed (e.g. artisan)
- Other _____

7. Do you have any side jobs?

- Yes
- No

If yes, please state: _____

8. Type of household

- Family household
- Non-family household

9. Number of household members? _____

10. What is your household main income source?

- Employment
- Regular monthly income (e.g. monthly salary, pensions, social benefits)
- Agriculture
- Animal husbandry
- Business
- Artisan
- Other _____

11. Total Annual Household Income

- Up to 144,000 MKD
- 144,001 MKD to 216,000 MKD
- 216,001 MKD to 288,000 MKD
- 288,001 MKD to 360,000 MKD
- 360,001 MKD to 432,000 MKD
- 432,001 MKD to 504,000 MKD
- 504,001 MKD to 576,000 MKD
- More than 576,001 MKD

12. Total Annual Household Expenditures

- Up to 144,000 MKD
- 144,001 MKD to 216,000 MKD

- 216,001 MKD to 288,000 MKD
- 288,001 MKD to 360,000 MKD
- 360,001 MKD to 432,000 MKD
- 432,001 MKD to 504,000 MKD
- 504,001 MKD to 576,000 MKD
- More than 576,001 MKD

13. Types of Total Household Expenditures

- Consumption
- Utilities
- Education
- Medical
- Supporting activities
- Others

14. Women's roles in the household (multiple choice)

- Household activities (e.g. house chores, cooking, caring for family members, etc.)
- Agriculture
- Animal husbandry
- Repairs and services in the household
- Working and contributing to household income

III. NATURAL ENVIRONMENT RELATED QUESTIONS

15. Is there any forest/wooded land within the village area or in close proximity to the village?

- Yes
- No
- Partial

16. What is the ownership of the forest?

- State forest
- Private forest
- Other: _____

17. Forest and wood as a resource is used for following purposes:

- Agriculture
- Animal husbandry
- Civil construction activities
- Heating, if heating go to 17a & 17b
- Other: _____

17a. If you are using woods for heating, from where you are getting your woods:

- PE Macedonian Forests warehouses
- Private companies
- On your own
- Other: _____

17b. If you are using woods for heating, what amount of woods you are using on an annual basis:

- to 3m³
- 4 to 6m³

- 7 to 9m³
- 10 to 12m³
- More than 12m³

18. What kind of trees are most usable for your households?:

- Oak
- Beech
- Acacia
- Coniferous trees
- Fruit growing trees
- Other: _____

19. Should be the forest land in your village and surrounding area increased?:

- Yes
- No
- I don't have opinion

19a. If Yes, then with what kind of trees should be forested:

- Oak
- Beech
- Acacia
- Coniferous trees
- Fruit growing trees
- Other: _____

20. What kind of benefit you are expecting from the increased forest land? (multiple choice)

- Wooden mass
- Environmental benefits (e.g. decreased air pollution, etc.)
- Protective function against natural hazards (e.g. erosion, torrential flooding, landslides, etc.)
- Fruits
- Flower nectar for honey bees
- Other: _____

IV. DISASTERS RELATED QUESTIONS

21. Which natural hazards are present in your village area?

- Floods (torrents)
- Erosions
- Wildfires
- Landslides
- Weather related hazards (e.g. storms, winds, hail, torrential rain, etc.)
- Other _____

22. Have you or your household been affected by any of these natural hazards?

- Yes
- No

If Yes, please state _____

23. What is needed for the residents of the village to protect themselves from natural hazards?

(multiple choice – select three answers)

- Assessment of risk and hazards
- Early warning activities
- Mitigation measures
- Improved communication and timely information
- Community emergency planning exercise
- Improved road networks
- Other _____

24. What kind of means can make it easier to obtain information on potential disasters? (multiple choice – select three answers)

- Competent institutions on local level
- Hazard maps
- Public information : TV, Radio, Newspaper, SMS, email, Internet
- Community education
- Other _____

25. Which disaster risk reduction measures should be used to mitigate the negative consequences of the natural hazard in your village? (multiple choice – select three answers)

- Improved communication and information from relevant authorities
- Community based engagement for disaster risk mitigation
- Campaigns on a volunteer basis
- Afforestation of vulnerable areas
- Community infrastructure disaster risk mitigation works
- Other _____

26. How do you normally protect your agricultural crops/field from grazed animals?

- Communicate with owners of the animals and warn it,
- Discuss it in the village meeting if it happens,
- Making fences and hedges for protections
- Others _____

ANNEX IV

Guide for Surveyors for implementation of the Questionnaire for FIELD SURVEY ON SOCIO-ECONOMIC AND OTHER ISSUES

INTRODUCTION

Activities of the Project on Capacity Building for ECO-DRR through Sustainable Forest Management will cover conduct of forest conservation works in the forest management unit near the village of Kodzhalija areas will be conducted. Therefore the current household level activities affecting deforestation and degradation of forest, and how villagers perceive natural environment and disasters is crucial for consideration of above intervention options for disaster risk reduction using Eco-DRR methods. Therefore, a field survey on socio-economic and other issues (hereafter referred as the Service) will be conducted to produce basic data with its analysis of the village level and household level activities and their perception on natural environment and disasters.

The main aim of the field survey is to identify the socio-economic and environment of Kodzhalija village near the micro-sites in Radovish through the analysis of generally available data (in the related authorities such as municipality and statistical data, as well as the application of field research through an interview with the local population (questionnaire).

OBJECTIVES OF THE GUIDE

This Guide includes guidelines, responsibilities and tasks that Field Surveyors are requested to follow when conducting the **Field survey on socio-economic and other issues (the Field Survey)** in the village of Kodzhalija in the Municipality of Radovish – Village Meeting and field survey using Questionnaire which guidelines are enclosed in this Guide as Annex I and Annex II.

YOUR ROLE AS A TEAM MEMBER FOR THE FIELD SURVEY

As a Team member for the Field Survey, you play a key role for implementation and success of the field survey assignment. You have to be fully knowledgeable about the survey, its objectives, interview process, as well as data analysis. During the survey, you must demonstrate highest ethical standards during the application of the Questionnaire, as well as data analysis. The Team Member shall act as professional field surveyor following all survey procedures. This will ensure the data to be collected with highest quality.

As a Team Member for the Field Survey you are expected to present full integrity and impartiality, honesty and acknowledgment of the rights of informers – participants in the survey (right on the information on the content, right to refuse participation in the survey, as well as accurate presentation). The process of the implementation of the Questionnaire is based on the confidentiality and data protection. All the identification data collected during this survey shall be utilized only for the purposes of this survey and shall not be in any aspect shared with persons and entities beyond the responsible parties of this survey (the Team for execution of the Field Survey and the Project as per the signed Contract). All answers on the questions of the Questionnaire shall be used for data analysis and preparation of the Report on the Field Survey and shall not be used for any other purpose. For the purposes of Confidentiality, the Team Members shall sign the **Statement of the Confidentiality for implementation of the Field Survey**, enclosed as *Annex III*.

During the implementation of the Field Survey, you should respect ethnical affiliations and religious background of the respondents. The village of Kodzhalija is inhabited with majority of ethnic Turks and

it is traditional environment. Therefore you will have to mind your attitude and behavior during the field survey. Also, take into consideration that the Field Survey is to be performed during the days of celebrating the Eid al Fitr (Ramadan Bayram).

GUIDELINES FOR CONDUCTING THE FIELD SURVEY

For conduct of the Field Survey you have to be well prepared knowing the Questionnaire and procedures for its implementation and well organized to conduct the survey efficiently with high quality.

➤ Contacting the Respondents

The scope of the survey is to cover 50 households in the village. Reference houses will be selected by the Project and each Team member will cover half of them. The field work shall be planned in efficient and effective manner meaning that the itinerary shall be defined to logical visiting the selected houses in the same neighborhoods. During the Village Meeting (see Annex II) precise daily itinerary of visits will be made based on the daily routines of the villagers.

Make a minimum of three attempts to complete survey at identified households. If, after repeated attempts you are unable to establish contact or the persons don't want to reply, inform the Team Member to determine the next steps.

➤ Preparation for the Field Survey

Each day before you start, you shall verify that you have all the necessary documents you will need during the working day (e.g. ID badge, enough numbers of printed Questionnaires, printed copy of the Guide for Surveyors for implementation of the Questionnaire for Field survey on socio-economic and other issues, pens or pencils, contact details of the Team members, etc.). If necessary take a printed map of the area or upload a map on your mobile phone. For each day you need to prepare a daily log with planned locations to be visited. Discuss the daily log with the Team Leader and other Team Member.

➤ Professional Approach

Your appearance and attitude will determine the level of cooperation of the respondents, and that is why it is necessary to make a good first impression that can encourage cooperation. You should be relaxed, confident, persuasive and calm, with professional approach and establishing a good rapport with the respondents. Rapport begins as you introduce yourself and the survey and continues throughout the screening and interviewing process. Establish rapport early and maintain it throughout your contact at the household. The rapport you develop during the initial contact at the door and as you conduct the household screening will determine the tone of your visit. You have to have a positive approach and demonstrate knowledge on the aspects of the survey. Don't be rude or aggressive.

After the introduction, briefly state the objective of the survey, how it is benefiting the villagers, importance to participate, its confidential nature, protection of data, as well as that the outcome shall be used only for the purposes of the report and consequent forest conservation works. If there are question from the residents on the survey, or why they are selected, is it confidential, etc, try to answer them stating again the purposes and the benefits of the survey for the village, importance to hear the voice of the villagers and the opportunity for them to contribute to the resilience of the village, as well as convincing them on the confidentiality and the anonymous nature of it. Interview the respondent in a private environment. Be neutral in your words, actions, and demeanor.

In certain cases it might happen that the respondents will refuse to take participation in the survey. If, despite your best efforts, the person will not consent to an interview, accept the refusal courteously and thank the person for his or her time. Do not pressure, argue, or otherwise alienate him or her. Your goal should be to leave the door open for you or someone else to contact the resident at a later date and secure a promise of cooperation. Inform the Team Member on the refusal to determine the next steps.

➤ **Implementation of the Questionnaire**

The Questionnaire will be implemented in the manner that you will read the questions to the respondents and you will insert their answers. Ask the questions using the exact words. Read them slowly in order the respondent to hear them and answer them. Ask every question that is in the Questionnaire in order as listed. Do not jump from one question to another later in the list. Repeat questions that are misinterpreted or misunderstood by the respondent. Do not suggest answers to the respondents. Responses must represent the respondent's own opinions without bias introduced by the Field Surveyors. Do not influence a respondent's answers with your behavior (that is, with your body language, your attitude, your tone of voice, or any other way).

You need to maintain proper record and storage of the questionnaires with ensuring that you have enough printed copies for work day's surveys, as well as that you are keeping the filled questionnaires properly. After checking the completeness of the forms, you will handle them to the Team Leader for photocopying and scanning.

ANNEX I

**FIELD SURVEY ON SOCIO-ECONOMIC AND OTHER ISSUES
VILLAGE MEETING**

GENERAL PROCEEDINGS

The Village Meeting will be held on 18 June 2018 at 12:00, in the premises of the _____ in the village of Kodzhaliya. It is expected to have approx. 10 – 15 participants from different parts of the village.

The discussion will be led by the Team Leader with support of the Team Member 1, whether the Team Member 2 will be responsible for taking the Minutes of Meeting. Also, the Team Member 1 will take notes on the discussion in parallel.

The Village Meeting will be held in following order:

- Introduction of the Team
- Objective of the meeting and proceedings
- Asking the questions from the proposed topics (topics can be photocopied and distributed to the participants) ensuring that all important aspects are covered, without interrupting the natural flow of discussion.
- Summarizing the discussions.

**FIELD SURVEY ON SOCIO-ECONOMIC AND OTHER ISSUES
VILLAGE MEETING FORM**

13.Characteristics and history of villages: (including water resources, village houses, demography)	This topic should give background on the village. Discussions should be guided to get overall information from the villagers on the
--	---

<ul style="list-style-type: none"> ● History of the village ● Demographic characteristics of the village <ul style="list-style-type: none"> - What is the population of the community? - As a percentage roughly, what is the breakdown of population by sex (male/female) ● Number of households ● Main economic activities and sources of income for villagers ● Employed/unemployed (as a percentage, roughly) ● Types of social infrastructure (e.g. schools, health institutions, etc.) 	<p>presented information and data.</p>
<p><u>14. Main products in terms of the quantity and the monetary value.</u></p> <ul style="list-style-type: none"> - What are the main products from the village? - Approx. quantity of production - Approx. monetary value of products 	<p>Quantity and monetary values should be approximate in order to support the profile of the village. Only the main products to be listed.</p>
<p><u>15. Usage situation of forest at village</u></p> <ul style="list-style-type: none"> - Is there a forest near the village? - Ownership of forests - Resources from forest - Types of trees - Any afforestation activities? Incidental/regular? - Should the forest area be increased? (trees/benefits) 	<p>It is important to get a background from the group of villagers on the information about the forest related information. Similar questions are part of the Questionnaire.</p>
<p><u>16. Traditional collaborative work, customs, practices</u></p> <ul style="list-style-type: none"> - Any types of traditional collaborative work in the village? - Specific customs and practices - Role of women in the community/contribution to DRR 	<p>This part should answer the tradition dynamics in the village, as well as to get an insight on the level of collaboration in the village, including DRR aspects and the role of women.</p>
<p><u>17. Ownership situations of agricultural land and pasture (including forest grazing)</u></p> <ul style="list-style-type: none"> - Ownership of the forests and land in the area of the village 	
<p><u>18. Main agriculture practices and annual schedule of the work (Including bee keeping and main flower sources of the bee keeping,)</u></p> <ul style="list-style-type: none"> - What are the main agricultural crops - Agricultural seasons (annual calendars of the main agricultural crops/animal husbandry/activities) - Record of harvest - What are the main agriculture practices? Any sustainable practices? For example, how to protect agricultural crop/forests 	<p>General information on the agricultural practices in the village, as well as main schedule of work.</p>

<p>from domestic animals such as fences, hedges, patrolling, protection of forest fires.</p> <ul style="list-style-type: none"> - In the village, is there any hedge grow to protect crops/trees from animals? If so, what kind of trees are used (thorn trees, shrub)? - How do you normally protect your agricultural crops from the animals? - Agriculture is male, female or joint work? 	
<p><u>19.Outline of existing residents organization</u></p> <ul style="list-style-type: none"> - What is the existing residents' organization of the village? - Existence of so called Mesna zaednica (Rural Community) - Is there any member from the village in the municipal councils or bodies? 	<p>The residential organization refers to the administrative and residents organization, as well as connection with the Municipality of Radovich.</p>
<p><u>20.Any locations where soil erosion is severe and problematic in the village</u></p> <ul style="list-style-type: none"> - Record of soil erosion events including area and population affected and damages - Identification of severe erosion locations and area and population affected - Any measures implemented or planned to be implement - Have you had any problems of soil erosion caused by domestic animals (trails and heel erosion)? 	<p>For the project it is necessary to get an information form this meeting on the soil erosion locations in the village area, as well as background information on the related issues.</p>
<p><u>21.Water conditions in the village? Water resource and wells.</u></p> <ul style="list-style-type: none"> - What is the main water source in the village? - Who is the owner of water source and water supply system? - Number of wells - Water shortages (past/present) - Water distribution network/Sewage/Atmospheric water network - Existence of storm water channels 	
<p><u>22.Forest and land use history surrounding the village</u></p> <ul style="list-style-type: none"> - Type of forests and type of lands 	<p>What are the types of forest and lands in the village area?</p>
<p><u>23.Illegal logging situations</u></p> <ul style="list-style-type: none"> - Purpose of illegal logging (commercial/private/other) - Frequency of illegal logging (year round/seasonal) - By villagers or non-villagers - Types of trees subjected to illegal logging 	<p>Issues on illegal logging are sensitive in most of the cases and not always background information is provided. So, the team members should be careful in asking these questions and the answers provided. If no replies, then they should not insist on answers.</p>

<ul style="list-style-type: none"> - Estimation of wooden mass - What are the negative impacts of illegal logging? - Existing inspection from PE Macedonian Forests inspectors or private forests guards 	
<p>24. Disaster record surrounding village</p> <ul style="list-style-type: none"> - What are the main natural hazards in the village? - Disastrous events happened (type, when, area and population affected, human losses, damages) - Are any groups in the village more affected than the others (e.g. elderly, women, children, disabled, etc.)? - Is someone responsible for disaster risk reduction in the village? - Existence of village level assessments or emergency plans - Community level information on hazards - Type of disaster risk reduction measures and works implemented for disaster risk mitigation in the past - Ongoing or projected disaster risk reduction works for risk mitigation - Have you had any land fires (agriculture /forest land) before? When is the fire prone season? 	<p>This section is valuable for the disaster profile of the village and should present general insight from the villagers on the situations with disasters.</p> <p>Only the main hazard as per the Questionnaire should be asked. General information on the happened events in the past.</p> <p>Exposure and vulnerability of villagers is not the same, what is their perception?</p> <p>Understanding on the level of disaster responsibility.</p>

ANNEX II

**FIELD SURVEY ON SOCIO-ECONOMIC AND OTHER ISSUES
QUESTIONNAIRE**

V. HOUSEHOLD LEVEL RELATED QUESTIONS	
<u>Questions</u>	<u>Descriptions</u>
<p>1. Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female</p>	<p>General question</p>
<p>2. What is your age group?</p> <ul style="list-style-type: none"> <input type="checkbox"/> 18 - 24 <input type="checkbox"/> 25 - 35 <input type="checkbox"/> 36 – 45 <input type="checkbox"/> 46 – 55 <input type="checkbox"/> 56 – 64 <input type="checkbox"/> 65 + 	<p>General question – participation in this survey is granted to villagers beyond the age of 18.</p>
<p>3. What is your ethnic affiliation?</p> <ul style="list-style-type: none"> <input type="checkbox"/> Macedonians <input type="checkbox"/> Albanians <input type="checkbox"/> Turks <input type="checkbox"/> Bosniaks <input type="checkbox"/> Roma 	<p>General question – it should present the ethnic affiliation of the participants in the survey.</p> <p>If the respondent does not have any of the suggested ethnic affiliations, the Team Member shall write his/her ethnic affiliation under the item: Other.</p>

<input type="checkbox"/> Other _____	
4. What is your religious background? <input type="checkbox"/> Orthodox <input type="checkbox"/> Muslim <input type="checkbox"/> Catholic <input type="checkbox"/> Other _____	General question – it should present the religious background
5. What is the level of your education? <input type="checkbox"/> Elementary <input type="checkbox"/> Secondary <input type="checkbox"/> University and higher <input type="checkbox"/> Other _____	General question – it should present the educational background of the participants in the survey. <i>Elementary</i> refers to completed primary education (1-8 grades), <i>secondary</i> to completed high school/gymnasium (1-4 classes) and the <i>university and higher</i> refers to undergraduate and postgraduate studies (masters and PhD). If the respondent does not have any of the suggested educational backgrounds (e.g. less than elementary, etc.) the Team Member shall write his/her educational background under the item: <i>Other</i> .
6. What is your employment status? <input type="checkbox"/> Employed <input type="checkbox"/> Unemployed <input type="checkbox"/> Student <input type="checkbox"/> Retired	General question – it should present employment status of the respondent. <i>Employed</i> refers to all types of employments with employment contract (e.g. full-time or part-time job). <i>Unemployed</i> refers to all situations of unemployment. <i>Retired</i> refers to retirement with payment of monthly pension.
6a. If you are employed, state your sector of employment. <input type="checkbox"/> Public sector <input type="checkbox"/> Private sector <input type="checkbox"/> Farmer (agriculture) <input type="checkbox"/> Animal husbandry <input type="checkbox"/> Self-employed (e.g. artisan) <input type="checkbox"/> Other _____	General question – it should present particular employment sector where the respondent is employed. <i>Public sector</i> – government (national/local), public enterprises, etc. <i>Private sector</i> – all types of private businesses. <i>Farmer</i> – registered farmer for agriculture. <i>Animal husbandry</i> = livestock producer. <i>Self-employed</i> – any type of self-employment contracts (e.g. artisan, single owners' legal entities, etc.). Any other employment sectors should be declared as <i>Other</i> (e.g. part time emigrants, part time job not based on employment contract, etc.).
7. Do you have any side jobs? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, please state: _____	<i>Side job</i> means any “job undertaken in addition to one’s main occupation, as a supplementary source of income (e.g. if it is employed and is doing agriculture as a side job, etc.)”.
8. Type of household <input type="checkbox"/> Family household <input type="checkbox"/> Non-family household	<i>Family households</i> consist of two or more individuals who are related by birth, marriage, or adoption, although they also may include other unrelated people. <i>Non-family households</i> consist of people who live alone or who share their residence with unrelated individuals.
9. Number of household members? _____	
10. What is your household main income source? <input type="checkbox"/> Employment	Information referring from which source is the biggest income of the household. If it cannot be identified in the existing items, then the Team Member should include it

<ul style="list-style-type: none"> <input type="checkbox"/> Regular monthly income (e.g. monthly salary, pensions, social benefits) <input type="checkbox"/> Agriculture <input type="checkbox"/> Animal husbandry <input type="checkbox"/> Business <input type="checkbox"/> Artisan <input type="checkbox"/> Other _____ 	<p>within item <i>Other</i> (e.g. remittances, etc.)</p>
<p>11. Total Annual Household Income</p> <ul style="list-style-type: none"> <input type="checkbox"/> Up to 144,000 MKD <input type="checkbox"/> 144,001 MKD to 216,000 MKD <input type="checkbox"/> 216,001 MKD to 288,000 MKD <input type="checkbox"/> 288,001 MKD to 360,000 MKD <input type="checkbox"/> 360,001 MKD to 432,000 MKD <input type="checkbox"/> 432,001 MKD to 504,000 MKD <input type="checkbox"/> 504,001 MKD to 576,000 MKD <input type="checkbox"/> More than 576,001 MKD 	<p>This question refers to the total annual household income and the amount is based on the average gross salary from March 2018 (24,000 MKD). The total annual household income is combination of incomes from different sources (e.g. employment, side jobs, agriculture, etc.). The gross salary amount is multiplied with different coefficients (e.g. 0.5, 1, 1.5, 2, and 2.5).</p>
<p>12. Total Annual Household Expenditures</p> <ul style="list-style-type: none"> <input type="checkbox"/> Up to 144,000 MKD <input type="checkbox"/> 144,001 MKD to 216,000 MKD <input type="checkbox"/> 216,001 MKD to 288,000 MKD <input type="checkbox"/> 288,001 MKD to 360,000 MKD <input type="checkbox"/> 360,001 MKD to 432,000 MKD <input type="checkbox"/> 432,001 MKD to 504,000 MKD <input type="checkbox"/> 504,001 MKD to 576,000 MKD <input type="checkbox"/> More than 576,001 MKD 	<p>This question refers to the total annual household expenditures and the amount is based on the average gross salary from March 2018 (24,000 MKD). The gross salary amount is multiplied with different coefficients (e.g. 0.5, 1, 1.5, 2, and 2.5).</p>
<p>13. Types of Total Household Expenditures</p> <ul style="list-style-type: none"> <input type="checkbox"/> Consumption <input type="checkbox"/> Utilities <input type="checkbox"/> Education <input type="checkbox"/> Medical <input type="checkbox"/> Supporting activities <input type="checkbox"/> Others _____ 	<p>General types of expenditures of the household on an annual basis are presented.</p> <p><i>Consumption</i> includes all types of expenses for the necessary needs of the household (e.g. food).</p> <p><i>Utilities</i> refer to all communal infrastructure and connectivity payments (e.g. water, wastewater, electric power, phone, internet, etc.).</p> <p><i>Supporting activities</i> includes transportation and similar (e.g. essential maintenance of the household), whether <i>Others</i> refer to all not specified expenditures.</p>
<p>14. Women's roles in the household (multiple choice)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Household activities (e.g. house chores, cooking, caring for family members, etc.) <input type="checkbox"/> Agriculture <input type="checkbox"/> Animal husbandry <input type="checkbox"/> Repairs and services in the household <input type="checkbox"/> Working and contributing to household income 	<p>Women's role in the household refers to understanding of the respondents for their predominant roles. This question has multiple choice answers.</p>
<p>VI. NATURAL ENVIRONMENT RELATED QUESTIONS</p>	
<p>15. Is there any forest/wooded land</p>	<p><i>Partial</i> is answered in case if there is no complete</p>

<p>within the village area or in close proximity to the village?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partial</p>	<p>forest or wooded land within the village area or in close proximity to the village.</p>
<p>16. What is the ownership of the forest?</p> <p><input type="checkbox"/> State forest <input type="checkbox"/> Private forest <input type="checkbox"/> Other: _____</p>	<p><i>State forest</i> refers to forest on state land managed by PE Macedonian Forests, whether <i>Private forest</i> refers to forest owned by natural persons. In all other cases, e.g. if the ownership of the land is unknown, <i>Other</i> is to be used.</p>
<p>17. Forest and wood as a resource is used for following purposes:</p> <p><input type="checkbox"/> Agriculture <input type="checkbox"/> Animal husbandry <input type="checkbox"/> Civil construction activities <input type="checkbox"/> Heating, if heating go to 17a & 17b <input type="checkbox"/> Other: _____</p>	<p>Forest and wood as a resource refers to usage of the wood and forest material predominantly for one of the listed purposes. If not presented, the answer should be listed as <i>Other</i>.</p>
<p>17a. If you are using woods for heating, from where you are getting your woods:</p> <p><input type="checkbox"/> PE Macedonian Forests warehouses <input type="checkbox"/> Private companies <input type="checkbox"/> On your own <input type="checkbox"/> Other: _____</p>	<p><i>On your own</i> refers to woods collected by the villagers from different sources. If not listed to answer the item <i>Other</i>.</p>
<p>17b. If you are using woods for heating, what amount of woods you are using on an annual basis:</p> <p><input type="checkbox"/> to 3m³ <input type="checkbox"/> 4 to 6m³ <input type="checkbox"/> 7 to 9m³ <input type="checkbox"/> 10 to 12m³ <input type="checkbox"/> More than 12m³</p>	<p>This question refers to average consumption of woods for heating of the household.</p>
<p>18. What kind of trees is most usable for your households?</p> <p><input type="checkbox"/> Oak <input type="checkbox"/> Beech <input type="checkbox"/> Acacia <input type="checkbox"/> Coniferous trees <input type="checkbox"/> Fruit growing trees <input type="checkbox"/> Other: _____</p>	<p>The respondent should list the most usable tree for his/her household. If not listed, then to answer it in the item <i>Other</i>.</p>
<p>19. Should be the forest land in your village and surrounding area increased?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> I don't have opinion</p>	<p>This question refers to increase of the forest land in the village and surrounding area through afforestation measures.</p>
<p>19a. If Yes, then with what kind of trees should be forested:</p> <p><input type="checkbox"/> Oak <input type="checkbox"/> Beech</p>	<p>The respondent should list the trees that should be used in afforestation or increase of the forest land in the village and surrounding area. If not listed, then to answer it in the item <i>Other</i>.</p>

<input type="checkbox"/> Acacia <input type="checkbox"/> Coniferous trees <input type="checkbox"/> Fruit growing trees <input type="checkbox"/> Other: _____	
<p>20. What kind of benefit you are expecting from the increased forest land? (multiple choice)</p> <input type="checkbox"/> Wooden mass <input type="checkbox"/> Environmental benefits (e.g. decreased air pollution, etc.) <input type="checkbox"/> Protective function against natural hazards (e.g. erosion, torrential flooding, landslides, etc.) <input type="checkbox"/> Fruits <input type="checkbox"/> Flower nectar for honey bees <input type="checkbox"/> Other: _____	<p>The respondent should state benefits for his/her household from the increased forest land. <i>Wooden mass</i> refers to use of woods for construction, heating, etc.</p>
VII. DISASTERS RELATED QUESTIONS	
<p>21. Which natural hazards are present in your village area? (multiple choice)</p> <input type="checkbox"/> Floods (torrents) <input type="checkbox"/> Erosions <input type="checkbox"/> Wildfires <input type="checkbox"/> Landslides <input type="checkbox"/> Weather related hazards (e.g. storms, winds, hail, torrential rain, etc.) <input type="checkbox"/> Other _____	<p>The respondent should list the natural hazards that are present in the village area. If not listed, than to answer in the item Other.</p>
<p>22. Have you or your household been affected by any of these natural hazards?</p> <input type="checkbox"/> Yes <input type="checkbox"/> No <p>If Yes, please state</p>	<p>If any of the listed natural hazards have affected the respondent or his/her household, then it has to be stated briefly (e.g. year, damage).</p>
<p>23. What is needed for the residents of the village to protect themselves from natural hazards? (multiple choice – select three answers)</p> <input type="checkbox"/> Assessment of risk and hazards <input type="checkbox"/> Early warning activities <input type="checkbox"/> Mitigation measures <input type="checkbox"/> Improved communication and timely information <input type="checkbox"/> Community emergency planning exercise <input type="checkbox"/> Improved road networks <input type="checkbox"/> Other _____	<p>The respondent should state the needed activities/measures for their protection from natural hazards. <i>Assessment of risk and hazards</i> – on village/municipal/national level. <i>Early warning activities</i> for timely information (including alerting). <i>Mitigation measures</i> for disaster protection <i>Improved communication and timely information</i> sharing from relevant local and national entities (e.g. Crisis Management Center, municipality, etc.). <i>Community emergency planning exercise</i> on village level – preparation and testing of emergency plans. <i>Improved road networks</i> – local and forest roads. If not listed, than to answer in the item <i>Other</i>.</p>

<p>24. What kind of means can make it easier to obtain information on potential disasters? (multiple choice – select three answers)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Competent institutions on local level <input type="checkbox"/> Hazard maps <input type="checkbox"/> Public information; TV, Radio, Newspaper, SNS, email, Internet <input type="checkbox"/> Community education <input type="checkbox"/> Other _____ 	<p>This question refers to means or channels to obtain the necessary information on potential disasters. The respondent has multiple choice: <i>Competent institutions on local level</i> refer to municipality authorities, Crisis Management Center, PE Macedonian Forest etc. <i>Hazard maps</i> produced by relevant institutions (local/national levels) and made available to or shared with villagers. Available general <i>public information</i> through various information and communication channels/sources. Disaster risk reduction <i>education of the community</i> by relevant institutions. If not listed, than <i>Others</i>.</p>
<p>25. Which disaster risk reduction measures should be used to mitigate the negative consequences of the natural hazard in your village? (multiple choice – select three answers)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Improved communication and information from relevant authorities <input type="checkbox"/> Community based engagement for disaster risk mitigation <input type="checkbox"/> Campaigns on a volunteer basis <input type="checkbox"/> Afforestation of vulnerable areas <input type="checkbox"/> Community infrastructure disaster risk mitigation works <input type="checkbox"/> Other _____ 	<p><i>Improved communication and information from relevant authorities</i> with the community (rural community – Mesna zaednica) and the villagers. <i>Community based engagement for disaster risk mitigation</i> – various initiatives for implementation of measures. <i>Campaigns on a volunteer basis</i> by the community members and local level authorities. <i>Afforestation of vulnerable areas</i> done by municipality and PE Macedonian Forest or through project activities. <i>Community infrastructure disaster risk mitigation works</i> – community level participation in identification of the needs, planning, co-financing or even execution of works for small scale works (e.g. storm-water channels, etc.). If not listed, than <i>Others</i>.</p>
<p>26. How do you normally protect your agricultural crops/field from grazed animals? (multiple choice)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Communicate with owners of the animals and warn it, <input type="checkbox"/> Discuss it in the village meeting if it happens, <input type="checkbox"/> Making fences and hedges for protections <input type="checkbox"/> Others _____ 	<p>The respondents should answer how they normally protect their crops/fields from grazed animals. If not listed, than <i>Others</i>.</p>

ANNEX III

STATEMENT OF THE CONFIDENTIALITY FOR IMPLEMENTATION OF THE FIELD SURVEY

I, the undersigned, hereby declare that I agree to participate in a capacity as a Team Member in the Team managed by Mr. Vasko Popovski for the implementation of the **Field Survey on Socio Economic and Other Issues** within the project *“Capacity Building for Ecosystem based Disaster Risk Reduction*

through Sustainable Forest Management in Macedonia” in the village of Kodzhalija, Municipality of Radovich starting from 18 June 2018. By making this statement, I confirm that I have familiarized myself with the information available to date concerning the implementation of this survey. I further declare that I shall execute my responsibilities honestly, confidentially and fairly.

Furthermore, I agree to treat as confidential all household-specific information obtained during this survey and all related issues. I shall treat the collected information confidentially beyond the data of the survey and shall not share them with any third party. I will not make copies or record by any other means any confidential survey information unless authorized by the Team Leader. I will not interview persons that I personally know and will report any alleged violations of the survey procedures to the Team Leader. During the implementation of this survey I shall abide to any valid data and regulation for this kind of surveys.

Name	
Signed	
Date	

Annex V

**FIELD SURVEY ON SOCIO-ECONOMIC AND OTHER ISSUES
VILLAGE MEETING – MINUTES OF MEETING**

Date of the Village Meeting: 18 June 2018, 13:00 – 14:30

Location: Village of Kodzhalija, Central Shop – Center of the village

Attendance:

- Representatives of the Team for Field Survey (Vasko Popovski, Lolita Arsova, Ljupco Milkovski)
- Representative of the Project (Igor)
- Representative of the Municipality of Radovich (Marija)
- Representative of the Regional Office of the Crisis Management Center (Ekrem)
- Representative of the Rural Community of Kodzhalija (Nazmi Memedov)
- Villagers of Kodzhalija – approx. 18



Photo of some of the Village Meeting participants, the Team and representatives from the municipal institutions after the completion of the meeting

Introduction

Vasko Popovski has informed present villagers on the objective of the meeting, as well as the objective and methodology of implementation of the field research on socio-economic and other issues in the village of Kodzhalija during the course of following week. Mr. Igor from the Project greeted the villagers and briefly explained the local level intervention and project activities in Kodzhalija and the objectives to be achieved through implementation of various works.

**Characteristics and history of villages:
(including water resources, village
houses, demography)**

- History of the village
- Demographic characteristics of the

- There are no written evidences on the history of the village that the participants of the meeting could have recalled. In general, the Yuruks (Turkish sub-ethnic group) came from Anatolia, region of Konya during the XIV and XV centuries. So, the early dates of Kodzhalija could be located in XV century.

<p>village</p> <ul style="list-style-type: none"> - What is the population of the community? - As a percentage roughly, what is the breakdown of population by sex (male/female) • Number of households • Main economic activities and sources of income for villagers • Employed/unemployed (as a percentage, roughly) • Types of social infrastructure (e.g. schools, health institutions, etc.) 	<ul style="list-style-type: none"> • The population of the village as per the 2002 Census was 478 citizens. Rough estimation of the present population is 550 – 600 citizens. Villagers’ opinion is that the breakdown of population by sex (male/female) is with ratio 1:1 or 50% - 50%. The population of the village is increasing after 2012 since the immigration in Turkey has decreased due to the limitation of the Turkish Government not to allow second citizenship alongside with Turkish citizenship, as well as the subsidized national Government programme for increasing of demography through providing subsidies for third or more children. In general, their consideration is that the population of the village is relatively young. Each family is with four or more members. Average is to have three children in a family. • There are 135 households in the village. • Main economic activities and sources for income of villagers is agriculture/tobacco (more than 90% of the households) and animal husbandry (8 households out of which 5 are in sheep breeding and 3 in cow breeding businesses). Sheep breeders have more than 150 sheep up to 300. Cow breeders sell their veal. There are also few private sector businesses (e.g. three grocery stores, transportation company), as well as 5 families of bee keepers. However, the existence of the villagers I heavy relying on the tobacco crop production. • Most of the villagers are unemployed with usually one member of the households registered as a farmer – tobacco producer for the purposes of participation in the Government subsidies programme. There is no organized employment in the industrial capacities in the neighboring cities (e.g. Radovish and Shtip) or in the Buchim Mine. In the past there were examples of employment in Johnson Control factory in the Shtip Industrial Zone. • Social infrastructure in the village is very limited. Namely there is one elementary school (I – V grades) for the territories of the villages Kodzhalija and Ali Koch with 115 school children (70 children from Kodzhalija and 45 from Ali Koch). No health institution in the village – closest is in the Ali Koch (1 medical doctor/1 medical supporting staff/limited working hours). Veterinary ambulance is in Radovish and the emergency veterinary services are provided on request. Street coverage of the village is 50% of the territory with only the main road from Radovish being with asphalt pavement layer. There is functional street lighting system. Water supply system is operated and maintained by the PE Plavaja from Radovish. Sewage network is very partially established through part of
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	<p>the village without being operational.</p> <ul style="list-style-type: none"> • There is no organized collection of solid waste and therefore it is dumped on illegal sites around the village. • The village does not have any urban planning documentations/plans. Most of the houses and buildings are illegal buildings without civil construction permit. The process of preparation of first detailed urban plan for the village is ongoing.
<p><u>Main products in terms of the quantity and the monetary value.</u></p> <ul style="list-style-type: none"> - What are the main products from the village? - Approx. quantity of production - Approx. monetary value of products 	<ul style="list-style-type: none"> • Main product is tobacco (Prilep type) and the average annual quantity of production on a level of the village is 200 t. In monetary terms it is equal to 800,000 EUR (estimation is made on the last year average price of 1 t of tobacco = 4 EUR). • For the animal husbandry production there are not quantified and monetary estimation.
<p><u>Usage situation of forest at village</u></p> <ul style="list-style-type: none"> - Is there a forest near the village? - Ownership of forests - Resources from forest - Types of trees - Any afforestation activities? Incidental/regular? - Should the forest area be increased? (trees/benefits) 	<ul style="list-style-type: none"> • There is a forest in the village area called Marush and the 70% of the forest is on state owned land under the competences of PE Macedonian Forests. Only 30% of the forest is owned privately by some of the villagers or by the Mosque. • Villagers are using wood as resources from the forest for agriculture, animal husbandry (branches and shrubs for goats breeding), construction activities, and heating purposes. Some of the villagers are collecting mushrooms and forest berries, but not in an organized way. • Main type of tree is oak, followed by beech. In the past there were areas with acacia. • There were no organized or incidental activities for afforestation of the land. Most of the participants at the village meeting stated their opinion that there should be regular activities for afforestation of land, but there is a small group of villagers that think that these afforestation activities could jeopardize the extension of the agricultural land for tobacco production. Joint agreement is that the animal husbandry producers are main opposition for the afforestation activities, because they think that this can result in decrease of the available grazing land. • However, the group stated that there are benefits from forest (e.g. more wooden mass, better environment, protection of the dust from the Buchim mine landfill).
<p><u>Traditional collaborative work, customs, practices</u></p> <ul style="list-style-type: none"> - Any types of traditional collaborative work in the village? - Specific customs and practices - Role of women in the 	<ul style="list-style-type: none"> • Agriculture is collaborative work for all family members. Also, the neighbors and other villagers can help families e.g. with mechanization, works etc. • There is a folklore group and futsal club. They are planning to open a cultural and art society for preservation of the Yuruks tradition and culture. • Village holidays are Ramadan Bayram and Herdelezi

<p>community/contribution to DRR</p>	<p>(06 May).</p> <ul style="list-style-type: none"> • Women are mostly seen in their role to support the families, look for other members of the families, responsible persons for all household chores, as well as equal labor force for agriculture works for tobacco crop production. Their life in the community is still very traditional and they predominantly stay at home doing household chores, almost without any contact with other persons.
<p><u>Ownership situations of agricultural land and pasture (including forest grazing)</u></p> <ul style="list-style-type: none"> - Ownership of the forests and land in the area of the village 	<ul style="list-style-type: none"> • As stated above 70% of the ownership of the forest is state owned and 30% is privately owned. Most of the agricultural land surrounding the village is privately owned. During the recent years more than 15 families bought or leased agricultural land in Radovish area, downstream Radovishka River of expansion of the tobacco crop production. Forest grazing is similar to forests and it is mostly state owned.
<p><u>Main agriculture practices and annual schedule of the work (Including bee keeping and main flower sources of the bee keeping,)</u></p> <ul style="list-style-type: none"> - What are the main agricultural crops - Agricultural seasons (annual calendars of the main agricultural crops/animal husbandry/activities) - Record of harvest - What are the main agriculture practices? Any sustainable practices? For example, how to protect agricultural crop/forests from domestic animals such as fences, hedges, patrolling, protection of forest fires. - In the village, is there any hedge grow to protect crops/trees from animals? If so, what kind of trees are used (thorn trees, shrub)? - How do you normally protect your agricultural crops from the animals? - Agriculture is male, female or joint work? 	<ul style="list-style-type: none"> • Main agricultural crop is tobacco. Other crops are only being planted for household needs (e.g. potato, corn, wheat, fruits). Same is the situation with animal husbandry – sheep and cow are bred for selling, whether the other animals (e.g. poultry, goats) are for individual needs. • Agricultural season is also related to tobacco within the period May – October. Animal husbandry is year round activity. • As stated average harvest of tobacco is 200 t annually depending on the year and its weather characteristics (e.g. humid with rain, dry, etc.) • Main agricultural practices are again related to tobacco and mainly are semi-automatic. There is no understanding of sustainable practices for agricultural production. However, there are new practices in tobacco crop production with enqueuer of tobacco leaves; seedling and packing of leaves are being done with machines. Turkish Development Agency – TICA has supported the villagers with provision of several items of agricultural mechanization and supporting items (e.g. nylon folio). • Not all the villagers are protecting the crop from domestic animals and when it is a case it is being done with hedges. No organized protection of forest fires, since there is no forest fires during the recent years and the fact that the surrounding area of the village is without forest. For protection of trees (e.g. walnuts, fruits) thorn trees, shrubs and wooden sticks from oak are being used. • Tobacco crop production is traditional agricultural practice and almost in all of the cases is family type of business, where all members of the family are actively contributing to all of the phases of tobacco production.

<p><u>Outline of existing residents organization</u></p> <ul style="list-style-type: none"> - What is the existing residents' organization of the village? - Existence of so called Mesna zaednica (Rural Community) - Is there any member from the village in the municipal councils or bodies? 	<ul style="list-style-type: none"> • The existing residents organization is in line with the usual residents organization in the country with the Rural Community (Mesna Zaednica) being established. Recently they have elected new Council of the Rural Community with 6 members and one President of the Rural Community. It is the main village body/entity with which the Municipality of Radovich is communicating regarding the all necessary issues. • There is a practice in the village to hold joint village meetings where interested villagers are participating and important issues are being discussed and decisions are made (e.g. last year there were regular meetings related to the water shortages situation).
<p><u>Any locations where soil erosion is severe and problematic in the village</u></p> <ul style="list-style-type: none"> - Record of soil erosion events including area and population affected and damages - Identification of severe erosion locations and area and population affected - Any measures implemented or planned to be implement - Have you had any problems of soil erosion caused by domestic animals (trails and heel erosion)? 	<ul style="list-style-type: none"> • There is a record of erosion events near the place called Inik. However, there is no record of population or households affected. Around the village small erosions of land or agricultural land are visible, especially after torrential rains. • Their observations are that the numbers of erosion events are increasing during the years and the land is sliding more frequently towards the village river. • No houses or population are directly affected by erosion events. • Near the dam, close to the village of Topolnica, there was an event of erosion due to the animals and two cows have slid in the river drowning them. • No measures have been implemented or are planned to be implemented to prevent erosions.
<p><u>Water conditions in the village?</u> <u>Water resource and wells.</u></p> <ul style="list-style-type: none"> - What is the main water source in the village? - Who is the owner of water source and water supply system? - Number of wells - Water shortages (past/present) - Water distribution network/Sewage/Atmospheric water network - Existence of storm water channels 	<ul style="list-style-type: none"> • In the village there is organized water supply system owned and operated by the municipal PE Plavaja – Radovich. Every house except the newly constructed has water meters installed (they will get water meters during this summer). Water consumption is paid on a regular, monthly basis. • Main water sources are from the Plachkovica Mountain and they are collected and through the filter station and the reservoir on the top of the village are distributed throughout the village. The water is treated with chlorine and controlled by the Public Health Institute – regional center from Shtip. • Households don't have individual wells and there are four wells around the village. • Last year there was a situation with shortage of water, but this year until now situation is good. • Also, there were several cases of poisoning with water, since the water is not with same quality all the time (e.g. smell). • There is no atmospheric water collection network. Sewage network is partially constructed and it is not connected as a system. Households don't have septic pits and the waste water is discharged freely in three

	directions around the village.
<p><u>Forest and land use history surrounding the village</u></p> <ul style="list-style-type: none"> - Type of forests and type of lands 	<ul style="list-style-type: none"> • Main type of forest is oak. In the past there were forests with Acacia. • Lands around the village are agricultural land.
<p><u>Illegal logging situations</u></p> <ul style="list-style-type: none"> - Purpose of illegal logging (commercial/private/other) - Frequency of illegal logging (year round/seasonal) - By villagers or non-villagers - Types of trees subjected to illegal logging - Estimation of wooden mass - What are the negative impacts of illegal logging? - Existing inspection from PE Macedonian Forests inspectors or private forests guards 	<ul style="list-style-type: none"> • There is no organized logging in the forest close to the village. All logging is illegal and is being done mostly by the people outside the village/non-villagers. There is limited number of local illegal loggers. However, most of the villagers are getting their wood for heating from illegal logging. • Main purpose for illegal logging is commercial and is being done very frequently around the year with spring to fall at most. • Main tree subjected to illegal logging is the Oak. • No estimation of wooden mass being illegally logged. • Negative impacts of illegal logging are significant decrease of the forest territory, erosion, loss of greenery. • There are guards from PE Macedonian Forests, but not very frequent patrols. No organized actions for prevention of illegal logging being done by Ministry of Interior and PE Macedonian Forests.
<p><u>Disaster record surrounding village</u></p> <ul style="list-style-type: none"> - What are the main natural hazards in the village? - Disastrous events happened (type, when, area and population affected, human losses, damages) - Are any groups in the village more affected than the others (e.g. elderly, women, children, disabled, etc.)? - Is someone responsible for disaster risk reduction in the village? - Existence of village level assessments or emergency plans - Community level information on hazards - Type of disaster risk reduction measures and works implemented for disaster risk mitigation in the past - Ongoing or projected disaster risk reduction works for risk mitigation - Have you had any land fires (agriculture /forest land) before? When is the fire prone season? 	<ul style="list-style-type: none"> • The main natural hazards are weather related hazards (torrential flood, drought, hail, thunderstorm, earthquake, snowfalls). Area of their village is not directly exposed to wild fires. • No major disastrous events happened. There were several cases of death of villagers from thunders. Five years ago there were major damages on the tobacco crops due to hail and storms. • Even though the houses and buildings are illegal and without construction permit or built based on the urban plan, the villagers are considering some civil construction essentials in order to mitigate the risk (e.g. distance between houses, etc.). • The vulnerable categories of villagers are more vulnerable to disasters, but the exposure depends on the location of the houses and the built environment. • No one is responsible for disaster risk reduction in the village. In general there is absence of disaster risk reduction notion and its mainstreaming in everyday life. • No assessments or emergency plans. • Community level information on hazards is shared orally amongst the villagers or through mobile phones. In certain cases they are organizing village meetings (e.g. last year water shortage situation). • In the elementary school building they have emergency plans. • As villagers they don't know what to do and how to

	<p>protect themselves in the event of disasters.</p> <ul style="list-style-type: none">• Wild fires are not typical for their region. Main areas prone to wild fires are located in the Shtip area. Only the area called Krusha has a wild fire couple of years ago.
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At 14:30 the meeting was adjourned.

Prepared by Lolita Arsova and Vasko Popovski, M.A.

Annex VI – Household Survey – MS Excel Spreadsheets

Data entry list for Question:				
1. Gender				
Questionnaire number	Question	Answer		
1	1. Gender	Male	Female	
1		1		
2		1		
3		1		
4		1		
5		1		
6		1		
7		1		
8		1		
9		1		
10		1		
11		1		
12		1		
13		1		
14		1		
15		1		
16		1		
17		1		
18		1		
19		1		
20		1		
21		1		
22		1		
23		1		
24		1		
25		1		
26		1		
27		1		
28			1	
29			1	
30		1		
31		1		
32		1		
33		1		
34			1	
35		1		
36			1	
37		1		
38		1		
39			1	
40		1		
41		1		
42/1		1		
43		1		
44			1	
45			1	
46			1	
47			1	
48			1	
49			1	
50			1	
Total		38	12	50

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Data entry list for Question:								
2. What is your age group?								
Questionnaire number	Question	Answer						
2	2. What is your age group?	18 - 24	25 - 35	36 - 45	46 - 55	56 - 64	65 +	
1					1			
2		1						
3			1					
4			1					
5				1				
6				1				
7					1			
8		1						
9					1			
10				1				
11			1					
12		1						
13			1					
14		1						
15				1				
16			1					
17				1				
18			1					
19					1			
20					1			
21		1						
22			1					
23			1					
24					1			
25			1					
26					1			
27					1			
28				1				
29		1						
30							1	
31			1					
32					1			
33			1					
34			1					
35			1					
36				1				
37					1			
38							1	
39				1				
40					1			
41				1				
42/1				1				
43			1					
44				1				
45		1						
46				1				
47				1				
48		1						
49			1					
50			1					
Total		8	16	13	11	0	2	50

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Data entry list for Question: 3. What is your ethnic affiliation?								
Questionnaire number	Question	Answer						
3	3. What is your ethnic affiliation?	Macedonians	Albanians	Turks	Bosniaks	Roma	Other	
1				1				
2				1				
3				1				
4				1				
5				1				
6				1				
7				1				
8				1				
9				1				
10				1				
11				1				
12				1				
13				1				
14				1				
15				1				
16				1				
17				1				
18				1				
19				1				
20				1				
21				1				
22				1				
23				1				
24				1				
25				1				
26				1				
27				1				
28				1				
29				1				
30				1				
31				1				
32				1				
33				1				
34				1				
35				1				
36				1				
37				1				
38				1				
39				1				
40				1				
41				1				
42/1				1				
43				1				
44				1				
45				1				
46				1				
47				1				
48				1				
49				1				
50				1				
Total		0	0	50	0	0	0	50

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Data entry list for Question:						
4. What is your religious background?						
Questionnaire number	Question	Answer				
4	4. What is your religious background?	Orthodox	Muslim	Catholic	Other	
1			1			
2			1			
3			1			
4			1			
5			1			
6			1			
7			1			
8			1			
9			1			
10			1			
11			1			
12			1			
13			1			
14			1			
15			1			
16			1			
17			1			
18			1			
19			1			
20			1			
21			1			
22			1			
23			1			
24			1			
25			1			
26			1			
27			1			
28			1			
29			1			
30			1			
31			1			
32			1			
33			1			
34			1			
35			1			
36			1			
37			1			
38			1			
39			1			
40			1			
41			1			
42/1			1			
43			1			
44			1			
45			1			
46			1			
47			1			
48			1			
49			1			
50			1			
Total		0	50	0	0	50

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Data entry list for Question:						
5. What is the level of your education?						
Questionnaire number	Question	Answer				
5	5. What is the level of your education?	Elementary	Secondary	University and higher	Other	Remark
1		1				
2		1				
3				1		
4			1			
5			1			
6					1	4th grade
7					1	4th grade
8					1	4th grade
9					1	4th grade
10					1	4th grade
11				1		
12			1			
13			1			
14					1	4th grade
15					1	4th grade
16					1	4th grade
17					1	4th grade
18			1			
19					1	4th grade
20					1	4th grade
21					1	4th grade
22				1		
23				1		
24					1	4th grade
25				1		
26					1	4th grade
27					1	4th grade
28					1	4th grade
29		1				
30					1	4th grade
31		1				
32					1	4th grade
33		1				
34					1	4th grade
35		1				
36					1	4th grade
37					1	4th grade
38					1	4th grade
39					1	4th grade
40					1	4th grade
41					1	4th grade
42/1					1	4th grade
43		1				
44					1	None
45					1	4th grade
46					1	4th grade
47					1	4th grade
48					1	4th grade
49					1	4th grade
50				1		
Total		7	5	6	32	50

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Data entry list for Question:							
6. What is your employment status?							
Questionnaire number	Question	Answer					
6	6. What is your employment status?	Employed	Unemployed	Student	Retired	No answer	
1			1				
2			1				
3		1					
4		1					
5			1				
6		1					
7			1				
8		1					
9		1					
10		1					
11		1					
12			1				
13		1					
14			1				
15			1				
16			1				
17			1				
18			1				
19			1				
20		1					
21			1				
22		1					
23			1				
24			1				
25		1					
26		1					
27		1					
28			1				
29						1	
30					1		
31						1	
32						1	
33			1				
34			1				
35			1				
36			1				
37			1				
38			1				
39			1				
40		1					
41			1				
42/1						1	
43						1	
44						1	
45						1	
46						1	
47			1				
48						1	
49						1	
50		1					
Total		15	24	0	1	10	50

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Data entry list for Question:							
6a. If you are employed, state your sector of employment.							
Questionnaire number	Question	Answer					
6a	6a. If you are employed, state your sector of employment.	Public sector	Private sector	Farmer (agriculture)	Animal husbandry	Self-employed (e.g. artisan)	Other
1							
2							
3			1				
4			1				
5							
6			1		1		
7							
8				1	1		
9				1			
10				1			
11		1					
12							
13		1					
14							
15							
16							
17							
18							
19							
20				1			
21							
22		1					
23							
24							
25		1					
26			1				
27			1	1			
28							
29							
30			1				
31							
32							
33							
34							
35							
36							
37							
38							
39							
40				1			
41							
42/1							
43							
44							
45							
46							
47							
48							
49							
50		1					
Total		5	6	6	2	0	0

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Data entry list for Question:					
7. Do you have any side jobs?					
Questionnaire number	Question	Answer			
7	7. Do you have any side jobs?	Yes	No	No answer	If Yes, please state:
1		1			tobacco
2		1			tobacco
3		1			fruit growing
4		1			agriculture and animal husbandry
5		1			tobacco and animal husbandry
6		1			agriculture
7		1			tobacco
8			1		
9			1		
10			1		
11		1			private shop
12			1		
13		1			agriculture/tobacco
14		1			animal husbandry
15		1			tobacco
16		1			agriculture/tobacco
17		1			agriculture/tobacco
18		1			agriculture/tobacco
19		1			agriculture/tobacco
20				1	
21		1			wood transport
22		1			agriculture/tobacco
23		1			agriculture/tobacco
24		1			agriculture/tobacco
25		1			agriculture/tobacco
26		1			agriculture/tobacco
27		1			agriculture
28		1			agriculture
29		1			agriculture
30			1		
31		1			agriculture
32		1			agriculture
33		1			agriculture
34				1	No answer
35			1		
36			1		
37			1		
38		1			agriculture
39		1			agriculture
40			1		
41		1			agriculture
42/1		1			N/A
43		1			wood transport
44		1			agriculture
45		1			agriculture
46		1			agriculture
47		1			agriculture
48		1			agriculture
49		1			agriculture
50		1			agriculture
Total		39	9	2	

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Data entry list for Question:				
8. Type of household				
Questionnaire number	Question	Answer		
		Family household	Non-family household	
8	8. Type of household			9. Number of household members?
1		1		4
2		1		6
3		1		4
4		1		8
5		1		8
6		1		7
7		1		3
8		1		3
9		1		7
10		1		6
11		1		3
12		1		5
13		1		5
14		1		8
15		1		7
16		1		3
17		1		5
18		1		5
19		1		4
20		1		2
21		1		6
22		1		7
23		1		3
24		1		2
25		1		5
26		1		6
27		1		5
28		1		4
29		1		8
30		1		7
31		1		5
32		1		4
33		1		5
34		1		7
35		1		6
36		1		5
37		1		2
38		1		6
39		1		7
40		1		9
41		1		4
42/1		1		5
43		1		6
44		1		3
45		1		3
46		1		5
47		1		5
48		1		9
49		1		5
50		1		5
Total		50	0	50
				262

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Data entry list for Question:									
10. What is your household main income source?									
Questionnaire number	Question	Answer							
10	10. What is your household main income source?	Employment	Regular monthly income (e.g. monthly salary, pensions, social)	Agriculture	Animal husbandry	Business	Artisan	Other	
1				1					
2				1					
3		1							
4					1				
5				1					
6				1					
7				1					
8				1					
9				1					Tobacco
10				1					Tobacco
11		1							
12				1					Tobacco
13		1							
14				1					Tobacco
15				1					Tobacco
16				1					Tobacco
17				1					Tobacco
18				1					Tobacco
19				1					Tobacco
20				1					Tobacco
21								1	Transport of woods
22		1							
23				1					Tobacco
24				1					Tobacco
25		1							
26				1					
27			1						
28				1					
29				1					
30			1						
31				1					
32				1					
33				1					
34				1					
35				1					
36				1					
37				1					
38				1					
39				1					
40				1					
41				1					
42/1				1					Animal husbandry
43								1	Timber collection
44				1					
45			1						Agriculture
46				1					
47				1					
48			1						
49				1					
50			1						Agriculture
Total		5	5	37	1	0	0	2	50

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Data entry list for Question:									
11. Total Annual Household Income									
Questionnaire number	Question	Answer							
11	11. Total Annual Household Income	Up to 144,000 Mkd	144,001 to 216,000 Mkd	216,001 to 288,000 Mkd	288,001 to 360,000 Mkd	360,001 to 432,000 Mkd	432,001 to 504,000 Mkd	504,001 to 576,000 Mkd	More than 576,001 Mkd
1		1							
2				1					
3			1						
4							1		
5				1					
6			1						
7		1							
8				1					
9		1							
10			1						
11						1			
12							1		
13				1					
14			1						
15				1					
16			1						
17			1						
18				1					
19					1				
20		1							
21		1							
22				1					
23			1						
24			1						
25				1					
26					1				
27						1			
28							1		
29							1		
30				1					
31				1					
32				1					
33				1					
34				1					
35							1		
36				1					
37		1							
38				1					
39							1		
40									1
41				1					
42/1									1
43				1					
44			1						
45				1					
46							1		
47									1
48									1
49				1					
50				1					
Total		6	9	20	2	2	7	0	4

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Data entry list for Question:

12. Total Annual Household Expenditures

Questionnaire number	Question	Answer								
		Up to 144,000 Mkd	144,001 to 216,000 Mkd	216,001 to 288,000 Mkd	288,001 to 360,000 Mkd	360,001 to 432,000 Mkd	432,001 to 504,000 Mkd	504,001 to 576,000 Mkd	More than 576,001 Mkd	
1		1								
2			1							
3			1							
4				1						
5				1						
6			1							
7		1								
8			1							
9			1							
10			1							
11					1					
12				1						
13			1							
14			1							
15				1						
16				1						
17			1							
18				1						
19				1						
20		1								
21		1								
22			1							
23			1							
24			1							
25			1							
26					1					
27						1				
28							1			
29							1			
30				1						
31				1						
32				1						
33				1						
34				1						
35							1			
36				1						
37		1								
38				1						
39							1			
40									1	
41				1						
42/1									1	
43				1						
44			1							
45				1						
46							1			
47									1	
48									1	
49				1						
50				1						
Total		5	14	19	2	1	5	0	4	50

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Data entry list for Question:									
13. Types of Total Household Expenditures									
Questionnaire number	Question	Answer							
13	13. Types of Total Household Expenditures	Consumption	Utilities	Education	Medical	Supporting activities	Others		Description of other costs
1		1	1		1		1		Fuel and maintenance of agricultural machinery
2		1	1		1	1			
3		1	1		1	1			
4		1	1	1	1	1	1		
5		1	1	1	1	1			
6		1	1	1	1	1			
7		1	1		1	1			
8		1	1		1	1			
9		1	1	1	1	1			
10		1	1	1	1	1			
11		1	1		1				
12		1	1		1	1			
13		1	1	1	1	1			
14		1	1	1	1	1			
15		1	1	1	1	1			
16		1	1		1	1			
17		1	1	1	1	1			
18		1	1	1	1	1			
19		1	1	1	1	1			
20		1	1		1	1			
21		1	1		1				
22		1	1		1	1			
23		1	1	1	1	1			
24		1	1		1	1			
25		1	1	1	1	1			
26		1	1		1	1			
27		1	1			1			
28		1	1						
29		1	1						
30		1	1						
31		1	1		1				
32		1	1						
33		1	1						
34		1	1						
35		1	1						
36		1	1						
37		1	1						
38		1	1		1				
39		1	1						
40		1	1						
41		1	1		1				
42/1		1	1						
43		1	1		1				
44		1	1	1					
45		1	1		1				
46		1	1	1	1				
47		1	1	1					
48		1	1	1					
49		1	1	1	1				
50		1	1	1					
Total		50	50	19	33	24	2	178	

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Data entry list for Question:						
14. Women's roles in the household (multiple choice)						
Questionnaire number	Question	Answer				
14	14. Women's roles in the household (multiple choice)	Household activities (e.g. house chores, cooking, etc.)	Agriculture	Animal husbandry	Repairs and services in the household	Working and contributing to household income
1		1	1			1
2		1	1			
3		1				
4		1	1	1		1
5		1	1	1		1
6		1	1	1		
7		1				1
8		1	1			1
9		1	1			
10		1	1			1
11		1				
12		1	1			1
13		1	1			1
14		1	1			1
15		1	1			1
16		1	1			1
17		1	1			1
18		1	1			1
19		1	1			1
20		1	1			1
21		1	1			1
22		1	1			1
23		1	1			1
24		1	1			1
25		1	1			1
26		1	1			1
27		1	1			
28		1	1			
29		1	1			
30		1	1			
31		1	1			
32		1	1			
33		1	1			
34		1	1			
35		1	1			
36		1	1			
37		1	1			
38		1	1			
39		1	1			
40		1	1			
41		1	1			
42/1		1	1	1		
43		1	1			1
44		1	1			
45		1	1			
46		1	1	1		
47		1	1			
48		1	1			
49		1	1			
50		1	1			1
Total		50	47	5	0	23

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Data entry list for Question:				
15. Is there any forest/wooded land within the village area or in close proximity to the village?				
Questionnaire number	Question	Answer		
15	15. Is there any forest/wooded land within the village area or in close proximity to the village?	Yes	No	Partial
1		1		
2		1		
3		1		
4		1		
5		1		
6		1		
7		1		
8		1		
9		1		
10		1		
11		1		
12		1		
13		1		
14			1	
15		1		
16		1		
17		1		
18		1		
19		1		
20		1		
21		1		
22		1		
23		1		
24		1		
25		1		
26		1		
27				1
28			1	
29				1
30			1	
31		1		
32		1		
33				1
34				1
35				1
36				1
37				1
38			1	
39			1	
40			1	
41			1	
42/1			1	
43			1	
44				1
45			1	
46			1	
47		1		
48		1		
49		1		
50		1		
Total		31	11	8

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Data entry list for Question:					
16. What is the ownership of the forest?					
Questionnaire number	Question	Answer			Comment
		State forest	Private forest	Other	
16	16. What is the ownership of the forest?				
1		1	1		
2		1	1		
3		1	1		
4		1	1		
5		1	1		
6		1	1		
7		1	1		
8		1	1		
9		1	1		
10		1	1		
11		1	1		
12		1	1		
13		1	1		
14		1	1		
15		1	1		
16		1	1		
17		1	1		
18		1	1		
19		1	1		
20		1	1		
21		1	1		
22		1	1		
23		1	1		
24		1	1		
25		1	1		
26		1			
27		1			
28		1			
29		1			
30		1			
31		1			
32		1			
33		1		1	Private 30%
34		1		1	Private 30%
35		1			
36		1			
37		1			
38		1			
39		1			
40		1			
41		1			
42/1		1			
43		1			
44		1			
45		1			
46		1			
47		1			
48		1			
49		1			
50		1			
Total		50	25	2	77

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Data entry list for Question:						
17. Forest and wood as a resource is used for following purposes:						
Questionnaire number	Question	Answer				
		Agriculture	Animal husbandry	Civil construction activities	Heating, (if heating go to 17a & 17b)	Other
17	17. Forest and wood as a resource is used for following purposes:					
1		1	1	1	1	
2		1	1	1	1	
3		1	1	1	1	
4			1	1	1	
5		1	1	1	1	
6		1	1		1	
7		1		1	1	
8		1	1		1	
9		1		1	1	
10		1			1	
11				1	1	
12		1			1	
13		1			1	
14		1	1		1	
15		1	1		1	
16		1	1		1	
17		1	1		1	
18		1	1		1	
19		1	1		1	
20		1	1		1	
21		1	1		1	
22		1	1	1	1	
23		1	1	1	1	
24		1	1		1	
25		1	1	1	1	
26		1		1	1	
27					1	
28					1	
29					1	
30		1			1	
31		1			1	
32		1			1	
33					1	
34					1	
35					1	
36					1	
37					1	
38					1	
39					1	
40					1	
41					1	
42/1					1	
43					1	
44					1	
45					1	
46		1			1	
47		1			1	
48		1	1		1	
49		1			1	
50		1			1	
Total		32	20	12	50	0

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17a	17a. If you are using woods for heating, from where you are getting your woods?	PEMF Forests warehouses	Private companies	On your own	Other
1				1	
2				1	
3				1	
4				1	
5				1	
6				1	
7				1	
8				1	
9				1	
10				1	
11				1	
12				1	
13				1	
14				1	
15			1		
16				1	
17				1	
18				1	
19				1	
20				1	
21				1	
22				1	
23				1	
24				1	
25				1	
26			1		
27		1			
28				1	
29				1	
30				1	
31				1	
32				1	
33				1	
34				1	
35				1	
36		1			
37				1	
38				1	
39				1	
40		1			
41			1		
42/1			1		
43				1	
44			1		
45				1	
46		1			
47				1	
48				1	
49				1	
50				1	
Total		4	5	41	0

50

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Field Survey on Socio-Economic and Other Issues

Data entry list for Question:						
17b. If you are using woods for heating, what amount of woods you are using on an annual basis:						
Questionnaire number	Question	Answer				
17b	17b. If you are using woods for heating, what amount of woods you are using on an annual basis:	to 3m ³	4 to 6m ³	7 to 9m ³	10 to 12m ³	More than 12m ³
1			1			
2					1	
3				1		
4						1
5					1	
6					1	
7					1	
8					1	
9					1	
10				1		
11				1		
12					1	
13					1	
14					1	
15						1
16			1			
17					1	
18						1
19					1	
20					1	
21						1
22				1		
23		1				
24				1		
25						1
26						1
27						1
28					1	
29					1	
30				1		
31					1	
32						1
33					1	
34						1
35						1
36					1	
37					1	
38						1
39						1
40						1
41					1	
42/1						1
43						1
44					1	
45						1
46						1
47						1
48						1
49						1
50				1		
Total		1	2	7	20	20

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Data entry list for Question:									
18. What kind of trees are most usable for your households?									
Questionnaire number	Question	Answer							
18	18. What kind of trees are most usable for your households?	Oak	Beech	Acacia	Coniferous trees	Fruit growing trees	Other		
1		1							
2		1							
3		1	1						
4		1	1				1	Gaber	Hornbeam
5		1							
6		1							
7		1							
8		1							
9		1	1			1			
10		1	1						
11		1							
12		1	1						
13		1	1						
14		1	1				1	Gaber	Hornbeam
15		1	1						
16		1	1			1			
17		1	1				1	Gaber	Hornbeam
18		1	1			1	1	Orev	Walnut
19		1				1	1	Orev	Walnut
20		1	1			1			
21		1							
22		1	1			1	1	Orev	Walnuts
23		1	1				1	Gaber	Hornbeam
24		1	1				1	Orev	Walnut
25		1	1			1	1		
26		1							
27		1							
28		1							
29		1							
30		1							
31		1	1						
32		1							
33		1							
34		1							
35		1							
36		1							
37		1					1	Sliva	Plum
38		1							
39		1							
40		1							
41		1							
42/1		1							
43		1							
44		1							
45		1							
46		1							
47		1							
48		1							
49		1							
50		1							
Total		50	17	0	0	7	10	84	

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Data entry list for Question:				
19. Should be the forest land in your village and surrounding area increased?				
Questionnaire number	Question	Answer		
		Yes	No	I don't have opinion
19	19. Should be the forest land in your village and surrounding area increased?			
1		1		
2		1		
3		1		
4		1		
5		1		
6		1		
7		1		
8		1		
9		1		
10		1		
11		1		
12		1		
13		1		
14		1		
15		1		
16			1	
17		1		
18		1		
19		1		
20				1
21		1		
22		1		
23		1		
24		1		
25		1		
26		1		
27		1		
28		1		
29		1		
30			1	
31		1		
32			1	
33		1		
34		1		
35		1		
36		1		
37		1		
38		1		
39			1	
40		1		
41			1	
42/1				1
43		1		
44		1		
45		1		
46		1		
47		1		
48		1		
49		1		
50		1		
Total		43	5	2

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Data entry list for Question:										
19a. If Yes, then with what kind of trees should be forested:										
Questionnaire number	Question	Answer								
19a	19a. If Yes, then with what kind of trees should be forested:	Oak	Beech	Acacia	Coniferous trees	Fruit growing trees	Other			
1							1			
2		1						no opinion		
3		1		1						
4		1		1						
5		1	1	1						
6		1			1		1	orevi	Walnuts	
7		1	1	1	1	1	1	gaber	Hornbeam	
8		1		1	1		1	gaber	Hornbeam	
9		1	1	1	1	1				
10		1	1	1	1	1				
11		1	1	1		1				
12		1	1	1		1				
13		1	1	1	1	1				
14		1	1	1	1	1				
15		1	1	1	1	1				
16										
17		1	1	1	1	1				
18		1	1	1	1	1				
19		1	1	1	1	1				
20										
21		1	1	1	1	1				
22		1	1	1	1	1				
23		1	1	1	1	1				
24		1	1	1	1	1				
25		1	1	1	1	1				
26							1	any tree		
27				1			1	jasen	Ash	
28		1								
29				1						
30										
31		1			1					
32										
33				1			1	bor	Pine	
34					1					
35				1						
36					1					
37				1	1					
38		1	1	1						
39										
40		1					1	jasen	ash	
41										
42/1										
43		1	1							
44		1					1	orev	Walnut	
45					1					
46		1		1	1		1	orev	Walnut	
47		1		1	1					
48		1		1						
49		1		1	1	1				
50					1					
Total		32	19	30	25	17	10	133		

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Data entry list for Question:							
20. What kind of benefit you are expecting from the increased forest land? (multiple choice)							
Questionnaire number	Question	Answer					
		Wooden mass	Environmental benefits (e.g. decreased air pollution, etc.)	Protective function against natural hazards (e.g. erosion, torrential flooding, landslides, etc.)	Fruits	Flower nectar for honey bees	Other
1		1					
2			1	1	1	1	
3			1	1			
4		1	1	1		1	
5		1	1	1		1	
6		1	1	1	1	1	
7		1	1	1	1		
8		1	1	1		1	
9		1	1	1	1	1	
10		1	1	1	1	1	
11		1	1	1	1	1	
12		1	1	1	1		
13		1	1	1	1	1	
14		1	1	1	1	1	
15		1	1	1	1	1	
16							
17		1	1	1	1	1	
18		1	1	1	1	1	
19		1	1	1	1	1	
20							
21		1	1	1	1	1	
22		1	1	1			
23		1	1	1	1	1	
24		1	1	1	1	1	
25		1	1	1	1	1	
26		1	1	1	1	1	
27			1	1			
28		1	1	1			
29			1	1			
30							
31		1	1	1			
32							
33			1	1			
34			1				
35			1	1			
36			1	1			
37		1	1	1			
38		1	1	1			
39							
40			1	1			
41							
42/1							
43		1	1	1			
44		1	1	1			
45		1	1	1			
46		1	1	1		1	
47		1	1	1		1	
48		1		1		1	
49		1	1			1	
50			1	1			
Total		33	41	40	18	23	0

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Data entry list for Question:							
21. Which natural hazards are present in your village area?							
Questionnaire number	Question	Answer					
21	21. Which natural hazards are present in your village area?	Floods (torrents)	Erosions	Wildfires	Landslides	Weather related hazards (e.g. storms, winds, hail, torrential rain, etc.)	Other
1						1	
2						1	
3						1	
4			1	1		1	
5		1			1	1	
6		1	1	1	1	1	
7		1	1	1	1	1	
8		1	1			1	
9		1	1		1	1	
10		1	1	1	1	1	
11		1	1	1	1	1	
12		1	1	1	1	1	
13		1	1		1	1	
14		1	1	1	1	1	
15		1	1		1	1	
16			1		1	1	
17		1	1	1	1	1	
18		1	1	1	1	1	
19		1	1		1	1	
20		1	1		1	1	
21		1	1	1	1	1	
22		1	1	1	1	1	
23		1	1		1	1	
24		1	1	1	1	1	
25		1	1	1	1	1	
26			1		1	1	
27					1	1	
28					1	1	
29					1	1	
30		1			1	1	
31		1	1		1	1	
32		1	1		1	1	
33			1	1	1	1	
34			1		1	1	
35			1		1	1	
36			1	1	1	1	
37			1		1	1	
38			1		1	1	
39				1	1	1	
40		1			1	1	
41		1			1	1	
42/1			1				
43				1	1	1	
44			1				
45		1	1		1	1	
46			1	1	1	1	
47			1		1	1	
48		1			1	1	
49			1			1	
50			1		1	1	
Total		27	37	18	42	45	0

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Data entry list for Question:				
22. Have you or your household been affected by any of these natural hazards?				
Questionnaire number	Question	Answer		
		Yes	No	
22	22. Have you or your household been affected by any of these natural hazards?			If Yes, please state:
1		1		heavy rain
2			1	
3		1		heavy rain and hail
4		1		hail
5		1		heavy rain and flood
6		1		
7		1		
8		1		
9		1		
10		1		
11		1		
12		1		
13		1		
14		1		heavy rain, strong wind and hail
15		1		frost and hail
16		1		hail
17		1		torrential floods, strong winds and drought
18		1		heavy rain, strong wind and drifts
19		1		heavy rain
20		1		heavy rain and hail
21			1	
22		1		torrential floods, hail and heavy winds
23		1		hail, heavy wind and frost
24		1		hail, heavy wind and torrential floods
25		1		heavy wind and hail
26			1	
27		1		hail, land slides
28		1		hail and land slides
29		1		hail and land slides
30		1		hail and land slides
31		1		land slides
32		1		hail and land slides
33		1		hail and land slides
34		1		hail and land slides
35		1		hail and land slides
36		1		hail
37		1		hail and land slides
38		1		hail
39		1		hail and land slides
40		1		hail and land slides
41		1		hail and land slides
42/1			1	
43			1	
44			1	
45		1		hail and land slides
46		1		hail and land slides
47		1		hail, erosion and land slides
48		1		hail, erosion and land slides
49		1		hail
50			1	
Total		43	7	50

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Data entry list for Question:										
23. What is needed for the residents of the village to protect themselves from natural hazards? (multiple choice – select three answers)										
Questionnaire number	Question	Answer								
23	23. What is needed for the residents of the village to protect themselves from natural hazards? (multiple	Assessment of risk and hazards	Early warning activities	Mitigation measures	Improved communication and timely information	Community emergency planning exercise	Improved road networks	Community based response	Other	
1			1	1			1			
2					1	1	1			
3				1	1	1				
4		1	1	1						
5		1	1				1			
6		1	1	1						
7			1	1			1			
8			1	1			1			
9		1		1		1				
10			1	1			1			
11		1			1			1		
12		1	1	1						
13		1	1	1						
14		1	1	1						
15		1			1		1			
16		1	1	1						
17		1	1				1			
18			1	1			1			
19			1	1		1				
20			1	1			1			
21				1	1		1			
22		1	1	1						
23		1		1				1		
24		1			1	1				
25		1		1				1		
26				1			1	1		
27					1		1			
28			1		1		1			
29		1		1			1			
30			1		1		1			
31		1	1	1			1			
32		1		1			1			
33		1		1			1			
34			1	1			1			
35				1			1			
36				1	1		1			
37			1	1			1			
38			1	1			1			
39			1	1			1			
40				1	1		1			
41				1	1		1			
42/1			1				1			
43			1	1			1			
44			1		1		1			
45		1	1	1	1		1			
46		1	1				1			
47			1		1		1			
48			1	1			1			
49		1			1		1			
50		1	1				1			
Total		23	31	35	16	5	36	4	0	150

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Data entry list for Question:							
24. What kind of means can make it easier to obtain information on potential disasters? (multiple choice – select three answers)							
Questionnaire number	Question	Answer					
24	24. What kind of means can make it easier to obtain information on potential disasters? (multiple choice)	Competent institutions on local level	Hazard maps	Public information ; TV, Radio, Newspaper, SMS, email, Internet	Community education	Other	
1						1	no idea
2			1	1	1		
3		1	1		1		
4		1	1	1			
5		1	1	1			
6		1	1	1			
7			1	1			
8		1	1	1			
9		1		1	1		
10		1		1	1		
11			1	1	1		
12		1	1	1			
13		1	1	1			
14			1	1	1		
15			1	1	1		
16		1	1	1			
17		1		1	1		
18		1		1	1		
19		1		1	1		
20		1	1	1			
21		1	1	1			
22		1		1	1		
23		1	1	1			
24		1		1	1		
25		1	1	1	1		
26		1		1	1		
27		1		1	1		
28		1		1	1		
29		1		1	1		
30		1		1	1		
31		1	1	1			
32		1	1				
33		1			1		
34		1			1		
35		1	1		1		
36		1	1		1		
37		1	1		1		
38		1	1		1		
39		1	1	1			
40		1	1	1			
41		1	1		1		
42/1		1	1		1		
43			1	1			
44			1	1	1		
45		1			1		
46			1	1	1		
47		1	1	1			
48		1	1	1			
49			1	1	1		
50		1	1	1			
Total		40	34	38	30	1	143

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Data entry list for Question:								
25. Which disaster risk reduction measures should be used to mitigate the negative consequences of the natural hazard in your village? (multiple choice)								
Questionnaire number	Question	Answer						
25	25. Which disaster risk reduction measures should be used to mitigate the negative consequences of the natural hazard in your village? (multiple choice)	Improved communication and information from relevant authorities	Community based engagement for disaster risk mitigation	Campaigns on a volunteer basis	Afforestation of vulnerable areas	Community infrastructure disaster risk mitigation works	Other	
1							1	no opinion
2			1		1	1		
3			1		1	1		
4				1	1	1		
5			1		1	1		
6			1		1	1		
7		1	1		1			
8		1	1			1		
9		1			1	1		
10		1	1		1			
11			1		1	1		
12		1			1	1		
13		1	1		1			
14		1	1			1		
15			1		1	1		
16		1	1			1		
17		1			1	1		
18		1	1		1			
19		1	1		1			
20		1	1			1		
21			1		1	1		
22		1	1		1			
23		1			1	1		
24			1		1	1		
25		1			1	1		
26			1		1	1		
27			1		1	1		
28		1			1	1		
29			1		1	1		
30		1				1		
31			1		1	1		
32			1			1		
33		1	1			1		
34		1	1			1		
35		1			1	1		
36		1	1			1		
37		1	1		1			
38		1			1	1		
39			1		1	1		
40			1		1	1		
41			1		1	1		
42/1					1	1		
43		1			1	1		
44		1			1	1		
45				1	1	1		
46			1		1	1		
47			1		1	1		
48		1	1		1	1		
49			1		1	1		
50		1			1	1		
Total		27	34	2	40	42	1	146

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Data entry list for Question:					
26. How do you normally protect your agricultural crops/field from brazed animals?					
Questionnaire number	Question	Answer			
26	26. How do you normally protect your agricultural crops/field from brazed animals?	Communicate with owners of the animals and warn it	Discuss it in the village meeting if it happens	Making fences and hedges for protections	Others
1		1			
2		1			
3			1		
4		1			
5		1			
6		1			
7		1	1		
8		1	1	1	
9		1			
10		1	1		
11		1	1	1	
12		1	1		
13		1			
14		1	1		
15		1	1	1	
16		1	1	1	
17		1		1	
18		1	1	1	
19		1			
20		1	1	1	
21		1			
22		1	1	1	
23		1	1	1	
24		1	1		
25		1			
26				1	
27		1			
28		1			
29		1			
30		1			
31		1			
32		1	1		
33		1			
34		1			
35		1			
36		1			
37		1			
38		1			
39		1			
40				1	
41				1	
42/1		1			
43			1		
44		1			
45		1			
46		1			
47		1			
48		1			
49			1		
50		1			
Total		44	17	12	0

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**ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА
- ФИНАЛЕН ИЗВЕШТАЈ -**

Автор: м-р Васко Поповски

Септември 2018

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КРАТЕНКИ

ЦУК – Центар за управување со кризи

УРК – Управување со ризици од катастрофи

НРК – Намалување на ризици од катастрофи

Еко-НРК – Еко-системски базирано намалување со ризици од катастрофи

ОУШ – Одделение за управување со шуми

ЈСА – Јапанска агенција за меѓународна соработка

МЦС – Меркалиева скала на интензитет

ЈП – Јавно претпријатие

ЈПМШ – Јавно претпријатие Македонски шуми

ТИКА –Турска агенција за меѓународна помош

ToRs – Услови на проектната задача

1. ИЗВРШНО РЕЗИМЕ

Шумите покриваат скоро една третина од сувата земја на планетата Земја и шумскиот екосистем е еден од најзначајните фактори за отпорни општества и заедници. Тие имаат различни важни функции меѓу другото заштита од ерозии на почвата, одведување на атмосферските и поројните води, обновување на водните ресурси, како и намалување на загадувањето на воздухот. Во Република Македонија вкупната површина под шуми изнесува 1,091,857.59 ха или една третина од почвата на државата, од кои 835,055.82 ха се вкупна површина под шуми и 256,801,77 ха од површините се шумски голеини. Сепак, функциите на шумите во државата се влошуваат, како поради зголемениот број на шумски пожари во текот на последната деценија кои го погодија шумското земјиште низ државата, така и поради значајните активности на бесправна сеча (на пр. во периодот 2001 – 2012 вкупно 32,585 ха биле подложни на бесправна сеча¹). Уште повеќе, поради фактот што повеќе од 80% од теренот во државата е планински и со брдовити региони, природните опасности како ерозиите, поплавите и поројните поплави се позиционираат високо во профилот на опасности во државата. Исто така, намалувањето на шумите придонесува за зголемување на интензитетот и фреквенцијата на опасните настани, сериозно погодувајќи ги населените области, критичната инфраструктура, змејоделските капацитети и многуте аспекти на општеството (на пр. смртоносните поројни поплави кои се случија во село Шипковица, Тетовско и село Стајковци во Скопје во 2015 и 2016 година).

Поради тоа со цел да се одговори на погоре споменатите предизвици и во рамките на своите континуирани напори за зајакнувањето на системот за управување со катастрофи во Република Македонија, ЈСА го имплементира проектот “Зајакнување на капацитетите за Еко-НРК ореку оддржливо управување со шумите” во кој главни корисници се Центарот за управување со кризи и Јавното претпријатие Македонски шуми. Главна цел на проектот е да се прошират можностите на Македонскиот информациски систем за шумски пожари (МКФФИС), способноста за одговор на штетите од поплави и други катастрофи, воведување и подобрување на системот за планирање и управување со шумите, како и зајакнување на мерките за пошумување и техниките за расадници за подобрени функции на шумите, особено во делот на митигација на штетите од поплави и свлечишта. Соодветно на ова, една од целните области е селото Коџалија во Општина Радовиш, каде што ќе се спроведат работи за конзервација на шумата во одделот за управување со шумите и ќе се развие план за управување со шумата вклучувајќи и зонирање.

Сегашното ниво на активностите на домаќинствата во село Коџалија кои влијаат врз обесшумувањето и деградацијата на шумата, како и начинот на кој селаните ја перцепираат животната средина, се круцијални за определување на погоре споменатите можности за намалување на ризикот од катастрофи употребувајќи Еко-НРК методи. Поради тоа, беше спроведено теренско истражување за социо-економските и другите прашања со цел да се добијат основните податоци преку анализа на активностите на ниво на селото и на ниво на домаќинствата, како и нивната перцепција на животната средина и катастрофи. Цел на оваа задача беше да се идентификуваат социо-економските услови и условите на животната средина во село Коџалија во близина на микро-локацијата во Радовиш преку анализа на општо достапните податоци (демографија, животна средина, економски активности, присуство на природни и други хазарди, и сл.) од референтните власти, како општината и статистичките податоци, како и примена на теренското истражување преку интервјуа со локалното население (прашалник). Собраните информации ќе се искористат за идните активности на проектот на ЈСА, изготвување на мапи на опасности, собирање на информации и мислења за избор на дрјата за садење врз основа на потребите и нивната употребливост како дрвна маса и сл.

¹ <http://respublica.edu.mk/blog/2017-11-23-09-42-20>

Теренското истражување ги идентификуваше основните социо-економските аспекти и аспектите на животната средина во селото преку изработка на Профил на селото и спроведување на истражување на ниво на селото и теренско истражување. Последователно, селото Коџалија е традиционална заедница на јуруците со традиции, културни навики и обичаи со специфични динамики. Врз основа на социо-економскиот профил на селото, како и на другите специфичности на заедницата може да се заклучи дека населението значително е ранливо на природните опасности и како заедница се слабо отпорни на катастрофи. За среќа, врз основа на анализата на профилот на природните опасности, селото нема претрпено значителен импакт од опасностите.

Теренското истражување имаше добра родов профил овозможувајќи да се слушне гласот и мислењето на женските испитаници за Еко-НРК темите и аспектите вклучувајќи ги соодветно во анализата. Нивниот придонес во истражувањето е многу значаен увид во заедницата, поради тоа што жените за најмногу ранливи на природните катастрофи. Исто така, тие поседуваат знаење и капацитети кои можат да се искористат за понатамошно зајакнување на отпорноста на заедницата. На ниво на селото, знаењето за Еко-НРК е многу ниско. Исто така испитаниците не ја препознаваат шумата како комплекс кој има превентивни, заштитни и корисни функции. Напротив, тие имплементираат практики кои ја уништуваат шумата со проширување на земјоделското земјиште и пасиштата или искористување преку прекумерна легална или бесправна сеча. Тие се свесни за ситуацијата на обесшумување во нивната област и на одредено ниво активно ја поддржуваат преку обезбедување на дрво за греење скоро во сите случаи “на своја рака”, т.е. од бесправните сечачи. Исто така, постои недостаток на расположливо земјоделско земјиште за производство на тутун и постојат повеќе од доволни показатели дека се прошируваат на шумското земјиште и на земјиштето во сопственост на државата. Според тоа, една од причините за обесшумувањето е зголемувањето на земјиштето за производство на тутун. Како финален заклучок, неопходно е да се потенцира дека овој документ потребно е да служи како клучен преглед и процена кој може да обезбеди потребен инпут на проектот и националните заинтересирани страни за активностите за понатамошниот напредок на агендата на Еко-НРК и отпорност во село Коџалија.

Со цел за подобро разбирање на неопходните резултати на ова теренско истражување и процена, како и ултимативно и брзо следење на поддршката за градење на отпорноста кон катастрофи на локалната заедница преку еко системски приод базиран на НРК, следниве препораки се формулирани и презентирани не во редослед на приоритетност:

- Вклучување на заедницата во проектните активности на локално ниво;
- Учество на заедницата во активностите за намалување на ризикот од катастрофи;
- Вклучување на младите како агенти на проемните;
- Дизајнирање и имплементација на таргетирани активности за јавната свест за Еко-НРК;
- Пошумување на ранливите области;
- Инфраструктурни работи за ублажување на ризикот од катастрофи на ниво на заедницата;
- Зајакнување на капацитетите на компетентните локални институции за Еко-НРК;
- Споделување на информациите преку навремено и расположливо јавно информирање;
- Воведување на оддржливи практики за отпорно земјоделство;
- Воведување на енергетско ефикасни начини на греење;
- Имплементација на најдобрите практики прилагодени на локалниот контекст;
- Вклучување на родовиот аспект во проектните активности.

2. ВОВЕД

2.1 Воведни напомени

Во рамките на проектот – “Градење на капацитетите за Еко-НРК преку оддржливо управување со шумите” финансиран од ЈСА и со главните корисници Центарот за управување со кризи (ЦУК) и ЈП Македонски шуми (ЈПМШ), ќе се реализираат работи за заштита на шумата во одделението за управување со шуми близу областа на село Коџалија, вклучувајќи и развој на План за управување со шумата со зонирање. Сегашното ниво на активности на домаќинствата кое предизвикува уништување и деградација на шумата, како и перцепцијата на селаните за природната средина и катастрофите е круцијална за разгледувањето на можностите за погоре наведените интервенции за намалување на ризикот од катастрофи употребувајќи Еко-НРК методи. Поради тоа, неопходно е да се спроведе теренско истражување за социо-економските и другите прашања со цел да се продуцираат основни податоци со анализа на активностите на ниво на селото и на ниво на домаќинствата, како и перцепцијата за природната средина и катастрофите.

2.2 Цели на задачата

Главна цел на задачата е да се идентификуваат социо-економските и прашањата на животната средина во селото Коџалија (целна област) во близина на микро-локацијата во Општина Радовиш, преку анализа на општо достапните податоци (демографија, животна средина, економски активности, присуство на природни и други опасности и др.) од страна на општинските и статистичките податоци, како и примена на теренско истражување со анкета на локалното население (прашалник). Собраните информации ќе бидат искористени за идните активности на проектот на ЈСА, како што се креирање на мапи на опасности, собирање на информации и мислења за селекцијата на дрвја за садење врз основа на потребите и нивната употреба како дрвен материјал и сл.

Главни резултати на задачата се следниве:

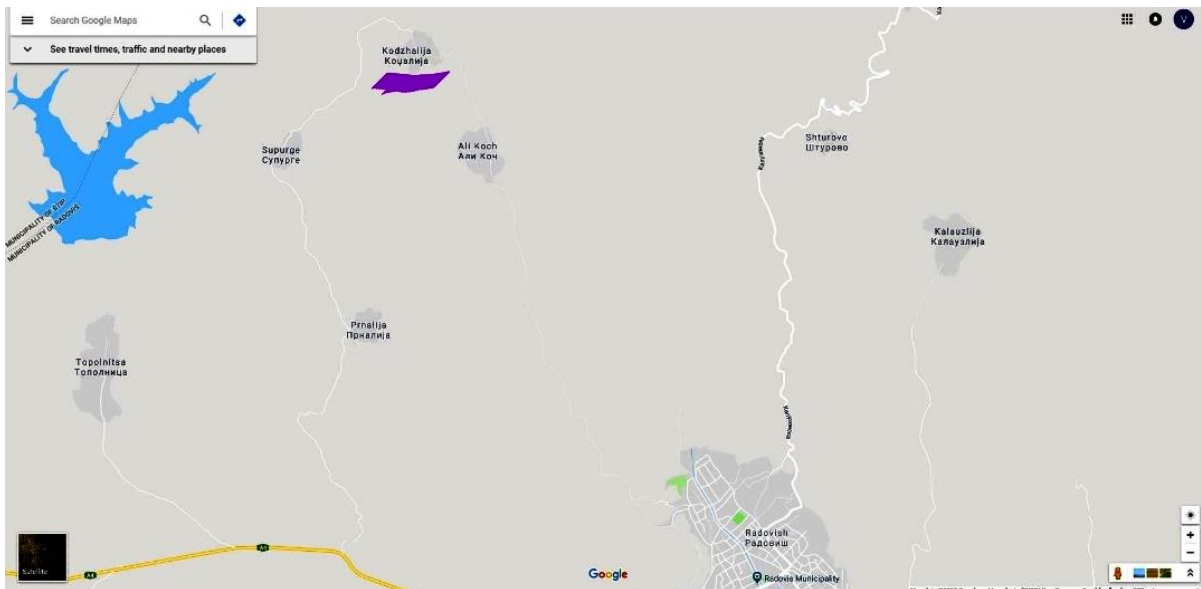
1. **Профил на селото** – собирање на основни податоци за регионот и општината преку постоечките документи како што е статистиката.
2. **Прашалник** – се состои од Формулар за состанокот со селаните и прашални за анкета на домаќинствата (50 домаќинства).
3. **Насоки** за спроведување на теренското истражување.
4. **Финален извештај** – ќе се финализира врз основа на коментарите од состанокот за појаснување кој ќе се одржи во почетокот на септември 2018 година.

Последователно, очекуваниот обем на услуги за извршување на активностите за теренското истражување и успешното обезбедување на главните резултати според целите на проектната задача се следниве:

- Нацрт распоред на активности и подготовка на Прашалникот и Насоките за теренската примена на македонски и англиски јазик под надзор на ЈСА, ЦУК и ЈПМШ.
- Собирање на основни податоци за регионот и општината преку постоечките документи како што е статистиката.
- Спроведување на анкета на две нивоа: групен состанок во селото и анкета на 50 домаќинства.
- Дискусиите помеѓу учесниците ќе бидат охрабрени на состанокот во селото.
- ЦУК и ЈПМШ ќе го организираат состанокот во селото со помош на општината.
- Изведувачот се очекува да состави еден тим за истражување, составен од две лица под водство на лидерот на тимот.

2.3 Локација на целната област

Локацијата за извршувањето на теренското истражување е во село Коџалија во Општина Радовиш, во југоисточниот плански регион. Селото е лоцирано на североисток од Радовиш на оддалеченост од 9 км. Наоѓајќи се на јужните падини на планината Плачковица на надморска височина од 860 м, истото е дел од т.н. јуручки регион² (јуруклак) во Република Македонија.



Мапа 1 – Локација на селото Коџалија



Мапа 2 – Сателитска слика на селото Коџалија

Од друга страна, сите останати активности, вклучувајќи ги и подготвителните активности и известувањето, ќе бидат реализирани, дома, во Скопје.

² <http://hybread.mk/juruci-skrienite-etnicki-zaednici-vo-makedonskite-planini/>

3. ПРИСТАП И МЕТОДОЛОГИЈА

Како што беше наведено погоре, главна цел на оваа задача е да се идентификуваат социо-економските аспекти и аспектите од животната средина во село Коџалија во близина на микро-локацијата на проектните активности во Општина Радовиш. Истото ќе се реализира преку анализа на општо расположливите податоци (демографија, животна средина, економски активности, присуство на природни и други опасности и др.), кои можат да бидат општински и статистички податоци, како и примена на теренско истражување со анкета на локалното население (Прашалник). Поради тоа, со цел за имплементација на теренското истражување, неопходно е да се дефинира прифатлив пристап и употреба на адекватна методологија во постапката. Последователно, тие се во линија со предметот на задачата, неговите карактеристики и воспоставената рамка за имплементација.

3.1 Пристап за имплементација на задачата

Пристапот за имплементација на задачата е заснован на разбирањето за концептуалната рамка за управување со катастрофи во државата, основното разбирање на Еко-НРК, како и теоретските и практичните аспекти на имплементација на теренско истражување. Согласно на тоа извршувањето на задачата е засновано на имплементација на активности во логичен след обезбедувајќи сите аспекти да бидат земени во предвид на ефективен и ефикасен начин, а кои се претставени подолу:

- **Запознавање со проектот**, како и останатите релевантни информации и документ со цел за идентификација на клучните елементи кои е потребно да бидат вклучени во испораката на резултатите.

- **Собирање и преглед** на општо достапните информации, документи и податоци (демографија, животна средина, економски активности, присуство на природни и други опасности, статистички податоци и др.) со цел за подготовка на Профилот на селото.

- **Подготовка** на *Формуларот за состанокот во селото*.

- **Подготовка** на *Прашалникот за теренското истражување*.

- **Подготовка** на *Насоките за анкетарите за имплементација на прашалникот за теренското истражување*.

- **Подготовка и доставување** на *Почетниот извештај* кој вклучува основни информации за имплементацијата на задачата (обем, цели, напредок во почетната фаза, работен план, ризици и како да се ублажат и др.).

- **Подготовка и доставување** на регуларни неделни извештаи.

- **Спроведување** на теренското истражување (вклучувајќи и надзор) во село Коџалија во периодот 18 – 26 јуни 2018 год. со цел за практична имплементација на истражувањето на ниво на селото и анкетата на домаќинствата (Состанок во селото и примена на прашалникот).

- **Внесување** на собраните податоци и нивна анализа.

- **Подготовка и доставување** на *Првиот извештај за напредокот*.

- **Подготовка** на *Профилот на селото*.

- **Подготовка и доставување** на *Нацрт извештајот*.

- **Подготовка** на *Вториот извештај за напредокот*.

- **Подготовка и доставување** на *Финалниот извештај*.

За ефективна и ефикасна имплементација на задачата според барањата беше формиран тим од искусни и стручни лица (Васко Поповски – лидер на тимот, Љупчо Милковски и Лолита Арсова – членови на тимот). Тимот има одлично искуство во управувањето со проекти за поддршка на имплементација на задачата и ги исполнува сите технички и договорни очекувања и барања од страна на проектот. Улогите и одговорностите во проектот се следниве:

- м-р Васко Поповски (Лидер на тимот) – Лидерот на тимот е одговорен за целосната имплементација на задачата, управувањето со активностите, координацијата на тимот, известувањето, комуникацијата со проектот, преглед на основните податоци и информации, подготовка на прашалникот и насоките за теренското истражување, едукација на анкетарите, олеснување на состанокот во селото, надзор над теренското истражување, како и подготовка на нацрт и финалниот извештај.

- Љупчо Милковски (Член на тимот бр. 1) и Лолита Арсова (Член на тимот бр. 2) се одговорни за учење на содржината на прашалникот употребувајќи ги насоките, учество во состанокот во селото и теренското истражување со употреба на прашалникот, внес на податоците, како и преведување на формуларите на македонски јазик.

3.2 Методолошка рамка

Како што беше наведено погоре за спроведувањето на задачата покрај предложениот пристап неопходно е да се дефинира и вистинската методолошка рамка на задачата. Методолошкиот пристап идеално балансира помеѓу рамката за истражување, практичните аспекти и цели кои треба да се постигнат со вклучување на методите и алатките за нивна поддршка. Последователно, врз основа на карактеристиките на задачата, следниве истражувачки методи се засновани и се применуваат за цело времетраење на задачата:

- *Анализа на содржина* – содржината на сите поднесени и расположливи информации, податоци и документ, како и извештаи беше прегледана и анализирана.

- *Споредбена анализа* – беше употребена за време на фазата на преглед на документи.

- *Квалитативен истражувачки дизајн* – за време на теренското истражување, состанок со селаните беше одржан со употреба на подготвен формулар, како и преку олеснета и структурирана дискусија со групата на заедницата.

- *Квантитативен истражувачки дизајн* – за време на теренското истражување, беше спроведена анкета на 50 домаќинства со употреба на прашалник.

3.2.1 Алатки за теренското истражување (Формулар за состанокот во селот и прашалник)

Сегашното ниво на активностите на домаќинствата кои влијаат врз уништувањето и деградацијата на шумата, како и перцепцијата на селаните за природната средина и катастрофите е круцијално за погоренаведените можности за намалување на ризици од катастрофи преку Еко-НРК методи. Поради тоа, беше спроведено теренско истражување за социо-економските и други прашања со цел да се продуцираат основни податоци со анализа на ниво на селото и активностите во домаќинствата и анализа на нивната перцепција за природната средина и катастрофите.

Теренското истражување за социо-економските и други прашања се состои од два дела: истражување на селото и домаќинствата. Според тоа, лидерот на тимот подготви два документи/алатки за нивна практична примена обезбедувајќи ефективно и ефикасно собирање на податоците од заинтересираните страни и олеснувајќи ја подготовката на извештајот. Нивната структура и содржина беа предложени од проектот, подобрени од лидерот на тимот и одобрени од страна на проектот (14.06.2018). Тие се структурирани да овозможат собирање на информации и да обезбедат повратен механизам на проектот и националните партнери за олеснување на постоечката ситуација, недостатоците и можностите, како и да придонесе за понатамошно зајакнување на отпорноста на село Коџалија и Општина Радовиш преку оддржлива Еко-НРК програма и имплементација на проекти обезбедувајќи оддржливост на интервенциите.

Формуларот за состанокот во селото (Анекс II) беше главна алатка за квалитативен истражувачки дизајн од теренското истражување со цел за собирање на податоци и информации за време на состанокот во селото организиран како дискусија на групата од заедницата. Главна цел беше да се поддржи дискусијата со членовите на заедницата за време на состанокот во селото на структуриран начин, како и негово успешно олеснување. Поради тоа беше подготвен на општо ниво на партиципација на селото и беше составен од повеќе важни области за дискусија и собирање на информации (на пр. карактеристики и историја на селото вклучувајќи и извори на вода, куќи во селото, демографија; главни продукти во поглед на количина и монетарна вредност; ситуација на употреба на шумата во селото; традиционална соработка во работата и обичаите; ситуација со сопственоста на шумата во селото; ситуација со сопственоста на земјоделското земјиште и пасиштата (вклучувајќи и шумски пасишта); главни практики во земјоделството и годишен распоред на работите (вклучувајќи и одгледување на пчели и вегетација за нивна паша); постоечка организација на населбата; локации со сериозна ерозија кои се проблем во селото; водоснабдување во селото вклучувајќи и извори на вода и бунари, историја на шумата и употребата на земјиштето околу селото, ситуации со бесправната сеча и досие на катастрофите околу селото). Последователно, собраните информации од групата на селани кои учествуваа на состанокот беше корелирана со податоците од прегледот и податоците на анкетата на домаќинствата, со цел за подобрување на известувањето за теренското истражување на социо-економските и други прашања во заедницата.

Од друга страна Прашалникот за анкетата на домаќинствата (Анекс III) беше главна алатка за квантитативен истражувачки дизајн на теренското истражување со цел за имплементација на анкетата на 50 домаќинства. Главна цел на ова истражување беше да се соберат податоци од домаќинствата кои учествуваа во анкетата за нивните активности на ниво на домаќинство и нивната перцепција за природната средина и катастрофите во областа на селото. Според тоа, структурата на прашалникот се состои од следниве три делови:

А) Прашања поврзани со домаќинството (демографски и социо-економски профил на испитаниците на пр. пол, возраст, националност, верска припадност, ниво на образование, статус на вработување, главни извори на приход, просечни годишни приходи и трошоци, улогата на жената во домаќинството).

Б) Прашања поврзани со животната средина (на пр. прашања поврзани со ресурсите и управувањето со шумите, шумата и дрвјата како ресурси, дрвја и придобивки, пошумување, свесност на испитаниците за овие аспекти и др.).

В) Прашања поврзани со катастрофите (на пр. профил на опасности во селото, мерки и активности за заштита од природните опасности и подобра комуникација, мерки за митигација и начини на заштита на приносот од животни).

Прашањата во прашалникот се затворени и полу-затворени со цел да обезбедат ефективно и ефикасно собирање на податоци и анализа. Анкетата на домаќинствата се спроведе од страна на членовите на тимот врз основа на директни интервјуа, лице-в-лице, со определни испитаници од различни делови на селото. Македонскиот јазик беше употребен за подготовка на прашалникот, како и за спроведување на анкетата. Анкетата на домаќинствата беше спроведена во период од 8 денови, како што беше определено во проектната задача и договорната рамка со проектот. Согласно со проектната задача, членовите на тимот го спроведоа внесот на податоците веднаш по завршувањето на анкетата на домаќинствата. Сите податоци беа внесени во MS Excel кој се користеше за анализа на податоците и главен инпут за подготовка на нацрт извештајот. Последователно, визуализацијата на анализата на податоците во табели беше интегрирана во извештајот.

3.2.2 Насоки за анкетарите за имплементација на теренското истражување за социо-економските и другите прашања

Насоките за анкетари за имплементација на теренското истражување за социо-економските и другите прашања (Анекс IV) вклучува насоки, одговорности и задачи кои членовите на тимот (анкетарите) мораа да ги следат за време на теренското истражување на социо-економските и другите прашања во село Коџалија, Општина Радовиш (анкета во селото и домаќинствата). Неговата содржина беше структурирана да ги опфати главните прашања на теренското истражување, како и да го олесни анкетањето преку употреба на практични информации и насоки за членовите на тимот со цел да постигнат целосно разбирање за задачите и активностите кои ги спроведоа, како и гарантирањето на доверливоста и обезбедување на квалитет на теренското истражување. Поради тоа се состоеше од неколку делови (на пр. улога на анкетарите, насоки за спроведување на анкетата, насоки за формуларот за состанокот во селото и прашалникот, објаснувања и препораки како да се спроведе анкетата врз основа на секое прашање). Насоките беа подготвени од лидерот на тимот и одобрени од проектот (14.06.2018). Последователно, членовите на тимот имаа доволно време да се запознаат со насоките со цел да ги имплементираат во теренското истражување на професионален начин и успешно. Дополнителна придобивка од овие насоки се дека тие може да бидат реплицирани и дополнително применети во идните теренски истражувања од страна на националните корисници во други делови од државата.

3.3 Работен план

Со цел за имплементација на услугите за теренското истражување на социо-економските и другите прашања во село Коџалија, на 04 јуни 2018 год. беше склучен договор помеѓу Изведувачот – м-р Васко Поповски, како лидер на тимот и Asia Air Survey Co., Ltd. Рокот за реализација на договорот е 30 септември 2018 год. Тимот за имплементација на договорните услуги е составен од следниве членови: м-р Васко Поповски, лидер на тимот; Љупчо Милковски и Лолита Арсова – членови на тимот.

Работниот план даден подолу, беше подготвен во согласност со проектната задача (Анекс I) и е заснован на Првиот извештај за напредокот од 10.07.2018 год. Ги презентира сите неопходни активности за извршување на задачата и постигнување на главните резултати, како и ја рефлектира имплементацијата на планираните активности во потребното време, без нивно одложување или доцнење.

FIELD SURVEY ON SOCIO-ECONOMIC AND OTHER ISSUES				May				June				July				August				September			
		Responsibility	Working Days	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
Phase I	PRE PARATION			18																			
		Collection and analysis of basic data and information	Team Leader				X	X				X											
		Preparation of the Questionnaire for the field survey	Team Leader					X															
		Preparation of the Guidelines for the field survey	Team Leader	2				X															
		Learning contents of Questionnaire	Team members	1-1				X															
Phase II	FIELD SURVEY			33																			
		Conduct of the village meeting	Team Leader -Team members	1-1-1					X														
		Conduct of the village (household) survey	Team members	8-8					X	X													
		Supervision of the village (household) survey	Team Leader	8					X	X													
		Data entry of the results of the survey	Team members	3-3								X											
Phase III	REPORTING			15																			
		Preparation of the Draft Report	Team Leader	7									X	X									
		Submission of the Draft Report	Team Leader	1										X									
		Feedback form the Project	Team Leader	1											X	X							
		Explanatory meeting	Team Leader	1																	X		
		Finalization of the report	Team Leader	4																	X	X	
	Submission of the Final Report	Team Leader	1																		X		
TOTAL WORKING DAYS FOR THE TEAM:			66																				

Табела 1 – Работен план за извршување на задачата од 10.07.2018 год.

Овој работен план ги вклучува и **подготвителните активности** за извршување на задачата кои беа иницирани веднаш по потпишувањето на договорот и се состоеја од регуларна комуникација со проектот, подготовка и испорака на бараните извештаи (неделен и Почетен извештај), како и имплементација на неопходните оперативни и логистички активности за извршување на теренското истражување.

➤ **Состанок со проектот** беше одржан на 04.06.2018 год. кога договорот беше потпишан и аспектите на имплементацијата на теренското истражување беа дискутирани.

➤ **Подготвителен состанок во Општина Радовиш и посета на терен на 13.06.2018 со учество на националните и локалните корисници** – Цел на состанокот беше да се презентираат пред општинските и селските претставници целите на теренското истражување, предложениот работен план на активности и организациските аспекти и логистичката поддршка на месната заедница од селото. Презентацијата на теренското истражување и работниот план беше добро примена и сите страни ја декларираа нивната поддршка на теренското истражување. За време на состанокот целосна поддршка беше добиена од претставникот на месната заедница на село Коџалија, како и од претставниците на институциите на локално ниво (регионалниот ЦУК, општината, локалната подружница на ЈПМШ) истовремено договорјќи ја и нивната координација и ангажман за поддршка. После завршувањето на состанокот во општинската зграда, се оддржа посета на село Коџалија со цел да се види местото за состанокот во селото, тимот да се запознае со околината и теренот во селото, како и за да се направи план за неопходната логистика. Локалните медиуми беа информирани и известија за состанокот и целите на проектот.

http://radovis.gov.mk/portfolio_page/dzaika-sos-koordi/

https://www.facebook.com/pg/Opstina.Radovis/photos/?tab=album&album_id=128818876128342

2



Слика 1&2 – Состанок со општинските и националните заинтересирани страни (13.06.2018) во Општина Радовиш

➤ **Известување** – За време на периодот на известување со овој Нацрт извештај, беше извршувано редовното неделно известување според проектната задача преку електронска пошта, додека Почетниот извештај и Првиот извештај за напредокот беа доставени на 16.06 и 11.07.2018 год. последователно.

➤ **Комуникација** – Со цел за ефективна и ефикасна имплементација на активностите, регуларна комуникација, првенствено преку електронска пошта беше споделена со проектот.

➤ **Оперативни и логистички аранжмани** – Со цел за успешна имплементација на теренското истражување беше неопходно навремено да се планираат и имплементираат сите оперативни и логистички аранжмани: подготовка на материјали за теренското истражување, транспорт, сместување, логистика, комуникација помеѓу членовите на тимот и со одговорните

национални и локални претставници, како и запознавање со материјалите за теренското истражување и развој на интерни процедури во тимот за спроведување на истражувањето и надзорот.

3.4 Ризици и претпоставки

За време на почетната фаза на извршувањето на задачите, следниве ризици и претпоставки беа идентификувани и профилирани, како и соодветни мерки за управување се дефинираа:

1) Расположливост на податоци и информации – Како дополнување на собраните документи, дополнителни информации и податоци се потребни пред и за време на реализирањето на теренското истражување со цел за анализа на податоците и синтеза на информациите. Податоците ќе бидат обезбедени од страна на општината.

Среден ризик.

Одговор на управувањето: Како резултат на добрата соработка и координација со проектот (локалниот координатор) и националните и локалните корисници, тимот ги собра сите расположливи информации и податоци.

2) Расположливост на клучните испитаници – Теренското истражување се одржа во период од 8 денови, така што правилното планирање и определувањето на испитаниците беше неопходно. Затоа е препорачано клучните домаќинства да бидат потврдени за време на состанокот во селото и да се дискутира достапноста на селаните.

Среден ризик.

Одговор на управувањето: Тимот врз основа на доброто планирање и координација со претставниците на селото и локалните корисници ја имплементираше анкетата на домаќинствата за време на наведениот период.

3) Временски услови – За реализација на теренското истражување неопходно да се земат во предвид поволните временски услови. Затоа планови се правеа на дневна основа.

Низок ризик.

Одговор на управувањето: Временските услови беа земени во предвид и соодветно планирање на активностите за истражувањето беа направени.

4. ПРОФИЛ НА СЕЛОТО

Во рамките на задачата, преглед на информациите и податоците на ниво на селото претставуваше фаза од задачата во која сите достапни информации и податоци беа прегледани со цел за подобро разбирање на контекстот на селото и за подобра подготовка на задачата и теренското истражување, обезбедување на основни информации за споредба, како и подготовка на профилот на селото. Сепак, во врска со овој преглед неопходно е да се спомене дека прегледаните информации, податоци и документи се само една форма на докази и тие беа споредени со истражувањето.

Профилот на селото служи за идентификација на социо-економските и еколошките прашања на село Коџалија во близина на микро-локацијата во Радовиш преку анализа на општо достапните податоци (демографија, животна средина, економските активности, присуство на природни и други опасности, комуналната инфраструктура и др.) во врска со релевантните власти како општината, националните партнери и статистичките податоци. Исто така, ги идентификуваше и клучните елементи кои требаа да бидат вклучени, како и да се разбере контекстот за НРК во контекст на локацијата. Уште повеќе, резултатите од прегледот ќе бидат сумарно претставени и вклучени во Нацрт извештајот и последователно во Финалниот извештај. Овие информации ќе ја поддржат анализата на податоци посебно во делот на креирање на препораки. Собраните информации ќе бидат искористени за идните активности на проектот: креирање на мапи на опасности, собирање на информации и мислења за избор на дрвја кои ќе бидат посадени врз основа на потребите и нивната употреба како дрвен материјал и сл.

За време на периодот на известување различни информации и документи беа собрани и анализирани, на пример, статистички податоци од Државниот завод за статистика, општинските податоци за образование, урбанистичко планирање и комунална инфраструктура во селото, податоци и мапа на шумата од ЈПМШ – регионална подружница во Радовиш, како и генерални општински податоци за профилот на опасности. Дополнително, општинските и регионалните податоци се собраа и анализираа. Синтезата на овие информации е вклучена во овој Нацрт извештај.

а) Општи карактеристики (географија, клима, економски активности)

Село Коџалија е лоцирано во југоисточниот дел на Република Македонија во рамките на територијата на Општина Радовиш во југоисточниот плански регион. Селото се наоѓа на јужните падини на планината Плачковица, во северозападниот дел на долината Радовиш – Струмица. Просечната надморска височина на селото е 860 м и територијата е со површина од 16.8 км². Селото Коџалија се наоѓа 9 км од Радовиш. Климата е умерено континентална. На надморската височина од 860 м постојат влијанија од планинска клима од планината Плачковица. Температурата се карактеризира на сезонска основа со зимските месеци кои се најстудени (јануари со просечна температура од 1.4°C) и летните месеци кои се најтопли (јули со 23.5°C). Периодот со мраз е 139 денови, додека снег има 13 денови во просек. Просечната количина на врнежи од дожд е 423.8 мм и месец ноември е месецот со најголемата количина на врнежи (49.7 мм), додека месец август е месецот со најмала количина на врнежи (21.1 мм). Најдоминантен ветер во регионот е од западен правец со просечна фреквенција од 196% и просечна брзина од 2.5 м/сек³. Присутен е во текот на целата година, но најфреквентен е во јануари и декември. Следни се северозападниот ветер со поголема просечна брзина од 3.2 м/сек. и источниот, и југоисточниот ветер.

³ “Услови за просторно планирање за подготовка на урбанистички план за село Коџалија”, Технички бр. Y23914, издадени од Агенцијата за просторно планирање на Република македонија, стр.4.

Село Коџалија е дел од областа за управување со води Радовиш – Струмица која се наоѓа во басенот на река Струмица. Областа е многу сиромашна со вода и специфичен проток на вода изнесува $q=3/1l/sec/km^2$ ⁴. Во близина на селото нема водни акумулации и хидрологијата е сиромашна со неколку потоци и рекички во областа. Присутни се 4 помали реки: Бунар Дерези во должина од 10 км и која тече од Коџалија кон Радовиш, и реките Балари, Кучишка и Букова.

Во близина на селото постојат неколку археолошки локалитети кои се под режим на заштита според важечката легислатива:

- Веждалан/Марашарди – 1 км од селото, некропола, доцен римски период;
- Ишарлак – доцен Среден век;
- Киршалам – 4.5 км од селото, соцен Среден век.

Во атарот на селото нема индустриски капацитети. Главните економски активности во селото се земјоделството – производство на тутун, па сточарството. Само 8 правни постојат во селото од кои 3 се со регистрација за транспорт и превоз во патниот сообраќај, 3 се регистрирани како продавници и 2 се за сточарство. Во атарот на селот има 286 ха земјоделско земјиште и 130 ха на пасишта, според книгата за Општина Радовиш која вклучува и податоци за село Коџалија.

б) Демографија

Според Пописот на население, домаќинствата и живеалиштата на Република Македонија од 2002 година⁵, вкупното население на село Коџалија изнесува 478 жители чија етничка припадност е дадена табелата подолу.

Етничка припадност	Вкупно
Македонци	0
Турци	478
Роми	0
Албанци	0
Власи	0
Срби	0
Бошњаци	0
Други	0

Табела 1 – Етничка припадност на населението во село Коџалија според Пописот од 2002 година

Населението во селото се Јуруци, турска под-етничка група која дошла во овие краевина државата од Анадолија, регионот на Коња, во текот на XIV и XV век. Важно е да се напомене дека јуручкиот регион (Јуруклак) е лоциран на западните делови на планината Плачковица, североисточно од врвот Лисец (1,754 м), се до регионот на реката Крива Лакавица на југо запад, на териториите на општините Радовиш и Штип. Јуручките села вообичаено се состојат од неколку делови (маала) во кои членовите на пошироките семејства и роднини живеат. Главната карактеристика на оваа етничка група е нивната тврдокорна традиција која се карактеризира со хомогена структура, без мешање со другото население и етнички групи, со иста демографска структура во селата, со обичаи кои се чувале со векови. Жените имаат многу традиционални улоги и тие се одговорни за домаќинството и обврските, како и за поддршка на земјоделските работи. Сите членови на селото се со исламска вероисповест.

⁴ “Услови за просторно планирање за подготовка на урбанистички план за село Коџалија”, Технички бр. Y23914, издадени од Агенцијата за просторно планирање на Република Македонија, стр.8.

⁵ <http://www.stat.gov.mk/Publikacii/knigaXIII.pdf>

Религија/вероисповест	Вкупно
Православна	0
Исламска/муслиманска	478
Католичка	0
Протестантска	0
Друга	0

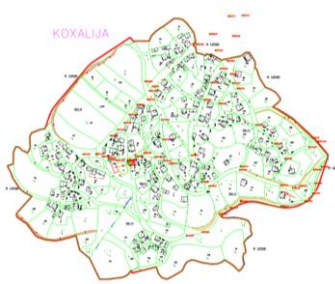
Табела 2 – Вкупно население според религиозната припадност во село Коџалија според Пописот од 2002 година

Демографската структура според старосните групи покажува дека населението во селото е релативно младо, со вкупно 229 деца и млади од 0 - 19 години, кои претставуваат скоро половина од населението. По нив следува работно активното население, додека има само неколкумина постари граѓани.

Старосна група	Машки	Женски	Вкупно
Вкупно:	250	228	478
0-4	24	25	49
5-9	32	38	70
10-14	43	30	73
15-19	21	16	37
20 - 24	18	14	32
25 – 29	32	23	55
30 – 34	24	21	45
35 - 39	15	12	27
40 – 44	8	8	16
45 - 49	1	7	8
50 – 54	7	6	13
55 – 59	7	11	18
60 – 64	7	9	16
65 – 69	5	5	10
70 - 74	2	-	2
75 - 79	4	2	6
80 - 84	-	1	1
85 и повеќе	-	-	-

Табела 3 – Вкупно население според старосни групи и пол во село Коџалија според Пописот од 2002 година

в) Урбанистичко планирање



Мапа 3 – Област на село Коџалија (Опфат на урбанистичкиот план)

Во село Коџалија не постои важечки урбанистички план кој ќе ги регулира аспектите на урбанистичкото планирање на локацијата и нејзиниот урбанистички развој. Првиот урбанистички план е во фаза на развој и донесување од страна на Општина Радовиш. Опфатот на планот изнесува 17.56 ха и е претставен на мапата погоре. Постои проблем со бесправната градба, бидејќи досега не бил донесен урбанистички план и повеќето од селаните ги градат куќите на своја рака.

г) Комунална и социјална инфраструктура

Генерално земено, комуналната инфраструктура се состои од патна инфраструктура, водоводна и канализациона мрежа, локации за одлагање на отпад, уличен систем за осветлување, телефонски и интернет услуги, како и други слични услуги. Од друга страна, социјалната инфраструктура се подразбира како функционален систем на образование, обезбедување и пружање на здравствени услуги, културни објекти, социјални услуги, медија, спортски активности и др.

Во село Коџалија постои следнава комунална инфраструктура:

- Патна инфраструктура (патишта со асфалт) – 608 м;
- Патна инфраструктура/улицы со бекатон - 322 м;
- Комунална субструктура (јавни електрична расвета/бандери) – 40 парчиња;
- Водоводна мрежа;
- Делумна канализациона мрежа која не е поврзана во целото село и не е функционална;
- Не постои организирано собирање на сметот и отпадот и нивно одлагање;
- Двата мобилни оператори имаат сигнал во селото и најголемиот дел од селото е покриен со 4Г сигнал (мрежата на Телеком беше проверена);
- Фиксната телефонија е обезбедена од страна на Македонски телеком;
- Нема организирана кабловска ТВ мрежа и скоро сите куќи имаат сателитски антени за да гледаат турски ТВ канали.

Образовната инфраструктура во село Коџалија се состои од едно основно училиште. Имено во селото постои подрачно училиште од Централното основно училиште “Крсте Петков Мисирков“ од Радовиш. Образовниот процес е организиран за ученици од 1во до 5то одделение. Наставата се изведува на турски јазик. Интересен е фактот дека бројот на ученици се зголемува секоја година. На пример, во учебната 2015/2016 год. биле запишани 72 ученици (37 машки и 35 женски), додека во 2016/17 год. настава посетувале 100 ученици (49 машки и 51 женски). Во 2017/18 год, запишани се вкупно 102 ученици (46 машки и 56 женски). Ова упатува на зголемениот наталитет во селото после мерката од Владата за субвенционирање на многу детни семејства со три или повеќе деца. Школската зграда е нова, изградена со поддршка на ТИКА. Зградата е со еден спрат, со училници за секоја година и спортски терен. Учениците го продолжуваат своето образование после 5то одделение во централното училиште во Радовиш и понатаму во средните училишта. На ниво на училишна генерација, еден или двајца ученици во просек го продолжуваат своето образование стекнувајќи се со диплома за високо образование.

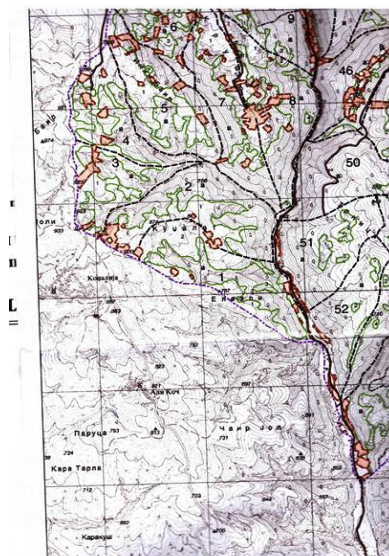


Слика 3 – Основното училиште во село Коџалија

Од аспект на останатите типови на социјална инфраструктура и обезбедување на социјални услуги, во селото нема други објекти. Селаните ги реализираат своите права и обврски, како и потреби или преку теренски посети (на пр. ветеринар редовно го посетува селото), преку посети во блиското село Али Коч (здравствена амбуланта) или преку патување до блискиот Радовиш.

д) Управување со шуми во областа на Коџалија

Управувањето со шуми во атарот на село Коџалија се обезбедува преку подрачната единица на ЈПМШ од Радовиш. Село Коџалија е лоцирано во дел од шумското земјиште кое не е регулирано. Во близина на селото, во правец на север-североисток се наоѓа шумско стопанската единица Радовиш-Ораовица која има три класи: 1а, 2а и 3а (претставени се во табелата подолу).



Мапа 4 - Шумско стопанска единица Радовиш-река Ораовица

Во табелата подолу се претставени основните карактеристики на шумската област во атарот на селото. Генерално, дабот е најзастапен во најголемиот дел на шумата. Има 126.8 ха под шуми (државна сопственост), 99.7 ха шумско земјиште (голина) и 8.5 ха приватни шуми. Од ова произлегува дека односот помеѓу шумата во државна сопственост и приватна сопственост е 96%-4%. Како што е наведено, шумата е поделена на три класи/области и секоја од нив е нападната од бесправна сеча, со тоа што класата 1 е најзагрозена. Квалитетот на шумата е слаб со лош квалитет на стеблата, мала висина, ниски круни. Неопходно е да се напомене дека во рамките на шумско стопанската единица, приватните шуми се идентификуваат и се обележани на мапата погоре со црвени кругови, но ЈПМШ преку својата подрачна единица не управува со нив освен нивно идентификување. На тој начин подрачната единица на ЈПМШ на никој начин не управува со овие области, туку само ги идентификува. Управувањето со шумите на областите на приватните шуми е обврска на самите сопственици.

Како што веќе беше кажано, има значително ниво на активности за бесправна сеча, уништување на шумата и трансформација на шумското во земјоделско земјиште или пасишта. Особено интрезивна е трансформацијата во земјиште за производство на тутун. Има случаи кога селаните (приближно 15ина) земаат под закуп земјоделско земјиште од државата или приватни сопственици во околината на Радовиш или подалеку.

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Одделение за управување со шуми Радовиш – река Ораовица

Бр	Класа	Опис на областа	Видови на дрвја	стебла/ха	Дрвна маса/ха м3	Дрвна маса/шума м3	Реално зголемување			Просечно зголемување		Класификација на дрвја	Област/ха
							%	1 ха	Цела област	1 ха	Цела област		
1	1а	Надморска висина: 500-820 м Изложеност: Југ/југоисток Остро наклонети падини Каменита и сува почва, без хумус	ass. Quercus carpinetum orientalis									Греење 90.00 Отпад 10.00	
			Quercus frainetto	1630	16	634	3.13	0.50	20	0.32	13 м3		
			Carpinus orientalis	2200	14	554	2.86	0.40	16	0.28	11 м3		
		Шума											39.60
		Шумско земјиште											48.60
		Вкупно:										88.20	
2	2а	Надморска висина: 500-920 м Изложеност: север/североисток Падини со помали порои Каменита и сува почва, без хумус	ass. Quercus carpinetum orientalis									Греење 90.00 Отпад 10.00	
			Quercus frainetto	1920	13	764	3.85	0.50	29	0.29	17 м3		
			Carpinus orientalis	2060	13	764	3.85	0.50	29	0.29	17 м3		
		Шума											58.80
		Шумско земјиште											30.00
		Вкупно:										88.80	
3	3а	Надморска висина: 600-970 м Изложеност: Исток/југоисток Шумско земјиште на брдо со две стрмни падини Каменита и сува почва, без хумус	ass. Orno Quercetum petraeae									Греење 90.00 Отпад 10.00	
			Quercus petrea	1350	32	909	1.25	0.40	11	0.58	16		
			Carpinus orientalis	1820	11	312	2.73	0.30	9	0.20	6		
		Шума											28.40
		Шумско земјиште											21.10
		Вкупно:										49.50	

é) Профил на природни опасности

Профилот на природни опасности е ист како и регионалниот профил на Општина Радовиш со поплавите (вклучувајќи ги и поројните поплави) како број еден опасност, следени од пожарите на отворено, земјотресите, и другите природни опасности, претежно опасностите поврзани со времето (град, олујни невремиња, силни ветрови, поројни дождови и сл.), како и свлечишта и ерозии.

Не постои досие на катастрофални настани за територијата на селото од минатото. Сепак, секој опасен настан кој се случил на територијата на Радовиш имал одредено влијание и на атарот на селото, но без големи последици. Главен проблем во селото се поројните поплави и опасностите поврзани со времето. Овие настани се особено микро-лоцирани во нивната фреквенција и интензитет и можат сериозно да го погодат основниот извор на нивниот приход – производството на тутун, при што се зголемува нивната ранливост како население и сериозно се намалува отпорноста на заедницата кон катастрофи.

Поројните поплави се главна опасност и поради карактеристиката на теренот на планината Плачковица, како и поради зголемениот интензитет и фреквенција на поројни дождови. Најврнежливиот период е помеѓу месеците ноември и март, додека најсушниот период е помеѓу август и септември. Сепак, поради промената на климата се случуваат чести настани на силни поројни дождови и во другите делови на годината, особено во текот на летните месеци.

Селото Коцалија е во радовишката сеизмичка зона која е предмет на чести земјотреси кои се предизвикани од локалните или далечните епицентрални жешки точки. Во овој регион до 1976 год. имало повеќе од 77 регистрирани земјотреси, од кои 6 биле со интензитет од 6 или повеќе. Епицентрите се во јужниот или југисточниот дел на радовишката долина, додека жариштето на еден од нив било во регионот на Лакавица. Врз основа на анализите, најголем дел од Радовиш е изложен на сеизмичка опасност со интензитет од 8° според МЦС, додека областа на планината Плачковица е изложена на интензитет од 9° според МЦС.

Не постојат техничко-технолошки опасности во атарот на селото, бидејќи нема индустриски капацитети. Сепак, селото се соочува со зголемено загадување на воздухот. Имено, јаловиштето на рудникот Бучим е блиску до селот и кога има силни ветришта во правец на селото, воздухот е загаден со висока концентрација на прашина и крупни честички. Поради тоа, неопходно е да се има шумско земјиште како вид на заштита.

5. НАОДИ ОД ТЕРЕНСКОТО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

5.1 Истражување на ниво на селото (Состанок во селото)

Истражувањето на ниво на селото (состанок во селото) беше одржан како што беше планирано на 18.06.2018 (13:00 – 14:30 часот) и беше одржан во централната продавница во центарот на селото. Приближно 18 селани беа присутни и земаа активно учество во истражувањето. Состанокот беше одржан во форма на фокус група и дискусијата беше водена и прашањата беа прашувани според претходно подготвениот и одобрен формулар за состанок во селото. Сите теми од формуларот беа покриени и селаните ги изразија нивните мислења и ја коментираа постоечката ситуација во селото. Состанокот беше раководен од страна на лидерот на тимот како главен модератор и членовите на тимот како записничари. Соодветно беше подготвен записник од состанокот кој е приложен во Анекс V.



Слика 4 – Дел од учесниците на состанокот во селото, тимот и претставниците од општинските институции по завршувањето на состанокот (18.06.2018)

Добиените информации од состанокот се вредни и обезбедуваат дополнителен аспект на социо-економските и аспектите на животната средина, како и профилот на природните опасности на селото. Според тоа, информациите од истражувањето во селото се презентирани во овој Нацрт-извештај и ќе бидат корелирани со Профилот на селото и истражувањето на домаќинствата и презентирани во извештајот.

i) Карактеристики на селото – нема докази за историскиот развој на селото и историјата на селото може да се датира до 15ти век. Според Пописот, населението брои 478 жители со однос на мажи и жени 50:50. Населението генерално е младо и се зголемува, бидејќи многу селани го прошируваат своето семејство со трето или четврто дете следејќи ја владината политика за субвенција на многудетни семејства. Друга причина е одлуката на турската влада да не дозволи двојни државјанства после 2012 год. Во селото има 135 домаќинства. Главна економска активност е земјоделството – одгледување на тутун (90% од семејствата) и сточарство (8 семејства). Има и 5 одгледувачи на пчели и неколку приватни фирми.

Најголемиот дел од селаните се невработени со еден член од семејството регистриран како земјоделец за да може да биде квалификуван за добивање на субвенции. Социјалната инфраструктура во селото е многу ограничена: има функционална водоводна мрежа, нема функционална канализација, има основно училиште, нема здравствен или ветеринарен објект.

Комуналната инфраструктура е лоша со само 50% од селото покриено со улици, еден асфалтиран пат до Радовиш, нема дистрибутер на интернет, има два сигнал од два мобилни оператори и функционален мобилен интернет, но нема организирано собирање на смет и поради тоа бесправно се одложува. Се подготвува урбанистички план за селото.

ii) **Главни селски продукти** – Главен продукт е тутунот, тип Прилеп, со просечно годишно производство од 200 тони или монетарна вредност на производството од 800,000 ЕУР.

iii) **Состојба со употреба на шумата** – Од страна на селаните беше наведено дека шумата околу селото 70% е во државна сопственост и 30% е во приватна сопственост. Шумата е управувана од страна на регионалната подружница на ЈПМШ. Дрвјата се главен ресурс за греење, како и за градежни работи, земјоделство и сточарство. Главни видови на дрвја се даб и бука. Во минатото имало и багрем. Нема организирано пошумување кое според нивното мислење потребно е да биде редовно и да обезбеди корист за селаните. Сточарите кои се 8 домаќинства во селото или 6% од домаќинствата се против оваа идеја и соодветно може да настане конфликт помеѓу сточарите и проектните активности за пошумување. Поради тоа сугестија е да се реализира добра програма за јавната свест за придобивките од пошумувањето, како и да се комуницира со сопствениците на животните кои пасат преку реализација на сесии за сензибилизирање со цел да се решат можните проблеми.

iv) **Традиционална работа со соработка, обичаи, практики** – Земјоделството е сектор со соработка за сите членови на семејството. Жените се гледаат во нивната улога за поддршка на семејството. Нивниот живот во селото е многу традиционален и тие претежно остануваат дома вршејќи ги сите домашни работи, скоро без контакт со други надворешни лица.

v) **Ситуацијата со сопственоста на земјоделското земјиште и пасиштата** – Како што е наведено погоре, 70% од шумите се во државна сопственост, а 30% во приватна. Најмногу од земјоделското земјиште околу селото е во приватна сопственост. Шумските пасишта се слични со сопственоста на шумата и во најголем дел се во државна сопственост.

vi) **Главни земјоделски практички и годишен распоред на работите** – Главна култура е тутунот, додека останатите култури се одгледуваат за семејни потреби. Ист е случајот и со сточарството – овци, крави, кози и живина. Земјоделската сезона е во периодот мај – октомври, додека во сточарството, работите се вршат во текот на целата година. Главните активности за одгледувањето на тутун се рачни и полу-автоматски. Не постои разбирање за оддржливи земјоделски практики. Сите селани не го заштитуваат производството од домашните животни и кога тоа го прават, најчесто употребуваат ограда. За заштита на дрвјата (на пр. ореви, овошки) се користат трња, грмушки и дрвени стапчиња од даб. Производството на тутун е семеен бизнис.

vii) **Постојна организација на населението** – постои функционална месна заедница за локалната заедница и има совет од 6 членови и 1 претседател. Ова тело комуницира со општинските органи во Радовиш за сите прашања од значење за селото. Ако е потребно, се организираат заеднички состаноци во селото каде што се дискутираат важни прашања и се носат одлуки.

viii) **Локации на ерозија на земјиштето** – Во близина на местото викано Иник имало неколку ерозии, но без влијание на населението или домовите. Има мали ерозивни подрачја околу селото, особено после поројни дождови. Бројот на ерозии се зголемува и земјиштето се почесто се свлекува во насока на реката. Во близина на браната во Тополница, животни предизвикале свлекување на земјата и две крави се удавиле во реката. Не се преземени мерки или работи ниту пак се планирани за спречување на ерозијата.

ix) **Состојба со водата во селото** – Има организиран систем за водоснабдување во селото со филтер станица и еден резервоар за вода. Главниот извор на вода е во планината Плачовица. Водата се филтрира со хлор и се контролира од надлежните органи. Скоро секоја куќа има водомер. Секое домаќинство плаќа за потрошената вода. Минатата година имале недостаток на вода. Има неколку случаи на труење со вода. Нема функционална канализација и отпадните води се испуштаат слободно во три насоки околу селото.

x) **Ситуација со бесправната сеча** – Нема организирана сеча во шумата во близина на селото. Сета сеча е бесправна и најмногу се прави од луѓе од страна кои не се од селото. Има мал број на лица од селото кои вршат бесправна сеча. Од друга страна, најмногу од селаните ги добиваат дрвата за огрев од бесправната сеча. Главна цел на оваа сеча е комерцијална и се врши интензивно во текот на целата година, со тоа што врвот на сезоната е од пролет до есен. Најмногу се сече даб. Нема проценка на количината на бесправна сеча. Негативните ефекти од оваа сеча се гледаат во значителното намалување на територијата под шума, ерозии, загуба на зеленилото. Има патроли од ЈПМШ, но не се чести. Нема организирани акции против бесправната сеча од страна на Министерството за внатрешни работи и ЈПМШ.

xi) **Рекорд на катастрофи околу селото** – Главните природни опасности се опасностите во врска со времето (поројни поплави, суша, град, олујни невремиња со грмотевици, снежни врнежи). Атарот на селото не е директно изложен на шумски пожари. Не се случиле катастрофални настани. Имало неколку случаи на смрт на селаните од грмотевици. Пред пет години имало големо оштетување на насадите со тутун поради град и олујно невреме. И покрај тоа што куќите и објектите се во најголем дел дивоградби без градежна дозвола или врз основа на урбанистички план, селаните сметаат дека применуваат основи на градењето за избегнување на ризикот (на пр. растојание помеѓу куќите). Ранливите категории на селани се поранливи од другите на катастрофите, но изложеноста зависи од локацијата на куќата и изградената средина. Никој не е одговорен за НРК во селото. Исто така, отсутствуваат насоки за постапување од страна на Владата или општината. Никој во селото, дури ни во нивната рурална заедница (месна заедница) нема делегирани одговорности за НРК. Генерално отсутствува поимањето на НРК и вклучувањето во секојдневниот живот. Нема проценки или планови за вонредни состојби. На нивото на заедницата информациите се споделуваат усмено помеѓу селаните или преку мобилни телефони. Некогаш се организираат и селски сосаноци (на пр. минатата година со недостатокот на вода). Во основното училиште има план за итни состојби. Селаните не знаат што да прават и како да се заштита во случај на катастрофи.

5.2 Истражување на ниво на домаќинствата (Употреба на прашалникот)

Истражувањето на ниво на домаќинствата беше имплементирано преку употреба на Прашалникот одобрен од проектот со структура и содржина елаборирани во делот за методолошката рамка на овој извештај. Временската рамка на оваа анкета беше 8 денови по состанокот во селот одржан на 18 јуни 2018 год. (19 – 26 јуни), но бидејќи ентузијазмот на селаните за учество во анкетата беше голем, четири интервјуа со испитаници беа одржани веднаш по селскиот состанок. Пресекот на интервјуата на дневна основа е презентираан во табелата подолу.

Анкета на домаќинствата	18.06	19.06	20.06	21.06	22.06	23.06	24.06	25.06	26.06	Вкупно
Број на испитаници	4	4	4	6	8	8	8	4	4	50

Табела 2 – Број на испитаници во анкетата на домаќинствата на дневна основа

Дистрибуцијата на маалата, полот и годините на испитаниците беше диверзифирана со цел да ги опфати различните динамики на локалната заедница. Пресекот на испитаници според дистрибуцијата на маалата – деловите од селото е балансиран со барањата горните делови од селото кои се поблиску до локацијата за интервенцијата на проектот да бидат позастапени од другите и е претставена во табелата подолу:

	Број на домаќинства	Процент
Горен дел од селото	19	38%
Централен дел од селото	15	30%
Долен дел од селото и влезниот дел од селото	16	32%
Вкупно:	50	100%

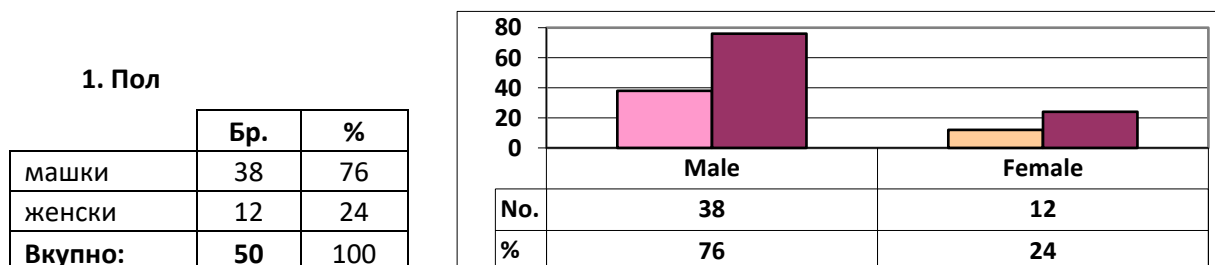
Табела 3 – Број на испитаници во анкетата на домаќинствата според локација во селото

Генерално земено, селаните беа отворени за соработка и учество во анкетата и последователните планови и имплементација на активности од страна на проектот и во 99% случаи, испитаниците учествуваа во анкетата. Само еден селанец одби да учествува во анкетата поради свои лични причини. Друг факт е дека тие ги одговараа сите прашања, дури и т.н осетливи прашања (на пр. за приходот и трошоците). Ова беше постигнато благодареејќи на искуството и пристапот и ставот на тимот, желбата за соработка на испитаниците, како и поддршката обезбедена од локалните партнери (на пр. општината, регионалната канцеларија на ЦУК).

Во текстот подолу се сумаризирани, наодите и анализите според индивидуалните прашања од прашалникот според трите делови на истиот:

- Прашања поврзани со домаќинството;
- Прашања поврзани со животната средина, и
- Прашања поврзани со катастрофите.

I. ПРАШАЊА ПОВРЗАНИ СО ДОМАЌИНСТВОТО



Графикон 1: Анализа на податоците според полот на испитаниците

Прашање 1: Пол

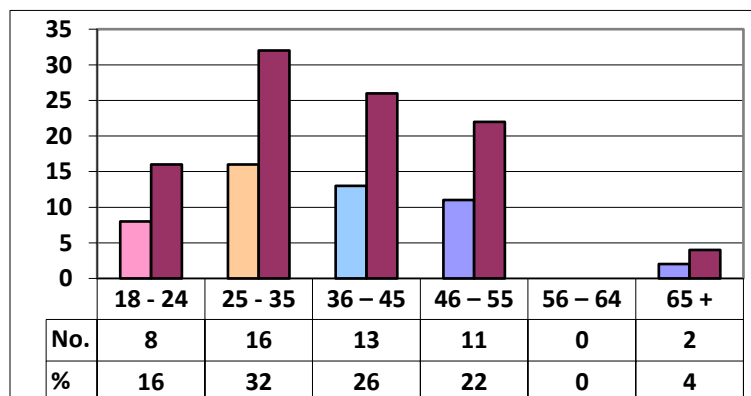
Врз основа на достапните информации за населението и културниот профил, како и традиционалните карактеристики на локалната заедница во село Коџалија, од најголема

важност беше да се има инклузивна родова застапеност на испитаниците во анкетата. Поради тоа, од самиот почеток на организациското планирање на задачата, тимот имаше предизвик како да обезбеди соодветно учество на жените од локалната заедница. Овој предизвик имаше две димензии: една поврзана со јазичната бариера и втората која произлегуваше од културните и традиционалните карактеристики на локалната заедница. Првата се карактеризираше со нивото на познавање на македонскиот јазик од страна на жените во селото, со оглед дека тие ја имаат традиционалната улога на домаќинки кои седат претежно дома и ги вршат домашните работи или ги поддржуваат земјоделските работи во полето. Врз основа на ова, во најголемиот број на случаи тие не го зборуваат македонскиот јазик. Вториот предизвик произлегуваше од културните навики од селото, каде што жените се резервирани во воспоставувањето на комуникација со надворешните лица, особено од машки пол. Овие предизвици беа успешно надминати од страна на тимот со поддршка на локалните корисници на проектот. Имено, еден од членовите на тимот беше жена, а од друга страна РЦУК Радовиш обезбеди присуство на жена вработена во центарот со познавање на турскиот јазик и обезбеди поддршка за време на анкетата со превод на интервјуата со женските испитаници. Како резултат, од 50 испитани домаќинства, 38 или 76% беа машки, а 12 или 24% беа женски испитаници.

Анализата на процесираниите податоци од Прашањето бр.1 – Пол е презентирано во графиконот 1: Анализа на податоците според полот на испитаниците. Од вкупно 50 испитаници од 50 домаќинства, 38 или 76% беа од машки пол, додека 12 или 24% беа од женски пол. Овој податок го истакнува добриот родов баланс на оваа анкета со можност гласот на жените и нивното мислење за темите и аспектите од Еко-НРК да се слушнат и вклучат во анкетата. Понатаму, за време на истражувањето, женските испитаници изразија свесност за истражувањето и тековниот Еко-НРК проект. Тие покажаа солидно знаење за тематската област која беше покриена со специфични прашања, како и интерес за подобрување на животните услови на заедницата, бидејќи жените се најранливи на природните катастрофи. Исто така, тие поседуваат знаење и капацитетити кои можат да се искористат за понатамошно зајакнување на отпорноста на заедницата.

2. Која е вашата возрастна група?

	Бр.	%
18 - 24	8	16
25 - 35	16	32
36 - 45	13	26
46 - 55	11	22
56 - 64	0	0
65 +	2	4
Вкупно:	50	100



Графикон 2: Анализа на податоци според возрастната група на испитаниците

Прашање 2: Која е вашата возрастна група?

Ова прашање спаѓа во групата на прашањата од домаќинството и има за цел да укаже на перцепцијата на селаните на раличните теми од анкетата на различните возрастни групи на испитаници и соодветно на локалната заедница. Возрасната структура на избраната категорија на граѓани, во случајот на село Коџалија, се однесува на различното ниво на разбирање на прашањата и темите од прашалникот и обезбедување на повеќе перспективност во одговорите од нивна страна. Различното ниво на перцепција дополнително е поврзано со нивото на

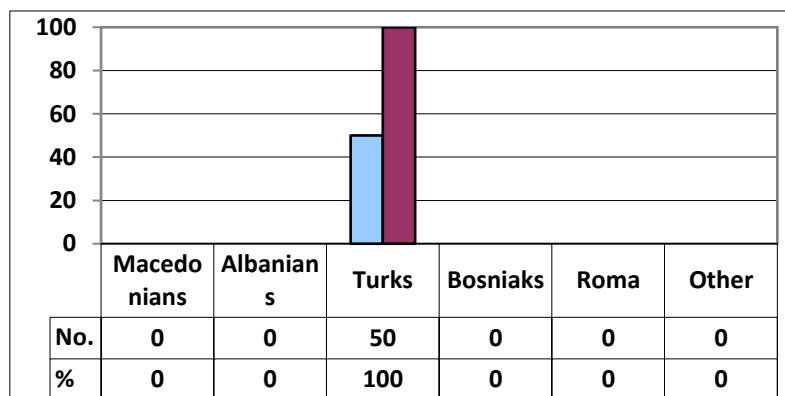
образование, животно и работно искуство, однесување и навики, ниво на свесност и други елементи кои се карактеристични за различните групи на население.

Со цел за собирање на податоци за возрастната структура на испитаниците, ниво со шест категории на возрастни групи беше дефинирано од страна на тимот и тоа од 18 до 65+ години како што е презентирано во табелата подолу. Деталните податоци за возрастната структура на испитаниците се дадени во Графикон 2: Анализа на податоци според возрастната група на испитаниците. Од собраните и анализирани податоци може да се види дека најмало е учеството на возрастната груп од 65+ години со само 2 учесници (94%), додека најголемо учество има групата од 25 до 35 години со 16 испитаници (32%). Потоа следува групата од 36 – 45 години (13 испитаници или 26%) и 46-55 години (11 испитаници или 22%). Исто така, 8 испитаници се млади од 18-24 години (16%). Како што може да се види најмногу испитаници се од возрастната група од 25 до 35 години на старост. Ова значи дека помладата структура на селани беше анкетирана и со овој пристап нивната свесност за значењето на Еко-НПК е зголемена. Следејќи ја имплементацијата на целосните проектни активности на локално ниво во наредниот период, тие можат да бидат агенти на промените за отпорности и оддржлив развој на заедницата. Уште повеќе, ако ја анализираме возрастната структура на женските испитаници, може да увидиме дека најмногу се од групата од 36 – 45 години со 6 испитаници (50% од сите женски испитаници), а потоа следуваат групите 18-24 и 25-35 години со ист број на испитанички – 3 или 25% секоја. Овие увиди дополнително го подобруваат вклучувањето на родот во заедницата, не само во аспектите на животната средина и катастрофите, туку и во сите социо-економски аспекти.

Уште еден интересен податок е дека 80% од испитаниците се со возраст помеѓу 25 и 55 години. Ако го корелираме овој податок со способноста за работа, целосната економска активност, искуството и останатите слични индикатори, можеме да очекуваме квалитативно исполнување на целите на ова истражување, особено оние кои што се поврзани со економските и социјалните аспекти на заедницата.

3. Која е вашата етничка припадност?

	Бр.	%
Македонци	0	0
Албанци	0	0
Турци	50	100
Бошњаци	0	0
Роми	0	0
Други	0	0
Вкупно:	50	100



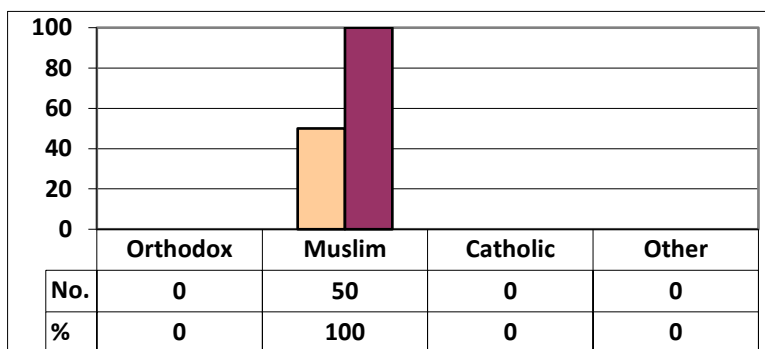
Графикон 3: Анализа податоците според етничката припадност на испитаниците

Прашање 3: Која е вашата етничка припадност?

Дури и пред да започне истражувањето, штом беа прегледани податоците за профилот на селото беше јасно дека етничката припадност на селаните од Коџалија е монолитна и дека локалното население е со турска етничка припадност. Сепак, за целите на официјално потврдување, едно од прашањата во прашалникот реферираше на ова и наодите се претставени во Графикон 3. Наодите го потврдуваат прегледаниот профил и од 50 испитаници, 50 или 100% се декларираа дека имаат турска етничка припадност.

4. Која е вашата религиозна припадност?

	Бр.	%
Православна	0	0
Муслиманска	50	100
Католичка	0	0
Друго	0	0
Вкупно:	50	100



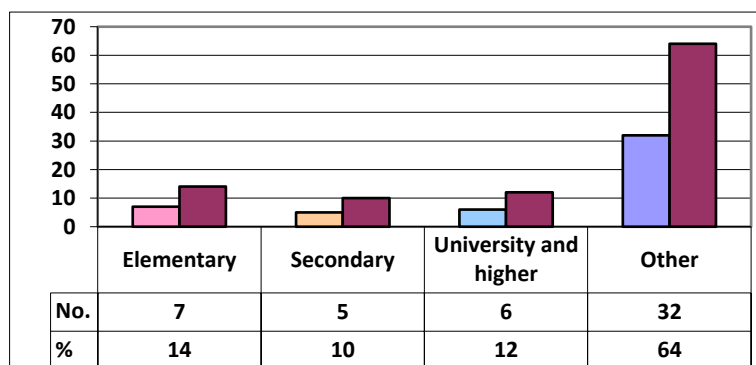
Графикон 4: Анализа на податоците според религиозната припадност на испитаниците

Прашање 4: Која е вашата религиозна припадност?

Ситуацијата беше слична и со ова прашање како и со претходното. Имено, етничката припадност е блиску поврзана со религиозната позадина и занејќи дека локалната заедница е составена од јуруци (турска под-етничка група која дошла од Анадолија, регионот на Коња за време на 14от и 15от век), се очекување дека нивната религиозна припадност ќе биде муслиманска. Сепак се постави соодветно прашање во прашалникот и се собраа и анализираа податоците кои се претставени во Графикон 4. Наодите ги потврдија претпоставките и испитаниците од 50 домаќинства или 100% се со муслиманска религиозна припадност.

5. Кој е вашиот степен на образование?

	Бр.	%
Основно	7	14
Средно	5	10
Високо или постдипломски	6	12
Друго	32	64
Вкупно:	50	100



Графикон 5: Анализа на податоците според нивото на образование на испитаникот

Прашање 5: Кој е вашиот степен на образование?

Главна цел на ова прашање е да се соберат податоци за образовниот профил на испитаниците, како елемент кој има силно влијание врз воспоставувањето на односи и врски од културни и социјални аспекти на ниво на локалната заедница. Уште повеќе, нивото на образование е во директна врска со разбирањето на основите на Еко-НРК концептот и општите цели и намери на проектот за градење на капацитети за вклучување на еко базираните решенија во НРК. Доказот за ова произлегува од самото истражување и обезбедените одговори на испитаниците, каде што нивото на образование реферира на нивото на знаење.

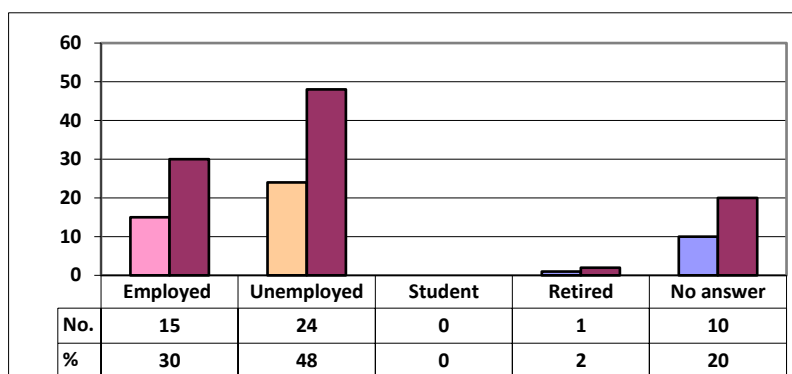
Последователно анализата на податоците во врска со ова прашање е презентирано во графиконот бр.5: Анализа на податоците според нивото на образование на испитаникот. Врз основа на добиените одговори може да се заклучи дека само 6 или 12% од испитаниците имаат високо или вишо ниво на образование, додека 5 или 10% од испитаниците имаат средно образование. Основното образование е стекнато од 7 испитаници (14%). Сепак, анализата на ова прашање на површина ги изнесува дополнителните карактеристики на образовната

ситуација во селото. Имено, најголемиот дел од испитаниците (32 или 64%) се запишани во делот други, со оглед дека се изјасниле дека имаат завршено само четврто одделение на основното образование. Тековното образование во државата има 9 одделенија, додека претходниот образовен систем имаше 8 одделенија. Сега е задолжително да се заврши средното образование, додека во минатото беше задолжително да се заврши основното образование. Според ова може да се заклучи дека најголемиот дел од испитаниците немаат завршено основно образование и имаат т.н. полу-основно образование. Оваа ситуација е иста и кај женските испитанички, од кои само 2 имаат завршено средни и високо образование, додека 10 од нив се само со завршено четврто одделение. Најверојатно е дека оваа образовна состојба со испитаниците може да се прелика и кај другите жители на селото.

Оваа состојба може да се поврзе со културата на т.н. затворена заедница која е типична за јуруците и за селото. Пристапот до образованието е друг аспект на ограниченото завршено образование, бидејќи во селото има само училиште од 1во до 5то одделение (1во до 4то во минатото) и претежно селаните се школувале во тоа училиште. Друг ограничувачки елемент е од културниот и традиционален аспект, каде што женските деца не се праќаат на школување надвор од територијата на локалната заедница, дури и во најблиското основно и средно училиште во Радовиш.

6. Кој е вашиот статус на вработување?

	Бр.	%
Вработен	15	30
Невработен	24	48
Студент	0	0
Пензиониран	1	2
Без одговор	10	20
Вкупно:	50	100



Графикон 6: Анализа на податоците според статусот на вработување на испитаникот

Прашање 6: Кој е вашиот статус на вработување?

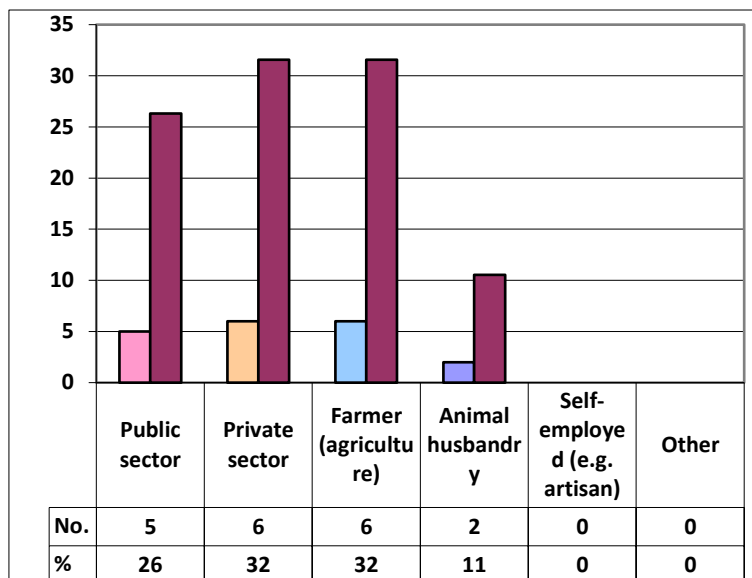
Ова прашање е во врска со статусот на вработување на испитаниците и е особено важно за прелиминарното разбирање на економската состојба на локалната заедница. Поради тоа во овој прашалник има неколку прашања во врска со ова, од кое едно се однесува на утврдувањето на статусот на вработеност на испитаникот. Анализата на податоците е презентирана во графиконот бр. 6.

Од 50 испитаници, само 15 или 30% имаат изјавено дека имаат континуиран статус на вработување, додека 24 или 48% се невработени и 1 испитаник (2%) е пензионер. Никој од испитаниците не се декларираше како студент и ако го корелираме ова прашање со нивото на образование, може да се потврди дека генерално нивото на образование во село Коџалија е многу ниско.

Сепак, важно е да се нагласи дека и покрај тоа што немаше опција за не одговарање на прашањето, тимот одлучи да го воведо како можност во анализата, со оглед на фактот дека 10 испитаници или 20% не дадоа одговор на прашањето за време на анкетата. Причина за ова е резервираноста на испитаниците околу употребата на податоците од прашалникот (на пр. можноста за пресметка на данок, дополнително оданочување или губење на одредени социјални услуги) и покрај тоа што анкетарите јасно ги образложија целите на истражувањето и процедурите за користење на податоци.

ба. Ако сте вработени, наведете го вашиот сектор на вработување.

	Бр.	%
Јавен сектор	5	26
Приватен сектор	6	32
Фармер (земјоделеие)	6	32
Сточарство	2	11
Самовработен (на пр. занаетчија)	0	0
Друг	0	0
Вкупно:	19	100



Графикон ба: Анализа на податоците според секторот на вработувањето на испитаникот

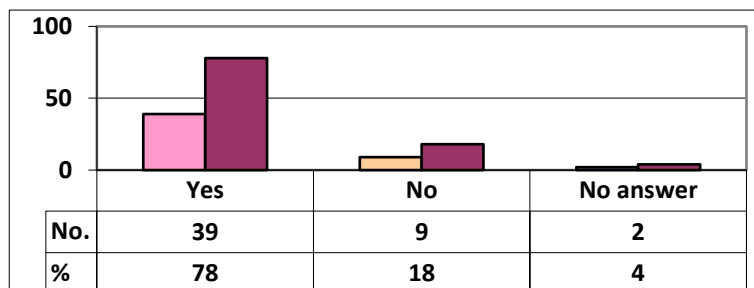
Прашање ба: Ако сте вработени, наведете го вашиот сектор на вработување.

Прашалникот за теренското истражување има за цел подобро разбирање на економската состојба на испитаниците и за таа цел дополнителното прашање бр. ба беше формулирано за да се дефинираат главните сектори на вработување на испитаниците. Целта беше и да се разјасни секторот на вработување и изворите на приход на домаќинството ако испитаникот одговорил дека е вработен во прашањето бр. б.

Вкупно 19 лица го одговорија прашањето што е повеќе од одговорите во претходното прашање. Ова ја потврдува резервираноста на испитаниците спрема јавното изјаснување за нивниот статус на вработување. Имено, од 19 испитаници, 5 или 26% се вработени во јавниот сектор, 6 или 32% се вработени со приватниот, 6 или 32% се изјаснија дека се земјоделци и само 2ца или 11% се вработени сточари. Битно е да се нагласи дека со теренското истражување не беше побарано да се соберат податоци за специфичните области на вработување на испитаниците во јавниот или приватниот сектор. Друга карактеристика е малиот број на регистрирани земјоделци и покрај тоа што земјоделството – производството на тутун е главен извор на приходи за заедницата. Како што беше дискутирано за време на состанокот во селото со селаните, во најголем број на случаи, еден од членовите на домаќинството е регистриран како земјоделец со цел за добивање на субвенции од страна на владата и во некои случаи, регистрирани се жени.

7. Дали имате дополнителна работа?

	Бр.	%
Да	39	78
Не	9	18
Без одговор	2	4
Вкупно:	50	100



Графикон 7: Анализа на податоците според дополнителната работа на испитаникот

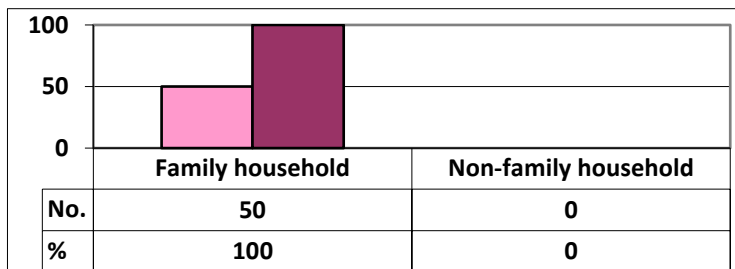
Прашање 7: Дали имате дополнителна работа?

Општ впечаток е дека многу семејства од областа на интензивното земјоделско производство (на пр. југоисточниот плански регион) се вклучени во земјоделските активности како дополнителна работа со цел за поддршка на нивната егзистенција преку дополнителен извор на приходи. Врз основа на ова, како и врз основа на претходното искуство со слични теренски истражувања, ова прашање беше вклучено во прашалникот. Резултатите од одговорите се прикажани во графиконот бр. 7. Од 50 испитаници, 39 или 78% одговориле дека имаат дополнителна работа, 9 или 18% немаат и само 2 или 4% испитаници не одговориле на прашањето.

Исто така, испитаниците дадоа коментари на типот на дополнителната работа врз основа на кои може да се види дека примарните дополнителни работи се земјоделството и сточарството. Главна земјоделска дополнителна работа е одгледувањето на тутун. Овој податок е потврден со претходните достапни информации дека од минатите години, локалните заедници во Радовиш се инволвирани во одгледувањето на тутун, како поради високите откупни цени, така и поради субвенциите за производство на тутун обезбедени од владата. Дополнително ако го земеме во предвид фактот дека во микрорегионот на село Коџалија нема доволно слободно земјоделско земјиште за одгледување на тутун и зголемениот интерес за започнување или проширување на производството, имаме доволно индикации дека бизнисот се проширува и за сметка на шумското земјиште и земјиштето во сопственост на државата. Од ова можеме да заклучиме дека една од причините за губење на шумата е зголемувањето на земјиштето за одгледување на тутун.

8. Вид на домаќинство

	Бр.	%
Семејно домаќинство	50	100
Не-семејно домаќинство	0	0
Вкупно:	50	100



Графикон 8: Анализа на податоците според видот на домаќинството на испитаникот

Прашање 8: Вид на домаќинство

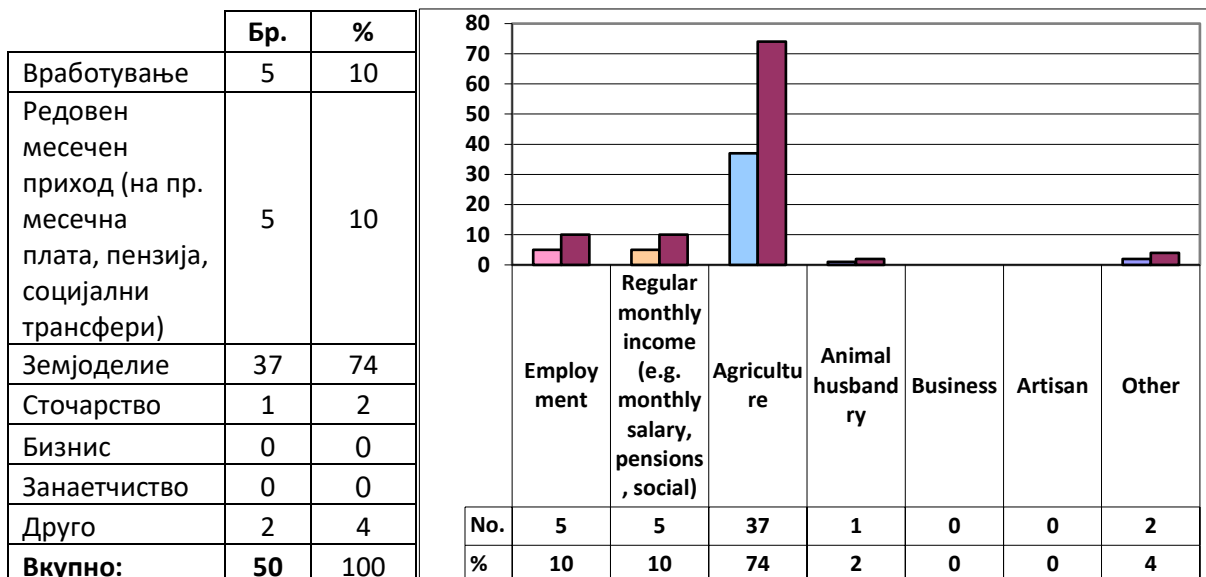
Прашање 9: Број на членови на домаќинството

Прашањата 8 и 9 беа анализирани во согласност определувањето на видот и бројноста на домаќинствата. Анализата е дадена во графиконот бр. 8. Сите 50 домаќинства или 100% се декларираа како семејни домаќинства. Според насоките за истражувањето, семејното домаќинство се состои од два или повеќе членови кои се поврзани според раѓањето, брак или посвојување, иако може да содржат поврзани и неповрзани луѓе.

Со цел за добивање на податоци за просечната структура на домаќинствата во село Коџалија, беше вклучено прашање за бројот на членови. Според одговорите, вкупно 262 жители беа опфатени со анкетата во испитаните 50 домаќинства и просечниот број на членови по домаќинство е 5.24. Најмногу од испитаниците живеат во домаќинства со 5 членови (родители и три деца). Овие податоци можат да бидат корелирани со информацијата од состанокот во селото дека поради владините субвенции за многудетни семејства (трето или повеќе деца),

многу од семејствата се одлучиле да го зголемат семејството со трето дете. Домаќинството со најмал број на членови има 2 члена, додека 2 семејства имаат 9 членови.

10. Кој е главниот извор на приходи на домаќинството?



Графикон 10: Анализа на податоци според главниот извор на приходи на домаќинството

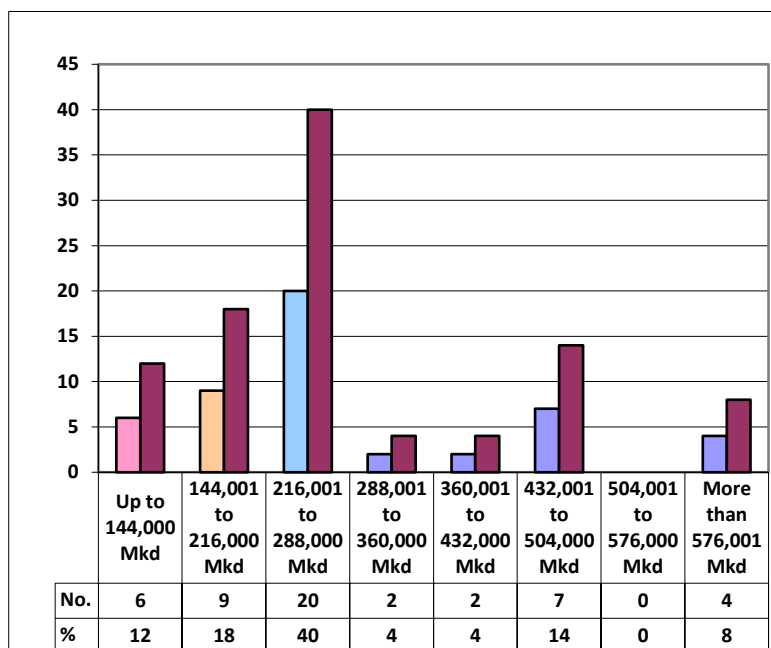
Прашање 10: Кој е главниот извор на приходи на вашето домаќинство?

Со цел за добивање на подетални податоци за економските услови на домаќинствата, беа вклучени прашања за приходи и трошоци во прашалникот. Во графикон бр. 10 се презентирани податоците за изворите на приходите. Според нив, 10 испитаници или 20% од домаќинствата имаат приходи од вработеност или регуларни месечни приходи (на пр. месечна плата, пензија, социјални трансфери и сл.) како главен извор на приходи. Само едно домаќинство или 2% живеат од сточарство, додека најголемиот број на семејства го имаат земјоделството како главен извор на приходи – 37 или 74%.

Следејќи ја структурата на прашалникот и економскиот профил на селото, неопходно е одговорите од ова прашање да се корелираат со одговорите од прашањето бр. 7. Според тоа може да се заклучи дека главниот извор на приходи за домаќинството во заедницата не е вработувањето или регуларниот месечен приход, туку дополнителните активности кои примарно се земјоделството и одгледувањето на тутун. Оваа економска ситуација ја зголемува ранливоста на населението на катастрофи, со оглед на фактот дека најголемиот дел од заедницата зависи од сезонското земјоделие – одгледувањето на тутун.

11. Вкупен годишен приход на домаќинството

	Бр.	%
До 144,000 МКД	6	12
144,001 до 216,000 МКД	9	18
216,001 до 288,000 МКД	20	40
288,001 до 360,000 МКД	2	4
360,001 до 432,000 МКД	2	4
432,001 до 504,000 МКД	7	14
504,001 до 576,000 МКД	0	0
Повеќе од 576,001 МКД	4	8
Вкупно:	50	100



Графикон 11: Анализа на податоците според вкупниот годишен приход на домаќинството

Прашање 11: Вкупен годишен приход на домаќинството:

За определување на општото разбирање на економската ситуација во селото, неопходно е да се формулира вкупниот годишен приход на домаќинството. Увидот од ова може да даде дополнително разбирање за ранливоста кон катастрофи, како и отпорноста на заедницата. Категоризацијата на годишниот приход на домаќинството е направена врз основа на податоците за просечната месечна нето плата за април 2018 според пресметките на Државниот завод за статистика и која изнесува 23,942 МКД.⁶ Следствено на тоа, просечната годишна проекција е направена во размер од 6 до 24 месечни плати – 144,000 МКД до повеќе од 576,001 МКД.

Резултатите од анализата на податоците е дадена во графикон бр. 11 и очигледно е дека најмногу од домаќинствата т.е. 35 или 70% имаат приход помеѓу 144,000 МКД и 288,000 МКД (помеѓу 6 и 12 просечни месечни плати). Најмногу т.е. 20 семејства или 40% имаат годишни приходи помеѓу 216,001 МКД и 288,000 МКД. 22% од домаќинствата (11) имаат повисоки примања (288,000 МКД до 504,000 МКД) и само 4 домаќинства (8%) имаат годишни приходи поголеми од 576,000 МКД или 24 просечни месечни плати.

Ако ова прашање со корелира со другите прашања од делот за економската ситуација во селото, може да се заклучи дека земјоделството/одгледување на тутун е главен контрибутор во годишниот приход на домаќинствата во село Коџалија. Исто така, со оглед дека неколку од испитаниците одговориле дека имаат понизок приход од минимумот за сиромаштија од 2013 година (147,578 МКД годишно)⁷, може да се каже дека живеат во состојба на сиромаштија. Овие податоци повторно упатуваат на разбирање на нивото на зголемена ранливост на домаќинствата кон ризиците и катастрофите, како и за ослабената отпорност на заедницата. Во таа смисла, економската ситуација/фактор е еден од аспектите на ранливоста кон катастрофи на населението. Според тоа, разбирањето е дека индивидуалците или заедницата ќе бидат

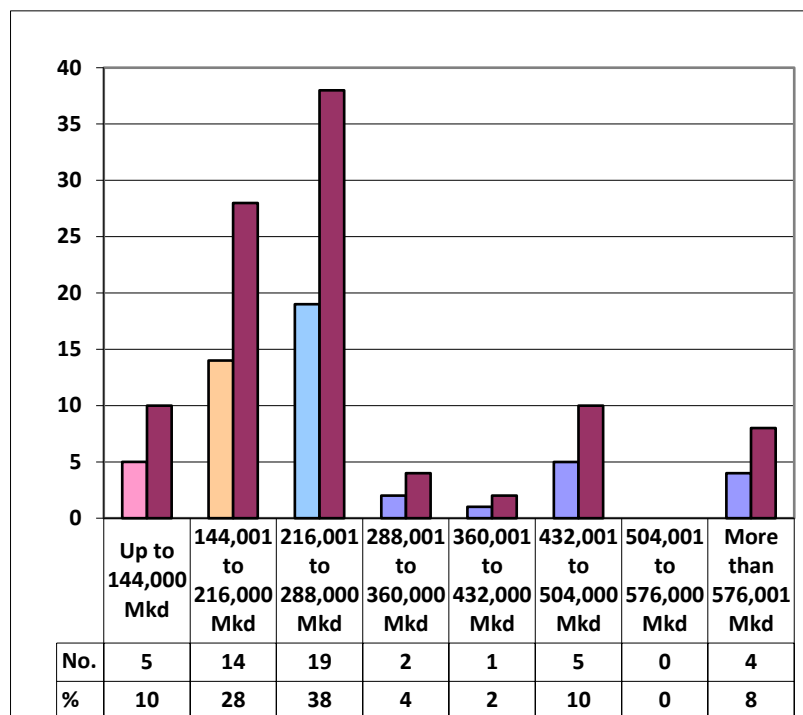
⁶ http://www.stat.gov.mk/KlucniIndikatori_en.aspx

⁷ <https://tinyurl.com/ybfosulz>

помалку отпорни доколку имаат слаба економска состојба. Ова исто така е дефинирано од страна на Меѓународната федерација на Црвениот крст: <http://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/what-is-vulnerability/>

**12. Вкупен годишен
расход на домаќинството**

	Бр.	%
До 144,000 МКД	5	10
144,001 до 216,000 МКД	14	28
216,001 до 288,000 МКД	19	38
288,001 до 360,000 МКД	2	4
360,001 до 432,000 МКД	1	2
432,001 до 504,000 МКД	5	10
504,001 до 576,000 МКД	0	0
Повеќе од 576,001 МКД	4	8
Вкупно:	50	100



Графикон 12: Анализа на податоците според вкупниот годишен расход на домаќинството

Прашање 12: Вкупен годишен расход на домаќинството

Паралелно на прашањето за вкупниот годишен приход има и прашање за вкупниот годишен расход, како излезна ставка на приходот. Главна цел на ова прашање беше да се разбере економската сила на просечното домаќинство во селото, презентирајќи ја врската помеѓу приходот и трошоците, како и постоењето или не на генерацијата на финансиски извори. Резултатите се презентирани во графикон бр. 12.

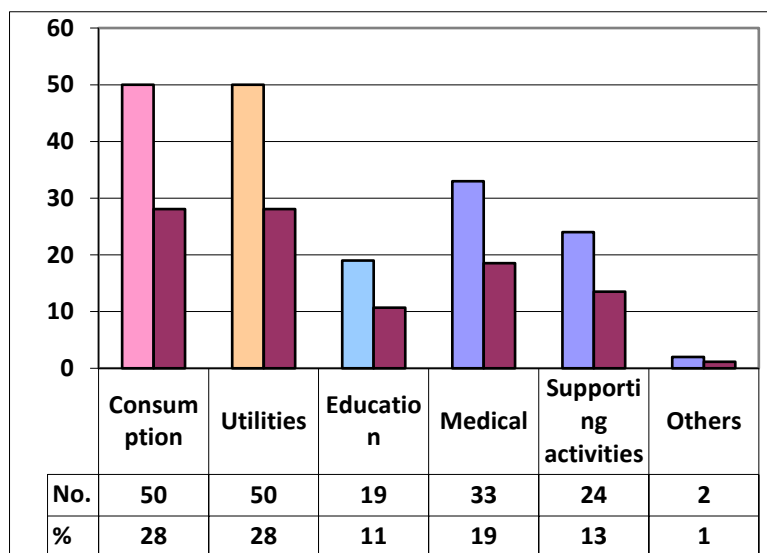
Од 50 домаќинства, 38 или 76% имаат годишни трошоци од 144,000 до 288,000 МКД или помеѓу 6 и 12 просечни месечни плати. Ова упатува на подпросечна економска сила на домаќинствата каде што сите потреби и трошоци на месечно ниво треба да се реализираат во износот помеѓу 12,000 до 24,000 МКД или помеѓу 6 и 12 просечни месечни плати. Дополнително, ова упатува на тоа дека голем процент на домаќинствата е потребно да имплементираат дополнителни работни активности за поддршка на нивната економска егзистенција и зголемување на нивната економска моќ. Исто така, упатува на можноста за недозволено задоволување на нивните потреби, на пример преку набавка на дрва за греење на домаќинствата преку нелегални канали и бесправна сеча, со оглед на тоа дека цената на дрвото за огрев е висока и претставува значително оптоварување на домашниот буџет. Во таа смисла, се корелира со прашањето бр. 17а за набавката на дрва за греење во кое огромниот дел на одговори се однесува на своја рака што упатува на бесправна сеча.

Вкупните годишни расходи во висина од 432,001 до 594,000 МКД или помеѓу 18 и 21 просечна плата имаат само 5 домаќинства или 10% од испитаниците. Само 4 домаќинства или

8% имаат поголеми расходи од 576,000 МКД (повеќе од 24 просечни месечни плати). Како финален заклучок на ова прашање, може да се утврди дека најголемиот дел од домаќинствата (70% - 80%) го димензионираат нивниот годишен расход во износ кој е понисок отколку годишниот просек во РМ. Анализата на ова прашање потврдува дека домаќинствата во селото имаат проста економска репродукција: износот кој е заработен се употребува за основна потрошувачка со многу мал процент на заштедување на средства. Ова исто така е дополнителна димензија на ранливоста на заедницата и прашање кое ја погодува нивната способност за можен одговор и опоравок од катастрофален настан намалувајќи ја нивната отпорност.

13. Видови на вкупни трошоци на домаќинството (повеќе одговори)

	Бр.	%
Потрошувачка	50	28
Комунални услуги	50	28
Образование	19	11
Медицински услуги	33	19
Помошни активности	24	13
Друго	2	1
Вкупно:	178	100



Графикон 13: Анализа на податоци според видовите на вкупни трошоци на домаќинството

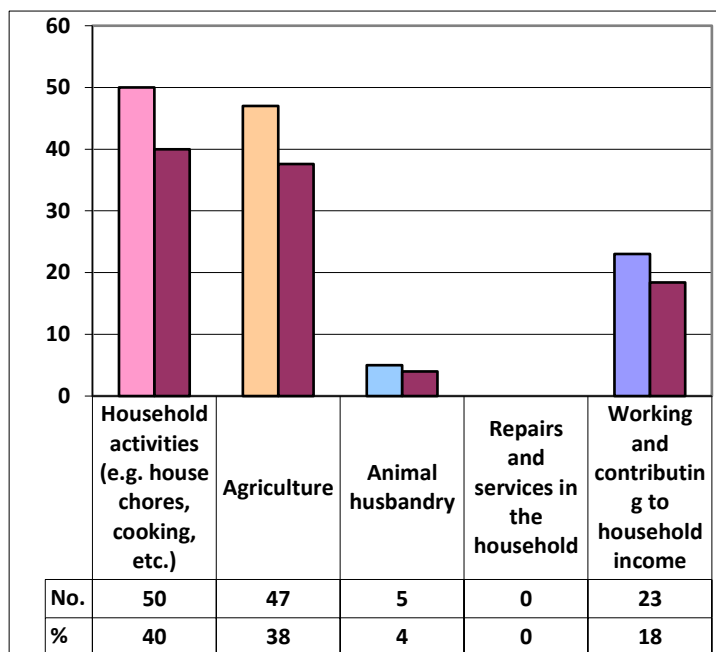
Прашање 13: Видови на вкупни трошоци на домаќинството (повеќе одговори)

Ова прашање е во врска со економската состојба во селото, особено поврзано со трошоците на домаќинствата. Ги презентира релевантните индикатори за природата на основните трошоци на домаќинството и анализата е претставена во графиконот бр. 13. Насоките ги дефинираат основните термини за овие трошоци: *потрошувачка* – ги вклучува сите видови на трошоци кои се неопходни за семејството (на пр. храна), *комунални услуги* – сите плаќања за комуналната инфраструктура и поврзаноста (вода, канализација, електрична струја, телефон, интернет и сл.), *помошни активности* – транспорт и слично (на пр. основно одржување на домаќинството), додека *друго* се однесува на сите неспецифицирани трошоци.

Од 50 испитаници, 28% домаќинства го трошат својот годишен приход за покривање на трошоците за потрошувачка и комунални услуги, 19% ги покриваат здравствените трошоци за семејните членови, 14% за помошни активности и само 11% ги плаќаат трошоците за образование на членовите на семејството. Последниот податок упатува на следново: ниското ниво на образование како во прашањето бр. 5 и ниската економска сила на семејствата и нивната неможност да алоцираат поголеми средства за образование после 5то одделение на основното образование, кое е достапно надвор од нивното село, во Радовиш и понатаму. Исто така, оваа состојба беше спомената од страна на селаните за време на истражувањето. Како генерален заклучок, се наведува дека типот на трошоци во заедницата се однесува на покривање на основните егзистенцијални трошоци без многу можности за развој на домаќинствата и инвестиции.

14. Улогата на жената во домаќинството (повеќе одговори)

	Бр.	%
Домашни активноти (на пр. домаќински активности, готвење, грижа за членовите на семејството и др.)	50	40
Земјоделие	47	38
Сточарство	5	4
Поправки и сервисни услуги во домаќинството	0	0
Работа и поддршка на приходот на домаќинството	23	18
Вкупно:	125	100



Графикон 14: Анализа на податоците според улогата на жената во домаќинството

Прашање 14: Улогата на жената во домаќинството (повеќе одговори)

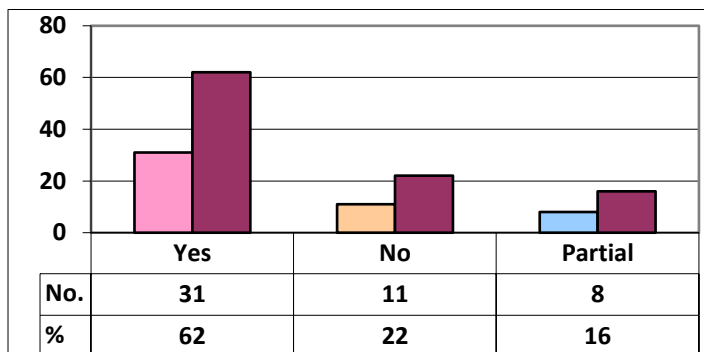
Ова прашање е последно од првата секција на прашалникот која се однесува на домаќинствата и претставува начин на собирање и анализа на податоци за улогата на жените во домаќинството во специфичната заедница. Улогата на жената реферира на разбирањето на испитаниците за доминантните улоги на жените. Ова дополнително е важно бидејќи заедницата е многу традиционална и специфична, населена од јуруци, каде што улогата на жената е многу конзервативна и е определена од традицијата. Жените се одговорни за домаќинството, работејќи ги сите задолженија, работејќи во земјоделството паралелно со мажите, со ограничен пристап до образование, многу ретко напуштајќи ја заедницата. Некако овие традиционални улоги им се доделуваат на девојчињата уште од најрано детство.

Анализите се претставени во графикон бр. 14 при што 40% од активностите се однесуваат на основните домашни активности, 38% се поддршка на земјоделството, 5% се на сточарството и 23 испитаници или 18% се однесуваат на одговорот дека жените придонесуваат на домашниот приход. Последователно, жените имаат централна улога во домаќинството и поддршка на активностите за одгледување на тутун кои навистина беа видени во живо од страна на тимот за време на теренското истражување. Имајќи ја во предвид традиционалната улога и информациите од ова прашање, неопходно е да се имплементира прилагодлив пристап за зајакнување на јавната свест за улогата на жената и вклучувањето на родовите перспективи во ЕКО-НРК на нивото на локалната заедница.

II. ПРАШАЊА ПОВРЗАНИ СО ЖИВОТНАТА СРЕДИНА

15. Дали има шума или пошумена површина во атарот на селото или во близина на селото?

	Бр.	%
Да	31	62
Не	11	22
Делумно	8	16
Вкупно:	50	100



Графикон 15: Анализа на податоците според тоа дали има шума или пошумена површина во атарот на селото или во близина на селото

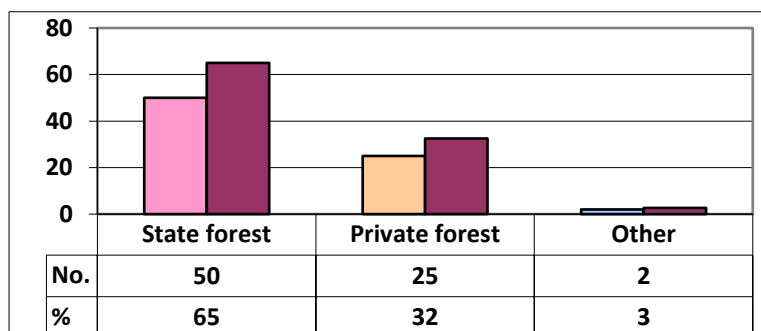
Прашање 15: Дали има шума или пошумена површина во атарот на селото или во близина на селото?

Ова е прво прашање од вториот дел на прашалникот кој се состои од прашања кои се однесуваат на животната средина во селото, како и разбирање и перцепција на локалната заедница за прашањата од животната средина вклучувајќи го и управувањето со шумите. Овој дел има 9 прашања и се однесуваат на животната средина и нарушувањата, а се со цел за собирање на податоци и информации за подобрување на функциите на еко-системот.

Ова прашање се однесува на знаењето на испитаниците за постоењето на шума или шумско земјиште во атарот на или во близината на селото. Анализата на одговорите е дадена во графиконот бр. 15. Од 50 испитаници, 31 или 62% одговорија дека постои шума или шумско земјиште. Напротив нив, 11 испитаници или 22% одговорија дека нема шума или шумско земјиште и 8 одговорија или 16% дека има делумно шума или шумско земјиште.

16. Каква е сопственоста на шумата?

	Бр.	%
Државна шума	50	65
Приватна шума	25	32
Друго	2	3
Вкупно:	77	100



Графикон 16: Анализа на податоците во врска со сопственоста на шумата

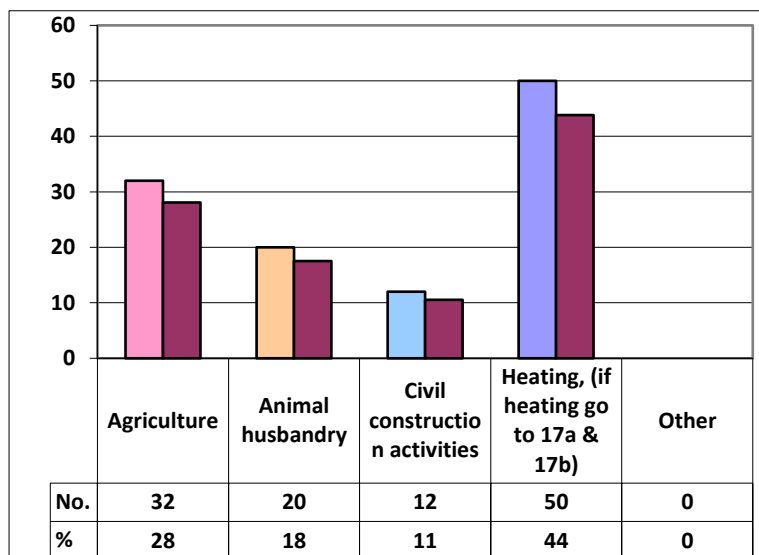
Прашање 16: Каква е сопственоста на шумата?

Целта на прашањето е да се презентира разбирањето на испитаниците за сопственоста на шумата во атарот на селото. Анализата е дадена во графикон бр. 16 и според гледањата на испитаниците, 65% одговорија дека шумата е во сопственост на државата, 32% одговориле дека е во приватна сопственост и 3% дека е во друга сопственост.

Важно е да се напомене дека некои од испитаниците инсистираа да се заокружат двата одговори – државна и приватна сопственост со мислење дека тоа претставува најдобар одговор бидејќи постојат двата вида на сопственост над шумите. Други мислеа дека треба да се наведе и по нивно мислење приближната поделба на шумите во државна и приватна сопственост (70% - 30%). Оваа поделба беше спомената и за време на состанокот во селото. Сепак, битно е да се напомене дека според официјалните податоци од ЈПМШ, ситуацијата е различна. Имено, постојат 126.8 ха шуми во државна сопственост, 99.7 ха шумско земјиште (голони) и 8.5 ха шума во приватна сопственост. Така испаѓа дека односот помешу шумите во државна и приватна сопственост е значително различен: 96% - 4%.

17. Шумата и дрвото како ресурс се употребуваат за следниве цели (повеќе одговори):

	Бр.	%
Земјоделие	32	28
Сточарство	20	18
Градежни активности	12	11
Греење, ако одговорите греење, продолжете на 17а & 17б	50	44
Друго	0	0
Вкупно:	114	100



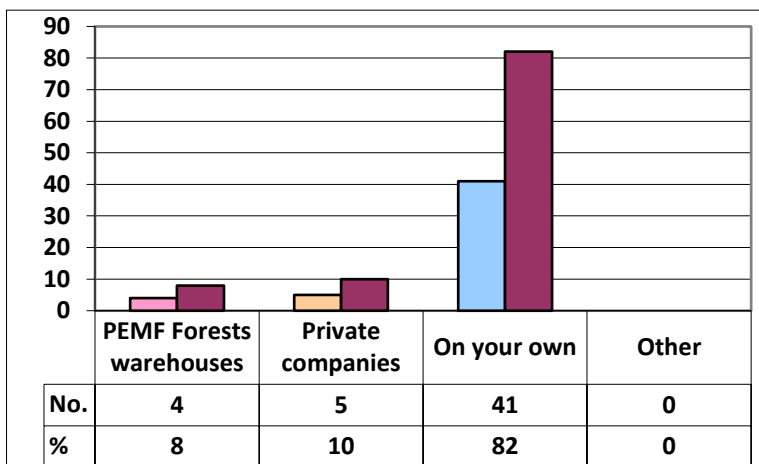
Графикон 17: Анализа на податоците според тоа како шумата и дрвото како ресурси се употребуваат за различни цели

Прашање 17: Шумата и дрвото како ресурс се употребуваат за следниве цели (повеќе одговори)

Според информациите на различните релевантни институции кои се дел од Еко-НРК проектот и неговата имплементација, шумата и дрвото се главни ресурси кои интензивно се користат од страна на населението во село Коџалија. Последователно беше потребно преку ова истражување да се разберат главните цели на употребата на шумата и дрвото и поради тоа прашањето бр. 17 беше формулирано за да ја долови перцепцијата на испитаниците. Анализите во графиконот бр. 17 упатуваат на тоа дека 32 испитаници или 28% одговориле дека ги употребуваат како ресурси во земјоделието (за одгледување на тутун, на пр. за нивите, огради, за сушење на тутунот и сл.). Дополнителни 20 испитаници или 18% одговорија дека ги користат во сточарството, додека 11% од одговорите упатуваат на нивна употреба како градежни материјали. Сепак во контекстот на ова истражување, како и општите цели на Еко-НРК проектот, неопходно е да се потенцира дека најголемиот дел од испитаниците одговорија дека ги користат за греење (50 одговори или 44%). Ова е во директна корелација со шумите и пошумените области во атарот на селото, нивната состојба, како намалувањето на шумата и бесправната сеча. Исто така, може да се претпостави дека штом сите 50 испитаници одговорија дека ги користат за греење, ова значи и дека целото село ги користат како ресурси за загревање на домаќинствата. Со цел за понатамошна анализа на овој феномен, две дополнителни прашања се поврзани со ова: 17а и 17б за добивање на подетални информации за изворот на обезбедување на дрвото како материјал за греење и просечната годишна потрошувачка на дрвото за греење во домаќинствата.

17а. Ако употребувате дрво како огревен материјал, од каде го набавувате:

	Бр.	%
Стоваришта на ЈП Македонски шуми	4	8
Приватни фирми	5	10
На своја рака	41	82
Друго	0	0
Вкупно:	50	100



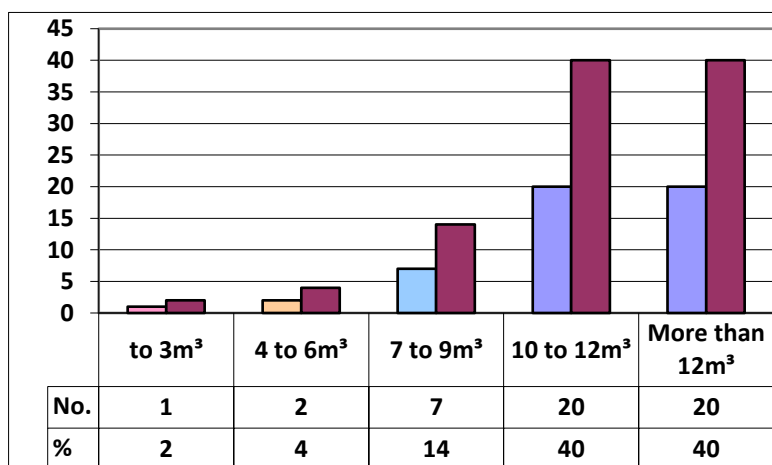
Графикон 17а: Анализа на податоците

Прашање 17а: Ако употребувате дрво како огревен материјал, од каде го набавувате?

Ова прашање има за цел да обезбеди прецизна информација за изворите за снабдување со дрво за греење на локалната заедница. Според анализата на податоците од графиконот бр. 17а, 82% од испитаниците или 41 домаќинство го добиват дрвото за огрев на своја рака, додека 18% или 9 домаќинства го купуваат од складиштата на ЈПМШ или од овластени приватно фирми. Анализата несомнено упатува на високо ниво на бесправна сеча на шумата во атарот на селото, било во таа во државна, или во приватна сопственост. Оваа можност на среден и долг рок упатува на очекувањата дека бесправната сеча не само што ќе продолжи, туку ќе се зголеми, имајќи во предвид дека струјата константно се зголемува, како и економската состојба на домаќинствата, недостатокот на стратешко и развојно планирање за алтернативни извори на греење на домаќинствата во руралните заедници и сл. Исто така, ова прашање е корелирано со податоците за управувањето со шумата, знаејќи дека просечниот прираст на шума во селото е 80м³ на 1 ха на година како што е презентирано во табелата на Одделот за управување со шумата “Радовиш – Ораовичка река”, страна 19. Со овој интензитет на бесправна сеча и користењето на дрвото за греење, во многу блиска иднина може да се очекува дека шумското земјиште ќе биде девастирано.

17б. Ако употребувате дрво како огревен материјал, кое количество употребувате на годишно ниво:

	Бр.	%
до 3м ³	1	2
4 до 6м ³	2	4
7 до 9м ³	7	14
10 до 12м ³	20	40
Повеќе од 12м ³	20	40
Вкупно:	50	100



Графикон 17б: Анализа на податоците според тоа колку дрво се употребува на годишно ниво

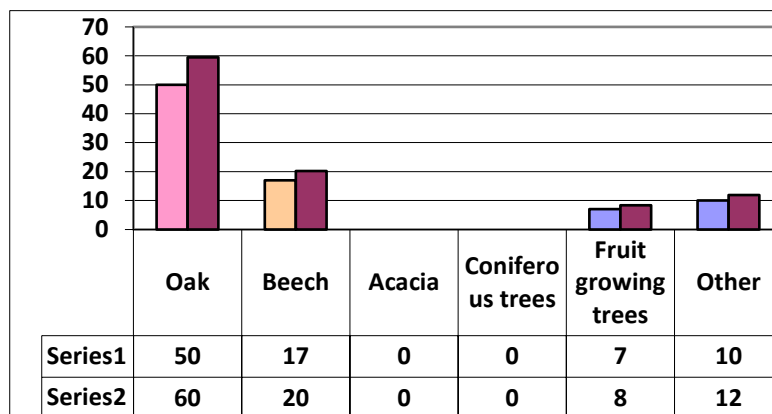
Прашање 17б: Ако употребувате дрво како огревен материјал, кое количество употребувате на годишно ниво?

Ова прашање е поврзано со претходните две и има цел за обезбеди податоци за количината на годишно ниво за користењето на дрвото за греење на испитаниците во селото. Графиконот 17б ја презентира анализата на одговорите и според неа високи 80% од домаќинствата во анкетата употребуваат 10 или повеќе м³ на годишно ниво за греење. Ако го корелираме ова со претходното прашање за тоа како се обезбедува дрвото за греење, може да се утврди дека бесправната сеча е сериозен ризик за шумата и шумското земјиште во атарот на село Коџалија. Ова е наведено и во податоците од ЈПМШ каде што е забележано дека сите три сектори на шума во селото се нападнати од бесправна сеча.

Со оглед на фактот дека главната цел на проектот е вклучувањето на Еко-НПК базирани решенија преку оддржливо управување со шумите и користење на нивните заштитни функции, овие податоци потребно е да бидат земени во предвид и користени во понатамошните активности. Со цел за ублажување на ризикот од бесправната сеча препорачливо е проектот да го употреби својот авторитет и добрата соработка со македонските партнери за вклучување на иновативен пристап во комуникацијата со локалната заедница, за вклучување на компоненти за подигнување на општата јавна свест, промена на однесувањето и навиките и традициите за бесправна сеча во локалната заедница, како и вклучувањето и мотивирањето на заедницата преку имплементација активностите на проектот на локално ниво во областа.

18. Кој видови на дрвја се најкорисни за вашето домаќинство?

	Бр.	%
Даб	50	60
Бука	17	20
Багрем	0	0
Зимзелени дрвја	0	0
Овошки	7	8
Други	10	12
Вкупно:	84	100



Графикон 18: Анализа на податоците според тоа кои видови на дрвја се најкорисни за вашето домаќинство

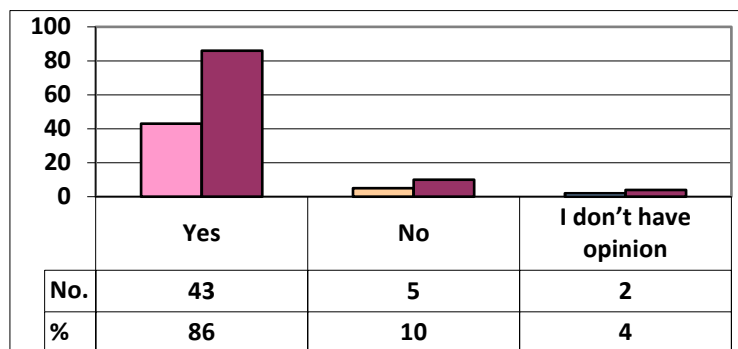
Прашање 18: Кој видови на дрвја се најкорисни за вашето домаќинство?

Имајќи ги во предвид расположливите информации за процесите на интензивната бесправна сеча и намалувањето на шумскиот фонд во село Коџалија, како и целите на проектот за зголемување на шумскиот фонд преку пошумување, прашалникот вклучува сет на поврзани прашања. Следствено, првото прашање бр. 18 има за цел да ја долови перцепцијата за видот на дрвјата кои се најкорисни за домаќинствата. Графикон бр. 18 презентира дека најголемиот број на испитаници (60%) сметаат дека дабот е најкорисно дрво, додека 20% изјавиле дека буката е најкорисно дрво. Други 8% ги избраа овошките, а 12% избраа други видови на дрвја. Ако ја корелираме оваа анализа со прашањето бр. 17 и целите на употребата на дрвото, можеме да разбереме дека високото ниво на испитаници ги избрале дабот и буката бидејќи тие се најдобри дрвја за греење, како градежни материјали и употреба во земјоделството и сточарството. Последователно, ова беше споменато од страна на селаните за време на состаноците и

дискусиите, како и беше видливо во селото. Анализата на дополнителните одговори на прашањето, ги идентификува и другите видови на корисни дрвја – габерот и овошките – оревот и сливата.

19. Дали е потребно шумското земјиште во атарот на вашето село да се зголеми?

	Бр.	%
Да	43	86
Не	5	10
Немам мислење	2	4
Вкупно:	50	100



Графикон 19: Анализа на податоци

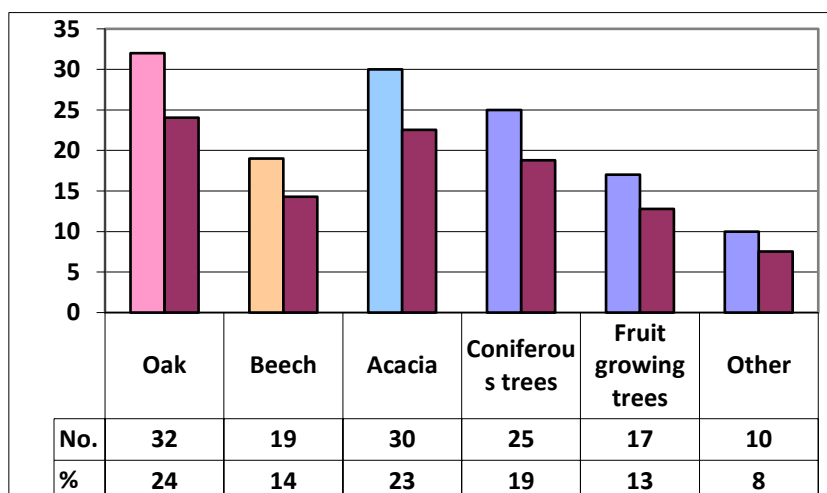
Прашање 19: Дали е потребно шумското земјиште во атарот на вашето село да се зголеми?

Паралелно со собирањето на информации и податоци за перцепцијата на испитаниците за корисноста на дрвјата за домаќинствата, прашањето бр. 19 се однесува на постоењето на шумско земјиште во нивниот атар. Анализата од графикон бр. 19 упатува дека голем број на испитаниците – 43 или 86% сметаат дека пошумената област во атарот на нивното село треба да се зголеми, додека само 10% одговорија негативно и 2 испитаника немаат мислење за ова прашање.

Дистрибуцијата на перцепцијата на испитаниците е комплетно во линија со главните цели на проектот и планираните активности во атарот на село Коџалија, со оглед на фактот дека активности за пошумување се планира да бидат имплементирани придонесувајќи значително за зголемување на шумското земјиште околу селото.

19а. Ако да, со какви видови на дрвја би требало да биде пошумено:

	Бр.	%
Даб	32	24
Бука	19	14
Багрем	30	23
Зимзелени дрвја	25	19
Овошки	17	13
Други	10	8
Вкупно:	133	100



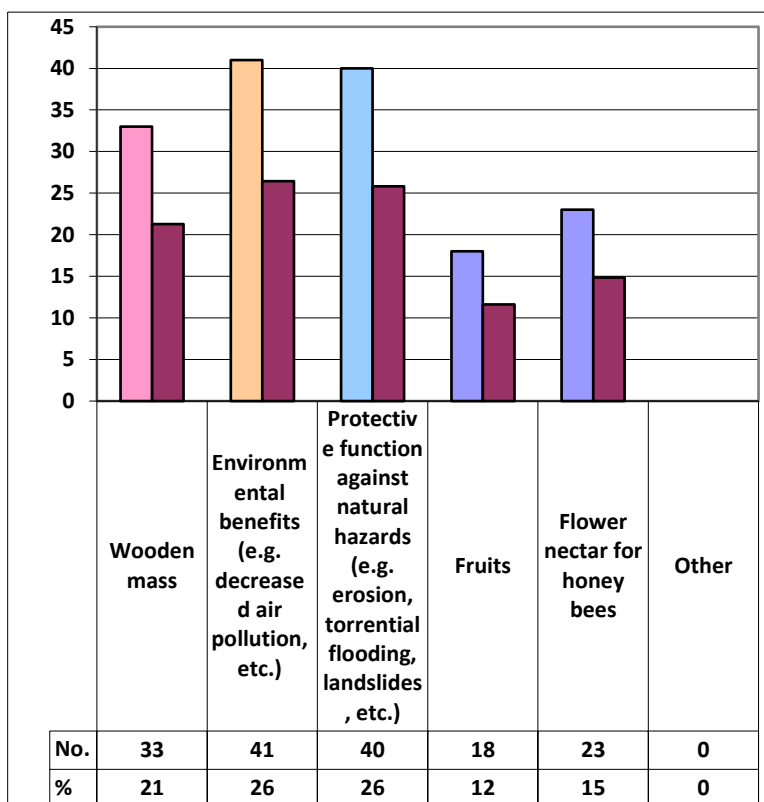
Графикон 19а: анализа на податоци

Прашање 19а: Ако да, со какви видови на дрвја би требало да биде пошумено?

Ова прашање беше опционално за испитаниците кои одговориле дека шумата оклу селото треба да биде зголемена. Тие го дадоа своето мислење за видот на дрвјата кои би требало да се засадат со цел да се даде придонес во планираните активности на проектот за пошумување. Анализата од графикон бр. 19а упатува дека 35% од испитаниците ги одбрале дабот и буката, 17% зимзелените дрвја, 12% се определиле за овошките, а 23% побарале да се вклучи и багремот. Ова е контрадикторно со прашањето бр. 18 каде што ниту еден од испитаниците не го навел багремот како корисно дрво. За другите видови на дрвја, 15% од испитаниците ги навеле габерот, оревот, борот и јасенот.

20. Какви придобивки очекувате од зголеменото шумско земјиште? (повеќе одговори)

	Бр.	%
Дрвна маса	33	21
Придобивки за животната средина (на пр. намалено загадување на воздухот и сл.)	41	26
Заштитна функција од природни опасности (ерозија, поројни поплави, свлечишта и сл.)	40	26
Овошје	18	12
Нектар за производство на мед	23	15
Друго	0	0
Вкупно:	155	100



Графикон 20: Анализа на податоците според придобивките кои се очекуваат од зголеменото шумско земјиште

Прашање 20: Какви придобивки очекувате од зголеменото шумско земјиште? (повеќе одговори)?

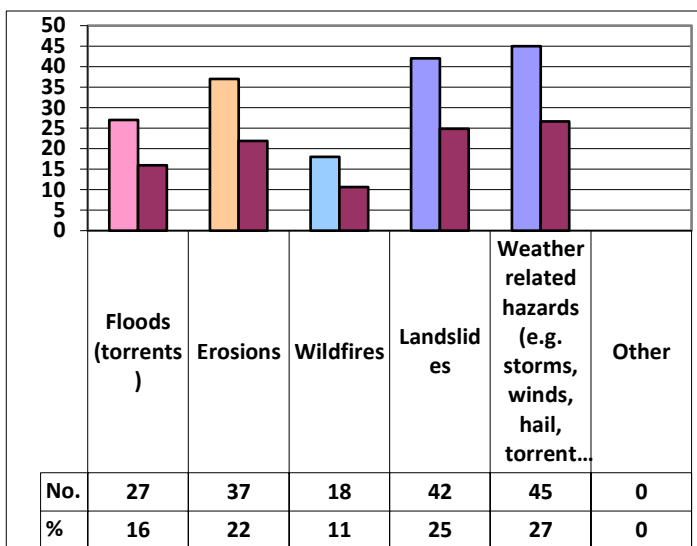
Ова е последното прашање од делот за животната средина кое има за цел да собере податоци за перцепцијата на локалната заедница, мислењата и сугестиите за потребите за зголемување на шумското земјиште, идентификацијата на најкорисните видови на дрвја, добива не препораки за проектот во нивните активности за пошумување. Според тоа, целта на ова последно прашање беше да се прашаат луѓето за нивната перцепција на корисноста од зголеменото шумско земјиште. Графиконот бр. 20 презентира дека повеќе од половината на испитаниците т.е. 52% сметаат дека од зголемувањето на шумата може да се очекуваат еколошки придобивки (на пр. намалено загадување на воздухот во контекст на загадувањето од јаловиштето на рудникот Бучим и сл.), и заштитна функција од природни опасности (ерозии, поројни поплави, свлечишта и сл.). Ова значително очекување од локалното население е во директна врска со целите и резултатите на проектот. Дополнително, 21% сметаат дека зголемената дрвна маса ќе се користи за греење, градежни материјали и земјоделски работи. Мал број од испитаниците (12%) сметаат дека ќе има корист од зголеменото производство на

овошје и 15% се за зголемување на шумата за да се обезбеди поголемо обезбедување на цветен полен за медоносните пчели.

II. ПРАШАЊА ПОВРЗАНИ СО КАТАСТРОФИТЕ

21. Кои природни опасности се присутни во атарот на вашето село? (повеќе одговори)

	Бр.	%
Поплави (поројни)	27	16
Ерозии	37	22
Шумски пожари	18	11
Свлечишта	42	25
Опасности поврзани со времето (на пр. бури, град, пороен дожд и сл.)	45	27
Друго	0	0
Вкупно:	169	100



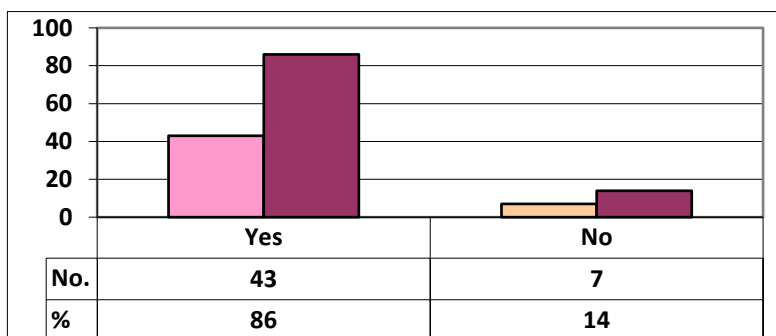
Графикон 21: Анализа на податоци според природните опасности кои се присутни во атарот на селото

Прашање 21: Кои природни опасности се присутни во атарот на вашето село?

Последниот дел од прашалникот посветен на разбирањето на профилот на катастрофи и поставеноста на локалната заедница, како и собирањето на податоци за ризиците од природни катастрофи. Се состои од 6 прашања поврзани со катастрофите. Првото прашање се однесува на разбирањето на профилот на опасности на селото и перцепцијата на испитаниците за постоењето на природни опасности во локалната област кои имаат потенцијал да прераснат во ризици по животот и здравјето на селаните, нивниот имот и животната средина. Графиконот бр. 21 ги презентира резултатите на анализирани податоци и тие индицираат дека присутноста на природните опасности во селото е типична како и за поширокиот регион – Радовиш и југоисточниот регион на државата. Најголем број од испитаниците (27%) мислат дека најприсутни се опасностите поврзани со времето (на пр. олујните невремиња, силните ветрови, градот, поројниот дожд), по кои следат свлечиштата (25%), ерозиите (22%), поплавите/пороите (16%) и пожарите на отворено (11%). Сите природни опасности кои се потенцирани од страна на локалните испитаници директно или индиректно се дел од обемот на активности на Еко-НПК концептот и ќе бидат имплементирани локално.

22. Дали вие или вашето домаќинство некогаш сте биле погодени од било која од наведените природни опасности?

	Бр.	%
Да	43	86
Не	7	14
Вкупно:	50	100



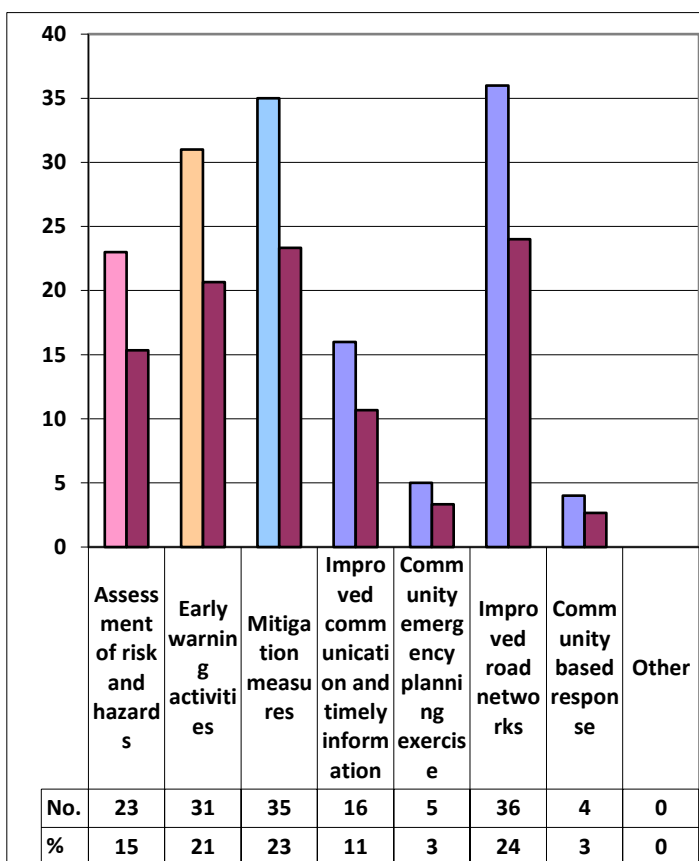
Графикон 22: Анализа на податоците

Прашање 22: Дали вие или вашето домаќинство некогаш сте биле погодени од било која од наведените природни опасности?

Следното прашање се однесува на личното искуство на испитаникот или неговото домаќинство од било која природна опасност. Од 50 испитаници, 43 или 86% одговориле потврдно дека тие или нивните домаќинства биле погодени од природните опасности, додека само 7 или 14% одговориле дека не биле погодени. Со цел за дополнително собирање на информации, постоеше можност да се наведат видовите на природните опасности кои направиле штета или загуби по нив или по домаќинствата. Сепак, не сите од испитаниците ја искористија оваа можност и дадоа информација. Сепак, од тие од кои е добиена информација може да се заклучи дека метеоролошките опасности се број еден опасности кои ја погодиле областа на селот (на пр. пороен дожд, силен ветер, мраз, суша, поројни поплави, свлечишта, град). Оваа информација е во корелација со информацијата презентирана за време на состанокот во селото. Всушност, еден сличен настан – пороен дожд до поплава и град, се случи за време на теренското истражување тешко погодувачки ја пошироката област на Радовиш на 19 јуни 2018 год.

23. Што е потребно жителите на селото да се заштитат од природните опасности? (повеќе одговори – одберете три)

	Бр.	%
Проценка на ризици и опасности	23	15
Активности за рано предупредување	31	21
Мерки за заштита	35	23
Подобрена комуникација и навремена информација	16	11
Планирачки вежби за итни состојби на заедницата	5	3
Подобрена патна мрежа	36	24
Одговор базиран на заедницата	4	3
Друго	0	0
Вкупно:	150	100



Графикон 23: Анализа на податоци

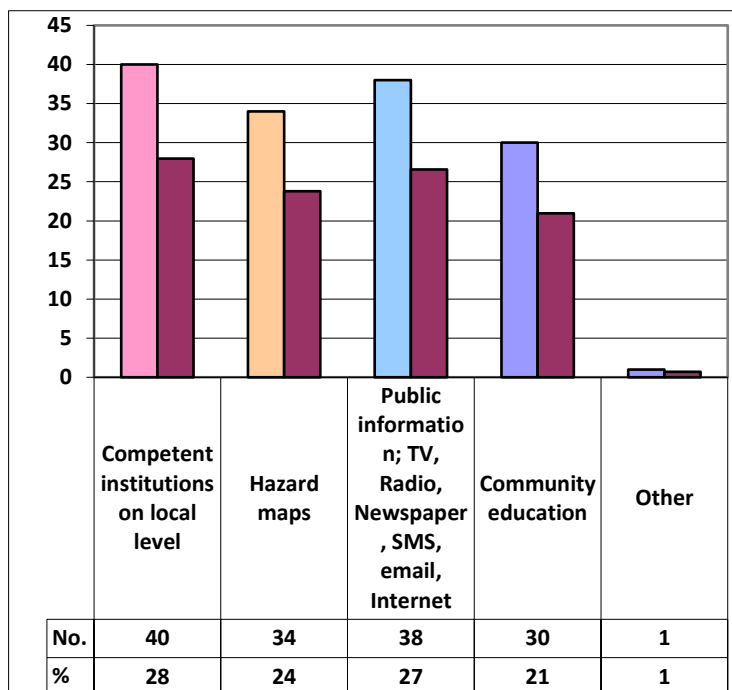
Прашање 23: Што е потребно жителите на селото да се заштитат од природните опасности?

Ова прашање е поставено со цел да собере значајни информации од испитаниците за тоа што е потребно за заштита од природните опасности. Одговорите беа со можност за избор на повеќе одговори. Графиконот бр. 23 ги презентира резултатите и најмногу од испитаниците или

22% мислеа дека ќе бидат заштитени со подобрување на патната инфраструктура (која сега е во многу лоша состојба, особено патиштата низ селото). Мерките за ублажување следат со 17% испитаници, потоа е подобрената комуникација и навремената информација (14%), проценката на ризици и опасности (13%), планирачки вежби за заедницата (11%) и одговор базиран на заедницата (3%). Според тоа може да се заклучи дека состојбата на инфраструктурата е неопходна за заштита, како и за имплементација на заштитни мерки и мерки за ублажување. Ова беше нагласено и за време на состанокот во селото, особено за лошата состојба на комуналната инфраструктура. Исто така, навремената информација и известување се неопходни особено за тие што се подалеку од општинскиот центар и живеат во затворена заедница.

24. Кои средства можат да го олеснат добивањето на информација за потенцијалните катастрофи? (повеќе одговори – одберете три)

	Бр.	%
Компетентни институции на локално ниво	40	28
Мапи на опасности	34	24
Јавни информации: ТВ, радио, весници, СМС, емаил, интернет	38	27
Едукација на заедницата	30	21
Друго	1	1
Вкупно:	143	100



Графикон 24: Анализа на податоците за средствата со кои може да се олесни добивањето на информации за потенцијалните катастрофи

Прашање 24: Кои средства можат да го олеснат добивањето на информација за потенцијалните катастрофи?

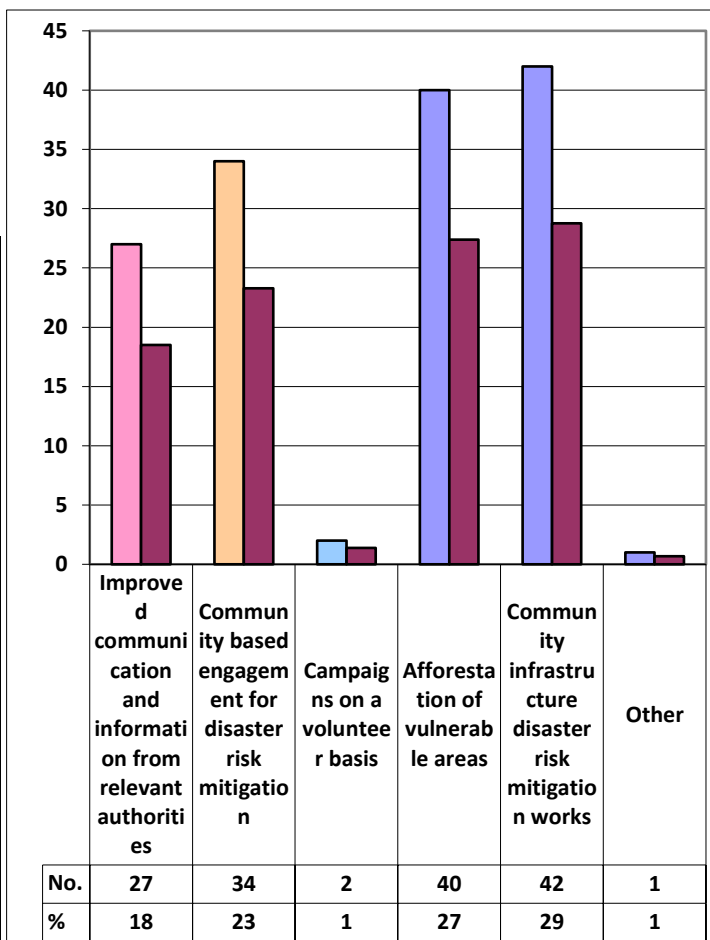
Да се биде информиран навремено и на професионален начин е една од најголемите важности во намалувањето на ризиците од катастрофи, и во делот на превенција и митигација и во сегментите на одговор и опоравок. Поради тоа едно од прашањата беше на оваа тема - Кои средства можат да го олеснат добивањето на информација за потенцијалните катастрофи? Целта беше да се соберат информации од селаните, како и нивната перцепција и мислења за споделувањето на информациите кои се корисни за севкупното НРК во селото. Постоеше можност за повеќе одговори и испитаниците имаа можност да одберат три од повеќето понудени.

Според резултатите од графиконот бр. 24, најмногу испитаници или 28% мислат дека најлесен начин за споделување на информации е да се има компетентни институции на локално ниво. Потоа следат мислењата дека мапите на опасности (24% од испитаниците) се корисни за информација за постоењето на природните опасности во локалната област. Ист процент на испитаници сметаат дека образованието на ниво на заедницата е добро средство за споделување на информациите и подготвеноста на локалната заедница. 27% од одговорите

упатуваат на јавното информирање како корисен канал преку кој лесно може да се добијат потребните информации, раното предупредување, тревожењето и известувањето. Само 1% од испитаниците сметаат дека информирањето може да се подобри на друг начин. Сепак, важно е да се нагласи дека најголемиот дел од заедницата има сателитски антени и гледа турски ТВ серии, бидејќи нема кабловска или интернет телевизија и интернетот е претежно мобилем. Поради тоа е препорачливо да се дискутира со националните и локалните партнери за прашањата за информирање. Исто така, бидејќи голем број од испитаниците сметаат дека мапите на опасности се многу практичен и корисен начин на споделување на информации, препорачливо е да се користат најдобрите практики и искуства од Јапонија кои можат да бидат прилагодени на македонскиот национален и локален контекст.

25. Кои мерки за намалување на ризиците од катастрофи е потребно да се употребат за да се намалат и спречат негативните последици од природните опасности во вашето село? (повеќе одговори – одберете три)

	Бр	%
Подобрена комуникација и информација од релевантните власти	27	18
Ангажирање на заедницата за намалување на ризиците од катастрофи	34	23
Кампањи на волонтерска основа	2	1
Пошумување на ранливите области	40	27
Инфраструктурни работи во заедницата за митигација на ризикот од катастрофи	42	29
Друго	1	1
Вкупно:	146	100



Графикон 25: Анализа на податоци за потребните мерки за НРК кои треба да се употребат за да се намалат и спречат негативните последици од природните опасности во селото

Прашање 25: Кои мерки за намалување на ризиците од катастрофи е потребно да се употребат за да се намалат и спречат негативните последици од природните опасности во вашето село?

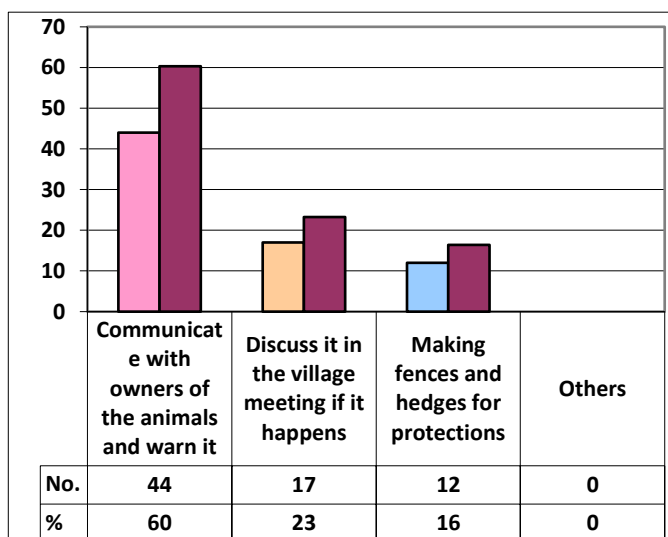
Со цел за собирање на сеопфатни информации од локалната заедница за мерките за НРК за ублажување на ефектите на катастрофите, посебно прашање беше формулирано. Според него, испитаниците требаше да ги дадат нивните мислења и перцепции за најкорисните и ефективните мерки за ублажување кои можат да се имплементираат во нивното село. Прашањето имаше можност за повеќе одговори, од кои испитаникот требаше да одбере три.

Според графикон бр. 25, вкупно 29% од испитаниците мислат дека состојбата може значително да се подобри со имплементација на инфраструктурни работи во заедницата за митигација на ризикот од катастрофи (селаните се многу заинтересирани да учествуваат во имплементацијата на такви мерки во рамките на проектот како еден од модалитетите за дополнителни приходи). Потоа следи пошумувањето на ранливите области (27%), ангажирање на заедницата за НРК (23%), подобрена комуникација и информација од релевантните власти (18%) и кампањи на волонтерска основа (1%).

Сумарен заклучок и препорака за проектот е дека повеќето од половина од испитаниците (55%) ќе ги поддржат активностите кои се базираат на ангажирање на заедницата за НРК, волонтерската основа и пошумувањето на ранливите области. Ова може да се употреби за поддршка на имплементацијата на проектот и активностите во областа. Уште повеќе за дополнителна мотивација на локалното население постои силна потреба за имплементација на активности за подигнување на јавната свест и информирање за долгорочните придобивки од проектот, за селаните во селото, но особено за поширокиот реон и градот Радовиш, бидејќи најголемиот дел од негативните ефекти од катастрофите е низводно.

**26. Како вообичаено ги заштитувате земјоделските површини од штета од крупен добиток?
(повеќе одговори)**

	Бр.	%
Комуникација со сопствениците и предупредување	44	60
Разговор на состанок во селото, доколку се случи	17	23
Подигнување на огради и грмушки за заштита	12	16
Друго	0	0
Вкупно:	73	100



Графикон 26: Анализа на податоци

Прашање 26: Како вообичаено ги заштитувате земјоделските површини од штета од крупен добиток?

Ова е последното прашање од овој дел и од прачалникот и се однесува на начините за заштита на културите и плодовите од животните кои пасат. Најмногу од испитаниците (59%) сметаат дека најефикасен начин е да се комуницира со сопствениците на животните и да се предупредат за негативните последици. Следат селаните (23%) кои сметаат дека ова прашање треба да се регулира преку дискусија на селските состаноци (тие се функционален начин за дискутирање во заедницата и донесувањето на одлуки во заедницата често ги користи за значајни прашања за целосната заедница) или правење огради и грмушки за заштита (16%).

6. ЗАКЛУЧОЦИ И ПРЕПОРАКИ

Во рамките на проектот Градење на капацитетите за Еко-НРК преку оддржливо управување со шумите кој е финансиран од ЈСА и со ЦУК и ЈПМШ како главни корисници, предвидени се за имплементација работи за заштита на шумата во одделот за управување со шумата во близина на Коџалија, при што ќе се направи план за управување со шумата вклучително и зонирање. Затоа сегашното ниво на активности на домаќинствата вклучувајќи ги намалувањето на шумата и нејзината деградација, како и перцепцијата на селаните на животната средина и катастрофите, се од круцијално значење за вклучување на горе споменатите можности за НРК употребувајќи Еко-НРК методи. Затоа беше спроведено теренско истражување за социо-економските и другите прашања за продуцирање на основните податоци со анализа на активностите на ниво на селото и на ниво на домаќинствата, како и перцепцијата на селаните за природната средина и катастрофите.

Во смисол на погоре кажаното, и според целите на проектната задача, може да се заклучи дека теренското истражување ги идентификуваше основните социо-економски аспекти и аспектите на животната средина на селото, преку креирање на порфилот на селото и спроведувањето на истражувањето на селото и теренското истражување. Според ова, село Коџалија е традиционална заедница на јуруците со традиции, културни навики и и обичаи и со специфична динамика. Генерално земено, претставниците на локалната заедница целосно го поддржаа теренското истражување и ја поздравиле имплементацијата на проектните активности.

Врз основа на социо-економскиот профил на селото, како и останатите специфичности на заедницата, може да се заклучи дека населението е значително ранливо на природни опасности и како заедница е слабо отпорна кон катастрофи. За среќа, според анализата на профилот на природни опасности, може да се заклучи дека нема значаен импакт на опасностите врз селото.

Знаењето за Еко-НРК е многу ниско и селаните не можат да идентификуваат соодветни концепти или практики. Тие не ја препознаваат шумата како комплекс кој има превентивни, заштитни и корисни функции, Спротивно на ова, тие или ја уништуваат со проширување на земјоделското земјиште и пасиштата или ја користат екстензивно со прекумерна бесправна сеча. Селаните се целосно свесни на ситуацијата со намалувањето на шумата во нивната област и на одреден начин тие тоа го поддржуваат преку активно набавување на срва за греење на своја рака т.е. од бесправните сечачи на шумата. Уште повеќе, екстензивната употреба на дрвото за греење на куќите значително придонесува за зголемување на легалната и бесправната сеча.

Како финален заклучок, неопходно е да се нагласи дека овој документ ќе послужи како клучен преглед и документ за проценка на состојбата обезбедувајќи го неопходниот придонес за проектот и за националните партнери преку понатамошно напредување на агендата за Еко-НРК и отпорност на село Коџалија.

Со цел за подобро разбирање на непосредните резултати од ова теренско истражување и проценка, како и ултимативното и брзо следење на поддршката за изградба на отпорна локална заедница кон катастрофи преку пристап за екосистемски базирано НРК, следниве препораки се формулирани и се претставени не во редослед на приоритетност:

1. Вклучување на заедницата во локалните активности на проектот – Како што беше нагласено, заедницата добро ја прифати анкетата и е отворена за поддршка на имплементацијата на проектните активности. Со цел за градење на сопственост на активностите и обезбедување на оддржливост, препорачано е да се вклучат во фазите на креирање на

мерките за митигација преку дискусија за нивните изворни техники за НРК, како и во делот на физичката имплементација на работите преку вклучување во нив како јавни работи или програми за надомест.

2. Учество на заедницата во активностите за НРК – паралелно со проектните активности, заедницата може да биде остречена да учествува во сетот на дополнителни активности за НРК (на пр. задолжителна проценка на ризици и опасности на заедницата, споделување на знаење и информации, подготовки и заштита на заедницата).

3. Вклучување на младите како агенти на промените – Населението во селото релативно е младо и може да биде искористено како генератор за знаењето за Еко-НРК и споделувањето на информациите во нивните семејства, домаќинства и социјални групи.

4. Дизајнирање и имплементација на таргетирани активности за јавната свест за Еко-НРК – локалната заедница не е свесна за Еко-НРК концептот и поради тоа е потребно да се дизајнира специфичен сет на активности за јавната свест кои ќе бидат прилагодени на специфичностите на заедницата. Целта е да се промени фокусот од шумата како ресурс на дрва за греење во шумата како средство кое обезбедува заштитни функции на заедницата, како и вклучувањето на навиките за НРК.

5. Пошумување на ранливите области – Постои диспропорција на пошумените области и интензитетот на бесправната сеча. Така што во текот на неколку години, таа ќе биде значително намалена. Поради тоа е препорачано да се имплементира редовно пошумување на идентификуваните ранливи области со цел да се одржи моментот на постоење на шумското земјиште. Овие активности потребно е да се направат во соработка со локалната заедница, проектот и националните и локалните партнери. Следствено, како што е идентификувано, се бара заштитната функција на дрвјата.

6. Работи на инфраструктурата на заедницата за ублажување на ризикот од катастрофи – идентификација и селекција на работи на инфраструктурата на заедницата за ублажување на ризикот од катастрофи во рамките на проектот и надвор од него.

7. Зајакнување на капацитетите на компетентните локални институции за Еко-НРК – протфолиото на проектните активности потребно е да вклучи мерки и активности за понатамошно зајакнување на националните и локалните власти за Еко-НРК.

8. Споделување на информациите преку навремено и достапно јавно информирање

9. Воведување на оддржливи практики за отпорно земјоделство – Земјоделството нема многу оддржливи практики и поради тоа е препорачано да се креира сет на практики особено за одгледувањето на тутунот (и сточарството) кои ќе бидат базирани на Еко-НРК концептот со цел да се подобри ефикасноста и оддржливоста на производството, како и да се намали употребата на дрвото во производството.

10. Воведување на модалитети за енергетски ефикасно греење – Употребата на дрвото за греење придонесува за намалување на шумата и препорачливо е да се воведат други начини на енергетски ефикасно греење кои нема да се базираат на дрвјата (на пр. пелети).

11. Имплементирање на најдобрите практики прилагодени на локалниот контекст – Со оглед дека Еко-НРК темата е релативно нова во националниот и локалниот контекст,

препорачливо е да се презентираат и имплементираат најдобрите практики од Јапонија кои можат да бидат прилагодени на локалниот контекст на селото Коџалија.

12. Вклучување на родовите аспекти во проектните активности – Жените, заедно со другите ранливи категории на граѓани (децата, лицата со попреченост, постарите) се најмногу ранливи на природните катастрофи. Со цел за подобрување на нивната отпорност, препорачливо е да се вклучат родовите аспекти во активностите, или преку активностите за зајакнување на свеста или преку практични активности за превенција и подготовка.

АНЕКС I: УСЛОВИ НА ПРОЕКТНАТА ЗАДАЧА

1. Наслов на услугата

Теренско истражување за социо-економските и другите прашања во рамките на проектот за градење на капацитетите за екосистемски базирано намалување на ризиците од катастрофи преку оддржливо управување со шумите во Македонија (понатаму наведено как проект).

2. Воведни напомени

Во рамките на проектот – Градење на капацитетите за Еко-НРК преку оддржливо управување со шумите, ќе се реализираат работи за заштита на шумата во одделението за управување со шуми близу областа на село Коџалија, вклучувајќи и развој на План за управување со шумата со зонирање. Сегашното ниво на активности на домаќинствата кое предизвикува уништување и деградација на шумата, како и перцепцијата на селаните за природната средина и катастрофите е круцијална за разгледувањето на можностите за погоре наведените интервенции за намалување на ризикот од катастрофи употребувајќи Еко-НРК методи. Поради тоа, неопходно е да се спроведе теренско истражување за социо-економските и другите прашања со цел да се продуцираат основни податоци со анализа на активностите на ниво на селото и на ниво на домаќинствата, како и перцепцијата за природната средина и катастрофите.

3. Цели

Да се идентификуваат социо-економските и прашањата на животната средина во селото Коџалија во близина на микро-локацијата во Општина Радовиш, преку анализа на општо достапните податоци (демографија, животна средина, економски активности, присуство на природни и други опасности и др.) од страна на општинските и статистичките податоци, како и примена на теренско истражување со анкета на локалното население (прашалник). Собраните информации ќе бидат искористени за идните активности на проектот на ЈСА, како што се креирање на мапи на опасности, собирање на информации и мислења за селекцијата на дрвја за садење врз основа на потребите и нивната употреба како дрвен материјал и сл.

4. Обем на услугите

- Нацрт распоред на активности и подготовка на Прашалникот и Насоките за теренската примена на македонски и англиски јазик под надзор на ЈСА, ЦУК и ЈПМШ.
- Собирање на основни податоци за регионот и општината преку постоечките документи како што е статистиката.
- Спроведување на анкета на две нивоа: групен состанок во селото и анкета на 50 домаќинства.
- Дискусиите помеѓу учесниците ќе бидат охрабрени на состанокот во селото.
- ЦУК и ЈПМШ ќе го организираат состанокот во селото со помош на општината.
- Изведувачот се очекува да состави еден тим за истражување, составен од две лица под водство на лидерот на тимот.

5. Целна област

Село Коџалија во близина на Радовиш

6. Број на домаќинства

- 50 домаќинства. Бројот на домаќинства ќе биде фиксиран од Проектот пред почетокот на теренските истражувања.

7. Времетраење на договорот

- Од 1ви јуни, 2018 до 30ти септември, 2018 год.

8. Очекувани резултати

Резултатите од услугата треба да се доставени од Изведувачот до проектот. Сите права на резултатите се на проектот откако ќе се испорачаат.

- **Прашалник** - Прашалник ќе биде изготвен од Изведувачот врз основа на дискусија и одобрение со проектот.

- **Насоки** - Насоките како да се спроведе теренското истражување треба да бидат изготвени од Изведувачот пред да започне теренското истражување. Овие насоки треба да бидат одобрени од проектот.

- **Нацрт извештај** - Нацрт-извештајот се доставува до проектот најдоцна до 31 јули или 21 ден по завршувањето на теренските работи, зависно од тоа кое прво ќе се случи. Нацрт-извештајот се врши во формат на Microsoft Word и Excel. Поднесувањето се врши преку електронска пошта до проектот. Проектот ќе го разгледа нацрт-извештајот и ќе ги даде коментарите. Резултатите се како што следува: Нацрт-извештајот на англиски јазик и примарни податоци и резултатот од интервјуата се сумираат како анекс. Исто така, се приложуваат оригиналните листови и податоците внесени во листовите.

- **Финален извештај** - Направете амандмани на нацрт-извештајот врз основа на повратните информации од објаснувачкиот состанок за нацрт-извештајот и коментарите од проектот. Објаснувачкиот состанок ќе се одржи на почетокот на септември, кој ќе биде објавен од страна на Проектот. Финалниот извештај се доставува до Проектот најдоцна 10 дена по денот на објаснувачкиот состанок. Конечни производи кои треба да се испорачаат се: Извештај, печатен и извештај, дигитален (pdf) формат.

9. Времетраење на анкетата

Очекуваните работни денови на лидерот на тимот се 40 дена, а за другите двајца членови за теренската анкета се 13 работни дена по лице. Овој договор ќе биде прекинат на 30 септември 2018 година. Пред почетокот на теренските истражувања ќе се одржи подготвителен состанок со Општина Радовиш и релевантните организации. Изведувачот ќе присуствува на состанокот и ќе добие релевантни информации.

No.	Испораки	Проценети работни денови	Датум на достава
1	Тим лидер	40	
1.1	Собирање на постоечки информации	7	TBD
1.2	Подготовка на Прашалникот	7	10 Јуни
1.3	Подготовка на Насоките	2	12 Јуни
1.4	Состанок во селото	1	18 Јуни
1.5	Надзор на теренско истражување	8	19 Јуни до TBD
1.6	Известување вклучувајќи анализа на податоци и подготовка на извештаи	15	Нацрт: 31 јули Финален: средина на септември
2	Други двајца членови	13 дена од лице	
2.1	Учење на содржината на Прашалникот	1	TBD
2.2	Состанок во селото	1	18 Јуни
2.3	Теренско истражување	8	19 Јуни до TBD
2.4	Внес на податоци	3	TBD

10. Известување

- Често комуницирање со проектниот тим, најмалку еднаш неделно преку е-пошта или писмен документ.

- Извештај за прогресот треба да се предава на месечно ниво до проектот.

- Првиот нацрт-документ треба да биде предаден до 31 јули или 21 ден по завршувањето на теренските работи, во зависност од тоа кое е прво.
- Финалниот документ треба да се прифати во финалниот извештај и да се достави до проектот подоцна од 10 дена по денот на објаснувачкиот состанок.
- Документот треба да биде напишан и на англиски текст и на македонски текст.

11. Временска рамна на анкетата

Отпочнувањето на теренските истражувања треба да биде на 18 јуни 2018 година. Распоредот за други активности е изготвен на следниов начин.

Распоред на теренски преглед за социо-економски и други прашања

Activity for Survey				
	June	July	August	September
(1) Preparation				
-1 Collection basic data through existing documents				
-2 Preparation of questionnaire				
-3 Finalizing questionnaire				
-4 Preparation of field survey				
(2) Field survey				
-1 Preparatory meeting with Municipality etc				
-2 Conducting village level survey				
-3 Conduction household level survey				
(3) Reporting				
-1 Making draft report				
-2 Submitting of draft report				
-3 Feedback from the Project				
-4 Explanatory meeting				
-5 Finalizing report				
-6 Submission of final report				

12. Надзор од страна на проектот

- Прашалникот треба да биде завршен под надзор на проектот.
- Распоред за теренското истражување мора да биде предаден до проектот барем 3 работни денови пред да започне.
 - Неделен извештај треба да биде доставен до проектот се додека не се поднесе нацрт-извештајот.
 - Другите активности мора да се вршат врз основа на согласност на проектот.

13. Цена на договорот

Постапката за расчленување на трошоците е приложена овде

14. Сопственост

Сопственоста и кредитот на документот како резултат од оваа набавка на услуги спаѓаат на проектот за градење на капацитетите за намалување на ризиците од катастрофи врз екосистемите преку одржливо управување со шумите во Македонија и Центарот за управување со кризи (ЦУК).

15. Плаќање

100% се плаќа откако ќе се добие конечниот документ и квалитетот на финалниот документ е прифатен од Проектот.

16. Референтен документ

-Предлог со договорот.

Пред да се развие идејата, треба да се изучуваат следниве документи;

- Проектна матрица (PDM)

17. Состав на тимот

Г-дин Васко Поповски, Тим лидер

Г-дин Љупчо Милковски, Член на тим

Г-ѓа Лолита Арсова, Член на тим

18. Легална валидност на договорот

Набавката на оваа услуга е склучена само кога поврзани странки го потпишуваат договорот за набавка на услуги.

Прилози: Листа на членови на тимот и листа на трошоци

Анекс II

**ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА
ФОРМУЛАР ЗА СОСТАНОКОТ ВО СЕЛОТО**

Почитувани учесници,

Ви благодариме за вашето учество на овој состанок како дел од подготовката на теренското истражување за социо-економските и другите прашања во рамките на проектот Јакнење на капацитетите за екосистемски базирано намалување на ризиците од катастрофи преку оддржливо управување со шумите во Македонија. Целта на овој состанок е да се објасни намената на оваа задача, како и да се дискутираат апектите кои се поврзани со целта на задачата.

Инструкција: Овој формулар е поплнет во форма на Записник од состанокот од страна на тимот врз основа на дискусиите на состанокот во селото.

Датум на состанокот во селото: _____

.....

1. Карактеристики и историја на селото: (вклучувајќи водени ресурси, куќи во селото, демографија)

- Историја на селото
- Демографски карактеристики на селото
 - Бројност на населението во заедницата
 - Процентуално, грубо изразен пресек на населението по пол (машки/женски)
- Број на домаќинства
- Главни економски активности и извори на приход на селаните
- Вработени/невработени (процентуално)
- Типови на социјална инфраструктура (на пр. училишта, здравствени институции и др.)

2. Главни продукти во поглед на количина и монетарна вредност

- Кои се главни продукти од селото?
- Приближна количина на производство
- Приближна монетарна вредност на продуктите

3. Ситуација со користење на шумата во селото

- Дали има шума во близина на селото?
- Сопственост на шумата
- Ресурси од шумата
- Видови на дрвја
- Било какви активности за пошумување?
(повремени/редовни?)
 - Дали е потребно да се зголеми површината под шума? (дрвја/корист)

4. Традиционална работа со соработка, обичаи, практики

- Видови на традиционални работи со соработка во селото?
- Специфични обичаи и практики
- Улога на жената во заедницата и контрибуција во НРК

5. Ситуација со сопственоста со земјодлското земјиште и пасиштата (вклучувајќи ги и шумските пасишта)

- Сопственост на шумите и земјиштето во областа на селото

6. Главни земјоделски практики и годишен распоред на работите (вклучувајќи и одгледување на пчели и цветни извори за паша)

- Кои се главните земјоделски култури
- Земјоделски сезони (годишни календари на главните земјоделски култури/сточарство/активности)
- Досие за жетва
- Кои се главните земјоделски практики? Оддржливи практики? На пример, како да се заштитат културите/шумата од домашните животни со помош на огради, грмушки, патроли, заштита од шумски пожари.
- Дали во селото се одгледуваат грмушки со намена за заштита на културите/дрвјата од животните? Ако да, кои видови се употребуваат (трња, грмушки)?
- Како вообичаено ги заштитувате земјоделските култури од животните?
- Земјоделството е машка, женска или заедничка работа?

7. Нацрт на постоечката организација на населението

- Која е постоечката организација на населението во селото?
- Постоење на т.н. месна заедница
- Дали има членови од селото во општинскиот совет и тела?

8. Дали постојат локации со сериозна ерозија на почвата и предизвикува проблеми на селото

- Досие на настани на ерозија на почвата вклучувајќи област, погодено население и штети
- Идентификација на локации со сериозна ерозија и области и погодено население
- Мерки кои се имплементирани или се планираат да бидат имплементирани
- Дали има проблеми со ерозија на почвата предизвикана од домашни животни (патеки и ерозија на брда)?

9. Услови со вода во селото? Извори на вода и бунари

- Кој е главен извор на вода во селото?
- Кое е сопственик на изворот со вода и водоснабдителниот систем?
- Број на бунари
- Недостаток на вода (минати/сегашни)
- Дистрибутивна мрежа за вода/канализација/атмосферски води
- Постоење на канали за поројни води

10. Историја на употреба за шумата и земјиштето околу селото

- Видови на шуми и земјишта

11. Ситуација со бесправната сеча

- Цели на бесправната сеча (комерцијални/приватни/други)
- Фреквенција на бесправната сеча (годишно/сезонско)
- Од страна на селаните или надворешни лица
- Видови на дрвја кои се подложни на бесправна сеча
- Процена на дрвната маса
- Кои се негативни импакти од бесправната сеча?
- Постоење на инспекција од ЈП Македонски шуми, инспектори или приватни чувари

12. Рекорд на катастрофи околу селото

- Кои се главните природни опасности во селото?
- Случени катастрофални настани (тип, кога, област и население погодено, човечки загуби, штети)
- Дали постојат групи во селото кои се повеќе погодени од страна на другите (на пр. постари, жени, деца, инвалиди и др.)
- Дали некој е одговорен за намалувањето на ризикот од катастрофи во селото?
- Постојење на проценка на ниво на селото или планови за итни состојби
- Информирање за опасностите на ниво на заедницата
- Видови на мерки за НРК и работи кои се имплементирани за митигација на ризикот од катастрофи во минатото
- Тековни и проектирани работи за НРК за митигација на ризикот
- Дали сте имале шумски пожари порано? Кога е сезоната на пожари?

АНЕКС III

**ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА
ПРАШАЛНИК**

Почитуван учесник,

Ви благодариме за учеството во теренското истражување за социо-економските и другите прашања во рамките на проектот Градење на капацитети за екосистемско базирано намалување на ризици од катастрофи преку одржливо управување со шумите во Македонија. Целта на овој прашалник е да се добие соодветна инпут информација која се однесува на социо-економските, еколошките и другите прашања во село Коџалија преку анкета со локалното население (прашалник) на ниво на домаќинства и нивната перцепција за животната средина и катастрофите.

За таа цел ве молиме да го одговорите прашалникот.

Инструкција: Прашалникот се пополнува од страна на анкетарот врз основа на одговорите дадени од испитаникот.

Благодарам за соработката!

Анкетар: _____

Датум на анкета: _____

Прашалник бр. _____

.....

I. ПРАШАЊА ПОВРЗАНИ СО ДОМАЌИНСТВОТО

1. Пол: машки женски

2. Која е вашата возрасна група?

- 18 - 24
- 25 - 35
- 36 – 45
- 46 – 55
- 56 – 64
- 65 +

3. What is your ethnic affiliation?

- Macedonians
- Albanians
- Turks
- Bosnians'
- Roma
- Other _____

4. Која е вашата религиозна припадност?

- православна
- исламска
- католичка
- друга _____

5. Кој е вашиот степен на образование?

- основно
- средно/гимназија
- високо
- друго _____

6. Кој е вашиот статус на вработување?

- вработен/а
- невработен/а
- студент/ка
- пензионер/ка

6а. Ако сте вработени, наведете го вашиот сектор на вработување.

- јавен сектор
- приватен сектор
- земјоделие
- сточарство
- самовработување (на пр. занаетчиство)
- друго _____

7. Дали имате дополнителна работа?

- да
- не

Ако имате, ве молам наведете ја: _____

8. Тип на домаќинство

- семејно домаќинство
- не-семејно домаќинство

9. Број на членови на домаќинството? _____

10. Кој е главниот извор на приходи на домаќинството?

- вработување
- редовен месечен приход (на пр. месечна плата, пензија, социјални трансфери)
- земјоделие
- сточарство
- бизнис
- занаетчиство
- друго _____

11. Вкупен годишен приход на домаќинството

- до 144,000 МКД
- 144,001 МКД до 216,000 МКД
- 216,001 МКД до 288,000 МКД
- 288,001 МКД до 360,000 МКД
- 360,001 МКД до 432,000 МКД
- 432,001 МКД до 504,000 МКД
- 504,001 МКД до 576,000 МКД
- повеќе од 576,001 МКД

12. Вкупен годишен расход на домаќинството

- до 144,000 МКД
- 144,001 МКД до 216,000 МКД
- 216,001 МКД до 288,000 МКД
- 288,001 МКД до 360,000 МКД
- 360,001 МКД до 432,000 МКД
- 432,001 МКД до 504,000 МКД
- 504,001 МКД до 576,000 МКД
- повеќе од 576,001 МКД

13. Видови на вкупни трошоци на домаќинството (повеќе одговори):

- потрошувачка
- комунални услуги
- образование
- медицински трошоци
- помошни активности
- друго

14. Улогата на жената во домаќинството (повеќе одговори)

- домашни активности (на пр. домаќински активности, готвење, грижа за членовите на семејството и др.)
- земјоделство
- сточарство
- поправки и сервисни услуги во домаќинството
- работа и поддршка на приходот на домаќинството

III. ПРАШАЊА ПОВРЗАНИ СО ЖИВОТНАТА СРЕДИНА

15. Дали има шума или пошумена површина во атарот на селото или во близина на селото?

- да
- не
- делумно

16. Каква е сопственоста на шумата?

- државна шума
- приватна шума
- друго: _____

17. Шумата и дрвото како ресурс се употребуваат за следниве цели (повеќе одговори):

- земјоделство
- сточарство
- градежни активности
- греење, ако одговорите греење, продолжете на 17а & 17б
- друго: _____

17а. Ако употребувате дрво како огревен материјал, од каде го набавувате:

- стоваришта на ЈП Македонски шуми
- приватни фирми
- на своја рака
- друго: _____

17б. Ако употребувате дрво како огревен материјал, кое количество употребувате на годишно ниво:

- до 3m³
- 4 до 6m³
- 7 до 9m³
- 10 до 12m³
- повеќе од 12m³

18. Кој видови на дрвја се најкорисни за вашето домаќинство?

- даб
- бука
- багрем
- зимзелени дрвја
- овошки
- друго: _____

19. Дали е потребно шумското земјиште во атарот на вашето село да се зголеми?

- да
- не
- немам мислење

19а. Ако да, со какви видови на дрвја би требало да биде пошумено:

- даб
- бука
- багрем
- зимзелени дрвја
- овошки
- друго: _____

20. Какви придобивки очекувате од зголеменото шумско земјиште? (повеќе одговори)

- дрвна маса
- придобивки за животната средина (на пр. намалено загадување на воздухот и сл.)
- заштитна функција од природни опасности (ерозија, поројни поплави, свлечишта и сл.)
- овошје
- нектар за производство на мед
- друго: _____

IV. ПРАШАЊА ПОВРЗАНИ СО КАТАСТРОФИТЕ

21. Кои природни опасности се присутни во атарот на вашето село? (повеќе одговори)

- поплави (поројни)
- ерозии
- шумски пожари
- свлечишта
- опасности поврзани со времето (на пр. бури, град, пороен дожд и сл.)
- друго _____

22. Дали вие или вашето домаќинство некогаш сте биле погодени од било која од наведените природни опасности?

- да
- не

Ако да, наведете _____

23. Што е потребно жителите на селото да се заштитат од природните опасности? (повеќе одговори – одберете три)

- проценка на ризици и опасности
- активности за рано предупредување
- мерки за заштита
- подобрена комуникација и навремена информација
- планирачки вежби за итни состојби на заедницата
- подобрена патна мрежа
- одговор базиран на заедницата
- друго _____

24. Кои средства можат да го олеснат добивањето на информации за потенцијалните катастрофи? (повеќе одговори – одберете три)

- компетентни институции на локално ниво
- мапи на опасности
- јавни информации: ТВ, радио, весници, СМС, емаил, интернет.
- едукација на заедницата
- друго _____

25. Кои мерки за намалување на ризиците од катастрофи е потребно да се употребат за да се намалат и спречат негативните последици од природните опасности во вашето село? (повеќе одговори – одберете три)

- подобрена комуникација и информација од релевантните власти
- ангажирање на заедницата за намалување на ризиците од катастрофи
- кампањи на волонтерска основа
- почумување на ранливите области
- инфраструктурни работи во заедницата за митигација на ризикот од катастрофи
- друго _____

26. Како вообичаено ги заштитувате земјоделските површини од штета од крупен добиток? (повеќе одговори)

- комуникација со сопствениците и предупредување
- разговор на состанок во селото, доколку се случи
- подигнување на огради и грмушки за заштита
- друго _____

АНЕКС IV

Насоки за анкетари за имплементација на Прашалникот за ТЕРЕНСКОТО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

ВОВЕД

Активностите на Проектот за градење на капацитетите за ЕКО-НРК преку одржливо управување со шумите ќе опфатат спроведување на активности за зачувување на шумите во единицата за стопанисување со шумите во близина на селото Коџалија. Поради тоа, сегашните активности на ниво на домаќинства кои влијаат на уништувањето на шумите и деградацијата на шумите и како селаните ја перцепираат природната средина и катастрофи е од клучно значење за разгледување на погоре наведените опции за интервенција за намалување на ризикот од катастрофи со употреба на методи на Еко-НРК. Затоа, ќе се спроведе теренска анкета за социоекономските и други прашања (во понатамошниот текст: Услуги) за да се изработат основните податоци со анализа на нивоата на селото и активностите на ниво на домаќинствата и нивната перцепција за природната средина и катастрофи.

Главната цел на теренското истражување е да се идентификуваат социо-економските прашања и прашањата од животната средина на село Коџалија во близина на микро-локалитетите во Радовиш преку анализа на општо достапните податоци (во соодветните власти, како што се општината и статистичките податоци, како и апликацијата на теренското истражување преку интервју со локалното население (Прашалник).

ЦЕЛИ НА НАСОКИТЕ

Во овие Насоки се вклучени насоки, одговорности и задачи кои теренските анкетари потребно е да ги почитуваат при спроведувањето на **теренското истражување за социоекономски и други прашања (теренско истражување)** во селото Коџалија во општина Радовиш – состанокот во селото и теренското истражување користејќи Прашалник со упатства кои се приложени во како Анекс I и Анекс II.

ВАШАТА УЛОГА КАКО ТИМ ЧЛЕН ЗА ТЕРЕНСКОТО ИСТРАЖУВАЊЕ

Како член на тимот, играте клучна улога за имплементација и успехот на теренското истражување. Треба да бидете целосно запознаени со анкетата, целите, процесот на интервју, како и анализата на податоците. За време на истражувањето, мора да покажете највисоки етички стандарди за време на примената на Прашалникот, како и анализа на податоците. Членот на тимот ќе дејствува како професионален теренски истражувач по сите постапки за испитување. Ова ќе обезбеди податоците да се собираат со највисок квалитет.

Како член на тимот, се очекува да презентирате целосен интегритет и непристрасност, чесност и признавање на правата на испитаниците - учесниците во анкетата (правото на информации за содржината, правото на одбивање на учество во анкетата, како и точна презентација). Процесот на имплементација на Прашалникот е базиран на доверливост и заштита на податоците. Сите податоци за идентификација собрани за време на ова истражување ќе се користат само за целите на ова истражување и нема да бидат во било кој аспект споделени со лица и субјекти надвор од договорните страни на ова истражување (тимот за спроведување на теренското истражување и проектот според потпишаниот договор). Сите одговори на прашањата на Прашалникот ќе се користат за анализа на податоците и подготовка на Извештајот за теренското истражување и нема да се користат за која било друга цел. За целите на

доверливоста, членовите на тимот ќе ја потпишат **Изјавата за доверливост за спроведување на теренското истражување**, која е приложена како Анекс III.

За време на спроведувањето на теренското истражување, треба да ги почитувате етничката и верската припадност на испитаниците. Селото Коџалија е населено со мнозинство етнички турци и тоа е традиционална средина. Затоа, ќе треба да го имате предвид вашиот став и однесување за време на теренското истражување. Исто така, земете во предвид дека анкетата на терен треба да се изврши во деновите на славењето на Еид ал Фитр (Рамадан Бајрам).

НАСОКИ ЗА ИЗВРШУВАЊЕ НА ТЕРЕНСКОТО ИСТРАЖУВАЊЕ

За спроведување на анкетата на терен треба да бидете добро подготвени со познавање на Прашалникот и процедурите за нејзино спроведување и добро организирани за ефикасно спроведување на истражувањето со висок квалитет.

➤ Контакттирање на испитаниците—

Обемот на истражувањето е покривање на 50 домаќинства во селото. Референтните куќи ќе бидат избрани од страна на проектот и секој член на тимот ќе покрие половина од нив. Работата на терен ќе се планира на ефикасен и ефективен начин што значи дека маршрутата ќе се дефинира за логички да ги посети избраните куќи во истите населби. За време на состанокот во селото (види Анекс II), прецизен секојдневен план за посети ќе се врши врз основа на дневните рутини на селаните.

Направете минимум три обиди за завршување на истражувањето на идентификуваните домаќинства. Ако по повторените обиди не сте во можност да воспоставите контакт или лицата не сакаат да одговорат, информирајте го членот на тимот за да ги одредите следните чекори.

➤ Подготовка за теренското истражување

Секој ден пред да започнете, ќе проверите дали ги имате сите потребни документи што ќе ви бидат потребни во текот на работниот ден (на пр. значка за идентификација, доволно броеви на печатени прашања, печатени копии од Насоките, пенкала или моливи, детали за контакт на членовите на тимот итн.). Ако е потребно, земете отпечатена мапа на областа или ставете карта на вашиот мобилен телефон. За секој ден треба да подготвите дневен дневник со планирани локации што треба да се посетат. Разговарајте за дневниот дневник со лидерот на тимот и другиот член на тимот.

➤ Професионален приод

Вашиот изглед и став ќе го одредат нивото на соработка на испитаниците, и затоа е неопходно да се направи добар прв впечаток што може да ја поттикне соработката. Треба да бидете релаксирани, убедени, убедливи и смирени, со професионален пристап и воспоставување добар однос со испитаниците. Извештајот започнува кога ќе се претставите себе и анкетата и ќе продолжите со текот на процесот на проверка и интервјуирање. Утврдете добар однос рано и одржувајте го низ вашиот контакт во домаќинството. Односот што ќе се развие за време на првичниот контакт на вратата и додека го спроведувате скринингот на домаќинството ќе го одреди тонот на вашата посета. Треба да имате позитивен пристап и да покажете знаење за аспектите на истражувањето. Не бидете груби или агресивни.

По воведувањето, накратко се наведува целта на истражувањето, како им е од корист на селаните, важноста за учеството, неговата доверлива природа, заштитата на податоците, како и дека исходот ќе се користи само за целите на извештајот и следствено на тоа за шумските конзерваторски работи. Ако има прашања од жителите, или зошто се избрани, дали е доверливо итн., обидете се да ги одговорите и повторно да ги наведете целите и придобивките од анкетата за селото, важноста да се слушне гласот на селаните и можност за нив да придонесат кон отпорноста на селото, како и да ги убедат во доверливоста и анонимната природа на тоа. Интервјуирајте го испитаникот во приватно опкружување. Бидете неутрални во вашите зборови, постапки и однесување.

Во одредени случаи може да се случи испитаниците да одбијат да учествуваат во анкетата. Ако, и покрај сите ваши напори, лицето нема да се согласи на интервју, прифатете го одбивањето и благодарете му се љубезно на лицето за своето или нејзиното време. Вашата цел треба да биде да ја оставите вратата отворена за вас или некој друг да го контактира жителот подоцна и да обезбедите ветување за соработка. Информирајте го членскиот тим за одбивањето за да ги одредите следните чекори.

➤ **Имплементација на прашалникот**

Прашалникот ќе се спроведува на начин на кој што ќе ги прочитате прашањата до испитаниците и ќе ги внесувате нивните одговори. Прашајте ги прашањата користејќи ги точните зборови. Прочитајте ги полека, со цел испитаникот да ги чуе и да одговори на нив. Прашајте го секое прашање кое е во прашалникот, како што е наведено. Не скокајте од едно прашање на друго подоцна во листата. Повторете ги прашањата кои се погрешно протолкувани или погрешно разбрани од страна на испитаникот. Не предлагајте одговори на испитаниците. Одговорите мора да ги претставуваат сопствените мислења на испитаникот без пристрасност внесена од страна на теренските геодети. Немојте да влијаете на одговорите на одговорите со вашето однесување (тоа е, со јазикот на телото, вашиот став, вашиот тон на глас или на кој било друг начин).

Треба да одржувате правилно чување и складирање на прашалниците со тоа што ќе имате доволно печатени примероци за анкети за работниот ден, како и правилно да ги чувате пополнетите прашалници. По проверка на комплетноста на формуларите, ќе ги предадете на лидерот на тимот тимот за фотокопирање и скенирање.

Анекс I

**ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА
СОСТАНОК ВО СЕЛОТО**

ОПШТИ ПОСТАПКИ

Состанокот во селото ќе се одржи на 18 јуни 2018 година во 12:00 часот, во просториите на _____ во селото Коџалија. Се очекува да има припл. 10 - 15 учесници од различни делови од селото.

Дискусијата ќе ја води лидерот на тимот со поддршка на член 1 на тимот, додека членот на тимот 2 ќе биде одговорен за изготвување на записник за состанокот. Исто така, членот на тимот 1 паралелно ќе фаќа забелешки од дискусијата.

Состанокот во селото ќе се одржи по следниов редослед:

- Претставување на тимот
- Цел на состанокот и постапката

ФИНАЛЕН ИЗВЕШТАЈ
 ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

- Поставување на прашањата од предложените теми (темите можат да се фотокопираат и да се дистрибуираат до учесниците) осигурувајќи дека се опфатени сите важни аспекти, без да се прекине природниот тек на дискусијата.
- Сумирање на дискусиите.

**ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА
 ФОРМУЛАР ЗА СОСТАНОК ВО СЕЛОТО**

<p><u>Карактеристики и историја на селото:</u> <u>(вклучувајќи водени ресурси, куќи во селото, демографија)</u></p> <ul style="list-style-type: none"> • Историја на селото • Демографски карактеристики на селото <ul style="list-style-type: none"> - Бројност на населението во заедницата - Процентуално, грубо изразен пресек на населението по пол (машки/женски) • Број на домаќинства • Главни економски активности и извори на приход на селаните • Вработени/невработени (процентуално) • Типови на социјална инфраструктура (на пр. училишта, здравствени институции и др.) 	<p>Темата е потребно да даде основни информации за селото. Дискусијата треба да се води околу генералната информација од селаните на презентираниите информации и податоци.</p>
<p><u>Главни продукти во поглед на количина и монетарна вредност</u></p> <ul style="list-style-type: none"> - Кои се главни продукти од селото? - Приближна количина на производство - Приближна монетарна вредност на продуктите 	<p>Квантитативната и монетарната вредност потребно е да бидат приближни со цел за поддршка на профилот на селото. Само главните продукти да бидат наведени.</p>
<p><u>Ситуација со користење на шумата во селото</u></p> <ul style="list-style-type: none"> - Дали има шума во близина на селото? - Сопственост на шумата - Ресурси од шумата - Видови на дрвја - Било какви активности за пошумување? (повремени/редовни?) - Дали е потребно да се зголеми површината под шума? (дрвја/корист) 	<p>Важно е да се даде позадината на проблемот од страна на групата на селани со информации поврзани со шумата. Слични прашања се дел од прашалникот.</p>
<p><u>Традиционална работа со соработка, обичаи, практики</u></p> <ul style="list-style-type: none"> - Видови на традиционални работи со соработка во селото? - Специфични обичаи и практики - Улога на жената во заедницата и контрибуција во НРК 	<p>Овој дел потребно е да одговори на динамиката на традициите во селото, како и да се добие увид во нивото на соработка во селото, вклучувајќи ги и аспектите за НРК и улогата на жената.</p>
<p><u>Ситуација со сопственоста со земјодлското земјиште и пасиштата (вклучувајќи ги и шумските пасишта)</u></p> <ul style="list-style-type: none"> - Сопственост на шумите и земјиштето во областа на селото 	
<p><u>Главни земјоделски практики и годишен</u></p>	<p>Општа информација за земјоделските</p>

<p><u>распоред на работите (вклучувајќи и одгледување на пчели и цветни извори за паша)</u></p> <ul style="list-style-type: none"> - Кои се главните земјоделски култури - Земјоделски сезони (годишни календари на главните земјоделски култури/сточарство/активности) - Досие за жетва - Кои се главните земјоделски практики? Оддржливи практики? На пример, како да се заштитат културите/шумата од домашните животни со помош на огради, грмушки, патроли, заштита од шумски пожари. - Дали во селото се одгледуваат грмушки со намена за заштита на културите/дрвјата од животните? Ако да, кои видови се употребуваат (трња, грмушки)? - Како вообичаено ги заштитувате земјоделските култури од животните? - Земјоделството е машка, женска или заедничка работа? 	<p>практики во селото, како и главниот распоред на работите.</p>
<p><u>Нацрт на постоечката организација на населението</u></p> <ul style="list-style-type: none"> - Која е постоечката организација на населението во селото? - Постојење на т.н. месна заедница - Дали има членови од селото во општинскиот совет и тела? 	<p>Организацијата на населението се однесува на административната организација и населението, како и врските со Општина Радовиш.</p>
<p><u>Дали постојат локации со сериозна ерозија на почвата и предизвикува проблеми на селото</u></p> <ul style="list-style-type: none"> - Досие на настани на ерозија на почвата вклучувајќи област, погодено население и штети - Идентификација на локации со сериозна ерозија и области и погодено население - Мерки кои се имплементирани или се планираат да бидат имплементирани - Дали има проблеми со ерозија на почвата предизвикана од домашни животни (патеки и ерозија на брда)? 	<p>За проектот е неопходно да се добијат информации од состанокот за ерозијата на почвата, локациите во областа на селото, како и сите поврзани информации во врска со овие прашања.</p>
<p><u>Услови со вода во селото? Извори на вода и бунари</u></p> <ul style="list-style-type: none"> - Кој е главен извор на вода во селото? - Кое е сопственик на изворот со вода и водоснабдителниот систем? - Број на бунари - Недостаток на вода (минати/сегашни) - Дистрибутивна мрежа за вода/канализација/атмосферски води - Постојење на канали за поројни води 	

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<p><u>Историја на употреба за шумата и земјиштето околу селото</u></p> <ul style="list-style-type: none"> - Видови на шуми и земјишта 	<p>Кои типови на шума и земјиште се во областа на селото?</p>
<p><u>Ситуација со бесправната сеча</u></p> <ul style="list-style-type: none"> - Цели на бесправната сеча (комерцијални/приватни/други) - Фреквенција на бесправната сеча (годишно/сезонско) - Од страна на селаните или надворешни лица - Видови на дрвја кои се подложни на бесправна сеча - Процена на дрвната маса - Кои се негативни импакти од бесправната сеча? - Постоене на инспекција од ЈП Македонски шуми, инспектори или приватни чувари 	<p>Прашањето на бесправната сеча е сензитивно во многу од случаите и не секогаш основни информации се достапни. Поради тоа, членовите на тимот неопходно е да бидат внимателни во поставувањето на овие прашања. Ако нема одговор, не е потребно да се инсистира на добивање на одговор.</p>
<p><u>Рекорд на катастрофи околу селото</u></p> <ul style="list-style-type: none"> - Кои се главните природни опасности во селото? - Случени катастрофални настани (тип, кога, област и население погодено, човечки загуби, штети) - Дали постојат групи во селото кои се повеќе погодени од страна на другите (на пр. постари, жени, деца, инвалиди и др.) - Дали некој е одговорен за намалувањето на ризикот од катастрофи во селото? - Постоене на проценка на ниво на селото или планови за итни состојби - Информирање за опасностите на ниво на заедницата - Видови на мерки за НРК и работи кои се имплементирани за митигација на ризикот од катастрофи во минатото - Тековни и проектирани работи за НРК за митигација на ризикот - Дали сте имале шумски пожари порано? Кога е сезоната на пожари? 	<p>Овој дел е особено значаен за профилот на катастрофи во селото и претставува генерален увид од страна на селаните во ситуацијата со катастрофите.</p> <p>Само главните опасности наведени во прашалникот е потребно да бидат прашани. Потребно е да се добие општа информација за настаните од минатото. Изложеноста и ранливоста на селаните не се исти, која е нивната перцепција?</p> <p>Разбирање на нивото на осговорноста кон катастрофите.</p>

АНЕКС II

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ПРАШАЛНИК**

V. ПРАШАЊА ПОВРЗАНИ СО ДОМАЌИНСТВОТО	
<u>Прашања</u>	<u>Опис</u>
<p>1. Пол: <input type="checkbox"/> машки <input type="checkbox"/> женски</p>	<p>Општо прашање</p>
<p>2. Која е вашата возрасна група?</p> <p><input type="checkbox"/> 18 - 24</p> <p><input type="checkbox"/> 25 - 35</p>	<p>Општо прашање – учество во ова истражување е дозволено на селаните со над 18 год. возраст.</p>

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<input type="checkbox"/> 36 – 45 <input type="checkbox"/> 46 – 55 <input type="checkbox"/> 56 – 64 <input type="checkbox"/> 65 +	
3. Која е вашата етничка припадност? <input type="checkbox"/> македонска <input type="checkbox"/> албанска <input type="checkbox"/> турска <input type="checkbox"/> бошњачка <input type="checkbox"/> ромска <input type="checkbox"/> Друга _____	Општо прашање – ја презентира националната определба на учесниците во анкетата. Ако анкетираниот нема определба, тогаш анкетарот ја пишува под друга.
4. Која е вашата религиозна припадност? <input type="checkbox"/> православна <input type="checkbox"/> исламска <input type="checkbox"/> католичка <input type="checkbox"/> друга _____	Општо прашање – ја претставува религиозната припадност на испитаниците
5. Кој е вашиот степен на образование? <input type="checkbox"/> основно <input type="checkbox"/> средно/гимназија <input type="checkbox"/> високо <input type="checkbox"/> друго _____	Општо прашање – ја презентира образовната позадина на испитаниците. <i>Основно образование</i> – завршено основно образование (1-8 одделение), <i>средно/гимназија</i> – завршено средно образование/гимназија (1-4 клас) и <i>високо</i> – дипломски и постдипломски студии (магистерски и докторски). Ако испитаникот нема некое од предвидените степени на образование (на пр. Помалку од основно и сл.), членот на тимот ќе го наведе тоа под <i>друго</i> .
6. Кој е вашиот статус на вработување? <input type="checkbox"/> вработен/а <input type="checkbox"/> невработен/а <input type="checkbox"/> студент/ка <input type="checkbox"/> пензионер/ка	Општо прашање – го претставува статусот на вработувањето на испитаникот. <i>Вработен</i> се однесува на сите видови на вработување со договор за вработување (на пр. На неопределено или определено време). <i>Невработен</i> се однесува на сите ситуации на невработеност. <i>Пензионер</i> се однесува на пензионирање со плаќање на меселна пензија.
6а. Ако сте вработени, наведете го вашиот сектор на вработување. <input type="checkbox"/> јавен сектор <input type="checkbox"/> приватен сектор <input type="checkbox"/> земјоделие <input type="checkbox"/> сточарство <input type="checkbox"/> самовработување (на пр. занаетчиство) <input type="checkbox"/> друго _____ _____	Општо прашање – се однесува на специфичниот сектор на вработување каде што испитаникот е вработен. <i>Јавен сектор</i> – владини институции (национални/локални), јавни претпријатија и др. <i>Приватен сектор</i> – сите видови на приватен бизнис. <i>Земјоделство</i> – регистрирани земјоделци. <i>Сточарство</i> – одгледување стока. <i>Самовработен</i> – сите видови на договори за самовработување (на пр. Занаетчија, трговец поединец и др.). Сите други видови на сектори на вработување ќе бидат наведени како <i>друго</i> (на пр. времено

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	вработување без договор и сл.).
<p>7. Дали имате дополнителна работа?</p> <p><input type="checkbox"/> да</p> <p><input type="checkbox"/> не</p> <p>Ако имате, ве молам наведете ја:</p>	<p><i>Дополнителна работа</i> означува “работа која се извршува како дополнување на главната професија и како дополнителен извор на приходи (на пр. ако е вработен и исе занимава со земјоделство како дополнителна работа и сл.)”.</p>
<p>8. Тип на домаќинство</p> <p><input type="checkbox"/> семејно домаќинство</p> <p><input type="checkbox"/> не-семејно домаќинство</p>	<p><i>Семејното домаќинство</i> се состои од два или повеќе индивидуи кои се поврзани врз основа на раќање, брак или посвојување, иако тие може да вклучат и неповрзани луѓе.</p> <p><i>Не-семејното домаќинство</i> се состои од луѓе кои живеат сами или кои го делат живеалиштето со неповрзани индивидуи.</p>
<p>9. Број на членови на домаќинството?</p>	
<p>10. Кој е главниот извор на приходи на домаќинството?</p> <p><input type="checkbox"/> вработување</p> <p><input type="checkbox"/> редовен месечен приход (на пр. месечна плата, пензија, социјални трансфери)</p> <p><input type="checkbox"/> земјоделие</p> <p><input type="checkbox"/> сточарство</p> <p><input type="checkbox"/> бизнис</p> <p><input type="checkbox"/> занаетчиство</p> <p><input type="checkbox"/> друго _____</p>	<p>Информациите се однесуваат на најголемиот извор на приход на домаќинството. Ако не може да се идентификува во постечките одговори, тогаш членот на тимот ќе го наведе под друго (на пр. трансфери и сл.).</p>
<p>11. Вкупен годишен приход на домаќинството</p> <p><input type="checkbox"/> до 144,000 МКД</p> <p><input type="checkbox"/> 144,001 МКД до 216,000 МКД</p> <p><input type="checkbox"/> 216,001 МКД до 288,000 МКД</p> <p><input type="checkbox"/> 288,001 МКД до 360,000 МКД</p> <p><input type="checkbox"/> 360,001 МКД до 432,000 МКД</p> <p><input type="checkbox"/> 432,001 МКД до 504,000 МКД</p> <p><input type="checkbox"/> 504,001 МКД до 576,000 МКД</p> <p><input type="checkbox"/> повеќе од 576,001 МКД</p>	<p>Ова прашање се однесува на вкупниот годишен приход и износот е заснован врз основа на просечната бруто плата од март 2018 (24,000 МКД). Вкупниот приход на домаќинството е комбинација на приходите од различни извори (на пр. вработување, дополнителни работи, земјоделство и др.). Овој бруто износ е мултиплициран со различен коефициент понатаму (на рп. 0.5, 1, 1.5, 2 и 2.5).</p>
<p>12. Вкупен годишен расход на домаќинството</p> <p><input type="checkbox"/> до 144,000 МКД</p> <p><input type="checkbox"/> 144,001 МКД до 216,000 МКД</p> <p><input type="checkbox"/> 216,001 МКД до 288,000 МКД</p> <p><input type="checkbox"/> 288,001 МКД до 360,000 МКД</p> <p><input type="checkbox"/> 360,001 МКД до 432,000 МКД</p> <p><input type="checkbox"/> 432,001 МКД до 504,000 МКД</p> <p><input type="checkbox"/> 504,001 МКД до 576,000 МКД</p> <p><input type="checkbox"/> повеќе од 576,001 МКД</p>	<p>Ова прашање се однесува на вкупните годишни трошоци на домаќинството и износот се базира на просечната бруто плата од март 2018 (24,000 МКД). Овој бруто износ е мултиплициран со различен коефициент понатаму (на рп. 0.5, 1, 1.5, 2 и 2.5).</p>
<p>13. Видови на вкупни трошоци на домаќинството (повеќе одговори):</p> <p><input type="checkbox"/> потрошувачка</p> <p><input type="checkbox"/> комунални услуги</p> <p><input type="checkbox"/> образование</p>	<p>Општите видови на трошоци на домаќинството на годишно ниво се следниве:</p> <p><i>Потрошувачка</i> – ги вклучува сите видови на трошоци кои се неопходни за семејството (на пр. храна).</p>

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<input type="checkbox"/> медицински трошоци <input type="checkbox"/> помошни активности <input type="checkbox"/> друго	<p><i>Комунални услуги</i> – сите плаќања за комуналната инфраструктура и поврзаноста (вода, канализација, електрична струја, телефон, интернет и сл.).</p> <p><i>Помошни активности</i> – транспорт и слично (на пр. основно одржување на домаќинството), додека <i>друго</i> се однесува на сите неспецифицирани трошоци.</p>
<p>14. Улогата на жената во домаќинството (повеќе одговори)</p> <input type="checkbox"/> домашни активности (на пр. домаќински активности, готвење, грижа за членовите на семејството и др.) <input type="checkbox"/> земјоделство <input type="checkbox"/> сточарство <input type="checkbox"/> поправки и сервисни услуги во домаќинството <input type="checkbox"/> работа и поддршка на приходот на домаќинството	<p>Улогата на жената во домаќинството се однесува на разбирањето на испитаниците за нејзината основна улога. Ова прашање има можност за повеќе одговори.</p>
<p>II. ПРАШАЊА ПОВРЗАНИ СО ЖИВОТНАТА СРЕДИНА</p>	
<p>15. Дали има шума или пошумена површина во атарот на селото или во близина на селото?</p> <input type="checkbox"/> да <input type="checkbox"/> не <input type="checkbox"/> делумно	<p><i>Делумно</i> се одговара во случај кога нема целосна шума или пошумено земјиште во атарот на селото или во близина на атарот на селото.</p>
<p>16. Каква е сопственоста на шумата?</p> <input type="checkbox"/> државна шума <input type="checkbox"/> приватна шума <input type="checkbox"/> друго: _____	<p><i>Државна шума</i> се однесува на шума на државно земјиште управувана од страна на ЈП Македонски шуми, додека <i>приватна шума</i> се однесува на шума која е во сопственост на физичко лице. Во сите преостанати случаи (на пр. сопственоста е непозната) се употребува <i>друго</i>.</p>
<p>17. Шумата и дрвото како ресурс се употребуваат за следниве цели (повеќе одговори):</p> <input type="checkbox"/> земјоделство <input type="checkbox"/> сточарство <input type="checkbox"/> градежни активности <input type="checkbox"/> греење, ако одговорите греење, продолжете на 17а & 17б <input type="checkbox"/> друго: _____	<p>Шумата и дрвото како ресурси се однесува на употребата на дрвото и шумските материјали првенствено за некоја од намените. Ако не е наведена, одговорот треба да се наведе под <i>друго</i>.</p>
<p>17а. Ако употребувате дрво како огревен материјал, од каде го набавувате:</p> <input type="checkbox"/> стоваришта на ЈП Македонски шуми <input type="checkbox"/> приватни фирми <input type="checkbox"/> на своја рака <input type="checkbox"/> друго: _____	<p>На своја рака се однесува на дрва кои се собираат/сечат од страна на селаните или се добиваат од други извори. Ако не е наведено се одговара под <i>друго</i>.</p>

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<p>17b. Ако употребувате дрво како огревен материјал, кое количество употребувате на годишно ниво:</p> <p><input type="checkbox"/> до 3m³</p> <p><input type="checkbox"/> 4 до 6m³</p> <p><input type="checkbox"/> 7 до 9m³</p> <p><input type="checkbox"/> 10 до 12m³</p> <p><input type="checkbox"/> повеќе од 12m³</p>	<p>Ова прашање се однесува на просечната потрошувачка на дрва за греење на домаќинството.</p>
<p>18. Кој видови на дрвја се најкорисни за вашето домаќинство?</p> <p><input type="checkbox"/> даб</p> <p><input type="checkbox"/> бука</p> <p><input type="checkbox"/> багрем</p> <p><input type="checkbox"/> зимзелени дрвја</p> <p><input type="checkbox"/> овошки</p> <p><input type="checkbox"/> друго: _____</p>	<p>Испитаникот треба да ги наведе најкорисните дрва за неговото/нејзиното домаќинство. Ако не се наведени, да се пополни друго.</p>
<p>19. Дали е потребно шумското земјиште во атарот на вашето село да се зголеми?</p> <p><input type="checkbox"/> да</p> <p><input type="checkbox"/> не</p> <p><input type="checkbox"/> немам мислење</p>	<p>Ова прашање се однесува на зголемувањето на шумското земјиште во атарот на селото и неговата близина преку мерки на пошумување.</p>
<p>19a. Ако да, со какви видови на дрвја би требало да биде пошумено:</p> <p><input type="checkbox"/> даб</p> <p><input type="checkbox"/> бука</p> <p><input type="checkbox"/> багрем</p> <p><input type="checkbox"/> зимзелени дрвја</p> <p><input type="checkbox"/> овошки</p> <p><input type="checkbox"/> друго: _____</p>	<p>Испитаникот треба да ги наведе дрвјата кои можат да бидат искористени во пошумувањето или зголемувањето на шумското земјиште во атарот на селото или во близина. Ако не е наведено, се внесува под друго.</p>
<p>20. Какви придобивки очекувате од зголеменото шумско земјиште? (повеќе одговори)</p> <p><input type="checkbox"/> дрвна маса</p> <p><input type="checkbox"/> придобивки за животната средина (на пр. намалено загадување на воздухот и сл.)</p> <p><input type="checkbox"/> заштитна функција од природни опасности (ерозија, поројни поплави, свлечишта и сл.)</p> <p><input type="checkbox"/> овошје</p> <p><input type="checkbox"/> нектар за производство на мед</p> <p><input type="checkbox"/> друго: _____</p>	<p>Испитаникот треба да ги наведе придобивките за неговото/нејзиното домаќинство од зголеменото шумско земјиште.</p> <p>Под <i>дрвна маса</i> се подразбира употребата на дрвото за градење, греење и сл.</p>
<p>III. ПРАШАЊА ПОВРЗАНИ СО КАТАСТРОФИТЕ</p>	
<p>21. Кои природни опасности се присутни во атарот на вашето село? (повеќе одговори)</p> <p><input type="checkbox"/> поплави (поројни)</p> <p><input type="checkbox"/> ерозии</p>	<p>Испитаникот треба да ги наведе природните опасности кои се присутни во атарот на селото. Ако не се наведени, се внесуваат под <i>друго</i>.</p>

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<input type="checkbox"/> шумски пожари <input type="checkbox"/> свлечишта <input type="checkbox"/> опасности поврзани со времето (на пр. бури, град, пороен дожд и сл.) <input type="checkbox"/> друго _____	
<p>22. Дали вие или вашето домаќинство некогаш сте биле погодени од било која од наведените природни опасности?</p> <input type="checkbox"/> да <input type="checkbox"/> не <p>Ако да, наведете</p>	<p>Ако било која од природните опасности го погодила испитаникот или неговото/нејзиното домаќинство, тогаш тоа треба да биде кусо опишано.</p>
<p>23. Што е потребно жителите на селото да се заштитат од природните опасности? (повеќе одговори – одберете три)</p> <input type="checkbox"/> проценка на ризици и опасности <input type="checkbox"/> активности за рано предупредување <input type="checkbox"/> мерки за заштита <input type="checkbox"/> подобрена комуникација и навремена информација <input type="checkbox"/> планирачки вежби за итни состојби на заедницата <input type="checkbox"/> подобрена патна мрежа <input type="checkbox"/> одговор базиран на заедницата <input type="checkbox"/> друго ____	<p>Испитаникот потребно е да ги наведе потребните активности/мерки за заштита од природните опасности.</p> <p><i>Проценка на ризици и опасности – на селско/општинско/национално ниво.</i> <i>Активности за рано предупредување – за навремено информирање со тревожење.</i> <i>Мерки за митигација за заштита од катастрофи.</i> <i>Подобрена комуникација и навремена информација од страна на релевантни локални и национални субјекти (ЦУК, општина и сл.)</i> <i>Планирачки вежби за итни состојби на заедницата – подготовка и тестирање на плановите за итни состојби.</i> <i>Подобрена патна мрежа – локални и шумски патишта.</i> Ако не е наведено во нив, се пополнува под друго.</p>
<p>24. Кои средства можат да го олеснат добивањето на информации за потенцијалните катастрофи? (повеќе одговори – одберете три)</p> <input type="checkbox"/> компетентни институции на локално ниво <input type="checkbox"/> мапи на опасности <input type="checkbox"/> јавни информации: ТВ, радио, весници, СМС, емаил, интернет. <input type="checkbox"/> едукација на заедницата <input type="checkbox"/> друго _____	<p>Ова прашање се однесува на каналите за добивање на соодветните информации за потенцијалните катастрофи. Испитаникот има можност за повеќе одговори:</p> <p><i>Компетентни институции на локално ниво се однесува на општинските власти, ЦУК, ЈПМШ и други.</i> <i>Мапи на опасности кои се изработени од страна на релевантни институции (локални/национални) и кои се расположливи за увид или споделување со селаните.</i> <i>Јавни информации преку различни информационални и комуникациони канали/извори.</i> <i>Едукација на заедницата за НРК од страна на релевантни институции.</i> Ако не се наведени, се внесуваат под друго.</p>
<p>25. Кои мерки за намалување на ризиците од катастрофи е потребно да се употребат за да се намалат и спречат</p>	<p><i>Подобрена комуникација и информација од релевантните власти во заедницата (месна заедница) и селаните.</i></p>

<p>негативните последици од природните опасности во вашето село? (повеќе одговори – одберете три)</p> <p><input type="checkbox"/> подобрена комуникација и информација од релевантните власти</p> <p><input type="checkbox"/> ангажирање на заедницата за намалување на ризиците од катастрофи</p> <p><input type="checkbox"/> кампањи на волонтерска основа</p> <p><input type="checkbox"/> пошумување на ранливите области</p> <p><input type="checkbox"/> инфраструктурни работи во заедницата за митигација на ризикот од катастрофи</p> <p><input type="checkbox"/> друго _____</p>	<p><i>Ангажирање на заедницата во НРК – различни иницијативи за имплементација на мерки.</i></p> <p><i>Кампањи на волонтерска основа од страна на челонивте на заедницата и локалните власти.</i></p> <p><i>Пошумување на ранливите области од страна на општината и ЈПМШ преку проектни активности.</i></p> <p><i>Инфраструктурни работи во заедницата за митигација на ризикот од катастрофи – учество на ниво на заедницата во идентификација на потребите, планирање, ко-финансирање или извршување на работи од помал обем (на пр. канали за поројни води и сл.).</i></p> <p>Ако не е наведено, се внесува под <i>друго</i>.</p>
<p>26. Како вообичаено ги заштитувате земјоделските површини од штета од крупен добиток? (повеќе одговори)</p> <p><input type="checkbox"/> комуникација со сопствениците и предупредување</p> <p><input type="checkbox"/> разговор на состанок во селото, доколку се случи</p> <p><input type="checkbox"/> подигнување на огради и грмушки за заштита</p> <p><input type="checkbox"/> друго _____</p>	<p>Испитаникот потребно е да одговори како нормално ги заштитува земјоделските култури/полиња од домашните животни.</p> <p>Ако не е наведено, се внесува под <i>друго</i>.</p>

Анекс III

ИЗЈАВА ЗА ДОВЕРЛИВОСТ ЗА ИМПЛЕМЕНТАЦИЈА НА ТЕРЕНСКОТО ИСТРАЖУВАЊЕ

Јас, долупотпишаниот, изјавувам дека се согласувам да учествувам како член во тимот раководен од г-дин Васко Поповски за спроведување на **теренското истражување за социоекономските и други прашања** во рамките на проектот "*Градење на капацитетите за екосистеми и намалување на ризиците од катастрофи преку одржливо стопанисување со шумите во Македонија*" во село Коџалија, општина Радовиш, почнувајќи од 18 јуни 2018 година. Со изјавата потврдувам дека се запознав со достапните информации за спроведувањето на ова истражување. И понатаму велам дека ќе ги извршувам моите одговорности чесно, доверливо и фер.

Понатаму, се согласувам да ги третирам како доверливи сите информации што се специфични за домаќинството, добиени за време на оваа анкета и сите поврзани прашања. Собраните информации ќе ги третирам доверливо надвор од податоците од истражувањето и нема да ги сподела со трети лица. Јас нема да направам копии или да снимам на било кој друг начин никакви доверливи информации за истражување, освен ако не сум овластен од страна на лидерот на тимот. Јас нема да ги интервјуирам лицата кои лично ги знам и ќе ги пријавам сите наводни прекршувања на процедурите за анкетирање на лидерот на тимот. Во текот на спроведувањето на ова истражување ќе се придржувам кон сите валидни податоци и прописи за овој вид анкети.

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Име	
Потпис	
Датум	

АНЕКС V

ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА
СОСТАНОК ВО СЕЛОТО – ЗАПИСНИК

Датум на состанокот во селото: 18 јуни, 2018 13:00 - 14:30

Локација: Село Коџалија, централната продавница во центарот на селото

Присутни:

- Претставници на Тимот за теренското истражување (Васко Поповски, Лолита Арсова, Љупчо Милковски)
- Претставник на проектот (Игор)
- Претставник на Општина Радовиш (Марија)
- Претставник на Регионалната канцеларија на Центарот за управување со кризи (Екрем)
- Претставник на месната заедница на Коџалија (Назми Мемедов)
- Селани од Коџалија - приближно 18



Фотографија на дел од учесниците на состанокот во селото, тимот и претставници од општинските институции по завршувањето на состанокот

Вовед

Васко Поповски ги информираше присутните селани за целта на состанокот, како и за целта и методологијата за спроведување на теренското истражување за социо-економски и други прашања во село Коџалија во текот на следната недела. Г-дин Игор од Проектот ги поздрави селаните и накратко им ги објасни интервенциите и проектните активности на локално ниво во Коџалија и целите кои треба да се постигнат преку имплементација на различните работи.

<p>Карактеристики и историја на селото: (вклучувајќи водени ресурси, куќи во селото, демографија)</p> <ul style="list-style-type: none">• Историја на селото• Демографски карактеристики на селото	<ul style="list-style-type: none">• Нема пишани докази за историјата на селото на кои можеа да се сетат учесниците на состанокот. Генерално, јуруците (турска под-етничка група) дошла од Анадолија, регионот на Коња во XIV и XV век. Значи, раните датуми на Коџалија можат да се лоцираат во XV век.• Населението од селото според Пописот од 2002
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<ul style="list-style-type: none"> - Бројност на населението во заедницата - Процентуално, грубо изразен пресек на населението по пол (машки/женски) • Број на домаќинства • Главни економски активности и извори на приход на селаните • Вработени/невработени (процентуално) • Типови на социјална инфраструктура (на пр. училишта, здравствени институции и др.). 	<p>година е проценето на 478 жители. Груба проценка на сегашната популација е 550-600 граѓани. Мислењето на селаните е дека поделбата на населението по пол (машки/женски) е со сооднос 1:1 или 50%-50%. Населението на селото се зголемува по 2012 година, бидејќи иселувањето во Турција се намалило поради ограничувањето на турската влада да не дозволи второ државјанство заедно со турското државјанство, како и субвенционираната програма на владата за зголемување на демографијата преку обезбедување субвенции за три или повеќе деца. Генерално, нивното мислење е дека населението во селото е релативно младо. Секое семејство има четири или повеќе членови. Просечно е да се има три деца во семејството.</p> <ul style="list-style-type: none"> • Во селото има 135 домаќинства. • Главни економски активности и извори за приходи на селаните се земјоделството / тутунот (повеќе од 90% од домаќинствата) и сточарството (8 домаќинства од кои во 5 се одгледуваат овци и во 3 се одгледуваат крави). Одгледувачите на овци имаат повеќе од 150 овци, па се до 300 овци. Одгледувачите на крави го продаваат телешкото месо. Исто така, постојат неколку бизниси од приватниот сектор (на пример, три продавници за храна, транспортна компанија), како и 5 семејства на чувари на пчели. Сепак, егзистенцијата на селаните главно се потпира на производство на тутун. • Повеќето од селани се невработени со обично еден член на домаќинствата регистриран како земјоделец - производител на тутун за целите на учество во програмата за субвенции на владата. Не постои организирано вработување во индустриските капацитети во соседните градови (на пример, Радовиш и Штип) или во рудникот Бучим. Во минатото имало примери за вработување во фабриката на Џонсон Контрол во индустриската зона Штип. • Социјалната инфраструктура во селото е многу ограничена. Имено, има само едно основно училиште (I-V одделение) за подрачјата на селата Коџалија и Али Коч со 115 ученици (70 од Коџалија и 45 од Али Коч). Нема здравствена установа во селото - најблиската е во Али Коч (1 доктор/1 медицински персонал со ограничено работно време). Ветеринарната амбуланта е во Радовиш, а вонредни ветеринарни услуги се обезбедуваат на барање. Уличната покриеност на селото е 50% од територијата со само главниот пат од Радовиш со асфалт. Постои функционален систем за улично осветлување. Системот за водоснабдување го управува и оддржува ЈП Плаваја од Радовиш. Канализационата мрежа е делумно воспоставена низ дел од селото без да функционира. • Не постои организирано собирање на цврст отпад и
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	<p>затоа се фрла на илегални локации околу селото.</p> <ul style="list-style-type: none"> Селото нема документи за урбанистичко планирање/планови. Повеќето од куќите и објектите се дивоградби без градежна дозвола. Процесот на подготовка на првиот детален урбанистички план за селото е во тек.
<p><u>Главни продукти во поглед на количина и монетарна вредност</u></p> <ul style="list-style-type: none"> Кои се главни продукти од селото? Приближна количина на производство Приближна монетарна вредност на продуктите 	<ul style="list-style-type: none"> Главен производ е тутунот (тип Прилеп), а просечното годишно производство на ниво на селото изнесува 200 т. Во монетарна смисла е еднакво на 800.000 евра (проценката е направена на минатогодишната просечна цена од 1 т тутун = 4 евра). За сточарството не постојат квантифицирани и монетарни проценки.
<p><u>Ситуација со користење на шумата во селото</u></p> <ul style="list-style-type: none"> Дали има шума во близина на селото? Сопственост на шумата Ресурси од шумата Видови на дрвја Било какви активности за пошумување? (повремени/редовни?) Дали е потребно да се зголеми површината под шума? (дрвја/корист) 	<ul style="list-style-type: none"> Во селската област наречена Маруш има шума, а 70% од шумата е на државно земјиште во надлежност на ЈП Македонски шуми. Само 30% од шумата е во приватна сопственост од страна на некои селани или од џамијата. Селаните користат дрво како ресурси од шумата за земјоделство, сточарство (гранки и грмушки за одгледување на кози), градежни активности и за греење. Некои од селаните собираат печурки и шумски плодови, но не и на организиран начин. Главен тип на дрво е даб, следено со бука. Во минатото имало области со багрем. Немало организирани или повремени активности за пошумување на земјиштето. Повеќето од учесниците на селскиот состанок изјавија дека треба да бидат редовни активностите за пошумување на земјиштето, но постои мала група селани кои сметаат дека овие активности на пошумување би можеле да го загрозат проширувањето на земјоделското земјиште за производство на тутун. Заедничкиот договор е дека сточарите се главна опозиција за активностите за пошумување, бидејќи сметаат дека ова може да резултира со намалување на достапните пасишта. Меѓутоа, групата изјави дека има придобивки од шумите (на пример, повеќе дрвна маса, подобра животна средина, заштита од прашина од јаловиштето во рудникот Бучим).
<p><u>Традиционална работа со соработка, обичаи, практики</u></p> <ul style="list-style-type: none"> Видови на традиционални работи со соработка во селото? Специфични обичаи и практики Улога на жената во заедницата и контрибуција во НРК 	<ul style="list-style-type: none"> Земјоделството е заедничка работа за сите членови на семејството. Исто така, соседите и другите селани можат да им помогнат на семејствата, на пр. со механизација, работи итн. Постои фолклорна група и фудбалски клуб. Тие планираат да отворат културно и уметничко општество за зачувување на традицијата и културата на јуруците. Празници во селото се Рамадан Бајрам и Херделези-Ѓурѓовден (6ти мај).

	<ul style="list-style-type: none"> • Жените најчесто се гледаат во нивната улога за поддршка на семејствата, грижата за други членови на семејствата, одговорни се за сите домашни работи, како и претставуваат помошна работна сила за земјоделските работи за производство на тутун. Нивниот живот во заедницата сè уште е многу традиционален и тие претежно остануваат дома извршувајќи домашни работи, речиси без никаков контакт со други лица.
<p><u>Ситуација со сопственоста со земјоделското земјиште и пасиштата (вклучувајќи ги и шумските пасишта)</u></p> <ul style="list-style-type: none"> - Сопственост на шумите и земјиштето во областа на селото 	<ul style="list-style-type: none"> • Како што е наведено погоре, 70% од сопственоста над шумата е државна и 30% е во приватна сопственост. Поголемиот дел од земјоделското земјиште околу селото е во приватна сопственост. Во изминатите години повеќе од 15 семејства купиле или изнајмиле земјоделско земјиште во Радовиш, низводно на Радовишка река за проширување на производството на тутун. Шумските пасишта се слични на шумите и претежно се во државна сопственост.
<p><u>Главни земјоделски практики и годишен распоред на работите (вклучувајќи и одгледување на пчели и цветни извори за паша)</u></p> <ul style="list-style-type: none"> - Кои се главните земјоделски култури - Земјоделски сезони (годишни календари на главните земјоделски култури/сточарство/активности) - Досие за жетва - Кои се главните земјоделски практики? Оддржливи практики? На пример, како да се заштитат културите/шумата од домашните животни со помош на огради, грмушки, патроли, заштита од шумски пожари. - Дали во селото се одгледуваат грмушки со намена за заштита на културите/дрвјата од животните? Ако да, кои видови се употребуваат (трња, грмушки)? - Како вообичаено ги заштитувате земјоделските култури од животните? - Земјоделството е машка, женска или заедничка работа? 	<ul style="list-style-type: none"> • Главна земјоделска култура е тутунот. Другите култури се засадени само за потребите на домаќинствата (на пример, компир, пченка, пченица, овошје). Иста е ситуацијата со сточарството - овците и кравите се одгледуваат за продажба, додека другите животни (на пример, живина, кози) се за индивидуални потреби. • Земјоделската сезона е поврзана со тутунот во периодот мај-октомври. Сточарството е активност во текот на целата година. • Како што е наведено, просечната жетва на тутунот изнесува 200 t годишно во зависност од годината и нејзините временски карактеристики (на пример, влажни со дожд, суви, итн.). • Главните земјоделски практики се повторно поврзани со тутунот и главно се полуавтоматски. Не постои разбирање за оддржливи практики за земјоделско производство. Сепак, постојат нови практики во производството на тутун со тоа што производството на тутун од лисја; расадот и пакувањето на лисја се вршат со машини. ТИКА ги поддржала селаните со обезбедување на неколку видови на земјоделска механизација и помошни предмети (на пр. најлон фолии). • Не сите селани ја штитат земјоделската култура од домашните животни и кога тоа е случај, тоа се прави со жива ограда. Нема организирана заштита од шумски пожари, бидејќи во последните години нема шумски пожари и фактот дека околното подрачје на селото е без шуми. За заштита на дрвјата (на пр, ореви, овошки), се користат трња дрвја, грмушки и дрвени стапчиња од даб. • Производството на тутун е традиционална

	<p>земјоделска практика и речиси во сите случаи се работи за семеен тип, каде што сите членови на семејството активно придонесуваат во сите фази на производството на тутун.</p>
<p><u>Нацрт на постоечката организација на населението</u></p> <ul style="list-style-type: none"> - Која е постоечката организација на населението во селото? - Постоење на т.н. месна заедница - Дали има членови од селото во општинскиот совет и тела? 	<ul style="list-style-type: none"> • Постојната организација на жители е во согласност со вообичаената организација на жители во земјата како месна заедница. Неодамна тие го избрале новиот Совет на месната заедница со 6 членови и еден претседател. Тоа е главното тело во селото/субјект со кој Општина Радовиш комуницира во врска со сите неопходни прашања. • Постои практика во селото да се одржуваат заеднички селски состаноци во кои учествуваат заинтересираните селани и се дискутираат важни прашања и се донесуваат одлуки (на пример, минатата година имаше редовни состаноци поврзани со недостатокот на вода).
<p><u>Дали постојат локации со сериозна ерозија на почвата и предизвикува проблеми на селото</u></p> <ul style="list-style-type: none"> - Досие на настани на ерозија на почвата вклучувајќи област, погодено население и штети - Идентификација на локации со сериозна ерозија и области и погодено население - Мерки кои се имплементирани или се планираат да бидат имплементирани - Дали има проблеми со ерозија на почвата предизвикана од домашни животни (патеки и ерозија на брда)? 	<ul style="list-style-type: none"> • Постојат сведоштва за настани на ерозија во местото викано Иник. Но, нема сведоштва за загрошено население или домаќинства. Околу селото има помали ерозии на земјиштето или на земјоделското земјиште кои се видливи, особено после поројни дождови. • Нивните забелешки се дека бројот на ерозивни настани се зголемува со текот на годините, а земјиштето почесто се свлекува кон селската река. • Ниту една куќа или население не се директно засегнати од ерозивните настани. • Во близина на браната на селото Тополница, настанала ерозија поради животните, а две крави се лизнале во реката која ги удавила. • Не се имплементирани или планирани да се спроведат мерки за спречување на ерозиите.
<p><u>Услови со вода во селото? Извори на вода и бунари</u></p> <ul style="list-style-type: none"> - Кој е главен извор на вода во селото? - Кое е сопственик на изворот со вода и водоснабдителниот систем? - Број на бунари - Недостаток на вода (минати/сегашни) - Дистрибутивна мрежа за вода/канализација/атмосферски води - Постоење на канали за поројни води 	<ul style="list-style-type: none"> • Во селото постои организиран систем за водоснабдување кој го поседува и управува општинското ЈП Плаваја - Радовиш. Секоја куќа, освен новоизградените, има инсталирани водомери (новите ќе добиваат водомери во текот на ова лето). Потрошувачката на вода се плаќа на редовна, месечна основа. • Главните извори на вода се од планината Плачковица и се собираат и преку филтерската станица и резервоарот во горниот дел од селото се дистрибуираат низ селото. Водата се третира со хлор и неа ја контролира Институтот за јавно здравје - регионален центар - Штип. • Домаќинствата немаат поединечни бунари за вода и вкупно има околу 4 бунари во селото. • Минатата година имаше ситуација со недостиг на вода, но оваа година до сега ситуацијата е добра. • Исто така, имало неколку случаи на труење со вода,

	<p>бидејќи водата не е со ист квалитет постојано (на пример, мирисот).</p> <ul style="list-style-type: none"> • Не постои мрежа за собирање атмосферски води. Канализационата мрежа е делумно конструирана и не е поврзана како систем. Домаќинствата немаат септички јами и отпадната вода се ослободува слободно во три правци околу селото.
<p><u>Историја на употреба за шумата и земјиштето околу селото</u></p> <ul style="list-style-type: none"> - Видови на шуми и земјишта 	<ul style="list-style-type: none"> • Главен тип на шума е даб. Во минатото имало шуми со багрем. • Земјата околу селото е земјоделско земјиште.
<p><u>Ситуација со бесправната сеча</u></p> <ul style="list-style-type: none"> - Цели на бесправната сеча (комерцијални/приватни/други) - Фреквенција на бесправната сеча (годишно/сезонско) - Од страна на селаните или надворешни лица - Видови на дрвја кои се подложни на бесправна сеча - Процена на дрвната маса - Кои се негативни импакти од бесправната сеча? - Постоене на инспекција од ЈП Македонски шуми, инспектори или приватни чувари 	<ul style="list-style-type: none"> • Не постои организирана сеча на шумата близу до селото. Секое сечење е бесправно и се прави главно од луѓе надвор од селото. Има ограничен број на локални нелегални дрвосечачи. Сепак, повеќето селани го добиваат дрвото за греење од бесправната сеча. • Главната цел за бесправната сеча е комерцијална и се врши многу често во текот на целата година од пролет до есен најмногу. • Главното дрво подложно на бесправна сеча е даб. • Нема процена на дрвната маса која е бесправно исечена. • Негативните влијанија на бесправната сеча се значајно намалување на шумската територија, ерозија, губење на зеленилото. • Постојат чувари од ЈП Македонски шуми, но не многу чести патроли. Не се организирани акции за превенција на бесправна сеча, што ги вршат Министерството за внатрешни работи и ЈП Македонски шуми.
<p><u>Досие на катастрофи околу селото</u></p> <ul style="list-style-type: none"> - Кои се главните природни опасности во селото? - Случени катастрофални настани (тип, кога, област и население погодено, човечки загуби, штети) - Дали постојат групи во селото кои се повеќе погодени од страна на другите (на пр. постари, жени, деца, инвалиди и др.) - Дали некој е одговорен за намалувањето на ризикот од катастрофи во селото? - Постоене на проценка на ниво на селото или планови за итни состојби - Информирање за опасностите на ниво на заедницата - Видови на мерки за НРК и работи кои се имплементирани за митигација на ризикот од катастрофи во минатото 	<ul style="list-style-type: none"> • Главните природни опасности се опасностите поврзани со временските услови (поројни поплави, суши, град, грмотевици, земјотрес, снежни врнежи). Областа на нивното село не е директно изложена на шумски пожари. • Не се случиле големи катастрофални настани. Имало неколку случаи на смрт на селани од громови. Пред пет години имало големи штети на тутунските култури поради град и бури. • Иако куќите и зградите се нелегални и без градежна дозвола или изградени врз основа на урбанистички план, селаните размислуваат за најважните основи на градежништвото за да го ублажат ризикот (на пример, растојанието меѓу куќите итн.). • Ранливите категории на селани се повеќе ранливи на катастрофи, но изложеноста зависи од локацијата на куќите и изградената средина. • Никој не е одговорен за намалување на ризикот од катастрофи во селото. Општо земено, отсутствува концептот за намалување на ризикот од катастрофи и неговото вклучување во секојдневниот живот. • Нема проценки или планови за вонредни состојби.

<ul style="list-style-type: none">- Тековни и проектирани работи за НРК за митигација на ризикот- Дали сте имале шумски пожари порано? Кога е сезоната на пожари?	<ul style="list-style-type: none">• Информациите на ниво на заедницата за опасностите се делат усмено меѓу селаните или преку мобилни телефони. Во одредени случаи тие организираат селски состаноци (на пример, минатата година ситуација на недостаток на вода).• Како селани тие не знаат што да прават и како да се заштитат себеси во случај на катастрофи.• Шумските пожари не се типични за нивниот регион. Главните области подложни на шумски пожари се лоцирани во делот на Штип. Само на подрачјето наречено Круша пред неколку години имало шумски пожар.
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Во 14:30 средбата беше завршена.

Подготвено од Лолита Арсова и м-р Васко Поповски.

Анекс VI – Анкета на домаќинствата – МС Ексел листови

Data entry list for Question:			
1. Gender			
Questionnaire number	Question	Answer	
		Male	Female
1	1. Gender		
1		1	
2		1	
3		1	
4		1	
5		1	
6		1	
7		1	
8		1	
9		1	
10		1	
11		1	
12		1	
13		1	
14		1	
15		1	
16		1	
17		1	
18		1	
19		1	
20		1	
21		1	
22		1	
23		1	
24		1	
25		1	
26		1	
27		1	
28			1
29			1
30		1	
31		1	
32		1	
33		1	
34			1
35		1	
36			1
37		1	
38		1	
39			1
40		1	
41		1	
42/1		1	
43		1	
44			1
45			1
46			1
47			1
48			1
49			1
50			1
Total		38	12

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:								
2. What is your age group?								
Questionnaire number	Question	Answer						
2	2. What is your age group?	18 - 24	25 - 35	36 - 45	46 - 55	56 - 64	65 +	
1					1			
2		1						
3			1					
4			1					
5				1				
6				1				
7					1			
8		1						
9					1			
10				1				
11			1					
12		1						
13			1					
14		1						
15				1				
16			1					
17				1				
18			1					
19					1			
20					1			
21		1						
22			1					
23			1					
24					1			
25			1					
26					1			
27					1			
28				1				
29		1						
30							1	
31			1					
32					1			
33			1					
34			1					
35			1					
36				1				
37					1			
38							1	
39				1				
40					1			
41				1				
42/1				1				
43			1					
44				1				
45		1						
46				1				
47				1				
48		1						
49			1					
50			1					
Total		8	16	13	11	0	2	50

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ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question: 3. What is your ethnic affiliation?								
Questionnaire number	Question	Answer						
3	3. What is your ethnic affiliation?	Macedonians	Albanians	Turks	Bosniaks	Roma	Other	
1				1				
2				1				
3				1				
4				1				
5				1				
6				1				
7				1				
8				1				
9				1				
10				1				
11				1				
12				1				
13				1				
14				1				
15				1				
16				1				
17				1				
18				1				
19				1				
20				1				
21				1				
22				1				
23				1				
24				1				
25				1				
26				1				
27				1				
28				1				
29				1				
30				1				
31				1				
32				1				
33				1				
34				1				
35				1				
36				1				
37				1				
38				1				
39				1				
40				1				
41				1				
42/1				1				
43				1				
44				1				
45				1				
46				1				
47				1				
48				1				
49				1				
50				1				
Total		0	0	50	0	0	0	50

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ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:						
4. What is your religious background?						
Questionnaire number	Question	Answer				
4	4. What is your religious background?	Orthodox	Muslim	Catholic	Other	
1			1			
2			1			
3			1			
4			1			
5			1			
6			1			
7			1			
8			1			
9			1			
10			1			
11			1			
12			1			
13			1			
14			1			
15			1			
16			1			
17			1			
18			1			
19			1			
20			1			
21			1			
22			1			
23			1			
24			1			
25			1			
26			1			
27			1			
28			1			
29			1			
30			1			
31			1			
32			1			
33			1			
34			1			
35			1			
36			1			
37			1			
38			1			
39			1			
40			1			
41			1			
42/1			1			
43			1			
44			1			
45			1			
46			1			
47			1			
48			1			
49			1			
50			1			
Total		0	50	0	0	50

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ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:						
5. What is the level of your education?						
Questionnaire number	Question	Answer				
5	5. What is the level of your education?	Elementary	Secondary	University and higher	Other	Remark
1		1				
2		1				
3				1		
4			1			
5			1			
6					1	4th grade
7					1	4th grade
8					1	4th grade
9					1	4th grade
10					1	4th grade
11				1		
12			1			
13			1			
14					1	4th grade
15					1	4th grade
16					1	4th grade
17					1	4th grade
18			1			
19					1	4th grade
20					1	4th grade
21					1	4th grade
22				1		
23				1		
24					1	4th grade
25				1		
26					1	4th grade
27					1	4th grade
28					1	4th grade
29		1				
30					1	4th grade
31		1				
32					1	4th grade
33		1				
34					1	4th grade
35		1				
36					1	4th grade
37					1	4th grade
38					1	4th grade
39					1	4th grade
40					1	4th grade
41					1	4th grade
42/1					1	4th grade
43		1				
44					1	None
45					1	4th grade
46					1	4th grade
47					1	4th grade
48					1	4th grade
49					1	4th grade
50				1		
Total		7	5	6	32	50

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ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:						
6. What is your employment status?						
Questionnaire number	Question	Answer				
		Employed	Unemployed	Student	Retired	No answer
6	6. What is your employment status?					
1			1			
2			1			
3		1				
4		1				
5			1			
6		1				
7			1			
8		1				
9		1				
10		1				
11		1				
12			1			
13		1				
14			1			
15			1			
16			1			
17			1			
18			1			
19			1			
20		1				
21			1			
22		1				
23			1			
24			1			
25		1				
26		1				
27		1				
28			1			
29						1
30					1	
31						1
32						1
33			1			
34			1			
35			1			
36			1			
37			1			
38			1			
39			1			
40		1				
41			1			
42/1						1
43						1
44						1
45						1
46						1
47			1			
48						1
49						1
50		1				
Total		15	24	0	1	10

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 ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:								
6a. If you are employed, state your sector of employment.								
Questionnaire number	Question	Answer						
		Public sector	Private sector	Farmer (agriculture)	Animal husbandry	Self-employed (e.g. artisan)	Other	
6a	6a. If you are employed, state your sector of employment.							
1								
2								
3			1					
4			1					
5								
6			1		1			
7								
8				1	1			
9				1				
10				1				
11		1						
12								
13		1						
14								
15								
16								
17								
18								
19								
20				1				
21								
22		1						
23								
24								
25		1						
26			1					
27			1	1				
28								
29								
30			1					
31								
32								
33								
34								
35								
36								
37								
38								
39								
40				1				
41								
42/1								
43								
44								
45								
46								
47								
48								
49								
50		1						
Total		5	6	6	2	0	0	19

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:					
7. Do you have any side jobs?					
Questionnaire number	Question	Answer			
7	7. Do you have any side jobs?	Yes	No	No answer	If Yes, please state:
1		1			tobacco
2		1			tobacco
3		1			fruit growing
4		1			agriculture and animal husbandry
5		1			tobacco and animal husbandry
6		1			agriculture
7		1			tobacco
8			1		
9			1		
10			1		
11		1			private shop
12			1		
13		1			agriculture/tobacco
14		1			animal husbandry
15		1			tobacco
16		1			agriculture/tobacco
17		1			agriculture/tobacco
18		1			agriculture/tobacco
19		1			agriculture/tobacco
20				1	
21		1			wood transport
22		1			agriculture/tobacco
23		1			agriculture/tobacco
24		1			agriculture/tobacco
25		1			agriculture/tobacco
26		1			agriculture/tobacco
27		1			agriculture
28		1			agriculture
29		1			agriculture
30			1		
31		1			agriculture
32		1			agriculture
33		1			agriculture
34				1	No answer
35			1		
36			1		
37			1		
38		1			agriculture
39		1			agriculture
40			1		
41		1			agriculture
42/1		1			N/A
43		1			wood transport
44		1			agriculture
45		1			agriculture
46		1			agriculture
47		1			agriculture
48		1			agriculture
49		1			agriculture
50		1			agriculture
Total		39	9	2	

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Data entry list for Question:					
8. Type of household					
Questionnaire number	Question	Answer			
		Family household	Non-family household		
8	8. Type of household			9. Number of household members?	
1		1		4	
2		1		6	
3		1		4	
4		1		8	
5		1		8	
6		1		7	
7		1		3	
8		1		3	
9		1		7	
10		1		6	
11		1		3	
12		1		5	
13		1		5	
14		1		8	
15		1		7	
16		1		3	
17		1		5	
18		1		5	
19		1		4	
20		1		2	
21		1		6	
22		1		7	
23		1		3	
24		1		2	
25		1		5	
26		1		6	
27		1		5	
28		1		4	
29		1		8	
30		1		7	
31		1		5	
32		1		4	
33		1		5	
34		1		7	
35		1		6	
36		1		5	
37		1		2	
38		1		6	
39		1		7	
40		1		9	
41		1		4	
42/1		1		5	
43		1		6	
44		1		3	
45		1		3	
46		1		5	
47		1		5	
48		1		9	
49		1		5	
50		1		5	
Total		50	0	50	262

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ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:									
10. What is your household main income source?									
Questionnaire number	Question	Answer							
		Employment	Regular monthly income (e.g. monthly salary, pensions, social)	Agriculture	Animal husbandry	Business	Artisan	Other	
1				1					
2				1					
3		1							
4					1				
5				1					
6				1					
7				1					
8				1					
9				1					Tobacco
10				1					Tobacco
11		1							
12				1					Tobacco
13		1							
14				1					Tobacco
15				1					Tobacco
16				1					Tobacco
17				1					Tobacco
18				1					Tobacco
19				1					Tobacco
20				1					Tobacco
21								1	Transport of woods
22		1							
23				1					Tobacco
24				1					Tobacco
25		1							
26				1					
27			1						
28				1					
29				1					
30			1						
31				1					
32				1					
33				1					
34				1					
35				1					
36				1					
37				1					
38				1					
39				1					
40				1					
41				1					
42/1				1					Animal husbandry
43								1	Timber collection
44				1					
45			1						Agriculture
46				1					
47				1					
48			1						
49				1					
50			1						Agriculture
Total		5	5	37	1	0	0	2	50

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ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:									
11. Total Annual Household Income									
Questionnaire number	Question	Answer							
11	11. Total Annual Household Income	Up to 144,000 Mkd	144,001 to 216,000 Mkd	216,001 to 288,000 Mkd	288,001 to 360,000 Mkd	360,001 to 432,000 Mkd	432,001 to 504,000 Mkd	504,001 to 576,000 Mkd	More than 576,001 Mkd
1		1							
2				1					
3			1						
4							1		
5				1					
6			1						
7		1							
8				1					
9		1							
10			1						
11						1			
12							1		
13				1					
14			1						
15				1					
16			1						
17			1						
18				1					
19					1				
20		1							
21		1							
22				1					
23			1						
24			1						
25				1					
26					1				
27						1			
28							1		
29							1		
30				1					
31				1					
32				1					
33				1					
34				1					
35							1		
36				1					
37		1							
38				1					
39							1		
40									1
41				1					
42/1									1
43				1					
44			1						
45				1					
46							1		
47									1
48									1
49				1					
50				1					
Total		6	9	20	2	2	7	0	4

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Data entry list for Question:

12. Total Annual Household Expenditures

Questionnaire number	Question	Answer								
		Up to 144,000 Mkd	144,001 to 216,000 Mkd	216,001 to 288,000 Mkd	288,001 to 360,000 Mkd	360,001 to 432,000 Mkd	432,001 to 504,000 Mkd	504,001 to 576,000 Mkd	More than 576,001 Mkd	
1		1								
2			1							
3			1							
4				1						
5				1						
6			1							
7		1								
8			1							
9			1							
10			1							
11					1					
12				1						
13			1							
14			1							
15				1						
16				1						
17			1							
18				1						
19				1						
20		1								
21		1								
22			1							
23			1							
24			1							
25			1							
26					1					
27						1				
28							1			
29							1			
30				1						
31				1						
32				1						
33				1						
34				1						
35							1			
36				1						
37		1								
38				1						
39							1			
40									1	
41				1						
42/1									1	
43				1						
44			1							
45				1						
46							1			
47									1	
48									1	
49				1						
50				1						
Total		5	14	19	2	1	5	0	4	50

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Data entry list for Question:									
13. Types of Total Household Expenditures									
Questionnaire number	Question	Answer							
13	13. Types of Total Household Expenditures	Consumption	Utilities	Education	Medical	Supporting activities	Others		Description of other costs
1		1	1		1		1		Fuel and maintenance of agricultural machinery
2		1	1		1	1			
3		1	1		1	1			
4		1	1	1	1	1	1		
5		1	1	1	1	1			
6		1	1	1	1	1			
7		1	1		1	1			
8		1	1		1	1			
9		1	1	1	1	1			
10		1	1	1	1	1			
11		1	1		1				
12		1	1		1	1			
13		1	1	1	1	1			
14		1	1	1	1	1			
15		1	1	1	1	1			
16		1	1		1	1			
17		1	1	1	1	1			
18		1	1	1	1	1			
19		1	1	1	1	1			
20		1	1		1	1			
21		1	1		1				
22		1	1		1	1			
23		1	1	1	1	1			
24		1	1		1	1			
25		1	1	1	1	1			
26		1	1		1	1			
27		1	1			1			
28		1	1						
29		1	1						
30		1	1						
31		1	1		1				
32		1	1						
33		1	1						
34		1	1						
35		1	1						
36		1	1						
37		1	1						
38		1	1		1				
39		1	1						
40		1	1						
41		1	1		1				
42/1		1	1						
43		1	1		1				
44		1	1	1					
45		1	1		1				
46		1	1	1	1				
47		1	1	1					
48		1	1	1					
49		1	1	1	1				
50		1	1	1					
Total		50	50	19	33	24	2	178	

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Data entry list for Question:						
14. Women's roles in the household (multiple choice)						
Questionnaire number	Question	Answer				
14	14. Women's roles in the household (multiple choice)	Household activities (e.g. house chores, cooking, etc.)	Agriculture	Animal husbandry	Repairs and services in the household	Working and contributing to household income
1		1	1			1
2		1	1			
3		1				
4		1	1	1		1
5		1	1	1		1
6		1	1	1		
7		1				1
8		1	1			1
9		1	1			
10		1	1			1
11		1				
12		1	1			1
13		1	1			1
14		1	1			1
15		1	1			1
16		1	1			1
17		1	1			1
18		1	1			1
19		1	1			1
20		1	1			1
21		1	1			1
22		1	1			1
23		1	1			1
24		1	1			1
25		1	1			1
26		1	1			1
27		1	1			
28		1	1			
29		1	1			
30		1	1			
31		1	1			
32		1	1			
33		1	1			
34		1	1			
35		1	1			
36		1	1			
37		1	1			
38		1	1			
39		1	1			
40		1	1			
41		1	1			
42/1		1	1	1		
43		1	1			1
44		1	1			
45		1	1			
46		1	1	1		
47		1	1			
48		1	1			
49		1	1			
50		1	1			1
Total		50	47	5	0	23

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ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:				
15. Is there any forest/wooded land within the village area or in close proximity to the village?				
Questionnaire number	Question	Answer		
		Yes	No	Partial
15	15. Is there any forest/wooded land within the village area or in close proximity to the village?			
1		1		
2		1		
3		1		
4		1		
5		1		
6		1		
7		1		
8		1		
9		1		
10		1		
11		1		
12		1		
13		1		
14			1	
15		1		
16		1		
17		1		
18		1		
19		1		
20		1		
21		1		
22		1		
23		1		
24		1		
25		1		
26		1		
27				1
28			1	
29				1
30			1	
31		1		
32		1		
33				1
34				1
35				1
36				1
37				1
38			1	
39			1	
40			1	
41			1	
42/1			1	
43			1	
44				1
45			1	
46			1	
47		1		
48		1		
49		1		
50		1		
Total		31	11	8

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Data entry list for Question:					
16. What is the ownership of the forest?					
Questionnaire number	Question	Answer			Comment
		State forest	Private forest	Other	
16	16. What is the ownership of the forest?				
1		1	1		
2		1	1		
3		1	1		
4		1	1		
5		1	1		
6		1	1		
7		1	1		
8		1	1		
9		1	1		
10		1	1		
11		1	1		
12		1	1		
13		1	1		
14		1	1		
15		1	1		
16		1	1		
17		1	1		
18		1	1		
19		1	1		
20		1	1		
21		1	1		
22		1	1		
23		1	1		
24		1	1		
25		1	1		
26		1			
27		1			
28		1			
29		1			
30		1			
31		1			
32		1			
33		1		1	Private 30%
34		1		1	Private 30%
35		1			
36		1			
37		1			
38		1			
39		1			
40		1			
41		1			
42/1		1			
43		1			
44		1			
45		1			
46		1			
47		1			
48		1			
49		1			
50		1			
Total		50	25	2	77

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:							
17. Forest and wood as a resource is used for following purposes:							
Questionnaire number	Question	Answer					
		Agriculture	Animal husbandry	Civil construction activities	Heating, (if heating go to 17a & 17b)	Other	
17	17. Forest and wood as a resource is used for following purposes:						
1		1	1	1	1		
2		1	1	1	1		
3		1	1	1	1		
4			1	1	1		
5		1	1	1	1		
6		1	1		1		
7		1		1	1		
8		1	1		1		
9		1		1	1		
10		1			1		
11				1	1		
12		1			1		
13		1			1		
14		1	1		1		
15		1	1		1		
16		1	1		1		
17		1	1		1		
18		1	1		1		
19		1	1		1		
20		1	1		1		
21		1	1		1		
22		1	1	1	1		
23		1	1	1	1		
24		1	1		1		
25		1	1	1	1		
26		1		1	1		
27					1		
28					1		
29					1		
30		1			1		
31		1			1		
32		1			1		
33					1		
34					1		
35					1		
36					1		
37					1		
38					1		
39					1		
40					1		
41					1		
42/1					1		
43					1		
44					1		
45					1		
46		1			1		
47		1			1		
48		1	1		1		
49		1			1		
50		1			1		
Total		32	20	12	50	0	114

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

17a	17a. If you are using woods for heating, from where you are getting your woods?	PEMF Forests warehouses	Private companies	On your own	Other
1				1	
2				1	
3				1	
4				1	
5				1	
6				1	
7				1	
8				1	
9				1	
10				1	
11				1	
12				1	
13				1	
14				1	
15			1		
16				1	
17				1	
18				1	
19				1	
20				1	
21				1	
22				1	
23				1	
24				1	
25				1	
26			1		
27		1			
28				1	
29				1	
30				1	
31				1	
32				1	
33				1	
34				1	
35				1	
36		1			
37				1	
38				1	
39				1	
40		1			
41			1		
42/1			1		
43				1	
44			1		
45				1	
46		1			
47				1	
48				1	
49				1	
50				1	
Total		4	5	41	0

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:						
17b. If you are using woods for heating, what amount of woods you are using on an annual basis:						
Questionnaire number	Question	Answer				
17b	17b. If you are using woods for heating, what amount of woods you are using on an annual basis:	to 3m ³	4 to 6m ³	7 to 9m ³	10 to 12m ³	More than 12m ³
1			1			
2					1	
3				1		
4						1
5					1	
6					1	
7					1	
8					1	
9					1	
10				1		
11				1		
12					1	
13					1	
14					1	
15						1
16			1			
17					1	
18						1
19					1	
20					1	
21						1
22				1		
23		1				
24				1		
25						1
26						1
27						1
28					1	
29					1	
30				1		
31					1	
32						1
33					1	
34						1
35						1
36					1	
37					1	
38						1
39						1
40						1
41					1	
42/1						1
43						1
44					1	
45						1
46						1
47						1
48						1
49						1
50				1		
Total		1	2	7	20	20

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:									
18. What kind of trees are most usable for your households?									
Questionnaire number	Question	Answer							
		Oak	Beech	Acacia	Coniferous trees	Fruit growing trees	Other		
1		1							
2		1							
3		1	1						
4		1	1				1	Gaber	Hornbeam
5		1							
6		1							
7		1							
8		1							
9		1	1			1			
10		1	1						
11		1							
12		1	1						
13		1	1						
14		1	1				1	Gaber	Hornbeam
15		1	1						
16		1	1			1			
17		1	1				1	Gaber	Hornbeam
18		1	1			1	1	Orev	Walnut
19		1				1	1	Orev	Walnut
20		1	1			1			
21		1							
22		1	1			1	1	Orev	Walnuts
23		1	1				1	Gaber	Hornbeam
24		1	1				1	Orev	Walnut
25		1	1			1	1		
26		1							
27		1							
28		1							
29		1							
30		1							
31		1	1						
32		1							
33		1							
34		1							
35		1							
36		1							
37		1					1	Sliva	Plum
38		1							
39		1							
40		1							
41		1							
42/1		1							
43		1							
44		1							
45		1							
46		1							
47		1							
48		1							
49		1							
50		1							
Total		50	17	0	0	7	10	84	

ФИНАЛЕН ИЗВЕШТАЈ
 ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:				
19. Should be the forest land in your village and surrounding area increased?				
Questionnaire number	Question	Answer		
		Yes	No	I don't have opinion
19	19. Should be the forest land in your village and surrounding area increased?			
1		1		
2		1		
3		1		
4		1		
5		1		
6		1		
7		1		
8		1		
9		1		
10		1		
11		1		
12		1		
13		1		
14		1		
15		1		
16			1	
17		1		
18		1		
19		1		
20				1
21		1		
22		1		
23		1		
24		1		
25		1		
26		1		
27		1		
28		1		
29		1		
30			1	
31		1		
32			1	
33		1		
34		1		
35		1		
36		1		
37		1		
38		1		
39			1	
40		1		
41			1	
42/1				1
43		1		
44		1		
45		1		
46		1		
47		1		
48		1		
49		1		
50		1		
Total		43	5	2

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:									
19a. If Yes, then with what kind of trees should be forested:									
Questionnaire number	Question	Answer							
19a	19a. If Yes, then with what kind of trees should be forested:	Oak	Beech	Acacia	Coniferous trees	Fruit growing trees	Other		
1							1		no opinion
2		1							
3		1		1					
4		1		1					
5		1	1	1					
6		1			1		1	orevi	Walnuts
7		1	1	1	1	1	1	gaber	Hornbeam
8		1		1	1		1	gaber	Hornbeam
9		1	1	1	1	1			
10		1	1	1	1	1			
11		1	1	1		1			
12		1	1	1		1			
13		1	1	1	1	1			
14		1	1	1	1	1			
15		1	1	1	1	1			
16									
17		1	1	1	1	1			
18		1	1	1	1	1			
19		1	1	1	1	1			
20									
21		1	1	1	1	1			
22		1	1	1	1	1			
23		1	1	1	1	1			
24		1	1	1	1	1			
25		1	1	1	1	1			
26							1	any tree	
27				1			1	jasen	Ash
28		1							
29				1					
30									
31		1			1				
32									
33				1			1	bor	Pine
34					1				
35				1					
36					1				
37				1	1				
38		1	1	1					
39									
40		1					1	jasen	ash
41									
42/1									
43		1	1						
44		1					1	orev	Walnut
45					1				
46		1		1	1		1	orev	Walnut
47		1		1	1				
48		1		1					
49		1		1	1	1			
50					1				
Total		32	19	30	25	17	10	133	

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:							
20. What kind of benefit you are expecting from the increased forest land? (multiple choice)							
Questionnaire number	Question	Answer					
		Wooden mass	Environmental benefits (e.g. decreased air pollution, etc.)	Protective function against natural hazards (e.g. erosion, torrential flooding, landslides, etc.)	Fruits	Flower nectar for honey bees	Other
1		1					
2			1	1	1	1	
3			1	1			
4		1	1	1		1	
5		1	1	1		1	
6		1	1	1	1	1	
7		1	1	1	1		
8		1	1	1		1	
9		1	1	1	1	1	
10		1	1	1	1	1	
11		1	1	1	1	1	
12		1	1	1	1		
13		1	1	1	1	1	
14		1	1	1	1	1	
15		1	1	1	1	1	
16							
17		1	1	1	1	1	
18		1	1	1	1	1	
19		1	1	1	1	1	
20							
21		1	1	1	1	1	
22		1	1	1			
23		1	1	1	1	1	
24		1	1	1	1	1	
25		1	1	1	1	1	
26		1	1	1	1	1	
27			1	1			
28		1	1	1			
29			1	1			
30							
31		1	1	1			
32							
33			1	1			
34			1				
35			1	1			
36			1	1			
37		1	1	1			
38		1	1	1			
39							
40			1	1			
41							
42/1							
43		1	1	1			
44		1	1	1			
45		1	1	1			
46		1	1	1		1	
47		1	1	1		1	
48		1		1		1	
49		1	1			1	
50			1	1			
Total		33	41	40	18	23	0

ФИНАЛЕН ИЗВЕШТАЈ
 ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:							
21. Which natural hazards are present in your village area?							
Questionnaire number	Question	Answer					
		Floods (torrents)	Erosions	Wildfires	Landslides	Weather related hazards (e.g. storms, winds, hail, torrential rain, etc.)	Other
1						1	
2						1	
3						1	
4			1	1		1	
5		1			1	1	
6		1	1	1	1	1	
7		1	1	1	1	1	
8		1	1			1	
9		1	1		1	1	
10		1	1	1	1	1	
11		1	1	1	1	1	
12		1	1	1	1	1	
13		1	1		1	1	
14		1	1	1	1	1	
15		1	1		1	1	
16			1		1	1	
17		1	1	1	1	1	
18		1	1	1	1	1	
19		1	1		1	1	
20		1	1		1	1	
21		1	1	1	1	1	
22		1	1	1	1	1	
23		1	1		1	1	
24		1	1	1	1	1	
25		1	1	1	1	1	
26			1		1	1	
27					1	1	
28					1	1	
29					1	1	
30		1			1	1	
31		1	1		1	1	
32		1	1		1	1	
33			1	1	1	1	
34			1		1	1	
35			1		1	1	
36			1	1	1	1	
37			1		1	1	
38			1		1	1	
39				1	1	1	
40		1			1	1	
41		1			1	1	
42/1			1				
43				1	1	1	
44			1				
45		1	1		1	1	
46			1	1	1	1	
47			1		1	1	
48		1			1	1	
49			1			1	
50			1		1	1	
Total		27	37	18	42	45	0

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:				
22. Have you or your household been affected by any of these natural hazards?				
Questionnaire number	Question	Answer		
		Yes	No	
22	22. Have you or your household been affected by any of these natural hazards?			If Yes, please state:
1		1		heavy rain
2			1	
3		1		heavy rain and hail
4		1		hail
5		1		heavy rain and flood
6		1		
7		1		
8		1		
9		1		
10		1		
11		1		
12		1		
13		1		
14		1		heavy rain, strong wind and hail
15		1		frost and hail
16		1		hail
17		1		torrential floods, strong winds and drought
18		1		heavy rain, strong wind and drifts
19		1		heavy rain
20		1		heavy rain and hail
21			1	
22		1		torrential floods, hail and heavy winds
23		1		hail, heavy wind and frost
24		1		hail, heavy wind and torrential floods
25		1		heavy wind and hail
26			1	
27		1		hail, land slides
28		1		hail and land slides
29		1		hail and land slides
30		1		hail and land slides
31		1		land slides
32		1		hail and land slides
33		1		hail and land slides
34		1		hail and land slides
35		1		hail and land slides
36		1		hail
37		1		hail and land slides
38		1		hail
39		1		hail and land slides
40		1		hail and land slides
41		1		hail and land slides
42/1			1	
43			1	
44			1	
45		1		hail and land slides
46		1		hail and land slides
47		1		hail, erosion and land slides
48		1		hail, erosion and land slides
49		1		hail
50			1	
Total		43	7	50

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:										
23. What is needed for the residents of the village to protect themselves from natural hazards? (multiple choice – select three answers)										
Questionnaire number	Question	Answer								
23	23. What is needed for the residents of the village to protect themselves from natural hazards? (multiple	Assessment of risk and hazards	Early warning activities	Mitigation measures	Improved communication and timely information	Community emergency planning exercise	Improved road networks	Community based response	Other	
1			1	1			1			
2					1	1	1			
3				1	1	1				
4		1	1	1						
5		1	1				1			
6		1	1	1						
7			1	1			1			
8			1	1			1			
9		1		1		1				
10			1	1			1			
11		1			1			1		
12		1	1	1						
13		1	1	1						
14		1	1	1						
15		1			1		1			
16		1	1	1						
17		1	1				1			
18			1	1			1			
19			1	1		1				
20			1	1			1			
21				1	1		1			
22		1	1	1						
23		1		1				1		
24		1			1	1				
25		1		1				1		
26				1			1	1		
27					1		1			
28			1		1		1			
29		1		1			1			
30			1		1		1			
31		1	1	1			1			
32		1		1			1			
33		1		1			1			
34			1	1			1			
35				1			1			
36				1	1		1			
37			1	1			1			
38			1	1			1			
39			1	1			1			
40				1	1		1			
41				1	1		1			
42/1			1				1			
43			1	1			1			
44			1		1		1			
45		1	1	1	1		1			
46		1	1				1			
47			1		1		1			
48			1	1			1			
49		1			1		1			
50		1	1				1			
Total		23	31	35	16	5	36	4	0	150

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:							
24. What kind of means can make it easier to obtain information on potential disasters? (multiple choice – select three answers)							
Questionnaire number	Question	Answer					
24	24. What kind of means can make it easier to obtain information on potential disasters? (multiple choice)	Competent institutions on local level	Hazard maps	Public information ; TV, Radio, Newspaper, SMS, email, Internet	Community education	Other	
1						1	no idea
2			1	1	1		
3		1	1		1		
4		1	1	1			
5		1	1	1			
6		1	1	1			
7			1	1			
8		1	1	1			
9		1		1	1		
10		1		1	1		
11			1	1	1		
12		1	1	1			
13		1	1	1			
14			1	1	1		
15			1	1	1		
16		1	1	1			
17		1		1	1		
18		1		1	1		
19		1		1	1		
20		1	1	1			
21		1	1	1			
22		1		1	1		
23		1	1	1			
24		1		1	1		
25		1	1	1	1		
26		1		1	1		
27		1		1	1		
28		1		1	1		
29		1		1	1		
30		1		1	1		
31		1	1	1			
32		1	1				
33		1			1		
34		1			1		
35		1	1		1		
36		1	1		1		
37		1	1		1		
38		1	1		1		
39		1	1	1			
40		1	1	1			
41		1	1		1		
42/1		1	1		1		
43			1	1			
44			1	1	1		
45		1			1		
46			1	1	1		
47		1	1	1			
48		1	1	1			
49			1	1	1		
50		1	1	1			
Total		40	34	38	30	1	143

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:								
25. Which disaster risk reduction measures should be used to mitigate the negative consequences of the natural hazard in your village? (multiple choice)								
Questionnaire number	Question	Answer						
25	25. Which disaster risk reduction measures should be used to mitigate the negative consequences of the natural hazard in your village? (multiple choice)	Improved communication and information from relevant authorities	Community based engagement for disaster risk mitigation	Campaigns on a volunteer basis	Afforestation of vulnerable areas	Community infrastructure disaster risk mitigation works	Other	
1							1	no opinion
2			1		1	1		
3			1		1	1		
4				1	1	1		
5			1		1	1		
6			1		1	1		
7		1	1		1			
8		1	1			1		
9		1			1	1		
10		1	1		1			
11			1		1	1		
12		1			1	1		
13		1	1		1			
14		1	1			1		
15			1		1	1		
16		1	1			1		
17		1			1	1		
18		1	1		1			
19		1	1		1			
20		1	1			1		
21			1		1	1		
22		1	1		1			
23		1			1	1		
24			1		1	1		
25		1			1	1		
26			1		1	1		
27			1		1	1		
28		1			1	1		
29			1		1	1		
30		1				1		
31			1		1	1		
32			1			1		
33		1	1			1		
34		1	1			1		
35		1			1	1		
36		1	1			1		
37		1	1		1			
38		1			1	1		
39			1		1	1		
40			1		1	1		
41			1		1	1		
42/1					1	1		
43		1			1	1		
44		1			1	1		
45				1	1	1		
46			1		1	1		
47			1		1	1		
48		1	1		1	1		
49			1		1	1		
50		1			1	1		
Total		27	34	2	40	42	1	146

ФИНАЛЕН ИЗВЕШТАЈ
ТЕРЕНСКО ИСТРАЖУВАЊЕ ЗА СОЦИО-ЕКОНОМСКИТЕ И ДРУГИТЕ ПРАШАЊА

Data entry list for Question:					
26. How do you normally protect your agricultural crops/field from brazed animals?					
Questionnaire number	Question	Answer			
26	26. How do you normally protect your agricultural crops/field from brazed animals?	Communicate with owners of the animals and warn it	Discuss it in the village meeting if it happens	Making fences and hedges for protections	Others
1		1			
2		1			
3			1		
4		1			
5		1			
6		1			
7		1	1		
8		1	1	1	
9		1			
10		1	1		
11		1	1	1	
12		1	1		
13		1			
14		1	1		
15		1	1	1	
16		1	1	1	
17		1		1	
18		1	1	1	
19		1			
20		1	1	1	
21		1			
22		1	1	1	
23		1	1	1	
24		1	1		
25		1			
26				1	
27		1			
28		1			
29		1			
30		1			
31		1			
32		1	1		
33		1			
34		1			
35		1			
36		1			
37		1			
38		1			
39		1			
40				1	
41				1	
42/1		1			
43			1		
44		1			
45		1			
46		1			
47		1			
48		1			
49			1		
50		1			
Total		44	17	12	0

Анекс VII – Листа на референци

1. ЈП Македонски шуми – регионална подружница во Радовиш, “Оддел за управување со шуми “Радовиш – Ораовичка река”, 2018
2. Агенција за просторно планирање на Република Македонија, “Услови за просторно планирање за подготовка на урбанистички план за село Коџалија”, Технички бр. Y23914, 2017
3. Државен завод за статистика на Република Македонија, Попис на население, домаќинства и живеалишта во Република Македонија, “Книга XII – Вкупно население, домаќинства и живеалишта според територијалната организација во Република Македонија – 2002”, 2005.
4. Државен завод за статистика на Република Македонија, МАКСТАТ клучни индикатори.
5. Блог од Hybread.mk, “Јуруци – скриена етничка заедница во македонските планини”.
6. Блог од Respublica.edu.mk

“SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES”



1

Author:

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**November 2020
Version 2.0**

¹ The Team Leader took the photo of the Lisiche Dam during the field visit on 14.09.2020.

EXECUTIVE SUMMARY

The “Capacity building for ecosystem-based disaster risk reduction through sustainable forest management in Macedonia” project funded by JICA and implemented in cooperation with the Crisis Management Centre and the Public Enterprise “National Forests” carries out activities related to disaster model development of ecosystem-based disaster risk reduction. The main purpose of this project is to develop the Eco-DRR model in North Macedonia against floods, landslides, soil erosion, and forest fire by utilization of multiple forest functions. Accordingly, this project identified four outcomes with more relevant activities: update and expand of MKFFIS function, enhancement of forest management and planning capacity, enhancement of capacity to carry out Eco-DRR related activities, and public awareness and results from desalination.

Consequently, a socio-economic survey on Eco-DRR related information focusing on the municipalities of Chaska and Veles was conducted to understand the broader context of the Lisiche Hydro System for the water conservation and exposure and vulnerability to natural disasters, as well as a desk review of the Payment for Environmental Services in the country and the region, was implemented identifying best practices, defining schemes and measures based on the forward-looking recommendations.

The field survey has identified essential socio-economic aspects and needs within the local contexts of the municipalities of Chashka and Veles. Consequently, the key informants from the survey target organizations fully supported the survey and welcomed the implementation of the activities of the project, especially the Lisiche dam works and mainstreaming of Eco-DRR in DRM and sustainable forest management. In this context, they are seen as an effort to introduce multi-hazard, multi-risk and multi-stakeholder risk reduction based on solutions from the nature that can be a blueprint for others. Furthermore, it can create synergies between the various stakeholders in the municipalities where it is implemented, primarily in the training, education and cross-sectoral coordination and cooperation of the entities of the crisis management system.

Based on the socio-economic profile of the municipalities, as well as the other specifics of the local contexts, it can be concluded that the municipalities are exposed to various natural hazards affecting their resilience. Fortunately, based on the analysis of the risk profiles, there is no significant impact to the municipalities and their communities. On a local level, the environment protection and disaster risk reduction system is still predominantly reactive, with more focus on response, than on the sustainable implementation of prevention and mitigation measures. Knowledge on Eco-DRR is very low and concept or practices are poorly identified or implemented. Still, the preventive, protective and beneficial functions of the forest are not recognized.

Concerning the PES, there is a need to introduce specific normative frameworks for PES, as well as to define the ecosystem services market and beneficiaries. Alongside the existing normative framework for PES mainstreaming, also the capacities of national and local authorities, as well as the users of the environmental services are weak. With regards the forest ecosystem services, until now very limited efforts were made either to promote the protective functions of the forests or to promote the forest products and services sustainably since there is still no market-oriented ecosystem service. The forestry planning system still has not the ecosystem approach leading not only to the provision of services and payment for them, but also to increase the biodiversity in the forests and its protection. Furthermore, PES is not mainstreamed in other sectors where ecosystem services potentially can be utilized e.g. climate change, DRR, smart agriculture, sustainable water management.

ABBREVIATIONS

CMC	Crisis Management Centre
CMS	Crisis Management System
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EC	European Commission
Eco-DRR	Ecosystem-based disaster risk reduction
EU	European Union
FMU	Forest Management Unit
ha	Hectares
ICT	Information and Communication Technologies
JICA	Japan International Cooperation Agency
m³	Cubic meters
MKD	Macedonian Denars
MKFFIS	Macedonian Forest Fire Information System
MRCMC	Main Regional Crisis Management Centre
LCM	Law on Crisis Management
LED	Local Economic Development
MAFWM	Ministry of Agriculture, Forestry and Physical Planning
MKFFIS	Macedonian Forest Fire Information System
MoC	Municipality of Chashka
MoEPP	Ministry of Environment and Physical Planning
MoV	Municipality of Veles
NGO	Non-governmental Organization
OPCEN	Operational Centre
PCE	Public Communal Enterprise
PE	Public Enterprise
PEDRR	Partnership for Environment and Disaster Risk Reduction
PENF	Public Enterprise National Forests
PES	Payment for Environmental Services
PRD	Protection and Rescue Directorate
RCMC	Regional Centre of Crisis Management
RHCM	Regional Headquarter for Crisis Management
SDGs	Sustainable Development Goals
TD	Tender Documents
ULSG	Unit of Local Self-government
UNDP	United Nations Development Programme
UXO	Unexploded Ordnance
WB	World Bank
WBA	Western Balkans

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1. INTRODUCTION

1.1 Background

Ecosystem-based approaches to disaster risk reduction (Eco-DRR) is defined as “the sustainable management, conservation, and restoration of ecosystems to reduce disaster risk, to achieve sustainable and resilience development” (Estrella and Saalismaa 2013)². Sustainable management of ecosystems, such as wetlands, forests, mangroves, etc., perform important functions that can reduce disaster risks – by preventing, mitigating, or regulating hazards (e.g. forests can reduce the incidence of landslides and avalanches, wetlands help regulate flooding and droughts), by acting as natural buffers and thus reducing people’s exposure to hazards (e.g. mangroves, coral reefs, and seagrasses protect coastal areas from storm surge impacts), and by reducing vulnerability to hazard impacts through supporting livelihoods and basic needs (food, water, shelter, fuel) before, during and after disasters (PEDRR, 2013)³. On the other side, DRR is a fundamental pillar of sustainable development and requires an “All of Society Inclusive Approach”. Building the resilience of nations and communities requires accelerating sustainable investments in social and economic development and the environment. The Sendai Framework for Disaster Risk Reduction 2015-2030 aims to achieve the substantial reduction of disaster risk and losses in lives, livelihoods, and health and the economic, physical, social, cultural, and environmental assets of persons, businesses, communities, and countries over the next 15 years. Strengthening of the ecosystem-based approaches to DRR is one of the priorities under the Sendai Framework for Disaster Risk Reduction⁴. The Sendai Framework for Disaster Risk Reduction identifies poor land management, unsustainable use of natural resources, and declining ecosystems as underlying risk drivers that need to be addressed. Recognizing the transboundary impact of environmental conditions on disaster risk, the Sendai Framework calls for work on ecosystems to be undertaken at appropriate scales. The Sendai Framework is underpinned by an inclusive approach and emphasizes the importance of local governments – both urban and rural – community-based organizations and indigenous peoples. The roles of science and private sector partnerships are essential. Accordingly, not only on the global level but also predominantly on a national and local level, activities for execution of related programs and projects shall be implemented.

Epecially, the forest ecosystems are known to have various functions, including preventing soil erosion and recharging water resources, but due to frequent forest fires and destruction caused by activities such as illegal logging, the functions of forests in Macedonia are deteriorating. Approximately 80 per cent of the land is in mountainous and hilly regions. Soil erosion, landslides, flooding, flash floods, caused by forest reduction are seriously affecting residential areas, transportation infrastructure, farmland, etc. For example, 96.5% of the total area is under processes of erosion, 1,539 torrents are registered over the whole country territory and their total catchment area is around 18,000 sq. km. (70% of the territory). Annual soil loss represents an annual loss of arable soil layer of 20 cm deep on an area of 8,500 ha. The economic cost of erosion is considerable. Torrent flows endanger infrastructural facilities and they cover

² Estrella M and N Saalismaa (2013) Ecosystem-based disaster risk reduction (Eco-DRR): An overview. In: Renaud FG, Sudmeier-Rieux K, Estrella M (eds) The role of ecosystems in disaster risk reduction. UNU Press, Tokyo.

³ PEDRR (2013) “PEDRR input into post-2015 global framework on disaster risk reduction”.

⁴ <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>

agricultural land with sterile sediments. About 37% of the total territory is classified as forestlands. Degraded forests and shrubs areas are 27% of the forestland. A substantial proportion of the forest is located on steeply sloping land, where forest cover is necessary for soil conservation and watershed protection purposes. One of the biggest environmental problems in North Macedonia is frequent forest fires and wildfires (JICA, CMC: 2017) that are increasing in intensity and damages. During the last decade and a half, there were major forest fires in 2007, when the first crisis was declared, in 2012 (Strumica wildfire with the loss of four human lives), continuing in 2015 and 2019.

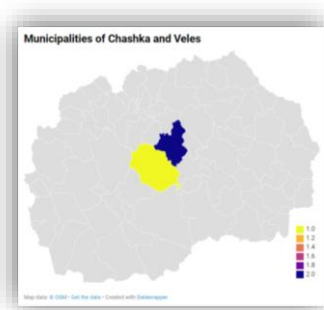
Therefore, the project “**Capacity building for ecosystem-based disaster risk reduction through sustainable forest management in Macedonia**” funded by JICA in cooperation with the Crisis Management Centre (CMC) and the Public Enterprise “National Forests” (PE NF) carries out activities related to disaster model development of ecosystem-based disaster risk reduction. The main purpose of this project is *to develop the Eco-DRR model in North Macedonia against floods, landslides, soil erosion, and forest fire by utilization of multiple forest functions*. Therefore, this project identified four outcomes with more relevant activities: update and expand of MKFFIS function, enhancement of forest management and planning capacity, enhancement of capacity to carry out Eco-DRR related activities, and public awareness and results from desalination.

1.2 Purpose of the Assignment

The *objective of this consultancy assignment* is to conduct a socio-economic survey on Eco-DRR related information focusing on the municipalities of Chaska and Veles, where it is necessary to understand the broader context of the Lisiche Hydro System for the water conservation and exposure and vulnerability to natural disasters, as well as to initiate the Payment for Environmental Services (PES) in the country and the region through an initial desk review of practices and potentials for Eco-DRR integration.

1.3 General information on the municipalities and the location of the Lisiche Hydro System

Municipalities of Chashka and Veles are located in the central part of North Macedonia and they are part of the Vardar Planning Region. Their hazard profile is similar to the regional and the national ones with wildfires, landslides, floods, extreme weather events, and earthquakes dominating the list.



Map 1 – Location of the municipalities of Chashka and Veles⁵

⁵ Municipality of Veles is marked with blue color and the Municipality of Chashka is marked with yellow color.

The water accumulation Lisiche/Lisiche Hydro System is located on the territory of the Municipality of Chashka near the village of Lisiche at the altitude of 350 – 360 m above the sea level. It is 2.4 km wide, 2 km long with a total accumulation of 23 million m³ of water. The Lisiche Hydro System consists of a dam with additional facilities (the dam has a height of 80 m and a length of 650 m), water accumulation, water supply pipeline from the Vranovska River (length = 20 km), filtering station for treatment of 300/sec and the maximum capacity of 600 l/sec, temporary catchment facility from the river Topolka, and a water supply pipeline from the lake to the City of Veles⁶. The distance of the dam from the inflow of the river Topolka into the river Vardar is about 31 km, and the closest city is the City of Veles. It is a stone embankment dam with a clay core. The Lisiche Hydro System presents the most valuable water source for the supply of drinking water of these municipalities, especially the City of Veles. Besides, it is used for irrigation of 5,900 ha of agricultural land on the territories of both municipalities, enhancement of the microclimate conditions, securing biological minimum of water of the Topolka River, as well as revitalization of the Mladost Lake. Lisiche Hydro System is exposed to various hazards mentioned above – floods, droughts, landslides, and erosions, as well as earthquakes.

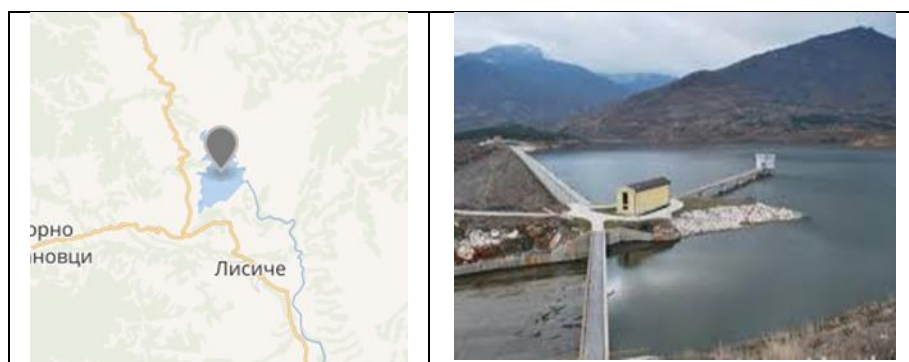


Figure 1 – Location of the Lisiche hydro system and view of the dam

As mentioned in the Tender Documents, from the Eco-DRR perspective it is necessary to preserve the upper side of the dam to prevent potential flood and drought. Extensive harvesting of trees, mainly because of illegal tree cutting is contributing to an increase of the flood risk during heavy rains and the risk of droughts when no rain. Another aspect is the inflow of sediment in some areas resulting from improper and not sustainable forest management practices. Municipalities of Chashka and Veles citizens once suffered from unhealthy water and drought during the 1990s, and accordingly, the construction of the Lisiche dam started. Therefore, it is necessary to understand the importance of the preservation of the upper side of the dam to some extent. Consequently, through the survey information from beneficiary organizations on the forest and clean water, regarding the current activity of preservation of the upstream area were collected. Furthermore, information about preservation methods such as the Payment for Environmental Services, which covers, not only around Lisiche but over the country and Western Balkans region was reviewed and collected. This information is essential information when considering how to apply Eco-DRR on a broader, national level. From the organizations indicated in the documents, their

⁶ Water Management Office of the Republic of Macedonia. *Study on the erosions in the water catchment area of the Lisiche Accumulation with the draft measures and works for anti-erosion regulation*. Skopje. 2006. p. 5.

information was collected through the survey, as well as the main aspects and benefits of the Eco-DRR approach were presented.

1.4 Essentials of the Draft Report

The *Draft Report* includes all the necessary information to summarize the implementation of the assignment. It captures the main aspects of the assignment, methodology and approach, work plan and time framework, regional crisis management framework, general and hazard profiles of the municipalities of Chashka and Veles, forest management in the area, findings of the socio-economic survey and conclusions and recommendations for the way forward. **Also, it includes a summary of the PES Report with recommendations on mainstreaming the PES on a national level, as well as concrete PES activities that can be piloted at the location site.**

2. APPROACH AND METHODOLOGY FOR IMPLEMENTATION OF THE ASSIGNMENT

2.1 Background

To implement this assignment, it was necessary to define the suitable approach and use of adequate methodology in the procedure. They were in line with the subject of the assignment, its characteristics, and the established framework. For the implementation of the assignment, two national consultants were engaged, out of which one of them acted as a Team Leader. Consultants worked in close cooperation, being responsible for particular parts of the assessment, contributing to the joined deliverables. The Team had a clear view of the Team’s responsibility on the delivering the outcome, preparation, conduct, and delivery of the “Socio-economic Survey”. The entire assignment as requested by the Tender Documents was milestone in three phases:

- Phase 1: Preparation
- Phase 2: Survey
- Phase 3: Report

Methodological and procedural steps necessary for the successful implementation of the assignment were the following:

2.2 General approach and methodology to implement the Assignment

To implement this assignment, a suitable approach and methodological framework was defined and implemented accordingly. They were fully in line with the subject of the assignment, its objectives and characteristics and established framework.

Approach - The assessment is summative and takes a mix of qualitative and quantitative approach to answer the assessment review questions contained in the assignment’s terms of reference/tender documents. Accordingly, execution of the assignment is based on the implementation of activities in logical sequences ensuring all aspects to be taken into consideration effectively and efficiently as presented below:

- **Familiarization with the project assignment** through initial discussion with CMC and the Project and review of essential background information, data, and documents.
- **Preparation of the Inception Report** including an updated Work plan for the assignment in consultation with the Project during the first week of the contract serving as a basis for the execution of the assignment.
- **Collection of basic data of the region and municipalities** through existing documents, such are risk and hazard assessments, statistics, etc. for the survey, as well as collection of the information for the PES research (North Macedonia/Western Balkans).
- **Drafting schedule and contents of questionnaires** in Macedonian and English under the supervision of JICA, CMC, and PENF experts. The proposed content of the Questionnaire was based upon the required framework Contents of the Questionnaire.
- **Preparation of a brief Guideline on how to conduct the survey.**
- **Desk review of collected documents and materials** i.e. normative framework from the crisis management area; risk and hazard assessments for the municipalities of Chashka and Veles; available

statistical data and municipal information, as well as studies, and PES related documents, normative acts and case studies from the country and the Western Balkans region.

➤ **Preparation of the conduct of the survey** i.e. timely information on the exact dates for the survey, preparation and printing of all forms, exact schedule for the survey, operational and logistics aspects of the implementation of the survey, etc.

➤ **Conduct of the survey of the targeted organizations** with a prepared questionnaire as per the Tender Documents. The Survey was implemented with physical meetings and virtually through or internet communication due to the COVID-19 situation and restrictions.

➤ **Data entry and analysis** – after the implementation of the field survey, questionnaires were processed and analyzed by the Team. Data entry and analysis was done using Google forms.

➤ **Preparation and submission of the PES Report** - This report presents an initial overview of the status of the PES and related activities in the country and the Western Balkans for the further consideration of the Eco-DRR methods.

➤ **Preparation and submission of the Draft Report.**

➤ **Preparation and submission of the Final Report** following the explanatory meeting with the Project and feedback on the Draft Report.

➤ **Presentation of the Final report** at a thematic workshop with the participation of the relevant stakeholders if necessary (by Skype or webinar type of event).

Methodological framework – It was ideally balanced between the research framework and objectives to be achieved with the inclusion of methods and tools that support this. Based on the characteristic of the assignment, the following research methods were applied:

- **Content Analysis** was applied during the initial phase of the assignment when the contents of all submitted documents, reports, information, and publications are reviewed and analyzed.

- **Comparative Analysis** was used during the desk review phase to review external practices and solutions and their relation to the subject of the assignment, especially the PES.

- **Mixed Quantitative/Qualitative Research Design** was implemented during the data collection process with the use of a Questionnaire for interviews with the key informants.

- **Qualitative Research Design** was applied during the capturing of the good practices and case studies, both for Eco-DRR and PES.

2.3 Implementation of the survey

2.3.1 Assessment tools and the sample selection

Survey Tools – this assignment deployed several of tools i.e. sampling, desk review, questionnaire, best practices. These tools were formulated to elicit the necessary information and necessary data for the detailed research on the current conditions, needs and perspectives of the Lisiche Hydro System connected to the sustainability of water conservation and protection of water reservoirs from natural disasters by using Eco-DRR based measures and activities. Their structures and contents were proposed by the Project, improved by the Team Leader and approved by the Project (10.09.2020). Also, the desk review and best practices tools were utilized for collection of the information about PES and related activities in the country and the Western Balkans for further consideration of Eco-DRR methods by the project and the project beneficiaries.

Questionnaire for the conduct of the interviews - In particular, this Questionnaire for the conduct of the interviews with the selected key informants from the survey target organizations was the main quantitative research design tool of the socio-economic survey on Eco-DRR related information focusing on the municipalities of Chashka and Veles. The main aim of this survey was to collect data from the participating household representatives on their household level activities and their perception of the natural environment and disasters in the village area. Accordingly, the structure of the Questionnaire consists of following main sections (*see Annex I*): general information: organizational information/personal information; information about the dam; information about the municipalities; forestry and agriculture; Crisis Management; drinking water supply; power station; other institutions/stakeholders; other, and information regarding the project.

Considering the specific professional profiles of survey target organizations, their competences and responsibilities, the expected input to the survey, as well as following the general framework for the conduct of the survey (as per Annex I), nine different sets of questionnaires (*see Annex II*) were prepared and implemented during the interview phase. These questionnaires were grouped as per the following division:

- PE Lisiche Hydro System;
- Municipalities of Chashka and Veles (relevant administration);
- PE National Forests + Regional Branch Office “Babuna” – Veles;
- CMC – Regional Crisis Management Centre – Veles;
- PE for Drinking Water Supply (Municipalities of Chashka and Veles);
- National + Local Irrigation Authorities (Municipalities of Chashka and Veles);
- Small Medium Hydraulic Power Plant;
- Other Local Authorities/Institutions;
- ADKOM (Association of public utility services providers of the Republic of North Macedonia).

The questions in the Questionnaires were closed or semi-closed ensuring effective and efficient data collection and analysis. The Household Survey was conducted by the Team Members using Internet-based interviews with the key identified informants from the survey target organizations. The questionnaires were prepared on English and Macedonian language, whether the latter one was used for the conduct of the interviews. The Eco-DRR Survey was conducted during the period 17.09 – 20.10.2020. As per the TD, the team members performed the data entry immediately after the finalization of the interviews. All the data was entered in Google Forms and through MS Excel the data was analyzed.

Brief Guideline on how to conduct the survey – This Guideline (*Annex III*) was prepared by the Team Leader before commencing the survey. In general, this document enabled the Team to successfully implement the survey. It consisted of the following parts: objectives of the assignment, general guidance for the team members, sections of the Questionnaire with individual questions, clarifications and recommendations how to conduct the survey, identification of the representative sample, guidance how to fill the data from the survey, and contact details. The Guidelines could be used by CMC and PE NF for similar surveys according to their plan for future replication of Eco-DRR activities.

Desk Review was a phase of the scope of work in which all existing information and documents were collected to review the existing information and data, better understand the programmatic scope of the assignment, feedbacks from participants, as well as to review the PES information. Desk Review provided a baseline for before/after comparison. Nevertheless, it is necessary to emphasize that the reviewed information and documents were one form of evidence and they were correlated with other types of information and data resulting from the survey interviews. Within the framework of this assignment, desk review and analysis were done on the set of documents provided by the Project and CMC, as well as other available external sources, especially regarding the PES. From this review, early appreciation of the key issues and potential approaches, as well as identified gaps, constraints, and opportunities for the sustainability of identified practices have been achieved. The review identified the key elements to be included, both, in the survey and the report defining its structure, context, and recommendations. Therefore, during this phase, the following documents were reviewed:

- Normative framework from the crisis management area;
- Risk and hazard assessments for the municipalities of Chaska and Veles;
- Available statistical data and municipal information, as well as studies;
- PES related documents, normative acts and case studies from the country and the WBA region.

Key Informants - For better understanding and gaining in-depth information on the overall context of the subject of the assignment, interviews were held with key informants from organizations that were previously selected by the Project. This list reflects all groups of stakeholders on the local level that were relevant to the objectives of the assignment. In the table below the total number of identified key informants as per the tender documents and number of key informants for the actual survey is presented.

#	Organizations	Key Informants	TD	Actual
1	PE Hydro system Lisiche	HQ Manager, 3 at Lisiche dam	4	4
2	Municipality of Chaska	Mayor + 2	3	3
3	Municipality of Veles	Mayor + 4	5	5
4	PE National Forest (Local branch of Veles)	1 Manager, 2 Engineers	3	2
5	CMC-RCMC Veles	1 Manager, 1 (Chaska) and 1 (Veles)	3	3
6	PE for drinking water supply, MoC	3	3	4
7	PE for drinking water supply, MoV	3	3	3
8	National irrigation authority	1	1	1
9	Local irrigation authorities - MoC	1	1	n/a
10	Local irrigation authorities - MoV	1	1	n/a
11	ADKOM	1	1	2
12	Small/Medium Hydraulic Power Station upper side of Lisiche dam	HQ manager or site manager	1	n/a
13	Local NGOs composed of local citizens	1 leader of NGOs or Local organization	3	1
14	Public Enterprise National Forests	1 competent forest engineer	0	1
Total (approx.):			32	29

Table 1 – List of identified key informants in each survey target organization

2.4 Data collection, analysis and synthesis of information

For the implementation of the data analysis, the Triangulation Method was used to verify the information collected from the desk review of documents, survey, interviews with key informants and validation during discussions with participating teams. The objective was in a structured manner to validate the information and data through verification from multiple data sources.



Figure 2 – Method of Triangulation

2.5. Time Framework for Implementation of the assignment

For the implementation of the above-mentioned services, on 26 August 2020, a contract was signed between the Contractor – Vasko Popovski, M.A. as a Team Leader of the Team and Asia Air Survey Co., Ltd. The deadline for implementation of the above-mentioned services is until 30 November 2020. The Team for implementation of the services is composed of the following members: Vasko Popovski, M.A. – team leader, and Ljupco Milkovski – team member. Accordingly, the initial Work Plan presented below was realistically modified and presents all necessary activities for the execution of the assignment and achievement of the deliverables.

SCHEDULE - Socio-economic survey on Eco-DRR related information focusing on Chaska and Veles			August				September				October				November					
		Responsibility	Working Days	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	
Phase I	PREPARATION			16																
	Collecting basic data through existing documents	Team Leader + Team Member	7 + 3																	
	Preparation of the Questionnaire	Team Leader	3																	
	Finalizing the Questionnaire	Team Leader	1																	
Phase II	SURVEY			27																
	Conducting Interview Survey	Team Leader + Team Member	12 + 12																	
	Collection of information	Team Leader + Team Member	3																	
Phase III	REPORTING			16																
	Making the Draft Report	Team Leader	7																	
	Submitting the Draft Report	Team Leader	1																	
	Feedback from the Project	Team Leader	1																	
	Explanatory meeting	Team Leader	1																	
	Finalizing the Report	Team Leader	5																	
	Submission of the Final Report	Team Leader	1																	
TOTAL WORKING DAYS FOR THE TEAM:			59																	

Table 2 – Initial Work Plan as per the Inception Report dated 05 September 2020

“Socio-economic Survey on Eco-DRR related information focusing In Chaska and Veles”
(Draft Report)

During the period of implementation of the assignment 26.08 – 25.10.2020, no major issues have happened influencing the timelines of the execution of the planned activities except the deteriorating COVID-19 situation in the country and inability to conduct field survey, as well as the prolonged issue in participation of the PE NF Regional Branch Office “Babuna” – Veles in the survey (the interview with their key informants happened only on 20.10.2020). Accordingly, the actual Work Plan was modified in that sense allowing for qualitative finalization of the analysis and formulation of recommendations. Consequently, no major delays were expected until the deadline of the consultancy contract.

SCHEDULE - Socio-economic survey on Eco-DRR related information focusing on Chashka and Veles			August				September				October				November				
		Responsibility	Working Days	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
Phase I	PREPARATION		16																
	Collecting basic data through existing information	Team Leader +Team member	7 + 3																
	Preparation of the Questionnaire	Team Leader	3																
	Finalizing the Questionnaire	Team Leader	1																
	Preparation of the field survey	Team Leader +Team member	2																
Phase II	FIELD SURVEY		27																
	Conducting Interview Survey	Team Leader +Team member	12 + 12																
	Collection of information	Team Leader +Team member	3																
Phase III	REPORTING		16																
	Preparation of the Draft Report	Team Leader	7																
	Submission of the Draft Report	Team Leader	1																
	Feedback form the Project	Team Leader	1																
	Explanatory meeting	Team Leader	1																
	Finalization of the report	Team Leader	5																
	Submission of the Final Report	Team Leader	1																
			59																

Table 3 – Modified Work Plan as per the Draft Report dated 23 October 2020

2.6. Ethical considerations and limitations

The team members safeguarded the rights and confidentiality of information providers, key informants and stakeholders through measures to ensure compliance with legal and other relevant codes governing the collection of data and reporting on data. They also ensured the security of collected information before and after the assignment and protocols to ensure confidentiality of sources of information where that was expected. The information knowledge and data gathered in the assessment process would also be solely used for the assessment and not for other uses with the express authorization of JICA and CMC. Furthermore, the Team members established professional and productive cooperation with key respondents, respecting all required principles. Accordingly, they briefed them on the objectives of the assignment, the way the survey should have been implemented, the importance of their participation, their rights arising from this relationship, and the possibility of agreeing or disagreeing to participate in the survey. In this way, through honest and open access, the implementation of the assessment have been enabled.

Limitations of the assignment related to the following issues and aspects:

- Time framework for the implementation of the survey;
- Longitudinal effects (time availability of the respondents for the survey);
- Fatigue of the key informants to participate in online surveys or Internet-based interviews, since the outbreak of the COVID-19 pandemic crisis almost all activities have been done virtually;
- Technical capacities and knowledge of the key informants;

- Potential data privacy issues.

2.7. Risks matrix

#	Description	Risk	Response Measure
1	Availability of data and information - Additional information and data are needed to be provided before and during the desk review for data analysis and synthesis of information.	Low Risk	Data have to be collected from the Project, CMC and the organizations and systematized by the project and CMC.
2	Availability of key informants – Key informants are not willing/available to participate in survey interviews.	Low Risk	CMC and the Project shall inform the representative sample of stakeholders, whether the team shall provide information on the process and expectations from the survey and interviews.
3	Weather conditions – adverse weather conditions could potentially delay the survey given the location of the hydro system.	Low Risk	Team members and CMC shall consider the weather conditions for the execution of the field survey and shall make plans daily.
4	COVID19 pandemic – It can affect both team members, staff and key informants. As a result, certain aspects of the assignment can be affected.	Medium Risk	Joint team documentary management system in place. With support of CMC and the Project, a reserve list of key informants shall be prepared and survey implemented.

Table 4 – Risk matrix for the implementation of the assignment

3. INSTITUTIONAL FRAMEWORK FOR CRISIS MANAGEMENT AT THE REGIONAL LEVEL

3.1 Organization of the local self-government on the territory of the municipalities of Chashka and Veles

On the territory of the municipalities of Chashka and Veles, there are two units of local self-government: Chashka and Veles, based in the settlements of the same name. For the execution of the municipal competencies, two municipal administrations have been established with its competent bodies. The table below provides a basic overview of municipal bodies. Because the Municipality of Chashka is a small, rural municipality, it has transferred a part of its competencies to the Municipality of Veles following the principle of inter-municipal cooperation. In addition to these bodies, there are public enterprises, public institutions and services, as well as regional units of the state government that function on the territory of the municipalities.

#	Municipality	Mayor	Municipal Council (members)	Departments/units
1	Chashka	Goran Stojanovski	11	<ul style="list-style-type: none"> • Department for administrative support, legal and general affairs and ICT. • Department of urbanism, LED and public services. • Unit for inspection affairs. • Unit for human resources management. • Unit for financial affairs. • Unit for internal audit.
2	Veles	Ace Kocevski	22	<ul style="list-style-type: none"> • Department of legal and general affairs, public services, public procurement and support to the Mayor. • Department of urbanism, environment protection, communal affairs, communal affairs, European integration and LED. • Unit for inspection affairs. • Unit for internal audit. • Unit for human resources management. • Unit for financial affairs. • Territorial firefighting brigade.

Table 5 – Review of administration bodies in the ULSG Chashka⁷ and Veles

3.2 Organization of the crisis management system at the regional level

3.2.1 General information on the crisis management system

With the adoption of the Law on Crisis Management on April 22, 2005, the Crisis Management System was established, followed by the establishment of the Crisis Management Center in October 2005. The LCM (29/05), Article 1 regulates the Crisis Management System in the Republic of North Macedonia, including organization, functioning, decision-making and use of resources, communication, coordination

⁷ Municipality of Chashka <https://caska.gov.mk/> and Municipality of Veles <https://veles.gov.mk/?lang=en>

and cooperation, assessment of the security and threat to the Republic, planning and financing, as well as other issues. The crisis management system is organized and implemented for prevention, early warning and crisis management (all risks) that pose a risk to material goods, human and animal health and that are the result of natural disasters and epidemics or other risks and dangers, which directly endanger the constitutional order and security of the Republic or part of it, when there would be no conditions for declaring martial law or state of emergency. The CMS also includes the collection of information, assessment, and analysis of the situation, setting goals and objectives, and the development and implementation of necessary activities for prevention, early warning and crisis management. This law prescribes the rights and obligations of the entities that make up the crisis management system. Article 2 of the same law states that the CMS is exercised by the bodies of the state administration and the bodies of the state government, Army, the protection and rescue forces and the bodies of the municipalities and the City of Skopje. Under certain conditions, public enterprises, public institutions, companies, citizens, citizens' associations and the Red Cross also participate.

According to the Law on Article 5, the municipalities of Chashka and Veles, within their competencies determined by law, have an obligation for their needs, for effective prevention and early warning of a potential crisis to assess the risks and dangers at the local level, to determine the needs and plan resources. In dealing with crises, municipalities also do the following:

- Monitor the conditions, actions, and phenomena that can lead to a crisis on the territory of the municipalities;
- Assess the threat from risks and dangers for the occurrence of a crisis situation on the territory of the municipalities;
- Adopt a program for revitalization of the municipalities after the elimination of the crisis;
- Implement the decisions of the Government regarding crisis management on the territory of the municipalities;
- Decide on the amount of crisis management funds from the municipal budget.

RCCM Veles prepares the assessment from line 2 for both municipalities. In dealing with the crisis, the mayors of the municipalities provide coordination of the participants in the crisis management system at the local level.

Public enterprises, public institutions and services, as well as companies of special importance for work in a crisis, which will be determined by the Government, should prepare for the performance of their functions and tasks for prevention and risk management and dangers that may cause a crisis or crisis in the country or a certain part of it. Their special competencies and responsibilities refer to the following:

- They are obliged, at the request of the bodies and bodies that manage the crisis management system and by a decision of the Government, to make their resources available for crisis management and elimination of the consequences of crises, for which they are entitled to appropriate compensation;
- They are obliged, without a call to a competent state body, in case of a sudden accident or other crisis, to undertake activities within their capabilities and to inform the Crisis Management Center on the only emergency number;
- They are obliged within their subject competencies or business processes to plan and take the necessary preventive measures and to prepare capacities for dealing with crises and disasters of greater intensity;

- Public enterprises, public institutions and services, as well as trade companies of a special nature, which with their operation can cause serious threats to people, animals and the environment, are obliged to take all preventive measures and finance them from their sources;
- Perform other obligations following the legal regulations and act upon decisions made by the Government.

For the smooth functioning of the crisis management system, proposing decisions and providing on-going consultations, coordination, timely response, efficiency and proper use of available resources in case of a crisis, as well as ensuring timely, quality and realistic assessment of security threats, in the crisis management system, following the Law on Crisis Management, the following bodies are formed: the Steering Committee, the Assessment Group, the Crisis Management Center⁸, the Regional Crisis Management Centers, the General Headquarters and the Regional Headquarters. CMC provides organizational, administrative and professional support to the system. In carrying out its crisis management tasks, the CMC performs the following activities:

1. Ensures continuity of cross-sectoral and international cooperation, consultations and coordination of crisis management;
2. Preparation and updating of the assessment of all risks and dangers for the security of the Republic;
3. Proposing measures and activities for resolving the crisis;
4. Providing overall support (professional, organizational, administrative, etc.) to the Steering Committee and the Assessment Group.

3.2.2 Regional Crisis Management Center Veles

According to Article 23 of the LCM, for informing, monitoring the situation, exchanging data and information, giving proposals for crisis management and making a single assessment, regional CMC centres are established in the CMC: 27 regional centres and 8 main regional centres. Consequently, on the territory of the municipalities of Chashka and Veles, the Regional Crisis Management Center (RCMC) Veles was established, which has jurisdiction over the area over the two municipalities. The headquarters of RCMC Veles is in the building of LSGU Veles (tel. 043 215 421, e-mail rcukveles@cuk.gov.mk). The Director of the CMC appoints the head of the regional centre. The local coverage of the Municipality of Chashka is done with an individual appointed person from RCMC Veles as a regional competent centre. On the other hand, RCMC Veles belongs has the regional and operational competence as the Main Regional Center for Crisis Management (MRCMC) and is responsible for the Vardar region. MRCMC Veles works 24 hours a day, 7 days a week. The on-duty service can be obtained on the characteristic and toll-free telephone number 195, which soon will be replaced by the European emergency number E-112.

3.2.3 Regional Headquarters for Crisis Management Veles (RHCM Veles)

In the Regional Center Veles as an operational-expert body for managing the activities for prevention and dealing with crisis situations (LCM, 2005) on the territory of the municipalities of Chashka and Veles, the *Regional Headquarters for Crisis Management Veles* (RHCM Veles) was established. This regional headquarters is managed by the head of the RCMC Veles and it is composed of high representatives from

⁸ Government of the Republic of North Macedonia, Crisis Management Center www.cuk.gov.mk

the municipalities of Veles and Chashka (mayors or other appointed representatives), representatives from the regional units of the ministries in the municipalities, a representative of the regional office of the PRD in Veles, a representative of the municipal organization of the Red Cross, as well as other members if necessary (representatives of public utility companies, etc.). Regular staff meetings are convened at least once every six months or twice a year, and more often as needed. Extraordinary staff meetings are convened for emergency prevention or crisis management. RHCM Veles adopts conclusions in the form of conclusion decisions, recommendations, directions and other measures and activities of RHCM and they are adopted by a majority vote of the total number of members present.

Summer period	Winter period
<ul style="list-style-type: none"> • Floods (torrential floods) • Open space fires • Extreme weather events (storms with hails, high temperatures, heatwaves, drought, etc.) • Earthquake • Epidemics • Massive poisoning of humans and animals • Epiphytotic • Technical-technological disasters • Environmental degradation • Water supply, electro supply and communications • Migrants/refugees crisis. 	<ul style="list-style-type: none"> • Floods • Extreme weather events (intensive snowfalls, snowdrifts, avalanches, low temperatures, cold waves, dense fogs) • Fires • Earthquakes • Air pollution • Health conditions • Technical-technological disasters • Environment degradation • Water supply, electric supply, communication • Migrants/refugees crisis.
<ul style="list-style-type: none"> • Preparedness of the competent entities and the modality of their functioning • Review of programmes of competent entities • Prioritization of activities and measures • Needs of the vulnerable categories of citizens • Enhanced coordination, communication and cooperation of the entities on the regional levels • Monitoring of the situation and regular information. 	<ul style="list-style-type: none"> • Preparedness of the competent entities and the modality of their functioning • Review of programmes of competent entities • Prioritization of activities and measures • Clearance of the road communication • Needs of the vulnerable categories of citizens • Enhanced coordination, communication and cooperation of the entities on the regional levels • Monitoring of the situation and regular information.
<ul style="list-style-type: none"> • Analysis of the evolved risks and hazards during the previous period and consequent damages and losses. 	<ul style="list-style-type: none"> • Analysis of the evolved risks and hazards during the previous period and consequent damages and losses.

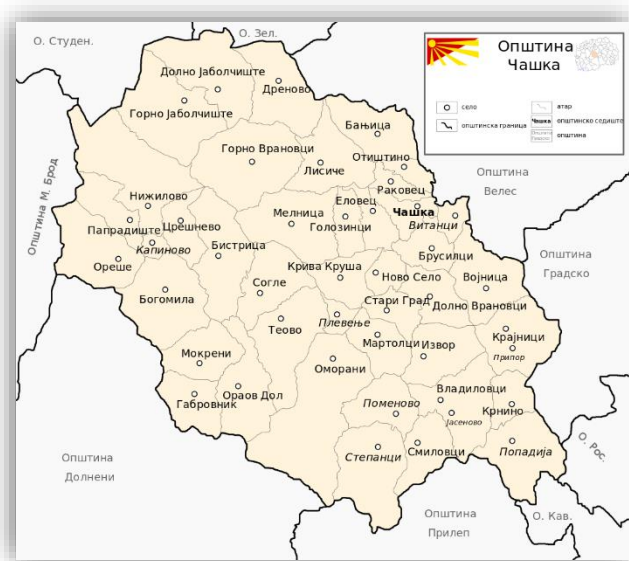
Table 6 – Risks, hazards and situations that are reviewed and for which decisions are made by the RHCM Veles

Monitoring of the realization of the conclusions, decisions, directions and other measures and activities adopted at the session of the Regional Headquarters is performed by the Head of the Headquarters, based on the submitted reports with data and information on the risks and dangers. When the decision of the RHCM in the field is implemented by several entities, the coordination with the entities is led by the head of the Regional Headquarters. The members of the Regional Headquarters implement the decisions based on the positive regulations that cover the risks and dangers, and in coordination with all bodies and institutions that participate in the crisis management system.

4. REGIONAL PROFILE

4.1 General Information

➤ **Municipality of Chashka** is located in the central part of the Republic of North Macedonia, covering an area of 825 km² and is one of the largest municipalities in Macedonia. It is a rural municipality with a good geographical position. Neighbouring municipalities bordering are from the east with Veles and Gradsko, from the north with Zelenikovo and Studenichani, from the west with Makedonski Brod and Dolneni and in the southern part with Prilep and Kavadarci. It has 42 settlements, the municipal centre Chashka and the following ones: Banjica, Bistrica, Bogomila, Busilci, Vladilovci, Vitanci, Vojnica, Gabrovnik, Golozinci, Gorno Vranovci, Gorno Jabolchishte, Dolno Vranovci, Dolno Jabolchishte, Drenovo, Elovec, Izvor, Kapinovo, Krajnici, Kriva Krusha, Krnino, Lisiche, Martolci, Mill, Mokreni, Nezhilovo, Novo Selo, Omorani, Oraov Dol, Oreshe, Otishtino, Papradishte, Plevenje, Pomenovo, Popadija, Rakovec, Smilovci, Sogle, Stari Grad, Stepanci, Teovo, and Creshnevo. Actually, on the territory of Chashka is the geographic centre of the country.⁹



Map 2 – Territory of the Municipality of Chashka with settlements¹⁰

➤ **Municipality of Veles** covers an area of 464.50 km² and its territory extends in the Veles valley which occupies a central position in the country and the valley of the River Vardar. It borders the municipalities of Petrovec and Zelenikovo to the north, Sveti Nikole and Lozovo to the east, Gradsko to the south and the Municipality of Chashka to the west. Beside the City of Veles, the municipality has other 29 settlements: Bashino Selo, Belestevica, Buzalkovo, Vetersko, Gorno Karaslari, Gorno Orizari, Dolno Karaslari, Ivankovci, Kumarino, Lugunci, Mamutchevo, Novachani, Novo Selo, Oraovec, Otovica, Rashtani,

⁹ <https://tinyurl.com/y5rratx6>

¹⁰ <https://tinyurl.com/yxfjbc2d>

Rlevki, Svlik, Svliknik, Svlik, Coloshevo and Dzidimirci. Settled rural settlements are Karabunishte and Krusje.



Map 3 – Territory of the Municipality of Veles with settlements¹¹

4.2 Hydrology, afforestation and land

➤ **Municipality of Chashka** has a water area of 8.62 km² with the Babuna (62 km) and Topolka (45) rivers being the largest. The Topolka River receives several tributaries, the most important of which are Vranovska and Melnichka Reka on the right and Mala Reka on the left. The total area under forest in the Municipality of Chashka is 419.04 ha, while total afforested area 1.15 ha. There is a clear breakdown of low thermophilic forests of white hornbeam, oak region, beech region and region of high mountain pastures. The forests of the pine curve that are spread on the mountain massif Jakupica represent scientific-research natural reserve. The municipality has a total arable agricultural area of 476.00 km² and 48.97 km². A total of 248.12 km² of land is used on pastures. Of all the total area available to the Municipality, 413.35 ha belong to construction land.

➤ **Municipality of Veles** covers the larger watercourses Babuna, Topolka and Otovicka Reka, which jointly belong to the basin of the river Vardar. Vardar is the largest watercourse on the territory of the municipality which flows through the Vardar Valley in a length of 10 km and the average water flow of 83.1 m³/s. The width of the riverbed ranges from 30 – 80 m and the depth is up to 2.5 m. Babuna River is

¹¹ <https://tinyurl.com/y4wyrx53>

the second biggest and has an average annual flow of 4.65 m³/s. The river Topolka is the third largest watercourse in the municipality of Veles, with an average annual flow of 2.41 m³/s. Otovicka Reka and Dervenski Potok are permanent watercourses that have insignificant average annual flow. They flow through the territory of the municipality in a length of 10 km. The Otovicka River flows into the artificial reservoir "Mladost", most often dries up in the summer months, while the Dervenski Potok has more torrent characteristics, which on its way with frequent spills endangers the residential and commercial buildings by flooding to the river Vardar. About 13 km north of the city, on the Otovica river, the Lake Mladost is located. The total volume of the lake is 8,000,000 m³ of water and the height of the dam is 35 m. The main purpose of this reservoir is irrigation of about 1,350 ha of agricultural land.

There are 53,000 ha of forests and forest land in the municipality, of which 38,500 ha are regulated forests and 14,500 ha of forest land. In the structure of the arranged forests, low-stemmed forests account for 20%, and high-stemmed forests for 80%, with available wood mass of 3,200,000 m³. On the other side, 69% of the total area of the municipality is treated as an agricultural area, and 370 km² or 34.5% of the total agricultural area are treated as agricultural arable land. In recent years, there has been a decrease in the cultivation of agricultural land, which is a negative trend in terms of ensuring the favourable economic and social status of the local population.

4.3 Climate conditions

The climate moderate continental with sub-Mediterranean influence which penetrates through the valley of the rivers Vardar and Topolka. The average annual temperature is 13.30C. The coldest month is January with an average temperature of 1.8C, whether the hottest one is July with an average temperature of 24.4C. During the summer months that are hot and dry, there could be extremely high temperatures e.g. 40.5C. Precipitation is light, mostly in autumn and winter. The average annual rainfall is between 427 mm (Veles) and 477 mm (Chashka). Average sun lights are calculated at 2,200 hours. There are winds from all directions, with the Vardarec wind, blowing from north to south alongside the Vardar River is the strongest, 9-31 m/s. The South Wind is a hot and dry type of wind that comes from Sahara and the Mediterranean with an average speed of 1.8 – 2.6 m/s. In the catchment area of the Lisiche Dam, the average temperature of the soil is from 13.6C up to 14.4C, whether the precipitations range from 300 to 700 mm.

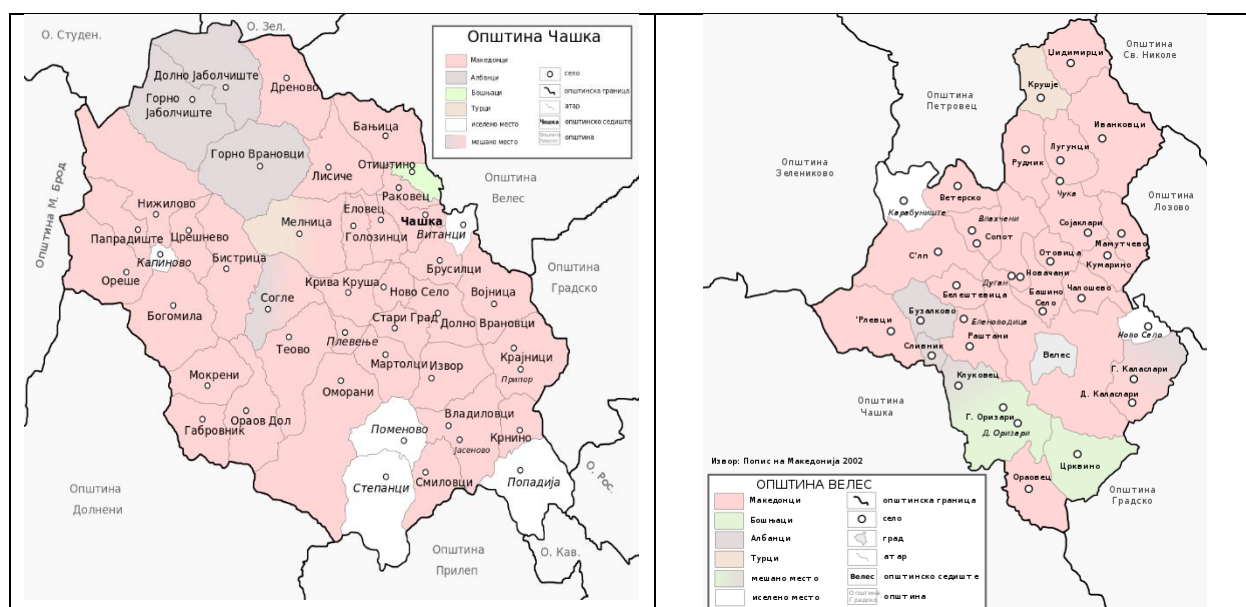
4.4 Demographic characteristics

According to the last Census of Population and Households from 2002, the total number of inhabitants in the two municipalities is 62,781, of which 7,673 live in Chashka and 55,108 live in Veles. Out of the total number of inhabitants, 51% are men and 49% are women. Macedonians are a dominant nationality with more than 81% of the population, followed by Albanians (8%), Turks (3%) and others (8%). Density of population in the two municipalities is different, with Chashka being partly populated (9.36 people per km²) and Veles being the moderate one (42 peopled per km²). Unemployment rate in the Municipality of Chashka is high, with 42% of the working population not being officially employed. Situation in the Municipality of Veles is slightly better (32% unemployment rate). There are 2,185 households in the Municipality of Chashka, with an average number of 3.15 members in a household, with a total housing area of 228,750 m². Each member of the family has an average of 17.49 m² of living space. In the

Municipality of Veles, there are total 16,958 households with an average of 3.20 members in a household and in total 20,633 individual residential units.

#	Municipality	Total	M	F	Macedonians	Albanians	Turks	Roma	Others
1	Chashka	7,673	4,017	3,656	4,370	2,738	390	0	175
2	Veles	55,108	27,632	27,476	46,767	2,299	1,724	800	3,518
Total:		62,781	31,649	31,132	51,137	5,037	2,114	800	3,693

Table 7 – Breakdown of the population on the territory of the municipalities of Chashka and Veles according to gender and nationality division (Census, 2002)¹²



Map 4 - Population on the territories of the municipalities of Chashka and Veles according to the nationality (Census, 2002)¹³

4.5 Socio-economic development

➤ **Municipality of Chashka** has significant deposits of non-metallic, mineral resources, marble, sand, clay and others, which are a solid base for the development of suitable industrial facilities. Among the mineral resources represented on the territory of the municipality, it dominates talc with established reserves (greater than 3 million tons) in the locality Izvor-Nikodin. For the time being, the deposit near the village of Izvor with an annual capacity of about 12,000 tones. There are no significant mineral resources on the territory of the municipality. The most common is the brick clay in the locality "Gorna Brca" and limestone in the locality "Prevalec", as well as talc processing. As energy potential, of special interest, is the use of the hydro potential of the rivers and the accumulations. The total length of the

¹² <http://www.stat.gov.mk/PublikaciiPoOblast.aspx?id=54&rbrObl=31>

¹³ Maps are downloaded from <https://mk.wikipedia.org/>

electricity network for the Municipality of Chaska is 268.42 km, of which 158.34 km is suburban (10KW). The rest is a city, i.e. low voltage network. The landfill for industrial and municipal waste is located near the village of Rakovec. Thanks to the favourable climatic conditions, a large number of citizens deals mainly with agriculture of which the most common crops are: tobacco, wheat, beans, barley, rice, vineyards and orchards, etc. Besides, there are 12 ha of greenhouses.

➤ **Municipality of Veles** in the past was known for its industry of strategic importance for the Republic of North Macedonia. Today it faces severe challenges for economic development, the problems resulting from the privatization process and outdated fixed assets largely reflect on local economic capacity. The data from the State Statistical Office show a growing trend of active business entities in the municipality and 2009, there were 1,737 entities. There are no significant phenomena of metallic mineral raw materials, while the situation with non-metallic one's raw material is much more favourable. Non-metals include clays, limestones, quartz. Due to the lack of its capacities for electricity production, the Municipality of Veles satisfies its needs by using the energy system of the Republic of Macedonia through the transmission line Skopje-Veles-Kavadarci. The local electricity distribution system has a distribution network of 423 km, through which quality and stable electricity supply is provided. The specific consumption per capita is around 980 kWh per year.

5. DISASTER RISK PROFILE

5.1 General hazard profile

According to the prepared Assessments of the endangerment in the area of the municipalities of Chashka and Veles from all risks and dangers, the profile of dangers is dominated by floods, fires and extreme weather conditions, landslides for the Municipality of Veles and other hazards (earthquakes, UXO as remnants of past wars, snowfalls, snowdrifts, snowstorms, various pollution, etc.). Together with the deteriorating state of the environment and the increasing impact of climate change, it is expected that there will be a significant increase in the frequency, intensity and magnitude of these events. Consequently, more and more people are exposed to their effects. All this is compounded by new challenges in the face of growing dangers such as the migrant crisis or the COVID-19 pandemic. Therefore, the hazard profile of the two municipalities is as follows:

FIRST DEGREE		NO RISK (Regular situation)	<i>Municipality of Veles - Other hazards (earthquake, pollution of the soil, water and air, UXO, asocial and criminal appearances)</i> <i>Municipality of Chashka - Other hazards (earthquake, UXO)</i>
SECOND DEGREE		LOW RISK (Regular situation with rarely manifested occurrences of endangerment)	<i>Municipality of Veles - Landslides, fires, floods, extreme weather events (temperature differences, torrential rain, wind storms, snow falls, forst and hail)</i> <i>Municipality of Chashka - Fires, floods, extreme weather events (snow falls, snow drifts and frost)</i>
THIRD DEGREE		INCREASED RISK (Potential start of a crisis or crisis situation)	
FOURTH DEGREE		HIGH RISK (Probability of a start of a crisis or crisis situations)	
FIFTH DEGREE		HIGHEST RISK (Endangerment of the vital values and conditions ofr declaration of a crisis or crisis situations)	

Table 8 – Degree of the endangerment of the security of the territory of the municipalities of Chashka and Veles¹⁴

5.1.1 Fires

On the territories of the municipalities of Chashka and Veles, open fires (forest fires) and fires of buildings are characteristic, with the former being the most common and with the greatest intensity. The reasons for their occurrence are different from the human factor as the most present. According to the analysis of the events, the profile of the danger and the exposure of the risk elements, the fires will occur with intensity that is more frequent in the coming period. The fires did not cause significant damage to key

¹⁴ Degree of the endangerment of the security of the territory of the Municipality of Strumica is done in accordance with the Article 6 of the Regulation on the methodology for preparation of the assessment of the endangerment of the security of the Republic of Macedonia from all risks and hazards... (Official gazette of RoM no.29/05).

infrastructure or disrupted the operation of CMS entities, but pose a major threat to the forest fund in the region. Because of forest fires, no outbreaks of infections and diseases have been registered so far in the population, but in addition to deforestation and illegal logging, it is the reason for the occurrence of diseases among plants: Borov Chetnik (*Thaumatopoea pityocampa*) and Pine Wasp (*Diprion pini*).

➤ **Municipality of Chashka** - During the period from 1998 to 2007, in total 178 forest fires occurred, which covered a forest area of 14,549.60 ha and burnt wood mass of 386,106 m³. Major forest fires happened in 2000 (v. Stepanci area, 4,012 ha forest area, 167,549 m³ burnt wood mass), 2011 (v. Oreshe, Nezhilovo, Drenovo, Creshovo, Kapinovo and Bistrica, 3,217 ha forest area, as well as the fire in 2012 in the area of the village Drenovo which occupied forest area of 1,500 ha. Forest fire localization and extinguishing is the competence of PE NF “Babuna” – Veles, Fire Brigade – Veles, local resources e.g. PCE Topolka – Chashka, PRD, ARM. Concerning the economic costs of the forest fires, despite the obsolete data and information, the price tag of forest fires is very high. For example, only seven fires from 2002 – 2008 (forest area of 4,717 ha; burnt wooden mass of 69,675 m³) have the direct cost of 155,757,000 MKD¹⁵ or 3,025,000 USD¹⁶. Concerning the fires on buildings, among other buildings of critical and social infrastructure on the territory of the Municipality of Chashka, the building facilities at the Lisiche Dam (administrative building and the valves warehouse) are exposed to a fire.

➤ **Municipality of Veles** - In the period from 1998 to 2012, 167 forest fires occurred. During this period, an average of about 10 forest fires occurred per year. The most characteristic year is 2000, with 26 fires that affected a forest area of 1,773 ha and burned wood mass of 42,488 m³. Besides, the most specific event is the forest fire on the Mladost Lake that happened on 26 August 2019.¹⁷ A 50-year-old black pine forest burned on an area of about 200 ha, another 250 ha of degraded forestland, which totals 400-500 ha of burned forest, i.e. about 20,000 m³ of wood. According to the first estimated data, damage was caused to about 60 million Denars or 1 million euros. Also, concerning the overall economic costs of the forest fires, despite the obsolete data and information, the price tag of forest fires is very high. For example, only seven fires from 1999 – 2007 (burnt wooden mass of 76,216 m³) have the direct cost of 175,296,800 MKD or 3,405,143 USD. Concerning the fires on buildings, among other buildings of critical and social infrastructure on the territory of the Municipality of Veles, the facilities of the Lisiche Hydro system could be exposed to a fire.

5.1.2 Floods

According to the characteristics of the territory and hydrography, the area of the municipalities are exposed to floods from overflowing water bodies, from overflows of torrents, as well as demolition of Lisiche or Mladost dams. According to the analyzed historical events, frequency, intensity, as well as the caused damages, the danger of flooding from the rivers is higher, but also the floods caused by the overflow of torrents cause damages in the hilly areas. In general, floods are the result of heavy rainfall, sudden melting of snow, and overflow of water from riverbeds, torrential rains, especially in urban areas, non-absorption of stormwater in urban areas, uncleaned riverbeds and sewers, and damage to river

¹⁵ Average price of 1 m³ of wood = 2,300 MKD.

¹⁶ 1 USD = 51.48 MKD.

¹⁷ <http://www.mkdsumi.com.mk/aktuelnosti.php?a=151&page=1>

embankments. The floods so far have not caused any loss of life. Several types of risk elements are vulnerable, which are analyzed and presented in detail - buildings - residential houses, buildings, etc., infrastructure - roads, streets, bridges, culverts, sewers, etc., and agricultural land. The floods so far have not caused significant damage to the key infrastructure and the functioning of the CMS entities.

➤ **Municipality of Chashka** -The area of the Municipality of Chashka is not exposed to the great danger of floods, but mainly as a result of complex hydrological conditions when at the same time there are extremely large precipitation and there is a sudden melting of snow from the mountain massifs level of watercourses increase in a short time. In the past, there were three major floods in 2006 and 2014 with material damage to the critical infrastructure of 12,000,000 MKD or 233,100 USD. By analyzing the results of the calculations of the hydraulic consequences of sudden collapse of the dam Lisiche it can be concluded the following:

- The flood wave caused by the sudden and complete collapse of the dam could be with great hydrodynamic force and propagates as a wave with a very steep forehead/front that has a great destructive effect.

- For the population in the village of Golozinci, settlement Chaska, village Dolno Orizari and village Prevalec, as well as for the buildings and roads directly on the banks of the river Topolka, the consequences will be catastrophic if the alarm is sounded later the demolition of the dam. It is possible to take the necessary measures to protect the population with evacuation outside the marked flood zone, only in case of the alarm was sounded before the collapse of the dam. To protect material goods and facilities it is not possible to take almost any measures of protection.

- The calculated hydraulic consequences in the valley downstream from the dam Lisiche after population, facilities and arable land are the most unfavourable and extreme. However, if we take into account that the Lisiche dam is an embankment type, its sudden, momentary and complete demolition is almost impossible. Collapse of the profile of the dam in the event of demolition will certainly be partial and so the calculated hydraulic consequences for the heights of a flood wave, maximum flow rates, maximum velocities of leakage, as well as the speed of propagation and the time of onset of the forehead of the wave in the valley downstream of the dam will certainly be smaller.

In case of possible sudden or complete demolition of the dam Lisiche, directly hit by the flood wave is the village of Golozinci and Chashka settlement. At the risk of partial flooding is also exposed to the village of Lisiche, part of the residential buildings that are located towards the confluence of the Vranovska River with the Topolka River. The total floating area downstream of the Lisiche dam is 14,275,371 m² or 14,275 km², or 1,427 ha.

➤ **Municipality of Veles** - The area of the Municipality of Veles is exposed to the medium danger of floods. Major events happened in 2009 with the torrential flooding from the Derven torrent stream and in 2013 with the overflow of the Vardar River. In case of complete demolition of the Lisiche Dam, the flood wave in the Municipality of Veles will move along the Topolka riverbed. The space through which the flood wave with its hydraulic consequences passes, on the territory of the Municipality of Veles is divided into three profiles, as follows: Profile km 21 + 000, at this profile the river valley of the river abruptly narrows between the protruding steep slopes of Teceni Bair and Kayanlak. Traffic communications for Veles and the village Izvor intersect here. Immediately downstream of this narrowing, the river valley widens. On the left side of this extension are located commercial buildings (Keramika Nova and production facilities

in the former Noncha Kamishova). At the end of this expansion on both banks of the river. Topolka is deployed in the Urban Community "Mirka Gineva". Immediately downstream the river enters the gorge until the confluence with the Vardar River.

Profile km 26 + 000, on the left and right bank of the river Topolka is located in the area of the Urban Community "Mirka Gineva". The railway line Veles-Prilep and the regional road Veles-Izvor stretch on the left side. A quarry is located directly downstream. At this place, the river enters the gorge which consists of the slopes of the mountain Babuna and Kameno Brdo. The profile km 31 + 000, and this profile is the inflow of the river Topolka in the Vardar River is located directly downstream from Veles. The Vardar River after the exit from Veles enters a long gorge part until the inflow of the Babuna River. On the right side of the river valley, there is the railway line Skopje-Veles-Gevgelija and the regional road Veles-Gradsko. During the simultaneous and sudden demolition of the Lisiche Dam, directly from the flood wave in the Municipality of Veles, an area of about 293 ha will be affected, and the buildings and infrastructure in the area of the village Dolno Orizari will be exposed to flooding and production facilities located in the area of the former "Svilara", the porcelain factory, smaller commercial buildings and residential houses. The inflow of the river Topolka in the Vardar River is exposed to flooding with all facilities located directly on the banks of the Vardar River, such as the monastery of St. Dimitrija, residential and commercial buildings as well as the leather industry "Dimko Mitrev". The regional road Veles-Chashka, Veles-Gradsko, part of the railway line Veles-Prilep and Veles-Gevgelija are exposed to flood infrastructure facilities.

5.1.3 Extreme weather events

➤ **Municipality of Chashka** – Most frequent weather events on the territory of this municipality are the snow falls, snowdrifts and frosts. In the area of the Municipality of Chashka, the snowdrifts most often occur on the local, regional and national roads. However, at certain times of the year, they can cause traffic problems, power outages and telephone disruptions communications as well as disconnection of certain settlements. Snowfall, which is usually present in a short time, several days during the winter, but the abundance of precipitation followed by strong wind creates snowstorms that make traffic difficult and often cause detachment of the rural settlements in the hilly part of the territory of the municipality, on settlements located higher than 800 meters above sea level. The weak road network to some of these villages and the terrain configuration contributes to the creation of large snowdrifts sections of the road, making it impassable for several days. Snowfall followed by wind caused snowfall in December and February 2012, due to which the villages: Drenovo, Gorno Jabolchishte, Dolno Jabolchishte, Gabrovnik, Mokreni, Bistrica and Oraov Dol. were cut off from the municipality for several days.

➤ **Municipality of Veles** – Most frequent extreme weather events on the territory of Veles are the temperature differences, torrential rains, windstorms, snowfalls, frost and hail. Torrential rains followed by strong winds that caused material damage happened in May and June 2013. Snowfalls followed by wind caused snowdrifts happened in December and February 2012, due to which the villages: Vetersko, Slp, Belestevica, Karabunishte, Dzidimirci, Rudnik, Lugunci, Rlevci and Buzalkovo were cut off from the city of Veles for several days. Snowfall, which is usually present in a short time, several days during the winter, but the abundance of precipitation followed by strong wind, creates snowstorms that make traffic difficult and often cause detachment of the rural settlements in the hilly part of the territory of the municipality, on settlements located higher than 800 meters above sea level.

5.1.4 Landslides and rockfalls (Municipality of Veles)

Most dangerous landslide is the Ramina Landslide that activated in 1999 and 2002 endangering approx. 400 objects and the landslide near the Kosturnica Monument. Rockfalls are happening around the city in the higher zones, as well as alongside some section of the highway and regional roads.

5.2 Risk profile and hotspots

Based on the analysis of the hazard profile, the events that occurred, as well as the assessments of the threat in the areas of the two municipalities, the following risks and hotspots were identified and they are presented in the Table 9:

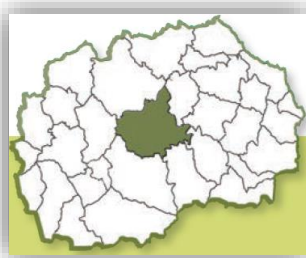
“Socio-economic Survey on Eco-DRR related information focusing In Chaska and Veles”
(Draft Report)

HAZARD	TYPE	DEGREE OF ENDANGERMENT		HOTSPOTS	PROBABLE CONSEQUENCES	EXPOSED POPULATION	TIME PERIOD/CAUSES	
FIRES	Fires (forest fires, open space fires, fires on buildings)	<i>Second Degree</i>		LOW RISK (Regular situation with rarely manifested occurrences of endangerment)	MUNICIPALITY OF CHASHKA <i>Fores fires/open-space fires/fires on buildings</i> (forest areas in all seven FMUs, open space and agricultural land, vegetation alongside the railway track to Bitola, buildings and facilities in all settlements) MUNICIPALITY OF VELES <i>Fores fires/open-space fires/fires on buildings</i> (FMUs Ezero Mladost - Karaslari, Crn Vrv - Gradishte, Topolka - Karabunishte, open space and agricultural land, vegetation alongside the railway tracks, buildings and facilities in all settlements)	Loss of human lives Buildings (residential, construction, etc.) Infrastructure (energy, communication, etc.) Forest and agricultural land	Municipality of Chashka 7,888 Men - 4,166 (53%) Women - 3,722 (47%) Municipality of Veles 54,995 Men - 27,648 (50%) Women - 27,347 (50%)	<i>February/March/April</i> (mainly agricultural related activities) <i>June - September</i> (temperatures/droughts/human influence) <i>October - March</i> (heating season)
FLOODS	Floods (floods from overflowing of water bodies, floods from demolition of the dam, floods from overflow of torrents)	<i>Second Degree</i>		LOW RISK (Regular situation with rarely manifested occurrences of endangerment)	MUNICIPALITY OF CHASHKA <i>Floods from overflow of the water bodies</i> (Babuna River - areas of v.Dolno Vranovci, Sogle, Teovo; Topolka River - areas of v. Golozinci, Elovo and the Chashka Settlement) <i>Floods from the demolition of the Lisiche Dam</i> MUNICIPALITY OF VELES <i>Floods from overflow of the water bodies/torrential flooding</i> (Rivers of Vardar, Babuna, Topolka, Otovichka; Mladost and Lisiche Lakes; Derwent torrential stream) <i>Floods from the demolition of Mladost and Lisiche</i>	Loss of human lives Buildings (residential, construction, etc.) Infrastructure (energy, communication, etc.) Forest and agricultural land	Municipality of Chashka 2,086 Men - 1,091 (52%) Women - 995 (48%) Municipality of Veles 54,995 Men - 27,648 (50%) Women - 27,347 (50%)	<i>Spring/Fall seasons</i>
EXTREME WEATHER EVENTS	Snowfall, snow-drifts, frosts + temperature differences, torrential rain, wind, snow, ice and hail	<i>Second Degree</i>		LOW RISK (Regular situation with rarely manifested occurrences of endangerment)	MUNICIPALITY OF CHASHKA (Villages of Drenovo, Dolno and Gorno Jabolchishte, Papradishte, Nezhilovo, Oreshe, Oraov Dol, Smilovci and Krajnici) MUNICIPALITY OF VELES (Snowfalls: Vetersko, Slp, Beleshteveica, Karabunishte, Dzidimirci, Rudnik, Lugunci, Rlevci, Buzalkovo and Ivankovci)	Facilities (roof constructions, older buildings, etc.) Infrastructure (local and regional roads, electronic communicatoin systems, power supply systems, etc.) Agricultural land	Municipality of Chashka 5,217 Men - 2,644 (51%) Women - 2,517 (49%) Municipality of Veles 54,995 Men - 27,648 (50%) Women - 27,347 (50%)	<i>January - March</i> (snowfalls) <i>March - May/October - December</i> (Torrential rains) <i>Spring/Fall</i> (windstorms)
LANDSLIDES	Landslides and rockfalls	<i>Second Dergree</i>		LOW RISK (Regular situation with rarely manifested occurrences of endangerment)	MUNICIPALITY OF VELES <i>Landslides:</i> Ramina and near the Kosturnica Monument <i>Rockfalls:</i> aaround the city in the higher zones and alongised some section of the highway and the regional roads	Loss of human lives Buildings (residential, construction, etc.) Infrastructure (energy, communication, etc.)	Municipality of Veles 500	<i>During the whole year</i>
OTHER HAZARDS	Earthquake, UXO, water, air and soil pollution	<i>First Degree</i>		NO RISK (Regular situation)	MUNICIPALITY OF CHASHKA (Earthquake - whole territory; UXO - some locations) MUNICIPALITY OF VELES (Earthquake - whole territory; air, water and soil pollution - some locations; UXO - some locations)	Loss of human lives Buildings (residential, construction, etc.) Infrastructure (energy, communication, etc.) Forest and agricultural land	Municipality of Chashka 7,888 Men - 4,166 (53%) Women - 3,722 (47%) Municipality of Veles 54,995 Men - 27,648 (50%) Women - 27,347 (50%)	<i>During the whole year</i>

6. FOREST MANAGEMENT IN THE MUNICIPALITIES OF CHASHKA AND VELES

6.1. Essential information on the forest management in the two municipalities

Forest management is provided by the regional branch of the PE NF “Babuna” – Veles. It borders with the regional offices “Karadzica” – Skopje (North), Sveti Nikole (Northeast), “Bor” – Kavadarci and “Crn Bor” – Prilep (South) and Makedonski Brod (West). It cooperates with these regional branches in the areas of forest preservation and protection, illegal logging and combating forest fires. The forest area under the management of “Babuna” – Veles has nine forest management units (see the table below). Seven of the FMUs are on the territory of the Municipality of Chashka: Gorna Babuna, Dolna Babuna, Basa, Kriva Krusha – Topolka, Mukos – Jasenova Glava, Popadija – Krajnici, and Topolka – Karabunishte. For the location site in Lisiche, relevant is the FMU “Topolka – Karabunishte”.

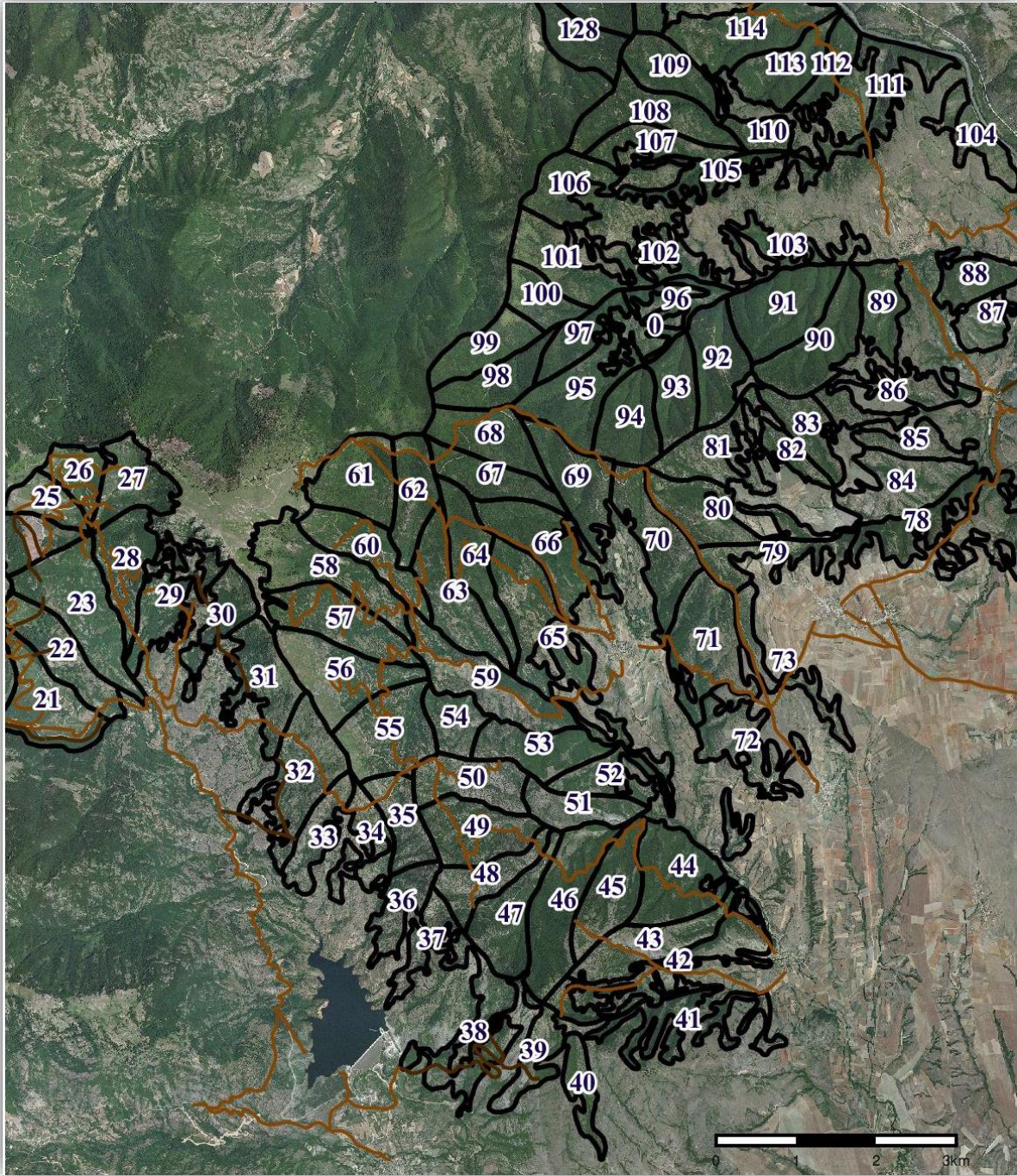


Map 5 – Location of the competences of the PE NF Regional Office “Babuna” - Veles

#	FMU	Validity	FMU (ha)	Area - ha					Wooden mass (m3)	Annual growth (m3)	Etat (State of forests) m3
				Total overgrown	High	Low	Cultures	Bush			
1	Popadija - Krajnici	2000-2009	7,087.87	3,063.15	294.80	2,593.50		175.30	52,238.00	740.00	15,156.00
2	Dolna Babuna	2003-2012	4,828.80	2,849.90	236.70	2,599.80	13.40		133,554.00	3,252.00	24,052.00
3	Mukos- Jasenova Glava	2003-2012	9,896.40	7,468.90	712.20	6,743.90	12.80		377,875.00	9,732.00	59,754.00
4	Basa	2005-2014	6,488.00	4,520.20	416.90	4,072.70	30.60		259,744.00	8,445.00	73,534.00
5	Gorna Babuna	2001-2010	5,931.10	5,172.70	3,596.40	1,576.30			962,967.00	17,234.00	70,567.00
6	Kriva Krusha - Topolka	2003-2012	8,242.80	7,213.76	2,437.28	4,722.38	54.10		736,038.00	12,040.00	85,820.00
7	Topolka - Karabunishte	2003-2012	9,630.40	9,012.40	972.60	8,039.80			355,078.00	7,470.00	80,761.00
8	Crn Vrv - Gradishte	1999-2008	3,382.20	2,818.90	2,818.90				65,367.00	3,284.00	2,093.00
9	Ezero Mladost - Karaslari	2005-2014	4,260.60	3,741.70	2,685.20	403.20	653.30		104,770.00	6,909.00	9,992.00
Sub-total:			59,748.17	45,861.61	14,170.98	30,751.58	764.20	175.30	3,047,631.00	69,106.00	421,729.00
10	Popadija - Krajnici	2010-2019	6,859.00	3,097.60	260.60	2,837.00			56,562.00	2,750.00	12,068.00
11	Dolna Babuna	2013-2022	3,957.65	2,849.90	239.20	2,610.70			135,789.00	2,439.00	22,970.00
12	Mukos- Jasenova Glava	2013-2022	9,760.73	7,483.80	589.60	6,881.40	12.80		397,830.00	10,652.00	55,986.00
13	Basa	2015-2024	6,724.30	4,816.80	466.00	4,350.80			283,638.00	7,926.00	62,498.00
14	Gorna Babuna	2011-2020	5,787.30	5,220.50	3,532.90	1,680.20	7.40		1,032,331.00	17,248.00	78,981.00
15	Kriva Krusha - Topolka	2013-2022	8,207.11	7,171.06	2,487.18	4,683.88			761,228.00	11,567.00	56,460.00
16	Topolka - Karabunishte	2013-2022	9,194.90	8,529.70	672.20	7,920.50			294,597.00	6,818.00	49,530.00
17	Crn Vrv - Gradishte	2009-2018	3,041.30	2,606.60	1.40	2,605.20			73,491.00	3,297.00	17,497.00
18	Ezero Mladost - Karaslari	2015-2024	4,260.51	2,078.91	1,459.66	315.81	303.44		65,462.00	1,981.00	2,927.00
Sub-total:			57,792.80	43,854.87	9,708.74	33,885.49	323.64		3,100,928.00	64,678.00	358,917.00

Table 10 – Regional Branch Office “Babuna” – Veles (FMUs data)¹⁸

¹⁸ https://issuu.com/aleksandarivanovski7/docs/cela_monografija1.1



Map 6 – Forest Management Unit “Topolka – Karabunishte” (location site)¹⁹

¹⁹ <http://mkffis.cuk.gov.mk/>

The total management area of "Babuna" - Veles is 145,748.00 ha and during the period 1998 – 2008, the maximum possible volume of logging in all FMUs was 462,600 m³. Average cut wood mass for the same period is 247,591 m³ out of which beech accounts for 20,893 m³ and the rest is oak and beech firewood. The maximum possible blade level is 373,068 m³ and maximum 220,511 m³ have been achieved, out of which 6,630 m³ of beech sawmills and 213,881 m³ beech firewood or realization was 63.8% of the total etat. During this decade, afforestation was done on a total area of 539.70 ha, 881 ha of the forest was thinned and 27 ha of burnt areas were rehabilitated. In general, during the period, 1998 – 2018 production of 27,523 m³ of beech sawmill and 461,472 m³ of heating was realized. Regarding the openness of the forests of the FMU, there are various data. Moving from the most open areas at the foot of "Solunska Glava", where the openness is up to 20 km per 1,000 ha along the Babuna River to the least open areas around the sources of the river Topolka, where the openness is 5.4 km per 1,000 ha.

#		Area		Wooden mass			Current growth	
		ha	%	m ³	%	m ³ /ha	m ³	m ³ /ha
1	Tall stems	10,032.38	22.84	1,733,276	55.89	173	30,983	3.01
2	Single adults	7,024.18	15.99	863,223	27.85	123	17,726	2.52
3	Diverse	3,008.20	6.85	870,053	28.04	289	13,257	4.41
4	Low stems	33,885.49	77.16	1,367,706	44.11	40	33,695	0.99
5	Low stems	33,885.49	77.16	1,367,706	44.11	40	33,695	0.99
Total:		43,917.87		3,100,982		71	64,678	1.47

Table 11 - Overview of plantations by form of management in the FMU "Topolka – Karabunishte"²⁰

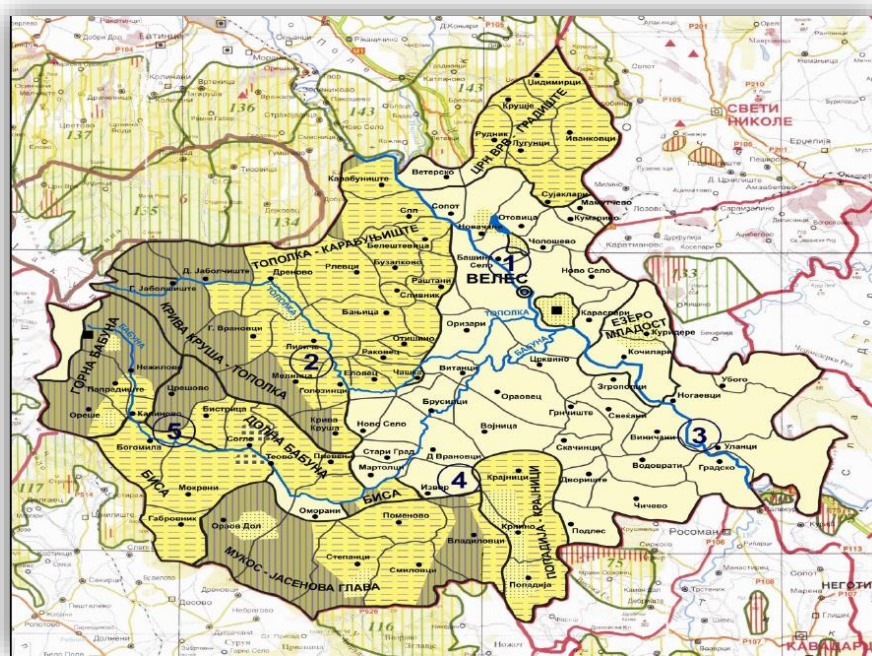
Forest roads - Intensive work is being done for forest roads, mostly for soft roads that are used for forest exploitation by forestry units. During 2008 – 2018 in total 75 km of forest truck roads were built and another 651.5 km were rehabilitated. Accordingly, new forest communications were built i.e. soft roads, on the following localities: "Mukos-Jasenova Glava" - 44 km, "Popadija-Krajnici" - 25 km "Topolka-Karabunishte" - 54.4 km, "Dolna Babuna" - 28.8 km, "Gorna Babuna" - 101 km, "Kriva Krusha-Topolka" - 60 km, "Lake Mladost - Karaslari" - 20 km of soft roads that were exclusively used for afforestation of arid areas suffering from major erosions. At the locality "Bisa", soft forest roads in the total length of 41.5 km and the section "Crn Vrv-Gradishte" has 39.4 km of soft roads. In the late eighties and early nineties, 20 km of soft roads were paved with macadam, semi-hard at a distance from the village of Nezhilovo to the mountain lodge Cheples and Teovski Most throughout the area of Charpas.

Illegal logging - Illegal logging is a big problem in the management of the FMU. The forest areas threatened by this phenomenon are mostly in the region of village Buzalkovo, where 2,000 ha are lost, low oak forest of economy class M, and all other areas together affected by illegal logging is 1,000 ha. In the region of the villages Gorno and Dolno Jabolciste, from the local population 350 ha of beech plantations were destroyed. Around the village of Malnica, 100 ha of oak and beech plantations were destroyed. It is also alarming the appearance of illegal cuttings in the Ovchepolie part, in the area of the village Ivankovci, where 200 ha under the forest class L were destroyed as formed land (forest cracking),

²⁰ https://issuu.com/aleksandarivanovski7/docs/cela_monografija1.1

as well as on the border with the village of Crnilishte, Prilep, on an area of 150 ha and the old road village Izvor - Prilep, on an area of 200 ha. The Forest Police and the Forest Guard Service at "Babuna" Veles is taking all necessary measures to combat this unfortunate phenomenon, but despite that the illegal logging difficult to control. In the period from 1999 to the middle of 2008, a total of 672 applications were submitted, of which 569 were misdemeanour and 103 criminal charges. The largest number of violations and reports were filed in 2004 and 2005 where illegal logging in the area of the branch has been on the rise.

Fires - On the territory of “Babuna” - Veles, during 1998-2018 there were 516 fires, on an area of 33,730 ha. In the past period has been developed and radio network through the construction of four base stations for radio connections which to this day function successfully for general useful functions. It is necessary to equip the Public Enterprise with fixed assets, modern mechanization, jeeps, with radio links that are excellent in the results of firefighting activities, in occurrence and extinguishing of forest fires and most importantly to create a unified forestry with unique principles, measures and criteria in operation, because only in this way can the forest fund inherited from the previous generations be preserved, with the possibility of improving the conditions, primarily in the openness of the forests that should be available to every citizen, with the possibility of exploitation of tourism resources.²¹



Map 7 - Degree of endangerment of forests by fires²² in FMU “Babuna” - Veles²³

²¹ https://issuu.com/aleksandarivanovski7/docs/cela_monografija1.1

²² First degree is with brightest color and the Fourth degree is with darkest color.

²³ PE National Forests, Regional Branch Office “Babuna” – Veles. *Annual Operational Plan for Protection of Forests from Fires.*

#	FMU	First degree of endangerment (ha)	Second degree of endangerment (ha)	Third degree of endangerment (ha)	Fourth degree of endangerment (ha)	TOTAL
1	Popadija - Krajnici	54.2	319.40	2,661.05	28.50	3,063.15
2	Dolna Babuna		99.90	2,347.80	402.20	2,849.90
3	Mukos- Jasenova Glava	10.20	3.90	2.648.80	4.806.20	7.469.10
4	Basa			326.50	4,193.70	4,520.20
5	Gorna Babuna		58.70	1,241.70	3,872.30	5,172.70
6	Kriva Krusha - Topolka		95.70	2,871.72	4,246.34	7,213.76
7	Topolka - Karabunishte		14.20	1,455.10	7,543.11	9,012.40
8	Crn Vrv - Gradishte		13.20	2,805.70		2,818.90
9	Ezero Mladost - Karaslari	2,717.50	1,024.20			3,741.70
	Total:	2,781.90	1,629.20	13,709.57	20,286.15	38,392.71

Table 12 - Overview of degrees of endangerment of FMUs on the territory of “Babuna” – Veles
(Source: PE NF Regional Branch Office “Babuna” – Veles)

6.2 Forest management in the Lisiche location in the FMU “Topolka – Karabunishte”

Forest management in the area of the village Lisiche is provided through the regional unit of PE NF “Babuna” - Veles. The village of Lisiche is located in a part of the forestland that is not officially regulated. Near the village, in the north-northeast direction, there is the forest economic unit “Topolka – Karabunishte” which has three classes: 33a, 33b, 34a and 36b.

The basic characteristics of the forest area in the area of the village Lisiche and the project site can be summarized as following: the Oak is present in most of the forest; there are 143.20 ha under forests on a state land (state property) and 2.5 ha of privately owned forests. It follows the proxy ratio between the state-owned and private forest is 99% -1%. As stated, the forest is divided into three classes/areas and each of them is attacked by illegal logging, with class 1 being the most endangered. The quality of the forest is poor with poor quality of trees, low height, low crowns. It is necessary to note that “Babuna” – Veles does not manage private forests, but only identify them for statistical/analysis purposes. Forest management of private forest areas is the responsibility of the owners themselves. As already mentioned, there is a significant level of activities for illegal logging, deforestation and transformation of forest into agricultural land or pastures.

➤ **FMU “Topolka – Karabunishte” (Section 33a)**

- thermophilic placement;
- altitude 450 - 650 m;
- exposure – South;
- steep side of a hill, which extends below the area Nakoalno, with a slope of 21 - 30°;
- geological base: muscovite - biotite gneisses;
- soil: eutrophic cambisol, shallow, dry to fresh, covered with a thin layer of humus and leaf;

- as. Querco - Carpinetum

Pure low-stemmed single-adult plantation of the Oak Blagun (*Quercus Pubescens*). Individually there can be found oak trees of Gorun, White Hornbeam, *Quercus conferta*, Ash. The plantation is of poor quality, with drying of the oak trees and observed illegal cuttings in the area.

➤ **FMU “Topolka – Karabunishte” (Section 33b)**

- thermophilic placement;
- altitude 550 - 800 m;
- exposure – South;
- very steep side of a hill, which is intersected by several distinct valleys, with a slope of 31 - 40°;
- geological base: muscovite - biotite gneisses;
- soil: eutrophic cambisol, dry to fresh, covered with a thin layer of humus and leaf;
- as. Querco - Carpinetum

Pure low-stemmed single-adult plantation of the Oak Blagun (*Quercus Pubescens*). Individually there can be found oak trees of Gorun, White Hornbeam, *Quercus conferta*, Ash. The plantation is of poor quality, with drying of the oak trees and observed illegal cuttings in the area.

➤ **FMU “Topolka – Karabunishte” (Section 34a)**

- thermophilic placement;
- altitude 520 - 930 m;
- exposure – South;
- very steep side of a hill, which is intersected by several distinct valleys, with a slope of 31 - 40°;
- geological base: muscovite - biotite gneisses;
- soil: eutrophic cambisol, dry to fresh, covered with a thin layer of humus and leaf;
- as. Querco - Carpinetum

Pure low-stemmed single-adult plantation of the Oak Blagun (*Quercus Pubescens*). Individually there can be found oak trees of White Hornbeam, *Quercus conferta*, Ash. The plantation is of poor quality, with drying of the oak trees and observed illegal cuttings in the area. It was burned during the previous economic-management period.

➤ **FMU “Topolka – Karabunishte” (Section 36b)**

- thermophilic placement;
- altitude 450 - 550 m;
- exposure – West;
- steep side of a hill, with a slope of 21 - 30°;
- geological base: muscovite - biotite gneisses;
- soil: eutrophic cambisol, shallow, dry to fresh, covered with a thin layer of humus and leaf;
- as. Querco - Carpinetum

Pure low-stemmed single-adult plantation of the Oak Blagun (*Quercus Pubescens*). Individually there can be found oak trees of Hornbeam, *Quercus conferta*, Ash. The plantation is of poor quality, with drying of the oak trees and observed illegal cuttings in the area.

7. FINDINGS FROM THE SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING ON THE MUNICIPALITIES OF CHASHKA AND VELES

7.1 Analysis of the answers from the questionnaires

For the needs of this Socio-economic survey, a semi-structured questionnaire was designed with carefully selected sets of questions to obtain the necessary qualitative and quantitative information by the key informants of the survey target organizations. Accordingly, a comprehensive analysis and report is prepared to focus on understanding the local context and survey target organization needs, identification of the existing situation, as well as the identification of plans and perspectives of the involved institutions in correlation with the goals and intentions of the Eco-DRR project on the territory of the municipalities of Chashka and Veles.

In parallel with the formulation of the questionnaire, a Guide for answering was created for each organization separately, where the necessary instructions and directions were given to the key informants to provide an adequate understanding of the questions and identical approach in the formulation of the answers. Within the possibilities and limitations related to the current situation with the COVID-19 pandemic, preparatory meetings were held with representatives of each involved organization as mentioned in the introductory section of this report.

The content of the Questionnaire consists of precisely formulated questions, which were grouped into the following 5 categories²⁴:

- I. Personal information;
- II. Information about the organization;
- III. Target-oriented questions for each organization;
- IV. Other questions, and
- V. Information regarding the Eco-DRR Project.

The structure of the questionnaire was designed for a comprehensive approach in collecting the necessary information related to several aspects. The first and second groups of questions are related to information about the employees who represent the organization and information about each organization involved. The third group of questions contains purposefully formulated questions that are related to the competencies and responsibilities of each institution separately. The fourth group contains questions related to subsidies and investments in the field of Eco-based DRR solutions, while the fifth group of questions is related to the information that the involved organizations have about the ongoing Eco-DRR project.

According to the content of the formulated categories of questions, it can be concluded that the first, second, fourth and fifth groups are questions of identical character and as such are included in the structure of the questionnaires for all covered institutions. Only the third group of questions that has a

²⁴ The structure of the Questionnaire for the Association of Utility Service Providers (ADKOM) is slightly different from the others due to the nature of their mission.

specific character depending on the competencies and responsibilities of each institution has different questions to obtain the necessary information for each involved organization.

Following the pre-prepared plan for the execution of the survey, the involvement of a total of 15 organizations was envisaged. During the preparatory meetings with the municipalities of Chaska and Veles, it was concluded that there are no special local irrigation authorities in both municipalities and instead the National Irrigation Authority (AD Vodostopanstvo) was additionally contacted and involved. Also, it was concluded that on the territory of the Municipality of Chashka there no other organizations/institutions/CSOs that can participate in the survey, so it proceeded to interview the relevant CSO from the Municipality of Veles.

The necessary administrative and organizational support for the realization of this survey was provided by the Crisis Management Center, by sending an official letter to the involved institutions, with attached project information, questionnaire and guidelines on how to respond. The CMC also scheduled preparatory meetings with all involved organizations to discuss the purpose and expectations of the Socio-economic survey. The structure of the questionnaire and the content in the context of all groups of questions were explained in more detail. Due to the situation with the COVID-19 virus, instructions were given for Internet-based interviews. Table below shows the List of invited survey target organizations:

No.	Name of the survey target organizations
1	Public Enterprise Hydro System Lisiche
2	Municipality of Chashka
3	Public Enterprise for Communal Affairs - Topolka Chaska
4	RCMC Veles
5	Municipality of Veles
6	Public Community Enterprise Derven Veles
7	ADKOM - Association of Utility Service Providers
8	PE NF Regional Branch Office “Babuna” - Veles
9	PE National Forests
10	National Irrigation Authority AD Vodostopanstvo
11	Other organizations/CSO Vila Zora - Veles
12	Small hydropower plants Topolka

Table 13 - List of invited survey target organizations

Below presented Table and Chart 1, provide a complete overview of the organizations involved, the number of questionnaires submitted to them, as well as the number of answered questionnaires received by them. From the content, it can be noticed that the survey covered 12 organizations, 9 of which are from the local level in the municipalities of Chaska and Veles, two institutions from the national level and one Association. A total of 31 respondents were included and 31 questionnaires were sent by e-mail. One organization did not participate in the survey (Small hydropower plants Topolka) and one organization did not answer one questionnaire (PE NF Regional Branch Office “Babuna” - Veles), which means that 29 questionnaires or 94% were answered. The acquired number of answered questionnaires will be further

analyzed in detail for the qualitative and quantitative objectives of this survey. All answers are summarized in Annex IV.

No.	Name of the survey target organizations	No. of Questionnaires Submitted	No. of Interviews conducted	%
1	Public Enterprise Hydro System Lisiche	4	4	
2	Municipality of Chashka	3	3	
3	PCE Topolka - Chashka	4	4	
4	RCMC Veles	3	3	
5	Municipality of Veles	5	5	
6	PCE Derven Veles	3	3	
7	ADKOM	2	2	
8	PE NF Regional Branch Office “Babuna” - Veles	3	2	
9	PE National Forests	1	1	
10	National Irrigation Authority AD Vodostopanstvo	1	1	
11	Other organizations/CSO Vila Zora - Veles	1	1	
12	Small hydropower plants Topolka	1	0	
Total:		31	29	94

Table 14 - List of invited survey target organizations and the number of submitted and answered questionnaires/conducted interviews

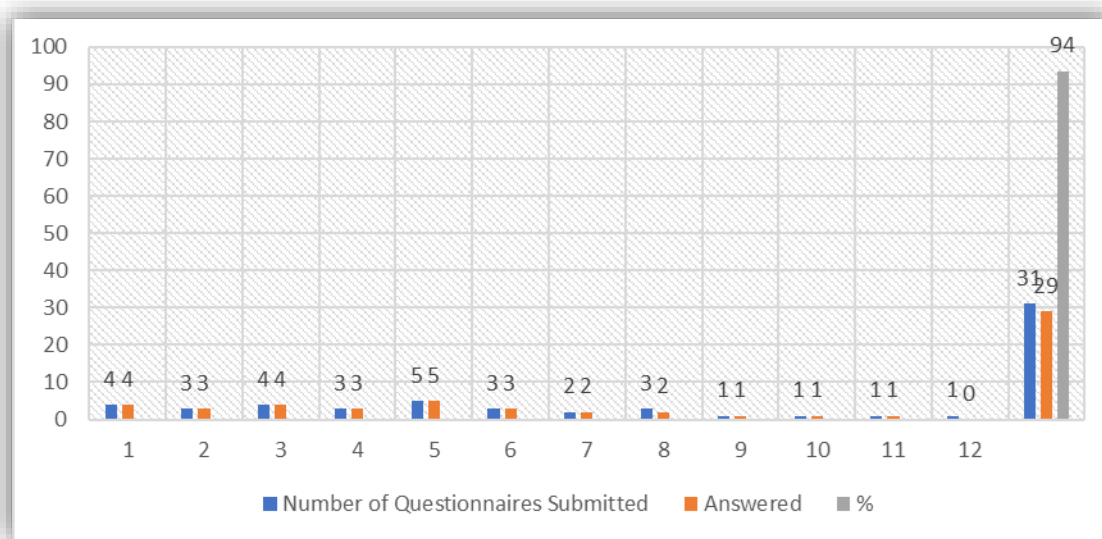


Chart 1: Invited survey target organizations and number of submitted and answered questionnaires

7.2 PART I - PERSONAL INFORMATION

The first part of the Questionnaire contains a group of questions for all involved organizations related to personal information about the respondent, such as name (optional), position in the institution, work experience (in years), gender, age group, nationality and level of education. These questions should provide an overview of the capacity of the respondent involved in the research to ensure the relevance of the information relating to the organization they represent.

1. Position in the institution

The position of the respondent that he/she has in the institution for this analysis is placed in the following 5 categories: mayor, director/manager, head of department/unit, advisor/expert/engineer and associate/assistant. From *Chart 2 (Position of the respondent in the institution)* can be seen that most of the respondents (13 or 45%) belong to the category advisor/expert/engineer, 7 or 24% are head of department or unit, 5 or 17 % are directors, 2 mayors of the municipalities of Cashka and Veles and 2 respondents from the category associate or assistant. Such distribution of the respondents according to their positions in the institutions provides a good basis for obtaining appropriate information on the competencies, activities and responsibilities of the institutions they represent.

Position in the institution

No.	Position	No.	%
1	Mayor	2	7
2	Director/Manager	5	17
3	Head of department/unit	7	24
4	Advisor/ expert/ engineer	13	45
5	Associate/ assistant	2	7
	Total	29	100

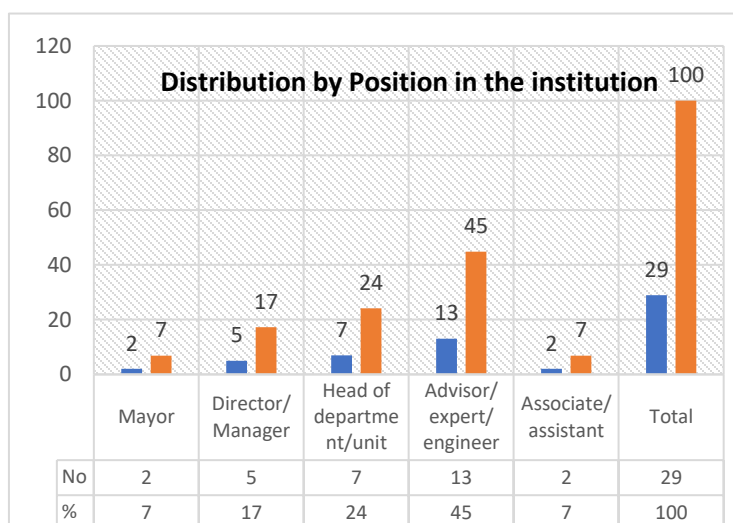


Chart 2: Position of the respondent in the institution

Table below shows a detailed overview by positions of the respondents within the institutions they represent, by categories of positions and by organizations.

No.	Name of the invited organizations	Position in the institution					Total
		Mayor	Director/ Manager	Head of department/unit	Advisor/ expert/ engineer	Associate/ assistant	
1	PE Hydro System Lisiche		1	1	2		4
2	Municipality of Chashka	1			1	1	3
3	PCE Topolka Chaska		1	1	2		4
4	RCMC Veles			1	2		3
5	Municipality of Veles	1		1	3		5
6	PCE Derven Veles		1	1	1		3
7	ADKOM		1	1			2
8	PE NF Babuna Veles		1		1		2
9	PE National Forests				1		1
10	National Irrigation Authority			1			1
11	Other organizations Veles					1	1
12	Small hydropower plants Topolka						0
	Total	2	5	7	13	2	29

Table 15 - Detailed review by position of the key informants in their respective organizations

1.1. Length of service (work experience)

Length of service or work experience of the key informants (in years) was in the range of 1 to 40 years. On the Chart 3 is presented an overview of Length of service (in years), distribution by category, while Table provides a detailed overview of Length of service of the respondents (in years), by category and organization. Accordingly, it is obvious that 13 or 45% of the respondents have a length of service in the category of 11-20 years, 4 respondents or 14% belong to two categories of 21-30 and 31-40 years and in the youngest category of work service from 1-10 years, belong 8 respondents or 28%.

Length of service

No.	Category	No.	%
1	1-10	8	28
2	11-20	13	45
3	21-30	4	14
4	31-40	4	14
	Total	29	100

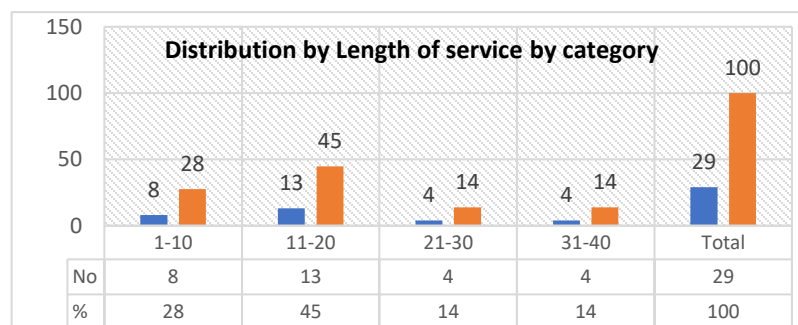


Chart 3: Length of service of the key informants (in years) & distribution by category

No.	Name of the invited organizations	Length of service (in years)				
		1 - 10	11-20	21-30	31-40	Total
1	PE Hydro System Lisiche		2	1	1	4
2	Municipality of Chashka	2	1			3
3	PCE Topolka Chaska	1	1	2		4
4	RCMC Veles	2			1	3
5	Municipality of Veles		3	1	1	5
6	PCE Derven Veles	1	2			3
7	ADKOM	1	1			2
8	PENF Babuna Veles	1			1	2
9	PE National Forests		1			1
10	National Irrigation Authority		1			1
11	Other organizations Veles		1			1
12	Small hydropower plants Topolka					0
	Total	8	13	4	4	29

Table 16 - Length of service of the respondents (in years), by category and organization

The presented data regarding the length of the service indicate that the key informants have solid work experience and valuable expertise in their organizations and therefore it can be expected that their answers to the questionnaire will be highly relevant.

2. Gender

The analysis of the questionnaires according to gender indicates that out of a total of 29 answered questionnaires, 17 respondents or 59% were female and 12 respondents or 41% were male (Chart 4). From this structure of the respondents, can be concluded that the gender component is highly represented within the involved organizations with women included in the expertise areas. From the detailed analysis of gender by organizations presented in Table below it can be seen that in four organizations 100%, in one 80% and two 67% of the respondents are female.

Gender			
No.	Category	No.	%
1	Male	12	41
2	Female	17	59
3	Total	29	100

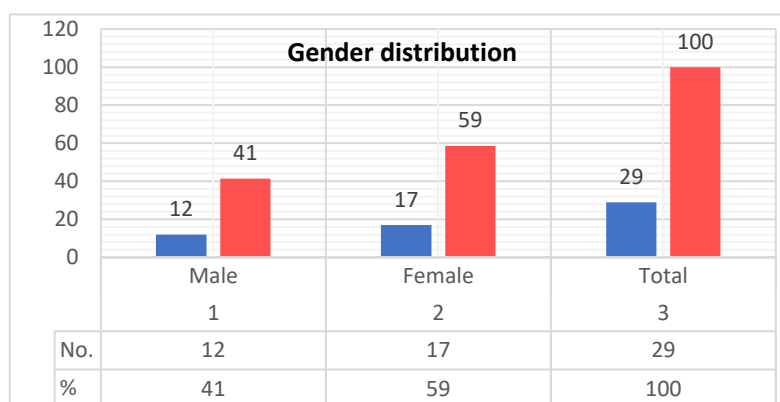


Chart 4: Gender Participation

No.	Name of the invited organizations	Answered	Male		Female	
			No.	%	No.	%
1	PE Hydro System Lisiche	4	3	75	1	25
2	Municipality of Chashka	3	2	67	1	33
3	PCE Topolka Chaska	4	3	75	1	25
4	RCMC Veles	3	1	33	2	67
5	Municipality of Veles	5	1	20	4	80
6	PCE Derven Veles	3	1	33	2	67
7	ADKOM	2	0	0	2	100
8	PENF Babuna Veles	2	0	0	2	100
9	PE National Forests	1	0	0	1	100
10	National Irrigation Authority	1	1	100	0	0
11	Other organizations Veles	1	0	0	1	100
12	Small hydropower plants Topolka	0	0	0	0	0
Total:		29	12	41	17	59

Table 17 - Detailed overview of gender participation by involved organizations

The presented data regarding the gender participation in this survey shows a high percentage of women experts in the participating survey target organizations with relevant knowledge on the subjects of the survey. Besides, it provides a foundation for their further participation in the project activities ensuring that their needs, capacities and professional expertise and knowledge shall be utilized. Furthermore, they can act as agents of change for Eco-DRR measures and overall community resilience, “leaving no one behind”.

3. Age group

Section 1 of the Questionnaire - Personal information provides a question regarding the age group of the key informants. The question identified five age groups in the range of 18 to 65 years of age. The respondent had the opportunity to select the group to which his/her ages belongs. The results of the conducted analysis of the obtained answers are shown on Chart 5 and Table below. Most of the respondents belong to the age groups of 36-45 and 46-55, nine (9) in each or total 18 or 62%. The age group of 56-65 includes 8 respondents or 28%, while the age group of 25-35 has 3 respondents or 10%. No respondents were registered in the first age group of 18-24.

If the results of the analysis are summarized, it can be seen that 90% of the respondents belong to the age group of 25-65 and even 62% to the range of 35-65. If a correlation is made with the data on the length of the service and the age groups to which the respondents belong, it is concluded that their answers are highly relevant for the survey and the needs related to the subject.

Age group			
No.	Category	No.	%
1	18 - 24	0	0
2	25 - 35	3	10
3	36 – 45	9	31
4	46 – 55	9	31
5	56 – 65	8	28
	Total	29	100

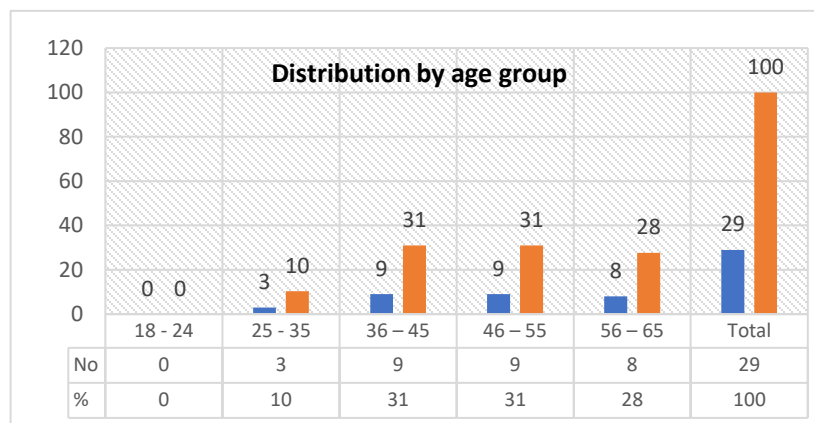


Chart 5: Age group participation

No.	Name of the invited organizations	Age group					
		18 - 24	25 - 35	36 – 45	46 – 55	56 – 65	Total
1	PE Hydro System Lisiche			1	2	1	4
2	Municipality of Chashka		1	2			3
3	PCE Topolka Chaska		1		2	1	4
4	RCMC Veles			2		1	3
5	Municipality of Veles				2	3	5
6	PCE Derven Veles				2	1	3
7	ADKOM		1		1		2
8	PENF Babuna Veles			1		1	2
9	PE National Forests			1			1
10	National Irrigation Authority			1			1
11	Other organizations Veles			1			1
12	Small hydropower plants Topolka						0
	Total:	0	3	9	9	8	29

Table 18 - Detailed age group participation by key informants from the involved organizations

4. Ethnic affiliation

The applied questionnaire anticipates an issue of ethnicity as a result of the multinational structure of the Macedonian society. The questionnaire had predefined the mainly represented ethnic groups in five categories and additionally a category for others. The respondent had the option to select which category belongs to. According to the results of the analysis of the questionnaires shown in Chart 6, it can be seen that the majority of respondents, i.e. 28 in total or 97% belong to the Macedonian nationality and one respondent belongs to the Albanian community. This result is related to the general demographic

structure and especially the representation of the ethnic communities in the areas of the municipalities of Chashka and Veles, where the Macedonian nationality is dominant (81%).

Ethnic affiliation

No.	Category	No.	%
1	Macedonians	28	97
2	Albanians	1	3
3	Turks	0	0
4	Bosniaks	0	0
5	Roma	0	0
6	Other	0	0
	Total	29	100

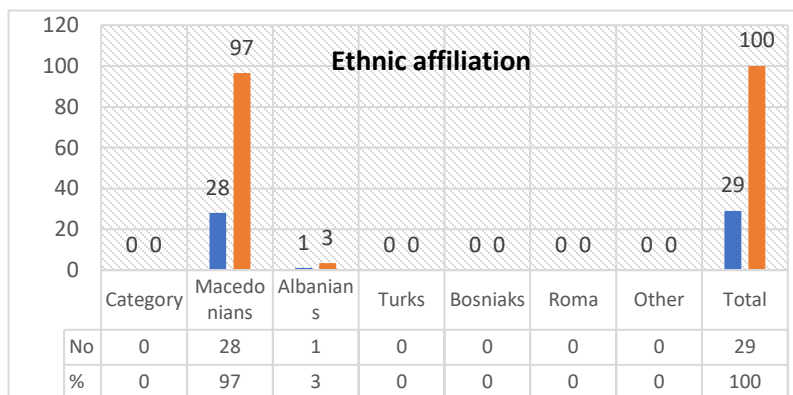


Chart 6: Ethnic affiliation

5. Level of education

The last question from section 1 of the Questionnaire related to the level of education of the key informants. The level of education was provided in four groups: primary, secondary, university or higher and other, following the national classification. The analysis of the questionnaires presented in Chart 7 shows that 25 respondents or 86% have university education, 4 respondents or 14% have secondary education. There is no registered respondent in the group of primary education. The majority of respondents have a university education which is an additional indicator of their competence and further relevance to their answers to the other questions in the questionnaire.

Level of education

No.	Category	No.	%
1	Elementary	0	0
2	Secondary	4	14
3	University and higher	25	86
4	Other	0	0
	Total	29	100

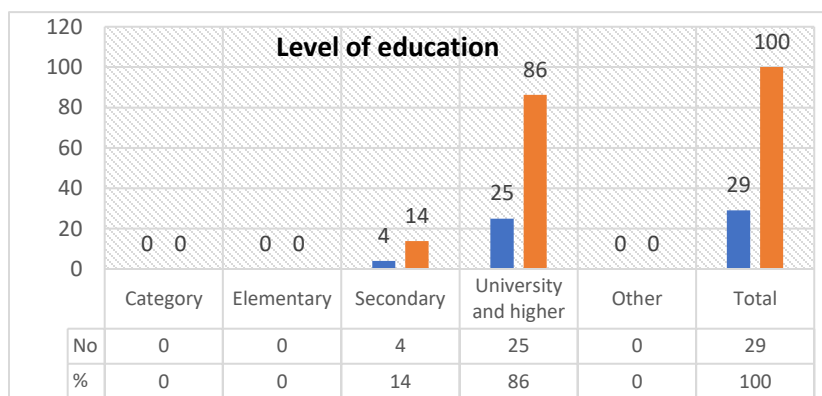


Chart 7: Level of education

7.3 PART II - INFORMATION ABOUT THE SURVEY TARGET ORGANIZATIONS

The second part of the Questionnaire contains a group of questions related to information about the survey target organizations involved in this Eco-DRR survey. The purpose of these questions is to collect general information about each organization that will be further correlated with questions from other parts of the questionnaire.

This section contains the following questions:

1. Date of establishment of the organization;
2. Number of employees;
3. Annual income/budget;
4. Competencies of the organization, and
5. Obligations and responsibilities of employees.

Based on the analysis of the questionnaires, a summary table was prepared where the results of all questions for each organization involved in the research are presented (please refer to Table below).

1. Date of establishment of the organization:

- **Public Enterprise National Forests** was established in 1998 as the main entity responsible for the overall forest management in the country.

- **Local branch of PENF “Babuna” - Veles:** Regarding the Date of establishment of this organization, from the summary table it can be seen that it is the oldest organization by date of establishment in the survey and it was established in 1946 as an independent forest management organization for the area that territorially covers. At the end of the last century, with the reforms in the national forestry system, the Regional Branch Office “Babuna” - Veles became an integral part of the Public Enterprise “National Forests”.

- **Public Enterprise “Hydro System Lisiche” - Veles,** initially was established in 1991 to manage the works for the construction of the dam and the complete hydro system, which was completed in 2007. In 2011 the founding decision was amended and the Lake Mladost which is located in the vicinity of Veles also was placed under the management of PE Lisice.

- **Municipalities of Chashka and Veles** – Municipality of Veles is with older tradition since it was established as Titov Veles established after the World War II and as Veles was established in 1996 when the name was changed without the prefix, Titov. In the survey is mentioned that the date of establishment is 2005 as per the Law on Local self-governance and the latest territorial division in the country and the Municipality of Veles. On the other hand, the Municipality of Chashka is established in 1996 as per the territorial division in that time.

- **Regional Crisis Management Centre in Veles** is established in 2005 as per the Law on crisis management (29/05) when the crisis management system in the country was established, alongside the Crisis Management Centre and its regional centres.

- **Public communal utilities in Chashka and Veles** – PCE Derven – Veles is the older one, being established in 1989, whether the PCE Topolka – Chashka was established in 1999 following the establishment of the Municipality of Chashka and needs for own public communal utility.

- **NGO Vila Zora – Veles** is one of the oldest civil society organizations in the country and it is established in 1992, only six months after the Republic of Macedonia gained its independence from the former Yugoslavia.

- **ADKOM** was established in 2015 following the last reforms in the water governance sector and as an association of the utility service providers on the territory of the country.

- Finally, during the same year, 2015, the **National Irrigation Authority – AD Vodostopanstvo** was established as a result of the liquidation of the former irrigation authority on central and local level and the new concept of irrigation organization.

2. Number of employees:

When it comes to the number of employees in the survey target organizations involved in this survey, the largest number of employees have the two national public companies, PE NF - 2,274 and AD Vodostopanstvo - 601. From the local organizations, the largest number of employees has the Municipality of Veles (104) and the PCE Derven (297). “Babuna” has 85 employees, the Municipality of Chaska has 21, and the Public Utility Company-Topolka has 23 employees. Consequently, PE Lisiche Hydro system has 27 employees and ADKOM and NGO Villa Zora have 3 employees each.

3. Annual income/budget:

The PE NF has the highest annual allocation out of all participating organizations (5,918,792,814 MKD or 114,972,665 USD). It is followed by the Municipality of Veles (932,930,000 MKD or 18,122,183 USD), PCE Derven Veles (194,467,000 MKD or 3,777,525 USD), Municipality of Chaska (136,585,000 MKD or 2,653,166 USD), “Babuna” – Veles (70,000,000 MKD or 1,359,751 USD), PE Lisiche Hydro System (46,350,000 MKD or 900,349 USD), PCE Topolka (12,500,000 MKD or 242,812 USD) and the NGO Vila Zora (2,386,600 MKD or 46,359 USD). RCMC Veles as a part of the centralized system of the Crisis Management Centre does not have its annual budget but is receiving monthly instalments for covering of the necessary operational activities and ADKOM and the National Irrigation Authority have not answered this question.

Specifically, there was no sub-question on the allocations of these budgets as per main areas of competences or specific allocation for nature conservation or DRR related activities, but it is general understanding is that the majority of funds are allocated for essential competencies of the organizations. In the country, there is no system of DRR/resilience-related budgeting or allocation of funds.

4. Competencies of the organization:

Competencies of the involved organizations arise from their legal framework that governs their establishment and operations.

- **PE Hydro System Lisiche**: Water collection, treatment and supply. Main purpose of the Lisiche Dam is for water supply, flood protection, irrigation and electricity production with small HPPs.

- **Municipalities of Chaska and Veles**: Fulfillment of all competencies arising from the Law on Local Self-Government (05/2002) – Article 22 (List of Competencies):

- Urban (urban and rural) planning, issuance of building permits for local significance determined by law, landscaping and landscaping;

- Protection of the environment and nature, measures for protection and prevention of pollution of water, air, land, protection of nature, protection of noise and non-ionizing radiation;
- Local economic development-planning of local economic development; determining development and structural priorities;
- Conducting local economic policy;
- Supporting the development of small and medium-sized enterprises and entrepreneurship in local and local context, participating in the establishment and development of local network institutions and agencies and promoting partnerships;
- Communal activities - supply of drinking water; the delivery of the technological water; drainage and treatment of wastewater; public lighting; drainage and treatment of storm water; maintaining public cleanliness; collecting, transporting and handling municipal solid waste and technological waste; arranging and organizing the public local passenger routes; natural gas and thermal energy supply; maintenance of graves, cemeteries, crematoriums and funeral services; construction, maintenance, reconstruction and protection of local roads, streets and other infrastructure facilities; regulation of traffic regime; construction and maintenance of public parking space; removal of illegally parked vehicles; removal of crashed vehicles from public areas; construction and maintenance of markets; cleaning the chimneys; maintenance and use of so-called urbanized parts; determining the names of streets, squares, bridges and other infrastructural objects;
- Culture - institutional and financial support of cultural institutions and projects; nurturing folklore, customs, old crafts and similar cultural values; organizing cultural events; encouraging a variety of specific forms of creativity;
- Sports and recreation - the development of mass sports and recreational activities; organizing sports events and manifestations; maintenance and construction of sports facilities; support for sports unions;
- Social protection and protection of children-kindergartens and nursing homes (ownership, financing, investments and maintenance); realization of social care for the disabled person; childless children and parental care; children-educational-social problems; children with special needs; children of parental families; children street; persons exposed to social risk; persons affected by drug and alcohol abuse; raising the awareness of the population; housing at social risk; realization of law and upbringing of children from preschool age. Exercising these competencies per the National Program for Development of Social Protection;
- Education - establishment, financing and administration of primary and secondary schools, in cooperation with the central government, per the law, organizing transportation and food for students and their accommodation in student dormitories;
- Health care - management of the network of public health organizations and facilities from primary health care that should include representation of the local self-government in all the boards of the health organizations in the public property, the health education; health promotion; preventive activities; protection of workers' health and protection of work; health surveillance environment; surveillance of infectious diseases; assisted patients with special needs (for example, mental health, child abuse, etc.) and other areas that will be established by law;
- Carrying out the preparations and undertaking measures for protection and rescue of the citizens and the material well-separated demolition, natural disasters and other accidents and the consequences caused by them;
- Fire protection performed by territorial firefighting units;

- Supervising the execution of the work within its competence. Makes elections, appointments and dismissals determined by law.
- Other work specified by law.
 - **PCE Topolka and PCE Derven Veles:** Water supply and collection and drainage of wastewater; communal services, removal and disposal of garbage; city markets and fairs; arrangement of public traffic areas, parks and greenery; maintenance of cemeteries; construction of facilities for water supply and other competencies related to the Law on Communal Activities.
 - **RCMC Veles:** Monitoring of the situation, informing, exchanging data and information, giving proposals for crisis management, undertaking activities for prevention and early warning in case of crisis, coordination in the exchange of data and information and preparation of an Assessment and its update. Responsible for territory of three municipalities: Veles, Chashka and Gradsko.
 - **ADKOM:** Promotion of the communal activity in North Macedonia through the public utility companies that are members of ADKOM. ADKOM has 87 PCE members. The competencies of ADKOM are aimed at improving the quality of utilities, efforts in the area of successful implementation of reforms in the communal activity, identification of problems faced by PCEs and their solution, organizing expert consultations, conferences, providing information in the part of the communal sphere for the members, preparation of proposals for improvement of the existing legal framework that refers to the communal activity including representation, representation and lobbying of the PCE before the central and local government.
 - **PE NF** - Management of national forests in public ownership on a whole territory of the country.
 - **“Babuna” - Veles:** Management of national forests in public ownership on the territory of the regional branch office.
 - **National Irrigation Authority:** AD Vodostopanstvo maintains and manages the irrigation and drainage systems in general, due to Irrigation water supply; Water supply to a utility company for human consumption (drinking water and other needs); Water supply for industrial and technological (economic) needs, including electricity generation); Arrangement of riverbeds; Land drainage and - Drainage of drained water To ensure efficient operation of the system; perform protection and defence against floods per the Law on Waters, Build and maintains facilities for protection and defence against flood; Builds and maintains facilities for prevention and protection against erosion; Build and maintains facilities for arranging rivers and torrents and performs other activities per the law. In total 12 branches have been established throughout the whole territory of the Republic.
 - **NGO Villa Zora** is a non-governmental, non-profit organization, dedicated to protecting the environment. Main activities include education, protection, prevention and solving environmental problems related to pollution of air, soil and water.

5. Obligations and responsibilities of employees: arise from the rules for internal organization of the work of the institutions, education and competencies of the employees.

A summary of all information related to the organizations is presented in the Table 19 below:

“Socio-economic Survey on Eco-DRR related information focusing In Chaska and Veles”
(Draft Report)

#	Name	Date of establishment	No. of employees	Annual income/budget (MKD)	Competencies of the organization
1	PE Hydro System Lisiche	01/09/1991	27	46,350,000	Water collection, treatment and supply. Main purpose - water supply, flood protection, irrigation and electricity production.
2	Municipality of Chashka	1996	21	136,585,000	Fulfilment of all competencies as per the Law on Local Self-Government.
3	PCE Topolka Chaska	27/01/1999	23	12,500,000	Water supply and collection and drainage of wastewater; communal services - removal and disposal of garbage; city markets and fairs & other.
4	RCMC Veles	05/10/2005	6	Centralized funding from CMC	Monitoring of the situation, informing, exchanging data and giving proposals for crisis management. Responsible for territory of 3 municipalities: Veles, Chaska and Gradsko.
5	Municipality of Veles	1996	104	932,930,000	Fulfilment of all competencies as per the Law on Local Self-Government.
6	Public utility enterprise, Derven Veles	05/12/1989	297	194,467,000	Water processing, distribution to the users and maintenance of the facilities and equipment from the water supply system. Acceptance and drainage of faecal water and maintenance of the sewerage network.
7	ADKOM	08/04/2004	3	n/a	The competencies of ADKOM are aimed at improving the quality of utilities, efforts in the area of successful implementation of reforms in the communal activity, identification of problems faced by PCEs and their solution, organizing expert consultations, trainings.
8	PENF Babuna Veles	1946	85	70,000,000	Management of national forests in public ownership on a territory of the local branch Babuna-Veles
9	PE National Forests	1998	2,274	5,918,792,814	Management of national forests in public ownership on a whole territory of the country
10	National Irrigation Authority	2015	601	n/a	Maintainance and management the irrigation and drainage systems, Irrigation water supply; Arrangement of riverbeds; Builds and maintains facilities for prevention and protection against erosion, arranging rivers and torrents, etc.
11	NGO Vila - Zora	20/04/1992	3	2,386,600	Environmental association "Vila Zora" Veles is a non-governmental, non-profit organization, dedicated to protecting the environment.

7.4 PART III - TARGET-ORIENTED QUESTIONS FOR EACH ORGANIZATION

In this section of the survey questionnaires, target-oriented questions were asked for each survey target organizations in the following manner:

- **PE Lisiche Hydro System - DAM** (Basic information, activities, conservation of the natural environment (forest, river, water) around the dam, disasters around the dam);
- **Municipalities of Chashka and Veles – MUNICIPALITY** (Activities, conservation of the natural environment (forest, river, water) around the dam, disaster in the city);
- **PE NF, “Babuna” – Veles – FOREST, AGRICULTURE** (Forest conservation activities in the managerial areas, disaster in the managerial areas);
- **RCMC Veles – CRISIS MANAGEMENT** (Conservation activities, disaster obstacle);
- **PCE Topolka and PCE Derven – DRINKING WATER SUPPLY** (Activities, conservation activities, disaster/obstacle);
- **National Irrigation Authority AD Vodostopanstvo – IRRIGATION BEST PRACTICES** (Activities, conservation activities, disasters affecting water supply system) & **ACTIVITIES FOR BUILDING OF CAPACITIES** (Details of capacity building activities);
- **NGO Vila Zora – Veles – OTHER LOCAL AUTHORITIES/INSTITUTIONS** (Conservation activities, disaster/obstacle);
- **ADKOM - WATER SUPPLY – BEST PRACTICES** (Activities, conservation activities, disasters affecting water supply systems) & **CAPACITY BUILDING ACTIVITIES** (Capacity building activities).

Accordingly, in the same order in the sections below the survey results from each survey target organizations are presented.

7.4.1 PE LISICHE HYDRO SYSTEM - VELES

General Information

From the PE Lisiche Hydro System – Veles four key informants participated in the survey: Director/General Manager, Head of the Department for financial, legal and general affairs, responsible civil engineer and the Microbiologist responsible for monitoring of the water quality.

III. INFORMATION FOR THE DAM

III.1. Basic information (questions 7.1, 7.2, 7.3 & 7.4)

The artificial lake (Lisiche Dam) is a part of the Lisiche Hydro System, located at the foot of the mountain Jakupica on the territory of the Municipality of Chashka near the village Lisiche. The water surface is one square kilometre and with its 25 million cubic meters of water, it is one of the medium reservoirs in the country. The main purpose of the reservoir is for water supply of 60,000 people from the municipalities of Veles and Chashka and irrigation of agricultural land. It is 60 meters deep and is located 450 meters above the sea level. In the middle of the lake, the Water intake tower is located, which is among the tallest structures for this purpose-built in the country, with a height of 70 meters. The complete project began with construction in 1987 and it was completed 20 years later, in September 2007 when the Hydro System officially started its operation. The completion of the entire project cost 65,000,000 Euro. The annual maintenance costs is 5.000.000 MKD or 97,125 USD and the life cycle is projected at 100 years.

III.2 Activities

- **Activities for stable water supply/water use/flood control (questions, 8, 8.1 & 8.2):**

- Regular activities for operational maintenance of the Hydro System, control check-up of the pipeline and other infrastructure, as well as monitoring of the water quality and implementation of response measures;
- Regularly taking care of filling the reservoir every year until the end of May/mid-June and at least up to the level that provides the retention space. This provides the required amount of water,
 - The total amount of water delivered along the pipeline to Veles for 2018 is 15,949,941 m³, while for 2019 it is 13,222,533 m³,
 - During the operation period no evidence for any water deficit and incident.

III.3 Conservation of the natural environment (forest, river, water) around the dam)(questions 9.1, 9.2 & 9.3):

➤ **Details of conservation activities**

• Comprehensive activities for conservation of the natural environment (forest, river, water) around the dam include the following measures:

- 1. Activities in the area of the narrower protection zone - Zone of strict sanitary supervision, and**
- 2. Activities in the area of the wider and wider protection zone**

1. Organization and implementation of the activities in the **narrower protection zone** are the responsibilities of PE Lisiche Hydro System - Veles and according to the "Law on Waters" and its bylaws, the Law on Environment and other legal regulations. From the beginning of operation of the water reservoir following activities are realized:

- The "Elaborate on the manner of determining and maintaining protection zones in the watershed of the Lisiche reservoir" has been prepared and decisions have been made by the councils of the municipalities of Veles and Chashka;

- Expropriation of the land in the area of the narrower protection zone was performed;
- A protective fence has been set up and maintained on the borders of this zone;
- The bottom of the reservoir before its first filling has been cleaned of all vegetation, including underground vegetative parts of woody plants;
- 24-hour security service with video surveillance has been established;
- The entry of outsiders is prohibited, i.e. the entry is allowed only for the employees and for persons with permission from the responsible person of the enterprise;
- The Lisiche Reservoir is excluded from fishing waters by a provision from the Government;
- Internal monitoring of the waters in the water reservoir Lisiche and the waters of the rivers Topolka and Vranovska has been established and is continuously carried out. It is performed through the operation of the microbiological and physicochemical laboratory in scope and dynamics defined in the "Elaborate for monitoring the Lisiche Reservoir and the watercourses that fill the reservoir";
- Water regime from the Lisiche reservoir is determined and applied according to the results of the obtained analyzes, and by using the special technical possibilities of the hydro-mechanical equipment, surface or thorough cleaning of the reservoir is performed;
- External monitoring of water quality is established and regularly conducted by external accredited professional institutions;
- The coastal part is regularly cleaned and maintained;
- All necessary measures are taken that will not directly or indirectly allow the deterioration of the existing water quality to the extent relevant for the protection of human health and increase the level of treatment for water purification.

2. On the territory of the **wider protection zone**, which covers the catchment areas of the rivers that fill the reservoir, existing protection activities are the following:

- Anti-erosion and anti-flood activities and works to control and significantly reduce the erosion processes in the catchment area to reduce to the lowest possible level the amount of erosive sediment

that enters and fills the accumulation. A "Study on the erosion of the catchment area of the reservoir" Lisiche" has been prepared with proposed measures and works for anti-erosion arrangement and in regular, legally determined dynamics, the amount of sediment in the reservoir Lisiche is measured;

- The activities for the protection of the waters from the anthropogenic influences are legally under the competences of the local self-government bodies and the central state bodies, but PE Lisiche Hydro System is actively involved in pointing out the problems, pointing out the conditions and initiating complete and complete solution of the existing problems (construction of sewerage systems and wastewater treatment stations);

- Regular monitoring of the water quality of the rivers Topolka and Vranovska along their course, until the inflow into the reservoir, by performing complete analyzes in the internal laboratories. Indication of the conditions and points of the largest sources of pollution according to the obtained results.

- All the above activities are part of the work processes in the company and take place at regular intervals, with a predetermined dynamics of execution.

- Costs: n/a.

- **Stakeholders involved in the conservation activities:**

- PE Hydro System Lisiche, Municipalities of Chaska and Veles, Government, Ministry of Agriculture, Forestry and Water Management.

- **Necessary facilities for conservation activities:**

- The overflow body, function: evacuation of waters that will exceed the level of the normal level of 422.92 meters above sea level.

- Installation costs: n/a,

- Maintenance costs: From what was seen on the spot (16.09.2020), the needs for interventions should be ascertained, and thus the costs for repairing part of the left wall from the overflow of the overflow organ,

- Life span: n/a.

III.4 Disasters around the dam (questions 10.1, 10.2, 10.3 & 10.4)

- **Disasters around the dam:**

- Frequent disasters: erosions, floods, forest fires, droughts;

- Potential disasters: flooding as a result of the dam burst, water pollution, and drought.

- **Activities of disaster prevention (contents, cost):**

- Implementation of erosion measures, regular monitoring of the water quality to prevent pollution and water deficit.

SUMMARY OF FINDINGS:

- PE Lisiche Hydro System is implementing nature conservation activities on a stand-alone basis and as a part of its competences. Multi-stakeholder approach in the natural conservation and risk reduction is needed since most of the hazards are deriving from the areas that are not under the responsibilities of the PE.

- Key informants were knowledgeable about the subjects of the survey, but without with deeper understanding of the concepts of Eco-DRR or risk reduction. Therefore, it is needed to conduct additional sensitizations sessions to increase their awareness and to gain essential skills how to mainstream them in their work.

- No major disastrous events or water deficit incidents have happened since the start of the operation of the hydro system. Nevertheless, there is ongoing erosion and sediment transportation to the lake waters, as well as forest fires in the vicinity of the lake. Therefore it is necessary to implement regular measure for their mitigations.

- Responsibility of the PE is only within the area under their competence and because the areas beyond them are either managed by “Babuna” – Veles or the national/local government, the main approach on protection of the hydro system shall be based on a multi-sector, multi-stakeholder approach with involvement of all necessary entities. This project could be a blueprint of how to plan and implement disaster risk reduction measures in an inclusive and participatory approach.
- PE Lisiche Hidro System has not established a subsidy system for nature conservation and disaster response, as well as the investable amount for nature conservation and disaster response. Financial resources are limited to sustainably mainstream them into their strategic policies and operational planning.
- Regarding the expectations from the project, the answers from the questionnaire show that PE Hidro System Lisice are well informed about the activities and intentions of the project and had certain short-term and long-term expectations.
- Another opportunity for synergy and mainstreaming of Eco-DRR measures is the implementation of the KFW funded loan on extension of the hydro system (2nd phase) and construction of three small hydropower plants owned and operated by the PE i.e. one on the Vranovska River and two on the discharge from the dam (3rd phase).

7.4.2 MUNICIPALITIES OF CHASHKA AND VELES

General Information

From the Municipality of Chashka, three key informants took place in the survey (Senior Associate for Health, Social, Civil Protection and Crisis Management; the Mayor and the associate for urbanism), whether from the Municipality of Veles five key informants were interviewed (the Mayor, Advisor for construction and maintenance of the communal infrastructure, Advisor for preparation of urban planning documents, Head of the Unit for protection of the environment and Advisor in the Unit for EU integration and LED).

➤ ***Municipality of Chashka*** - The Sector for urbanism, local economic development and public activities (Unit for LED and Public Activity Department) is competent for emergency management/disaster prevention (***question 6.5***). One person has responsibilities for emergency management/disaster prevention and his educational background is pedagogical (class teacher) with 13 years of working experience (***questions 6.5.1, 6.5.2***). His responsibilities are for monitoring of the situation and organizing activities for prevention, reduction of risks and organization of activities in the field of civil protection and crisis management (***question 6.5.3***).

➤ ***Municipality of Veles*** – It has a more complex structure than the other municipality. Directly responsible is the *Department for Urbanism, environment protection, communal affairs, euro integration and LED – Unit for communal affairs and traffic* is competent for emergency management/disaster prevention. Additionally, within the framework of the *Department for legal and general affairs, public activities, public procurement, information technology and support of the Mayor* there is an employee with competencies for protection and rescue and crisis management. As the main resource for the overall response and search and rescue is the Territorial Fire Brigade. Also, selected economic operators can provide their internal resources for prevention, response or liquidation of consequences. Furthermore, as the main operational-expert body on the territory of the municipality, a *Municipal Crisis Headquarter* is established and it consists of the Mayor and representatives from the following institutions: Ministry of Interior – Police Department Veles, RCMC Veles, PRD Regional Unit Veles, the Army, PCE Derven, the Institute for Health Protection – Center for Public Health in Veles, Territorial Fire Brigade, municipal administration and other persons as needed. (***question 6.5***). The number of responsible staff is presented with three different statements: 10, 8 (7 experts from the Unit for communal affairs and traffic + 1 Associate for protection and rescue), as well

as 36 (including the firefighters from the Territorial Fire Brigade (**question 6.5.1**). Responsible staff are engineers and firefighters with diploma (**question 6.5.2**). The Associate for protection and rescue has the responsibilities to organizes and coordinates the activities in the field of protection and rescue, coordinates the activities in the field of protection and rescue, fire protection, crisis management and proposes directions according to which the competent bodies on the territory of the municipality are obliged to act; participates in the work of the municipal headquarters for protection and rescue; participates in the preparation of acts and strategic documents per the Law on Protection and Rescue, the Law on Firefighting and the Law on Crisis Management and depending on the competencies of the local self-government per the Law on Protection and Rescue. Furthermore, the conclusions from the Crisis Staff are realized in the field by issuing work orders to selected economic operators to eliminate the consequences of the harmful event (**question 6.5.3**).

Municipality of Chashka	Municipality of Veles
III.1 Activities	
7.1 Activities for stable water supply/water use/ flood control:	
The hydro system (dam) is managed by PE Lisiche Hydro System, which controls the water level in the system and the discharge of water into the river Topolka due to flood protection. The Municipality uses water only for irrigation of agricultural areas through a built pipeline and for flood protection cleans the riverbed of the river Topolka.	Water supply, construction of water supply systems, drainage and wastewater treatment, construction of drainage and wastewater treatment systems, early warning for floods provided by the national institutions, regular monitoring for floods, cleaning of riverbeds, irrigation channels, storm-water channels and other activities.
7.2.1 Total population:	
7,673 (2002 Census)	51,108 (Census 2002)
7.2.2 Number of households:	
2,185 (2002 Census)	17,000 (Census 2002)
7.2.3 Number of settlements/villages:	
42	30
7.2.4 Religion:	
Orthodox, Islam, Catholics	80% Christian and 20% Muslim
7.2.5 Average annual income per household:	
n/a	436,628 MKD (8,482 USD) as per the official statistics for 2018 (average) on national level
7.2.6 Average annual income per citizen:	
n/a	119,284 MKD (2,317 USD) - Official statistics for 2018
7.2.7: Annual budget for activity 7.1:	
n/a	11,430,000 MKD or 222,028 USD
7.3 Urban planning, mountain area conservation planning, mountain area development planning - exists or not:	
There is no urban planning for the protection of the mountain landscapes and planning for their development by the local self-government. MoEPP has proposed the National Park Jakupica to be established.	No - urban planning is done only for areas in the urban and rural parts of the municipality. Outside these areas, it is regulated with the Spatial Plan or through extraordinary plans for exact locations. Planned funds for 2020 for urban planning are of 4,200,000 MKD or 81,585 USD.

Municipality of Chashka	Municipality of Veles
7.4 Main agricultural and industrial activities:	
Growing tobacco, cereals, rice, orchards, nuts, vineyards Greenhouses Agronimex Settlement Chashka ²⁵	Growing of cereals, early vegetable products and vineyards, metal, technical, automotive, textile, agroindustry industry. Largest industrial facilities: Metal industry Brako, Markarta - automotive parts, Leov Company and Dinamo Hit - electrical industry, Dimko Mitrev - leather, Alena and Juka - textile, Rontis - plastic plastics, Blagoj Gjoreva A (23) Premena (23) - food, MISA-MG and Technopaver mineral industry, Zegin winery, Macedonia Road, etc.
7.5 Agricultural products and quantity (past data):	
The data are given in the following document: ²⁶	Wheat: 2017 1,731 tons, 2018 2,957; Barley: 3,611 tons, 4,497 tons; Corn: 265 tons; Grapes: 2,340 tons, 2018 2,622 tons. See the table in the original Questionnaire.
7.6 Breakdown of income and expenses:	
n/a	n/a
7.7 Foreign countries' support – exists or not:	
No	In general, No, only on some project level. Various projects financed by the World Bank, UN, UNDP, USAID, Swiss Development Cooperation, etc. for various sectors e.g. good governance, infrastructure, local economic development, environment, increasing employability, support to education, youth, etc. In general, projects are implemented on the national level with some components done in the municipality.
III.2 Conservation of the natural environment (forest, river, water) around the dam	
8. 1 Details of conservation activity/activities:	
No activities	All activities for protection of the dam are carried out by PE Lisiche Hydro System, and for the forest area around the dam, PE National Forests – Regional Branch office Babuna – Veles, whether the river is under the responsibility of ministries, municipalities.
8. 2 Stakeholders involved with conservation activities:	
n/a	Macedonian forests that conduct afforestation in the area around the dam. Municipal headquarters for protection and rescue, which is composed of Commander. The headquarters holds sessions as needed and brings conclusions for further action and singing about the accidents. PE Lisiche Hydro System, Babuna - Veles, MoEPP, MAFWM, municipalities

²⁵ <https://tinyurl.com/y5ucydw b>

²⁶ <https://caska.gov.mk/wp-content/uploads/2020/09/poledelstvo-i-ovostarstvo-2017.pdf>
<https://tinyurl.com/y5djaizk>

Municipality of Chashka	Municipality of Veles
8.3 Necessary facility/facilities for conservation activities:	
n/a	n/a
III.3 Disasters in the city	
9.1 Frequent disaster:	
Open space fires/forest fires	Floods, rock falls, landslides, erosive processes, fires, landslides, etc.
9.2 Potential disasters	
Flood with catastrophic consequences for people and property in the settlements: Chashka, Golozinci village and Otishtino village in case of collapse of the hydro system (dam) Lisiche.	Landslide Ramina, torrential streams, ravines and landfalls from high zones, earthquake, hails storm, etc. Landslide Ramina can further endanger the family houses in the area during, so the rehabilitation works should continue. Heavy rains increase the level of rivers and cause flooding to the part of the city and the settlements, as well as large amounts of water in the ravines and descent of soil deposits from the high zones, etc.
9.3 Disaster profile (past events: date, location, affected area, affected population, brief description, damages):	
Large forest fires that caused great damage to nature in several areas (the entire territory of the Municipality of Chashka), without consequences for the population and property in the settlements in 2019 and 2018.	<ul style="list-style-type: none"> • 01.09.2015 - a fire occurred on the Lake Mladost and the area of Novachani, burning a pine and mixed forest. • 13.03.2019 - a rock block of 10 tons fell on the regional road Veles-Gradsko, damaging the road and the railway track Veles-Gevgelija. At the moment it is being repaired and the value of the investment is 62,441,350.00 denars. • 21.12.2019 - a fire occurred near Varnalia and burned two buildings that were destroyed and were declared cultural heritage. There was also a human casualty. • 26.08.2019, a fire occurred on the Lake Mladost, which burned a pine and mixed forest. • 08.08.2020 - a flood occurred in the settlement Prevalec and due to the arrival of a dry valley, several houses were flooded, a building and a retaining wall collapsed, the faecal sewerage and the wing wall of the bridge on the Regional Road were damaged.

Municipality of Chashka	Municipality of Veles
9.3 Disaster profile (past events: date, location, affected area, affected population, brief description, damages): (contd)	
n/a	
9. 4 Activities of disaster prevention:	
n/a	<ul style="list-style-type: none"> • PCE Derven performs regular cleaning of atmospheric canals, gutters and catchment grids, cleaning of river banks, regulation of stormwater by construction of drainage systems, etc. • Regular maintenance of the atmospheric channel on Ljubljanska and Pajak streets. • Development of project designs for several mitigation solutions for construction of the following facilities: <ul style="list-style-type: none"> • By-pass channel for storm-waters to prevent flooding of the high zones in the city and direct them to the Topolka river; • Atmospheric channels that will accept and lead the water safely to the outflow point; • Atmospheric channel Trgoshped for collection of atmospheric waters and discharge through the existing channels network in the Vardar River; • Atmospheric channel behind the administrative building of PCE Derven; • Atmospheric canal Rashtani. <p>Costs: The preparation of the project documentation is estimated around 239,540 MKD or 4,653 USD.</p>
9. 5 Facility required for disaster prevention activities:	
	<p>Bypass channel and atmospheric channels for safe acceptance and drainage of water into the recipient. Installation costs: 120,000,000 MKD (2,331,000 USD). Maintenance costs: 3,000,000 MKD (58,275 USD). Lifespan: 50 years.</p>

SUMMARY OF FINDINGS:

➤ Municipalities of Chashka and Veles has established necessary institutional framework for nature environment protection/disaster management as required. Nevertheless, Chashka has weak resources since only one person is engaged and has a different educational background, but it is experienced. Small municipalities always have problems with the allocation of resources, but given the size of the territory it is necessary, these resources to be increased, at least doubled. On the other side, the Municipality of Veles has developed respective administrative capacities for these areas. Given the existing workload of the option is through the inter-municipal cooperation mechanisms to support the colleagues from Chashka.

- Key informants are knowledgeable about the areas of their competence, but they are missing the understanding of the Eco-DRR concept and how to mainstream the overall disaster risk reduction in municipal strategic and operational programming and planning, as well as into their work. The impression is that the risk reduction activities are detached from their administrative work and it is the only responsibility of the central level organizations. Therefore, there is a need for awareness-raising and capacity-strengthening activities on disaster risk reduction and Eco-DRR to be implemented.
- Accordingly, the local system for risk reduction can be seen as reactive only, without a deeper understanding of the prevention/mitigation concept.
- Even though the Lisiche Dam is the main water supply source for Veles, the municipality is not implementing prevention activities, since it is on the territory of another municipality and under the management of another entity.
- Municipality of Chashka does not have resources or planning documents to implement prevention activities, both for the nature conservation of the area or disaster prevention. On the other side, the Municipality of Veles is doing some prevention planning and execute some mitigation works, but they are stand-alone activities as per their municipal priorities that are not always synchronized with the hazard profile and assessment of the municipality.
- From the aspects of financial resources, there is no systematic risk reduction budgeting, even though within the structure of the budget certain mitigation works can be identified as such.

7.4.3 PE NF, REGIONAL BRANCH OFFICE BABUNA - VELES

General Information

The Public Enterprise National Forests (PE NF) is a partner in the implementation of the Eco-DRR project and realizes close cooperation with the project management in the implementation of project activities related to the practical implementation of Eco-DRR based disaster risk reduction solutions. Most of the selected pilot sites where conservation measures are implemented are managed by PE NF through their local branches. The pilot location next to the dam from the Lisiche Hydro System is under the jurisdiction of the Regional branch Office of PE NF – “Babuna” from Veles, i.e. within the Forest Management Unit Topolka-Karabunishte. Therefore, this Socio-economic survey has a special connection with PE NF and especially “Babuna” that will further work closely with the project experts and will have to take over the project results at this location along with the transferred knowledge and experience. During the preparatory meetings held with representatives of “Babuna”, the importance of their participation and role in the research was discussed. Because during the research it appeared that one engineer from PE NF HQ is responsible for planning and arranging of the FMUs that are close to the location carried out field activities, it was agreed that one Questionnaire to be answered from her and on behalf of PENF HQ and 3 questionnaires to be interviewed with key informants from “Babuna”. Unfortunately, there was a delay in the interview process due to the non-responsiveness of the branch office key informants. Several notifications and reminders have been sent either by CMC or PE NF focal points, but without a result. This situation was presented to the Project also. Nevertheless, on 20.10.2020 survey was conducted only with two key informants from the regional branch office. Below the key findings are presented notified by them concerning the questions.

PE NF	“Babuna” - Veles
III. FOREST, AGRICULTURE	
III.1 Forest conservation activities in managerial areas	
7.1 Details of conservation activities:	
n/a	Afforestation of new areas and maintenance of existing ones/protection of forests on the whole territory under the competence and through the forest service Frequency: regular Costs: according to the annual budget
7.2 Details of planting activities:	
Trees are planted that correspond to the location.	Tree species planted: Acacia, Black Pine, Ash
Bare, terrains after felling where filling is done.	
No planting activities on the privately owned land/in privately owned forests.	
There are significant level of activities for illegal logging, deforestation and transformation of forest into agricultural land or pastures.	Growing and protection of seedlings from diseases and pests. To prevent illegal logging because the deforestation not only destroys the forest but also agricultural land and is causing floods.
7.3 Stakeholders involved with conservation/plantation activities:	
“Babuna” – Veles, owners of private forest	
7.4 Necessary facilities for conservation activities:	
n/a	Forest roads, infrastructure, forest guard service
7.5 Timber (firewood/construction) sales information:	
n/a	Annual sales amount – 34,300,000 MKD or 666,278 USD Annual sales volume: 14.000 m3 Price: 2,450 MKD (47.80 USD) per 1 m3
7.6 Recreational use:	
n/a	n/a
7.7 Rare wildlife/rare plants exist or not:	
n/a	Rare wildlife/rare plants: Castanea sativa (Sweet chestnut), Juglans regia (Walnut)
7.8 Biodiversity survey result and economic evaluation – exists or not:	
n/a	n/a
III.3 Disasters in managerial areas	
8.1 Frequent disaster:	
Fires, illegal logging	Erosion, torrents, fires
8.2 Potential disaster:	
Erosion	Flood, fires
8.3 Activities of disaster prevention:	
8.4 Facility required for disaster prevention activities:	
	Afforestation, water diversion canals and ponds for temporary water retention

SUMMARY OF FINDINGS:

➤ PE NF is the largest state-owned public enterprise with legal competencies to manage state-owned forests. Having in mind the fact that the forests in the country is one of the largest national assets and resources can be concluded that PE NF has a serious capacity expressed in staff, equipment and finances and can be a credible partner in the implementation of the Eco-DRR project, as well as to continue with further replication of Eco based solutions for DRR.

➤ According to the current forestry policies, the main function of PE NF is aimed at forest management to produce wood mass (for industry and firewood). According to the set project framework, the Eco-DRR project is expected to contribute to the change of these policies and to expand the generally useful functions of forests, primarily the introduction of a category of “protective forests”.

➤ “Babuna” – Veles has weaker capacities in terms of understanding the sustainability of the forest management, mainstreaming of Eco-DRR and integration of disaster risk reduction within the pillars of the forest management. Still, their approach is reactive, meaning that they are seeing the forests as a source of wooden mass, not considering the protective functions, nature-based solutions, recreational services, ecosystem services and payment, etc.

➤ Given the fact, that “Babuna” is “owner” of the land where the pilot intervention will be executed it is necessary the regional branch office to be fully on board whole the time and to design a mechanism for ensuring the sustainability of intervention beyond the completion date.

➤ Through the set-up of the organizations involved in the project implementation, at national and local level, as well as the lead role of CMC, it is expected to strengthen cross-sectoral cooperation and to provide a proactive approach in disaster risk reduction.

7.4.4 RCMC - VELES

General Information

From the RCMC Veles, three key informants participated in the survey: Head of RCMC, Advisor for preparations of the affairs of the system of interest for the Municipality of Chashka and the Advisor for operational planning affairs. As per the question **6.5. Roles and responsibility of the employees**, the Head of the RCMC is responsible for the organization, management and coordination of the RCMC in the field of planning and implementation of operations, assessment and analysis of events and occurrences, coordination with the preparation process with the assessments of the threat of the municipalities from all risks and dangers. The Advisor for preparations of the affairs of the system of interest for the Municipality of Chashka performs expert work related to prevention, early warning and crisis management of the entities of the crisis management system in the municipality of Chashka, planning, assessment and use of resources for the municipality, monitoring the situation and phenomena that may lead to the occurrence of a crisis on the territory of the municipality, preparation and updating of the Assessment of the endangerment of the municipality of Chashka from all risks and hazards. The Advisor for operational planning affairs performs professional activities related to coordination of the entities in the crisis management system, coordination of the activities of the local material-technical and human resources, monitoring of all types of risks and dangers for situations from occurrence to elimination of the crisis situation, preparation and preparation of the Municipal Risk and Hazard Assessment for the City of Veles, and submission and exchange of documents, information and data with the entities in the area.

III. CRISIS MANAGEMENT

III.1. Conservation activities in managerial areas (questions 7.1, 7.2 & 7.3)

- Identification of the needs for undertaking measures and activities for early warning, giving recommendations and monitoring the implementation by the competent entities.
 - Works and tasks related to the realization of cooperation with the institutions covered by the crisis management system in the area of responsibility of the RCMC Veles.
 - Giving recommendations and monitoring the implementation of the activity by the competent entities of the Crisis Management System.

Frequency: Continuously, as needed and required.

Costs: As part of the regional coordination responsibilities.

➤ **Stakeholders involved with conservation activities:** Crisis Management System entities at national and local levels.

➤ **Necessary facilities for conservation activities:** RCMC Veles is not responsible for the implementation of activities and facilities for protection.

III.2 Disasters (questions 8.1, 8.2 & 8.3)

➤ **Frequent disasters:** floods from overflow of riverbeds, forest fires, open space fires, landslides, rock falls, snowdrifts, heavy rainfalls.

➤ **Potential disasters:** heavy rainfalls, snowfalls, earthquakes, epidemics of quarantine infectious diseases in animals and humans, overdue unexploded ordnance, air and soil pollution and technical-**technological disasters.**

➤ **Activities of disaster prevention:** RCMC does not have direct competences in this segment since their competences are in the areas of coordination, cooperation and communication for prevention, early warning and crisis management, caused by natural disasters and epidemics or other risks and dangers.

SUMMARY OF FINDINGS:

➤ RCMC Veles is a part of the centralized system for crisis management in the country. It is the main regional crisis management centre covering the Vardar Region (municipalities of Veles, Chaska, Gradsko, Negotino, Kavadarci, and Rosoman). Its main competencies are in the implementation of measures for information, monitoring of the situation, exchange of data and information during prevention, early warning, response and liquidation of consequences from crises.

➤ RCMC is not directly implementing measures and activities for disaster risk reduction, but the main activities are focused on the coordination of the entities from the crisis management system, as well as preparation of the integrated multi-risk, multi-hazard municipal assessments in a multi-sector way. Very rarely through the CMC headquarters, RCMC Veles can be engaged in support of the local/regional level projects for disaster prevention or mitigation.

➤ Key informants are knowledgeable about the areas of crisis management and disaster risk management and direct execution of their competencies. Nevertheless, there is a need for additional sensitization on the Eco-DRR concepts and how it needs to be mainstreamed during the preparation of the risk and hazard assessments, as well as prioritization of the mitigation measures.

7.4.5 PCEs TOPOLKA AND DERVEN

General Information

From the public utilities companies, PCE Topolka – Chashka and PCE Derven – Veles in total 7 key informants took part in the survey and their working background is the following: PCE Topolka (general manager, head of the water network, financial advisor & collector) and from the PCE Derven (manager, assistant director for technical affairs and advisor).

PCE Topolka	PCE Derven
III. DRINKING WATER SUPPLY	
III.1 Activities	
7.1 Activities for stable water supply:	
Content: Construction of new wells for water supply, procurement of new pumps for water supply, change of dilapidated water supply installations, change of valve, interventions for defects due to dilapidation of installations. Costs: Annually - 1,000,000 MKD or 19,425 USD	Following the Law on Food Safety, the procedures based on the HACCP principles have been implemented and the risk assessment system for the critical control points has been applied. The implementation of the HACCP system enables the production of health-hygienically safe drinking water. In the Water and Sewerage Sector, a Maintenance Department has been established, which is organized with on-duty teams that intervene on a call to eliminate defects in the water supply network twenty-four hours every day of the week, as well as during public holidays. In this way, a continuous water supply is provided without major interruptions. Operating costs for 2018. - 70,948,010 MKD or 1,378,166 USD, for 2019. - 75,928,146 MKD or 1,474,905 USD.
7.2 Average drinking water bill:	
319 MKD or 6.20 USD	452 MKD or 8.78 USD
7.3 Annual quantity of water used in the area:	
12,143 m ³	5,000,000 m ³
III.2 Conservation activities in managerial areas	
8.1 Details of conservation activities:	
	Services provided by PCE DERVEN covers 51,000 citizens in the city of Veles with 48,000 inhabitants, suburban settlement Prevalec and the villages of Gorno Orizari and Bashino Selo which have a total of 3,000 inhabitants. The total coverage of the population in these places with water supply is 99%.
8.2 Stakeholders involved with conservation activities:	
Municipality, Ministry of Environment, Ministry of Agriculture, Forestry and Water Management, PE NF	PCE Derven, Municipality of Veles, PE Hydro System Lisiche

PCE Topolka	PCE Derven
8.3 Necessary facilities for conservation activities:	
n/a	n/a
III.3 Disasters	
9.1 Frequent disasters:	
Fires, floods, extreme weather events, and the most common breakdowns are power outages	Disasters (in terms of water supply) in the last 20 years did not happen. Floods, wildfires, landslides, torrential rain, rock falls, erosions, hail storms
9.2 Potential disasters:	
Droughts	For the water supply, a potential catastrophe on a smaller scale would cause an accident on the supply pipeline from the fox reservoir to the drinking water treatment plant. Earthquake, drought, water shortage.
9.3 Water deficit incidents (date, location, affected settlements, affected population, brief description, damages/losses):	
Despite the protection installed in the water supply facilities (pumping stations), the defects are caused by storms and power outages (defects in the electricity network).	In 1995 before construction of the Lisiche dam, after that period no major deficit, only temporary disruption of the water supply due to minor defects or regular maintenance.
9.4 Activities of disaster prevention:	
Cleaning of irrigation channels, riverbeds, water supply. Costs: 350,000 MKD or 6,800 USD.	With rapid interventions to repair water supply network defects, there was no case of water shortage for more than 12 hours. The costs are from regular operation. Urgent supply with potable and technical water, urgent reparation of network problems, flood protection, riverbed and storm-water channels cleaning.

SUMMARY FINDINGS:

- Public utility companies in Chashka and Derven are the sole utility companies responsible for various of communal affairs. Also, they are the main resource for disaster/incident response on local level alongside the Territorial Fire Brigade from Veles.
- They are implementing essential prevention activities aimed at preserving their facilities and resources, as well as population and municipal assets and the critical infrastructure. Nevertheless, this has not be done in a systematic and integrated way, based on the risk and hazard assessment.
- Key informants are knowledgeable for their area of expertise but have a very limited understanding of the environment protection, DRR, and especially Eco-DRR concepts.
- Financial investments in protective/mitigation measures are minimal and done on investment cycles rather than the profiled hazards and regular budgeting.
- No major water deficit incidents or disasters have happened in the past.

7.4.6 NATIONAL IRRIGATION AUTHORITY – AD VODOSTOPANSTVO – SKOPJE

General Information

During the preparatory meetings held with the local authorities in the municipalities of Chashka and Veles, it was concluded that there are no special Local Irrigation Authorities on their territories and in consultation with the Project, for this survey was decided to invite the National Irrigation Authority instead. Accordingly, the Team has made an interview one representative of the AD Vodostopanstvo – the Head of the ecology and erosion unit. For successful and efficient water management, per the Law on Water Economy, the Government founded the Joint Stock Company Vodostopanstvo of the Republic of Macedonia in state ownership – Skopje (AD Vodostopanstvo) on 28.10.2015. Subject of the operation are all activities determined by the National Classification of Activities except those for which a license for consent or approval issued by a state body or other competent authority is required. AD Vodostopanstvo has a main headquarter and branch offices for performing water management activities in a certain geographical area of activity. Twelve subsidiaries have been established covering certain regions, such as subsidiary Tikvesh, headquartered in Kavadarci, subsidiary Bregalnica, based in Kocani, subsidiary Skopsko Pole – Skopje, subsidiary Prilepsko Pole, head office in Prilep, subsidiary Kumanovo-Lipkovo Pole, subsidiary Strumica, head office in Strumica, subsidiary Radovishko Pole, head office in Radovish, subsidiary Bitolsko Pole, head office in Bitola, subsidiary Polog, based in Gostivar, subsidiary South Vardar, with head office in Gevgelija, subsidiary Berovo, head office in Berovo, subsidiary Crn Drim, based in Ohrid.

III. IRRIGATION – BEST PRACTICES

III.1 Activities (question 7.1)

➤ ***Activities for stable irrigation:*** Seasonal irrigation of arable land by gravity and irrigation utilizing pumps in higher parts.

III.2 Conservation activities (questions 8.1, 8.2 & 8.3)

➤ ***Details of conservation activities:***

- Construction of embankments in the canals that can overflow;
- Servicing the canals that are mostly older and eroding;
- Grouting the canals;

Before the irrigation season starts.

Costs: n/a.

➤ ***Stakeholders involved in the conservation activities:*** AD Vodostopanstvo, subsidiaries, users.

➤ ***Necessary facilities for conservation and activities of disaster prevention:*** To ensure efficient operation of the system, to protect or provide security to the facilities belonging to the system, and to perform protection and defence against floods per the Law on Waters, AD Vodostopanstvo with funds from the programs of the body competent for environmental management and spatial planning execute following actions:

- Builds and maintains facilities for flood protection;
- Builds and maintains facilities for preventing and protecting against erosion;
- Builds and maintains objects for arranging rivers and streams.

III.3 Disasters affecting the irrigation systems (questions 9.1, 9.2 & 9.3)

➤ ***Frequent disasters:*** Floods, water spills, erosions, flooding of canals by locals, older canals that have been in operation for a long time.

➤ ***Potential disasters:*** Torrential floods.

- **Activities of disaster prevention:** Cleaning the channels and regular maintenance.

IV. ACTIVITIES FOR BUILDING OF CAPACITIES (question 10.1)

- **Details of capacity building activities:** Regular seminars and trainings for employees.
- **Stakeholders:** AD Vodostopanstvo/employees.
- **Financial sources: donor or budget** – Own budget.
- **Training curriculum: yes or no** – No.
- **DRR/Eco-DRR issues included – yes/no:** No.
- **Needs of DRR/Eco-DRR mainstreaming in the capacity building activities:** Yes.

SUMMARY OF FINDINGS:

➤ AD Vodostopanstvo as a newly established state-owned company with the competence for water management, per the water management legal framework, and has the authority for comprehensive management of water bodies (watercourses, shorelines of lakes and water reservoirs, channels), as well as their surroundings. This includes the competence to implement disaster risk reduction measures. Nevertheless, the DRR is not fully mainstreamed in their work and the preventive or response activities are stand-alone, very much limited in their scope or reactive.

➤ The Eco-DRR concept is not integrated into their work, both on strategic programming and operational planning. Its mainstreaming in their work can directly contribute to the sustainable water management and irrigation, as well as to the fulfilment of the SDGs and the SDG 6 “Clean water and sanitation” in particular.

➤ From the available information on the organizational structure of AD Vodostopanstvo, it can be seen that there is an internal unit for ecology, protection from floods and erosion.

➤ Based on the answers received, the relevant expertise is not knowledgeable about DRR or the Eco-DRR concept and no training materials and guidebooks/handbooks are developed.

➤ According to the answers received, it is concluded that the main measures taken to reduce the risks of disasters are through the construction of facilities and other civil engineering measures.

➤ It is recommended that the Project pay attention to involve this entity in the further implementation of the project to expand the scope of the Eco-DRR concept in the Republic of North Macedonia.

7.4.7 NGO VILA ZORA - VELES

General Information

One respondent from the NGO Vila Zora – Veles in the position of Assistant participated in the survey as a key informant. Environmental association "Vila Zora" Veles is a non-governmental, non-profit organization, dedicated to protecting the environment. As per the **question 6.4. Role of the organization** the NGO is active in the improvement of the environment through education, protection, prevention and solving environmental problems. The key informant has the role and responsibilities of a project and financial assistant.

III. OTHER LOCAL INSTITUTIONS/AUTHORITIES

III.1 Conservation activities (questions 7.1, 7.2 & 7.3):

- **Details of conservation activities**

- Cultivation of seeds for evergreen trees intended for afforestation of burned areas in the area of the Municipality of Veles.

Frequency: Annually.

Costs: 30,000 MKD.

- **Stakeholders involved with conservation activities:** Civil associations sector of the City of Veles.
- **Necessary facilities for conservation activities:** n/a. NGO has not participated in these type of activities.

III.2 Disasters (questions 8.1, 8.2 & 8.3)

- **Frequent disasters:** Accidents caused by local industrial installations (air, river and soil pollution), uncontrolled dumping of PET packaging.
- **Potential disasters:** wildfires, floods, landslides.
- **Activities of disaster prevention:** Introduction of the Eco patrol, afforestation, decontamination of soil contaminated with heavy metals through phytoremediation, Actions for collection and selection of PET packaging. All activities are intended for the protection and improvement of the environment in the region of Veles.
Costs: 2,000,000 MKD or 38,850 USD.

SUMMARY OF FINDINGS:

- NGO Vila Zora – Veles is one of the oldest NGOs in the country and most prominent one on the territory of the Municipality of Veles. It has a credible history of implementation of relevant project activities. Its capacities are weak given the available resources i.e. human, material-technical, financial, etc.
- They are implementing nature conservation/environment-related projects on a stand-alone basis, predominantly based on the availability of funds. Their main focus is on the environmental issues connected to the urban resilience of the City of Veles. Nevertheless, they have the necessary technical capacities and knowledge to participate in further dissemination of project activities, as well as to implement small-scale Eco-DRR projects. Also, they can be a good resource that can be engaged for resource mobilization of the citizens, sharing of the project related information, organization of consultation meeting and forums, as well as mobilization for civic engagement in Eco-DRR and the overall environmental protection and disaster risk reduction. This can be done either on a project basis cooperation or cooperation with the municipalities, public utilities and RCMC Veles.

7.4.8 ADKOM

General Information

Two respondents from ADKOM (Association of public utility services providers of Republic of North Macedonia) were included in the survey, of which one was the Executive Director and the second one was the Training Manager. ADKOM is an association of citizens, established to perform activities and activities for the promotion of the communal activity in the country. The mission of ADKOM is to represent the interests of the public utility companies in the Republic of North Macedonia and to support and assist them in providing reliable, affordable and quality services in the field of communal activity. ADKOM is a source of knowledge and experience for the public utility companies and provides their cooperation for environmental protection and support of local and regional economic development. As per the **question, 6.4 Responsibilities of the organization**, the mission of ADKOM is related to promotion of the communal activity in the country through the public utility companies that are members of ADKOM (87 members). The competencies are aimed at improving the quality of utilities, efforts in the area of successful implementation of reforms in the communal activity, organizing expert consultations, conferences, providing information in the part of the communal sphere for the members, preparation of proposals for improvement of the existing legal framework that refers to the communal activity including representation, representation and lobbying of the PCE

before the central and local government. Furthermore, the employees of ADKOM are responsible for the operational, administrative-professional and auxiliary activities of common interest of the members, to achieve the tasks and goals of ADKOM (**question 6.5 Roles and responsibility of the employees**). Unlike the other entities of the crisis management system, ADKOM has implemented the standards for risk management (**question 6.6**).

III. WATER SUPPLY – BEST PRACTICES

III.1 Activities (question 7.1)

➤ **Activities for stable water supply:**

- Conducting of trainings for PCE through the Training Center of ADKOM;
- Establishing a platform for dialogue with the central government on issues in the water services;
 - Organization of round tables;
 - Representation of interest of PCEs in front of the central government;
 - Organization of international conference;
 - Organization of study visits;
 - Creating the water supply policies at the central and local level;
 - Creating opportunities for investments in water supply infrastructure;
 - Cooperation with stakeholders - involvement of central and local government;
 - International cooperation - participation in regional projects, conferences and networks;
 - Preparation of public awareness campaigns for beneficiaries/users;
 - Conducting research and preparation of studies related to the entire water supply cycle (from sources to users);
 - Organizing trainings for the separate operational and technological processes in the water supply process;
 - Organizing trainings for the management and the employees in the PCE water service providers;
 - Support in the business planning processes and preparation of tariff adjustment plans.

III.2 Conservation activities (questions 8.1, 8.2 & 8.3)

➤ **Conservation activities in managerial areas:**

• Based on the ADKOMs role, the protection activities to the organization of training and sharing of good practices and in advocacy and lobbying before the central government. The main contents can be distinguished as follows: continuity in the provision of services and identification and increasing the awareness for implementation of disaster protection measures.

➤ **Stakeholders involved in the conservation activities:** Directors, managers, technical and administrative staff in PCEs.

➤ **Necessary facilities for conservation activities:**

- Springs and surface waters;
- Water plants;
- Supply pipelines;
- Secondary network;
- Reservoirs;
- Installation costs: n/a;
- Maintenance costs: n/a;
- Service life: generally long term- depending on the facilities.

III. Disasters that affects the water supply systems (questions 9.1, 9.2 & 9.3)

➤ **Frequent disasters:** ADKOM has identified the following frequent disasters among its members: floods, landslides, drinking water contamination, pandemics, fires,

➤ **Potential disasters** identified by ADKOM: Consequences of climate change in terms of drinking water source discharge.

➤ **Activities of disaster prevention (contents, cost):** ADKOM implements activities to increase the awareness of PCEs about the need to strengthen their capacities for disaster protection. For that purpose, ADKOM has signed a Memorandum of Cooperation with the CMC where activities of common interest have been identified:

- Joint organization of seminars, workshops, expert discussions, training and other forms of educational cooperation;

- Cooperation between the CMC and the Public Utility Companies (PCE) established by the Local Self-Government Units, as members of ADKOM, through the exchange of data and information for risk assessment and prevention, as well as planning the preparations for response to crisis situations and situations;

- Cooperation between the Regional Crisis Management Centers and the Public Utility Companies (PCEs) established by the Local Self-Government Units, through mutual information on regular and emergency interruptions in the public utility services, to timely and accurately inform the users;

- Enabling mutual use of funds and premises of the Crisis Management Center and PCE - members of ADKOM;

- Enabling mutual use of data and information of common interest for the Crisis Management Center and the Association of Utility Providers – ADKOM;

- Conducting joint exercises and other activities to check the functionality of the procedures and capacities of the Crisis Management Center and PCE - members of ADKOM;

- Providing mutual expert assistance in the preparation of certain projects, analyzes, draft laws and bylaws of common interest;

- Joint implementation of research, development and application projects;

- Cooperation in other mutually agreed activities.

Costs: n/a

Stakeholders: Directors, managers and employees of PCE and water service providers.

➤ **Activities of disaster prevention (contents, cost):** ADKOM implements activities to increase the awareness of PCEs about the need to strengthen the capacities of PCEs for disaster protection. In this regard, through regional cooperation with the Danube Learning Partnership, a multi-month training has been developed on crisis and emergency management/disaster risk reduction/service continuity planning.

- Risk management: identification of risks and levels of risk;

- Drinking water supply security - risk and crisis management guidelines - Part 2: Risk management) MKC EN 15975-2: 2013;

- Crisis management – basics;

- MKC EN 15975-1: 2011 + A1: 2016 (Security of drinking water supply - guidelines for risk and crisis management - Part 1: Crisis management;)

- Establishment of organizational structure and crisis management procedures in PCE staff appointed as Crisis Managers;

- PCE training of staff assigned to individual positions (eg S2, S3, S5) and the Assistant Team of the Crisis Management Team;

- Organizing a final exercise: Practical simulation of the work of the Crisis Management Team in PCE.

Costs: n/a

Stakeholders: Managers and employees of PCE water service providers.

IV. CAPACITY BUILDING ACTIVITIES

IV.1 Capacity building activities (question 10.1)

➤ **Details on the capacity building activities:** Capacity building of PCEs, primarily the capacities of directors, technical and administrative staff is one of the main goals for which ADKOM was established. To achieve this strategic goal, ADKOM in its work practised and researched several models for increasing the capacities of PCE. To make a systematic approach to the issue of strengthening the capacities of PCE, ADKOM within its organizational structure establishes a Training Center whose main activity is the implementation of measures for strengthening the capacities of PCE. In its activities, the Training Center cooperates with regional initiatives such as the Danube Learning Partnership <https://www.iawd.at/d-leap/> and the RCDN Regional Capacity Building Network <https://rcdnsee.net/>. ADKOM Training Center focuses on providing generic and specialist training for PCEs in the Republic of Northern Macedonia. The Training Center of ADKOM researches, plans, develops, implements and evaluates trainings and other forms of capacity building of PCEs.

Frequency: The activities are planned annually. Some of the activities are one-day and some multi-month training programs.

Costs: Costs are variable, depending on the source of funding provided.

Participants: Management and employees of PCE water service providers.

➤ **Details on the capacity building activities:** ADKOM to provide strengthening of the capacities of PCE within its organizational structure has established a Training Center through which it implements various forms of training of PCE employees. The Training Center organizes generic and specialist trainings in all areas important for the provision of water services. Every year, ADKOM conducts a process of assessment of the training needs of PCE. A Training Catalog for 2021 is being prepared. Capacity-building activities include several different models: training; workshop; on-the-job training; sharing good practice; expert debates; conferences; organizing and participating in fairs. In terms of areas and content of PCE capacity building activities, we can list the following:

- Crisis and emergency management / Disaster risk reduction / Service continuity planning;
- Preparation of Business Plans and Tariff Adjustment Plans for water supply companies;
- Preparation of Annual Reports for RKEVU;
- Preparation of water balance;
- Setting indicators and benchmarking in PCE;
- Energy efficiency (EE);
- Preparation of feasibility studies;
- Annual Regional Conference - related to water and wastewater;
- Project management.

Frequency: The activities are planned annually. Some of the activities are one-day and some multi-month training programs.

Costs: Costs are variable, depending on the source of funding provided.

Participants: Management and employees of PCE water service providers.

➤ **Donor funded or from their budget:** Capacity building activities are funded by both donors (mostly) and their budget.

➤ **Training curriculum: yes or no** - Yes, for part of the trainings offered by the training centre. For the most part, they need to be developed.

➤ **DRR/Eco-DRR issues included: yes or no** – In part of the trainings – Yes.

➤ **Needs for DRR/Eco-DRR mainstreaming in capacity building activities:** YES - by sharing results and tools.

SUMMARY OF FINDINGS:

- ADKOM as an Association of public utility services providers has a good network between all relevant entities in the field of public utilities which can be an additional catalyst for strengthening cooperation in the field of environmental protection, climate change adaptation and disaster risk reduction.
- ADKOM has implemented the risk management standards and has essential knowledge of the inter-connectivity of the sustainable water supply and the crisis management.
- ADKOM has a well-developed structure for training and education, primarily for the representatives of the public utility companies and local self-government organizations, which can be useful for additional sensitization on the Eco-DRR concept and raising awareness on its importance, as well as its mainstreaming in the public utility companies competences, through development and implementation of necessary materials and implementation of practical actions.
- ADKOM Training Center can serve as an organizational platform for organization of customized professional orientations and trainings on Eco-DRR concept within the sustainable water supply and disaster risk management.
- ADKOM has credible experience in organizing public awareness campaigns and promotion of good practices and experiences and it is recommended to keep this in mind when it comes to promotion and dissemination of the results of the Eco-DRR project.

7.5 PART IV – OTHER

PART IV - of the Questionnaire contained two questions to obtain answers from the key informants from the organizations involved regarding the existence of *Subsidy system for nature conservation and disaster response - whether it exists or no?* and *The existence of a special investable amount for nature conservation and disaster response within the regular budget of the involved institutions.*

From the analysis of the received answers can be noticed only one example of subsidies from the Municipality of Veles for obtaining fuel from the central level for cleaning of the river bodies and drainage canals for the prevention of floods. All other organizations had a negative answer to both questions (non/applicable meaning no answer to these questions). In the further implementation of its activities, Eco-DRR project should pay attention to raising awareness among its national partners about this weakness. A complete overview of the answers to these two questions is presented in the table below.

No.	Name of the organizations	Subsidy system for nature conservation and disaster response - exists or no	The investable amount for nature conservation and disaster response
1	PE Hydro System Lisiche	No	0
2	Municipality of Chashka	No	0
3	PCE Topolka Chaska	No	0
4	RCMC Veles	It is not applicable and we have no competence regarding this issue. We intervene in the area of prevention and early warning.	n/a
5	Municipality of Veles	Ministry of environment approves petrol for local self-government for cleaning atmospheric channels and riverbeds	
6	PCE Derven Veles	No	0
7	ADKOM	n/a	n/a
8	PENF Babuna Veles	No	0
9	PE National Forests	No	0
10	National Irrigation Authority	No	0
11	NGO Vila - Zora	n/a	n/a

Table 21 - Information on the system of subsidies and investment funds

7.6 PART V - INFORMATION REGARDING THE PROJECT

As part of this Socio-Economic survey, the Questionnaire provided a section on "Information regarding the project ". The following questions were formulated in this section:

1. *Expectations regarding the project*
 - 1.1. *Short term*
 - 1.2. *Long term*
2. *Problems or concerns for the continuation of this project, and*
3. *Comments on this project.*

The purpose of these questions was to gather relevant information from the representatives of the organizations involved regarding the activities of the current Eco-DRR project. This is especially important before starting the practical activities at the selected location in the vicinity of the dam from the Lisiche Hydro system. The results of the analysis of the answers to the questions in this part of the Questionnaire show a range of diversity in terms of project expectations (short-term and long-term), Problems or concerns for the continuation of the project, as well as some Comments for this project, depending on the organization in question and their prior knowledge of the Eco-DRR project. An interesting point is that 4 out of 11 organizations involved in this survey did not offer an answer to any of the questions in this part of the Questionnaire. Among them are the Municipality of Chashka, the National Irrigation Authority, NGO Vila Zora, as well as PE NF. On the other hand, some organizations have a completely different approach and have offered answers that are in line with the course of the project, as in line with the expected results. In that direction, the answers received from PE Hidrosystem Lisice, RCMC Veles, the Municipality of Veles and ADKOM can be positively emphasized. The other organizations involved had offered partial answers to the questions related to this part of the Questionnaire. The following table presents a sublimated presentation of the answers received from all involved organizations about the questions from the PART V "INFORMATION REGARDING THE PROJECT".

Table 22 - Information regarding the project

#	Name of the invited organizations	11. Expectations regarding the project		12. Problems or concerns for the continuation of this project	13. Comments on this project
		11.1. Short term	11.2. Long term		
1	PE Hydro System Lisiche	Reduction of erosion from the banks of the reservoir	Stabilization of soil surface layers; change of the structure and type of soil, enrichment with organic and inorganic substances; stabilization of active and potential landslides; reduction of erosive phenomena and processes; reduction of the amount of erosive sediment, which through torrential rains would flow and enter the reservoir; preventing the rapid and abrupt enrichment of the accumulation, improving the physicochemical, microbiological and biological characteristics of water.	This project will give positive effects concerning the reservoir Lisice and will enable the extension of the period of its exploitation, which will directly benefit the residents of the city of Veles and the surrounding settlements, which are users of drinking water from this reservoir. These anti-erosion measures should be followed by appropriate works and activities by the competent organisation.	//
2	Municipality of Chashka	//	//	//	//
3	PCE Topolka Chaska	Protection of accumulation from sediments, protection of water quality, protection of the environment.	Protection of water quality in the reservoir	//	//
4	RCCM Veles	Upgrading and expanding the functions of the existing MKFFIS established within the framework of a previous project cooperation with JICA in the direction of a database for erosions, landslides and torrents. Improving the national system for planning, arranging and managing	Reducing the risks of natural disasters and catastrophes upstream of the Topolka River. Protection of water resources of the dam Lisiche.	In continuation of this project, it is necessary to plan the construction of a treatment plant-collector for purification of faecal waters coming from the settlements in the mountainous part of the river Topolka.	//

“Socio-economic Survey on Eco-DRR related information focusing In Chaska and Veles”
(Draft Report)

#	Name of the invited organizations	11. Expectations regarding the project		12. Problems or concerns for the continuation of this project	13. Comments on this project
		11.1. Short term	11.2. Long term		
		national forests. Increasing the capacity of the involved institutions to carry out activities related to Eco-DRR activities. Strengthening public awareness			
5	Municipality of Veles	Continuous water supply to the city of Veles from the Lisice Hydro system as well as prevention of natural disaster.	Protection by afforestation and sustainable management of the newly planted forests.	To enable the acceptance and drainage of faecal waters that are currently flowing into the dam and after treatment to be introduced into the accumulation, as well as a way of capturing and disposing of recyclable waste coming from settlements above the dam site.	It enables the improvement of the water supply of the city as well as greater security of the accumulation and the surrounding area.
6	Public utility enterprise, Derven Veles	//	//	//	PCE Derven Veles takes care of regular water supply, wastewater disposal, collection, transportation and disposal of waste in the city and rural areas, and we are not sufficiently informed about the project

“Socio-economic Survey on Eco-DRR related information focusing In Chaska and Veles”
(Draft Report)

#	Name of the invited organizations	11. Expectations regarding the project		12. Problems or concerns for the continuation of this project	13. Comments on this project
		11.1. Short term	11.2. Long term		
7	ADKOM	Opportunity for realization of joint activities with CMC and other stakeholders in sharing the project results	Opportunity for cooperation of ADKOM with JICA to support the capacity building of PCE.	Identification of opportunities for involvement of ADKOM in its extension and involvement of the Training Center of ADKOM.	The project can create synergies between the various stakeholders in the municipalities where it is implemented, primarily in the training of employees in local institutions and PE.
8	PENF Babuna Veles	Improving the forest fund, ecology and protective function of forests	//	////	//
9	PE National Forests	//	//	//	//
10	National Irrigation Authority				
11	NGO Vila Zora – Veles				

8. PAYMENT FOR ENVIRONMENTAL SERVICES (PES) – SUMMARY FROM THE REPORT

8.1 Background

Ecosystems as forests, mountains, wetlands, freshwaters, etc. provide a variety of economically valuable services (e.g. freshwater supply; irrigation and power generation; storm and erosion protection, etc.). These services are defined as ecosystem services and they provide various benefits to the people (e.g. food, water, timber, climate, water quality, soil formation, nutrient cycling, recreation, etc.). They are provided free, but there is a constant need for inputs to protect them while ensuring their sustainability. Accordingly, Payment for Environmental Services (PES) are financial mechanisms that place an economic value of the ecosystems, in support of the conservation and expansion of ecosystems and ensuring their sustainable management.

Within the framework of the development of an Eco-DRR model in North Macedonia against floods, landslides, soil erosion, and forest fire by utilization of multiple forest functions, the JICA funded project “Capacity building for ecosystem-based disaster risk reduction through sustainable forest management in Macedonia” initiated the assignment for a closer understanding of the PES concept, reviewing existing concepts and best practices in the Western Balkans countries including North Macedonia. Consequently, the Payment for Environmental Services Report (PES Report) is prepared (Annex V) capturing the main aspects of the assignment, overall approach and methodological framework, elaboration of PES essentials (main definitions, types of PES, main stakeholders, PES and SDGs, etc.), as well as a brief overview of the status of PES within the normative framework of selected countries of the Western Balkans and selected case studies, including North Macedonia. Finally, the section on conclusions and recommendations is summarizing the way forward on how to consider them in future activities of the Project and its beneficiaries.

8.2. PES – situation in the Republic of North Macedonia

The issue of PES is advancing on the nature and environment protection agenda, either through the best practices sharing from regional/global projects, or essential normative stipulation and implementation of stand-alone project interventions. With the advancement of the EU approximation process and the ratification of international conventions and mainstreaming the global sustainable development mechanisms into the national normative and institutional frameworks, the concept of the payment for environmental services was profiled as one of the key principles for sustainable management of the nature and its resources. This approach is intended to upgrade the concept of sustainable development, which is widely accepted and used in policymaking, through larger integration of the environment and the economy. Furthermore, the rich and heterogeneous biodiversity and ecosystems in the country are a great foundation for the development of the fiscal aspects of the ecosystems. Nevertheless, the current experiences in the North Macedonia for the application of these methods are still modest. Consequently, the summary of the PES context in the country is reviewed from the aspects of the normative framework and the practical experience in implementation of PES related activities.

➤ **PES related normative framework** - In the existing normative framework, the payment for environmental services is not well mainstreamed, partially due to the novel approach in the protection of

nature and environment including their sustainable utilization and partially due to the lower level of awareness of the policy creators and the decision-makers. In that direction, the EU North Macedonia Report 2019 states, that “steps have been taken to establish ecosystems services. However, it lacks sustainable and long-term funding centrally protected areas.” Furthermore, the SDGs Voluntary National Review (2020) regarding the ecosystem approach to natural resource management states, that “the country accomplished progress in applying the principles of the ecosystem approach to managing natural resources. The first attempts at integrated management have been made Prespa and Lake Ohrid, and more recently with the Bregalnica river basin. Ongoing activities are for the implementation of a short-term capacity building plan for all stakeholders in ecosystem services.” Concerning the individual normative acts, the PES concept is included in some strategic documents and action plans and legislative acts.

- *National strategic documents and action plans* – PES concept is one of the priorities within the framework of the **National Strategy for Nature Protection 2017 - 2027**²⁷ - “National Target 3 - To embed the nature protection policies into the strategies, plans and programmes of other sectors by 2020”. The Strategy refers mainly to the protected areas and therefore the PES is considered as a source of finances for the protection areas (from the fees). The payment for ecosystem services is the implementation of the “user pays” principle and has two main objectives: mobilization of funds for the entities in charge of protected area management and providing financial incentives for landowners to engage in the preservation of ecosystems. In the **National Biodiversity Strategy and Action Plan for the Period 2018 - 2023**²⁸ PES are integrated in the National Target 3: “Introduction of positive incentives for conservation and sustainable use of biological diversity following the Convention and EU related obligations and identification and correction of incentives that are harmful to affect biological diversity components” within the action 3.1.2. Analysis and introduction of incentive measures, including payment for ecosystem services towards poverty reduction through sustainable use of biological diversity and ecosystem services. Finally, in the **Programme for the protection of the biological diversity in the livestock (2018 – 2014)**²⁹, PES are considered regarding the wide variety of domestic animal breeds, especially in the pasture ecosystems, as well as increased awareness, training and research in all areas of animal generic resource management including emerging areas i.e. ecosystems services.

- *Legislative acts* - Most prominent elaboration of the PES concept is stipulated in the **Law on Protection of the Nature**³⁰ were in the Section: Definitions in article 6, para.1, item 61 – 63, definitions and essential of the ecosystem services are elaborated. The main consideration of the ecosystem services in this act related to the nature protected areas but refers also to all other areas and related services. Accordingly, the *ecosystem services* are services that are provided and available to all entities considering the natural characteristics of an area, which especially means the following groups of services: support, supply, regulatory and cultural services. *PES* is an operationalization of the principle “user pays” and implies payment of fees or other payments determined through voluntary negotiation to reach a binding agreement by users of ecosystem services on the one hand and entities that manage the protected area on the other, to maintain, protect and manage the ecosystems on the territory of the protected area by the entities that manage the protected area. *Users of ecosystem services* are legal or physical entities that

²⁷ <https://bit.ly/357p289>.

²⁸ <https://bit.ly/3j3IXJZ>.

²⁹ <https://bit.ly/3duKIEe>.

³⁰ <https://bit.ly/357p7IZ>.

perform activity or activity outside the territory of the protected area, but which due to the ecosystem services provided by it enjoy an advantage over other legal or physical entities that perform the same or similar activity or activity but do not have benefit from the ecosystem services of the protected area. In this law, PES is mainly related to the protected areas, national parks and for the nature protection. **The Law on the forest** (64/09, 24/11, 53/11, 25/13, 79/13, 147/13 and 43/14)³¹ does not directly stipulate the ecosystem services or payment of these services. There are only two aspects that refer to the mentioned topic. They are usage of the forest and rights of the entities that are managing the forests owned by the state. The former refers to the cutting of timber and production of forest assortments, usage of the debris, other forest products (forests fruits, herbal plants, mushrooms, lichens, moss, seeds, resin, stone, etc.), trade-in wood and other forest products, as well as usage of the forests for tourism, hunting and recreation. The latter enables the mentioned entities to make gains through collection and selling of forest assortments; collection, production and selling of forest fruits, mushrooms and herbal plants, snails and turtles; exploitation of stone, sand, gravel, hummus, etc. **The Law on water**³² does not directly stipulate the ecosystem services related to water or payment of those services. Indirect payment of water services relates to the use of the water as stipulated in the article 207. Economic instruments with environmental impact incorporated into the Law include user charges for water supply and consumption, sewage and wastewater charges, and penalties.

➤ **Practical experience in implementation of PES related activities** – There are three groups of practical experiences: projects near establishing PES schemes, concepts of PES schemes and feasibility studies and strategies.

- **Projects near establishing PES schemes** – Most prominent is the **Programme for nature conservation in Macedonia – Phase II**³³ (2017 – 2020) – Among other objectives, the project supports the MoEPP in developing an ecosystem service payment mechanism, including a methodology and guidelines for implementing the PES mechanism. In parallel with the development of the guide, the Program provides support for strengthening the ecosystem service capacity for key stakeholders. In particular, regarding the PES component, the Project engaged in learning by doing approach to establish a PES framework and to test it in a particular environment. The project targeted the Municipality of Vevchani as a beneficiary for the development of PES schemes. Until now, a work plan for the establishment of the PES scheme was developed, important services on the local level were identified, protected area of Vevhanski Izvori (Vevchani Springs) was identified and mapped, a list users and provides established, opportunities and challenges identified, etc. As a result selection of ecosystem services was made including tourism and collection of wild plants and herbs. Public awareness survey with the local population is ongoing. Once it is completed, the activities will follow. The test results are expected to help in the future development of a PES rulebook by the MoEPP. Within the **GEM Balkans - Creating conditions for the development of forest and catchment areas in the Balkans**³⁴ activities are following: the establishment of two pilot areas, one in North Macedonia and one in Albania, where the proposed measures for protection against floods and erosion will be tested as part of integrated forest management in catchment areas; harmonization of forest and catchment management measures with EU standards;

³¹ <https://bit.ly/3nW38x7>.

³² <https://bit.ly/37bLsaX>.

³³ <https://bit.ly/2SX2cdp>.

³⁴ <https://bit.ly/2T1mzGp>.

strengthening the capacities for planning in forestry concerning the aspects related to the protection of water resources, as well as protection from floods and erosion; raising awareness in society to increase understanding of the ecosystem services provided by forests concerning water resources. The Macedonian Ecological Society with the **Component for improvement of the status of the natural values in the Bregalnica Region (2018)**³⁵ implemented the activities for identification of the NATURA 2000 areas in the Bregalnica region, development of proposals for protected areas, revitalization of riparian ecosystems and *pilot testing of the mechanism for payment of ecosystem services*. The latter one consisted of the adoption of adequate methodology for the process of analysis of the ecosystems in the country and assessment of their status through the selection based on adequate indicators. Accordingly, the process continued with the identification of indicators and parameters for the analysis of the ecosystems and establishment of the mechanisms for pilot testing of the PES.

- *Concepts of PES schemes* – With the **Private Forests for Positive Changes in the Popolga Planning Region (5P)**³⁶ project aspects of the environmental services were also covered within the field survey with the owners of private forests and the municipal authorities. The former still do not see the prevention function of the forest and want to utilize it for the supply of wood for heating. The latter ones do not integrate the private forests in their plans and competencies. The **Project for modernization of the agriculture**³⁷ considers the ecosystem principle as a part of the assessment process for financing of the pilot projects through the “change of ecologically important areas, including wetlands, natural forests, pastures and others, as well as “critical” natural habitats and ecosystem services. The **Nature Park “Ezerani”**³⁸ project provides a good example of how the concept of ecosystem services can be applied in the management of degraded ecosystems in protected areas. There are types of ecosystems that offer a range of ecosystem services, which are used by the local and the population from the wider region. What needs to be done before introducing payment procedures for ecosystem services is their prior identification. But the current situation testifies that quite a bit ecosystem services such as water, wood, sand, gravel, fish, birds, meadows, reeds are used directly without any compensation. Accordingly, it is required to introduce a transparent mechanism by which to ensure that all those using ecosystem services of the type directly accessible (sand, gravel, water, reeds, food) must pay a certain amount.

- *PES feasibility studies and strategies* – In the **Local Environmental Action Plan of the City of Skopje (2020 – 2026)**³⁹ the ecosystem approach is mainstreamed in the nature and environment areas and services that under the competence of the City of Skopje. Since, in the Park-forest Vodno, many cultural and historical monuments have left an important mark in the history of Skopje and beyond and they are a key foundation for the development of *cultural ecosystem services* in the protected area of the Park-forest. As part of the **Nature Protection of the Shara Mountain and the Osogovo Mountains** initiatives, public discussion with the interested stakeholders and the local population are ongoing and accordingly, outputs of these discussions shall be incorporated in the final proposal for declaration of the status of the protected areas. This new status shall contain a high level of biological and cultural values of the protected areas and fulfilment of the national and international obligations for the protection of the area diversities and biodiversity. Furthermore, the great potential of the local economies shall be used

³⁵ <https://bit.ly/37bJSpu>.

³⁶ <https://bit.ly/31eLM4G>.

³⁷ <https://bit.ly/31ceYcu>.

³⁸ <https://bit.ly/3dnyrm>.

³⁹ <https://bit.ly/37dm0BY>.

through sustainable management of these areas and provision of ecosystems services including ecotourism. In the context of the initiative for the protection of the Shara Mountain, it is necessary to refer to the **“Study on the valorization of the natural values of the Shara Mountain and the assessment of their market values”** (Melovski & Hristovski, 2008) where for the first time the economic valuation of the Shara Mountain values that can not be measured by the market was done. Within the framework of this approach, a survey was conducted with the participation of the population on various issues including the willingness and readiness to pay for the services. Nevertheless, the majority of the respondents (27% of 323) answered that they would not pay for any services deriving from the natural environment of the mountain, whether the majority of respondents (73%) is ready to pay for the services, ranging from small to more significant contributions. Finally, the **Integrated Water Resource Management at Dojran Lake in Macedonia⁴⁰ project** developed a **Framework proposal for development and implementation of Payments for Ecosystem Services scheme at Dojran Lake (2016)**.⁴¹ Based on the already identified elements constituting a PES scheme, the following response options are further taken into consideration: restoration of forest belts, lake restoration through reed management and ecotourism. The objective of the restoration of the forest belts is to prevent the soil erosion and through reforestation of abandoned agricultural lands to strengthen the functions of ecosystems for erosion control, water quality and thus ensure suitable habitat for biodiversity. Oak, ash or elm trees will maintain the scenic landscape and biodiversity for recreational benefits for the local population and tourists.

8.3 Recommendations for the way forward

Consequently, there is a need to introduce specific normative frameworks for PES, as well as to define the ecosystem services market and beneficiaries. In the creation of a normative framework for PES, regulations must be based on concrete experiences which have shown to be successful in the region and the country itself. Alongside the existing normative framework for PES mainstreaming, also the capacities of national and local authorities, as well as the users of the environmental services are weak. The responsible authorities cannot identify which services can be sustainably provided to the users and the users of the environmental services cannot recognize the cost of the services and they are not willing to pay for them. With regards the forest ecosystem services, until now very limited efforts were made either to promote the protective functions of the forests or to promote the forest products and services sustainably since there is still no market-oriented ecosystem service. The forestry planning system still has not the ecosystem approach leading not only to the provision of services and payment for them, but also to increase the biodiversity in the forests and its protection. Furthermore, PES is not mainstreamed in other sectors where ecosystem services potentially can be utilized e.g. climate change, DRR, smart agriculture, sustainable water management, etc. Since the PES can be implemented on two levels of government i.e. national (e.g. compensation of fixed changes in agricultural practice or sustainable forest management practices or watershed protection) and local (e.g. additional taxation of water bills, municipal bonds, fixed payments for protection of the ecosystems), it can be a tool for the consolidation of decentralization processes since these consolidate and strengthen local institutions, among other benefits and especially with regards to the natural hazards.

⁴⁰ <https://www.cepf.net/sites/default/files/final-report-63842.pdf>

⁴¹ <https://bit.ly/37akLTZ>.

In this context, the following recommendations can be formulated aiming at successful and comprehensive mainstreaming. It is strongly recommended to continue and strengthen the application of PES by all entities managing the country's natural resources per EU regulations and other good practices. In particular, within the scope of the second phase of the Eco-DRR project emphasis be paid to the regulation of the regulatory function of forests, in the context of strengthening control over natural disasters, protection against erosion, regulation of climate condition, etc. Furthermore, the Eco-DRR project should conduct an additional study/analysis related to the process of comprehensive identification and determination of forest ecosystem services and appropriately propose to the relevant partners (MAFWE and PENF) to be incorporated in the legal framework in the management of national forests with to ensure the sustainability of the project results and their synergy with the concept of PES. Sensitization of users of environmental services is essential for these to recognize the cost of producing environmental services and to increase their willingness to pay for these services. As for service providers, education programs may improve the adoption of techniques contributing to the production of environmental services. Nevertheless, the education programmes are not the only mechanism, but they need to be combined with the provision of incentives mechanism. New ways of managing natural resources, such as inter-ministerial exchange forums, regional, international ecosystem access forums, and integrated field planning tools, can encourage better integration and help reduce inadequate land and natural use incentives, resources.

Accordingly, a brief action plan is prepared containing the essential actions/measures that need to be implemented for further integration of PES in

#	Action/measure	Stakeholders	Priority
1	Understanding of the regulatory functions of the forests in the context of strengthening control over natural disasters, protection against erosion, regulation of climate condition, etc.	CMC, PENF, MoEPP, MAFWE	Short-term
2	Study on comprehensive identification and determination of forest ecosystem services and appropriately propose to the relevant partners to be incorporated in the legal framework in the management of national forests	CMC, PENF, MAFWE, MoEPP	Short-term
3	Understanding of the needs of the local stakeholders and the PES demand-supply ratio	CMC, PENF, MoEPP, MAFWE	Short-term
4	Capacity-building of the key project stakeholders on the PES contextual frameworks, mechanisms and benefits for the local communities.	CMC, PENF, municipalities, Babuna, MAFWE	Short-term
5	Sensitization of users of environmental services is essential for these to recognize the cost of producing environmental services and to increase their willingness to pay for these services	CMC, PENF, MAFWE, Babuna, municipalities	Short-term
6	Codification of the project best practices & lessons learned	CMC, PENF	Short-term
7	Review and mainstreaming of PES in essential normative framework	MoEPP, CMC, PENF, MAFWE, etc.	Mid-term

#	Action/measure	Stakeholders	Priority
8	Capacity building of key national institutions on PES	CMC and key national institutions	Mid-term
9	Water quality PES schemes (e.g. constructed wetlands for dealing with wastewater discharges, PES schemes to address increased nutrient pollution from development, etc.) Buyers: Government, PCEs, private business. Providers: Land-owners, Pes, etc. Intermediaries: NGOs, farming industry. Associations.	CMC, MoEPP, MAFWE, municipalities, PCEs, PEs.	Long-term
10	Flood risk management PES schemes (e.g. alteration, restoration or use of landscape features, mechanisms include storing water using landscape features, increasing soil infiltration, and slowing water by interrupting and increasing resistance to its flow, etc.) Investors: Local authorities, developers, PCEs, PEs, private businesses. Providers: Land-owners/managers. Intermediaries: National and local authorities, regional centres, NGOs, associations, etc.	CMC, MoEPP, MAFWE, municipalities, PCEs, PEs.	Long-term
11	Forestry PES schemes (e.g. afforestation and planting programmes, creation of new urban forests, sustainable forest management and practices, investments in forests for carbon sequestration purposes, visitor payback schemes, etc.) Buyers: governments (national/local, visitors, downstream beneficiaries, businesses, PCEs, PES, etc. Providers: PE NF, private forest and land-owners, businesses, etc. Intermediaries: NGOs, environmental organizations and associations, forest carbon brokers, etc.	CMC, PENF, MAFWE, MoEPP, municipalities, PCEs, PEs.	Long-term

8.4 Pilot PES solutions for the project site

Within the framework of the assignment, based on the outputs from the survey, the existing situation regarding PES in the country and identified needs, the following realistic pilot solutions are recommended for the broader area of the project site i.e. Lisiche Dam:

➤ Broader perimeter of the area surrounding the water accumulation, the Lisiche Lake, is categorized as a forest land and is managed by the PE NF. Current risks are related to the forest fires and soil movement which contribute to the process of transportation of the sediment to the water accumulation. As mentioned previously this situation significantly is impacting the stable water supply. Accordingly, this process in the short- and medium- terms can be significantly reduced through afforestation and strengthening of the forest vegetation within the competent FMU.

Recommendation: The PE Lisiche Hydro-system should find a modality for allocation of funds aimed at subsidizing the forest seedlings at the PE NF nursery and to introduce and conduct regular annual afforestation campaigns. These funds can be calculated in the end-user service accounts such as PES.

➤ The PE Lisiche Hydro-system manages two artificial water reservoirs – Lisiche and Mladost. Accordingly, in direct or indirect forms, it delivers various services to the citizens, such as water supply, irrigation, recreational, sports, fishing, catering and other services.

Recommendation: Part of the fees for these services should be allocated as contributions of the newly established PES Fund, that will provide stable and regular financing for afforestation and increasing of the forest vegetation in the narrow and the broader areas of the water reservoirs to increase the quality of existing and introduction of additional services.

➤ PCE “Derven” – Veles supplies the citizens of Veles and surrounding settlements with drinking water from the Lisiche Hydr-system.

Recommendation: Potential consideration of allocation of a small percentage from the water bill amount of the legal and physical entities for subsidization of the environmental services around the broader area of the water accumulation and alongside the water supply system from the accumulation to the city.

Furthermore, for the mainstreaming and piloting of the PES services related to the project site, two more general recommendations are formulated:

➤ ADKOM, as an association of public utility providers through its mechanisms for the strengthening of the capacities of its members (PCEs) to consider the possibility of initiating expert discussions and an initiative for changes in the legislation on communal activities and water supply to introduce the PES approach and to support PES related capacity development in its members.

➤ The Eco-DRR project, within its project activities to transfer good practice and experiences for PES from Japan and other relevant countries and to propose their incorporation in the normative framework for sustainable forest management in the Republic of North Macedonia.

9. CONCLUSIONS AND RECOMMENDATIONS

Within the framework of the project “Capacity Building for ECO-DRR through Sustainable Forest Management” implemented by JICA with main beneficiaries being CMC and PEMF, pilot intervention measures for protection of the Lisiche Hydro System, in particular, the accumulation Lisiche, will be implemented sustainably. Namely, the whole set of activities aimed at preventing the erosion and sediment deposition at the bottom of the reservoir, as well as the introduction of the protection functions of the forest through afforestation of the slopes near the lakeshore will be executed. Therefore, a socio-economic survey on Eco-DRR related information focusing on the municipalities of Chaska and Veles was implemented to initially understand the broader context of the Lisiche Hydro System for the water conservation and exposure and vulnerability to natural disasters

Accordingly, as per the objectives of the assignment, it can be concluded that the socio-economic research conducted within the Eco-DRR project funded by JICA provides a comprehensive analysis that looks at the current situation, perspectives and expectations of the involved and affected organizations in the area of Chashka and Veles who will be collaborators during the implementation of the activities related to the project location in the vicinity of the accumulation Lisiche.

The Eco-DRR project is a unique form of project activities that are currently being implemented in the country and through this project, the concept of Eco based solutions in disaster risk reduction is promoted, primarily the concept of multi-user function of forests and introduction of the category of "protective forests". The project location and the activities that will be undertaken in the area of the Lisiche Hydro System, in addition to the DRR function, also have the function of protection of water resources and sustainability in their long-term water management.

Besides, the field survey has identified essential socio-economic aspects and needs within the local contexts of the municipalities of Chashka and Veles. Consequently, the key informants from the survey target organizations fully supported the survey and welcomed the implementation of the activities of the project, especially the Lisiche dam works and mainstreaming of Eco-DRR in disaster risk management and sustainable forest management. In this context, they are seen as an effort to introduce multi-hazard, multi-risk and multi-stakeholder risk reduction based on solutions from the nature that can be a blueprint for others. Furthermore, it can create synergies between the various stakeholders in the municipalities where it is implemented, primarily in the training, education and cross-sectoral coordination and cooperation of the entities of the crisis management system.

Based on the socio-economic profile of the municipalities, as well as the other specifics of the local contexts, it can be concluded that the municipalities are exposed to various natural hazards affecting their resilience. Fortunately, based on the analysis of the risk profiles, there is no significant impact to the municipalities and their communities. On a local level, the environment protection and disaster risk reduction system is still predominantly reactive, with more focus on response, than on the sustainable implementation of prevention and mitigation measures. Knowledge on Eco-DRR is very low and concept or practices are poorly identified or implemented. Still, the preventive, protective and beneficial functions of the forest are not recognized.

Concerning the PES, there is a need to introduce specific normative frameworks for PES, as well as to define the ecosystem services market and beneficiaries. Alongside the existing normative framework for PES mainstreaming, also the capacities of national and local authorities, as well as the users of the environmental services are weak. With regards the forest ecosystem services, until now very limited efforts were made either to promote the protective functions of the forests or to promote the forest products and services sustainably since there is still no market-oriented ecosystem service. The forestry planning system still has not the ecosystem approach leading not only to the provision of services and payment for them, but also to increase the biodiversity in the forests and its protection. Furthermore, PES is not mainstreamed in other sectors where ecosystem services potentially can be utilized e.g. climate change, DRR, smart agriculture, sustainable water management, etc.

As a conclusion, it is necessary to emphasize that this document shall serve as a key review and assessment document that can provide additional input for the Project and the national stakeholders for further advancing the Eco-DRR and resilience agenda in the municipalities of Chashka and Veles, as well as designing the activities and measures beyond the project intervention.

For a better understanding of the immediate outputs of this survey, and the ultimate fast-tracking the support to building a disaster resilient municipalities through an Ecosystem-based DRR approach, following recommendations are formulated and presented not in an order of priority:

- Multi-stakeholder approach in the natural conservation and disaster risk reduction is needed in the case of the PE Lisiche Hydro System since most of the hazards are deriving from the areas that are not under the responsibilities of the public enterprise.
- It is needed to conduct DRR and Eco-DRR sensitizations sessions with relevant local stakeholders to increase their awareness and to gain essential skills how to mainstream them in their work. Also, there is a need for additional sensitization on the Eco-DRR concepts and how it needs to be mainstreamed during the preparation of the risk and hazard assessments, as well as prioritization of the mitigation measures.
- The mechanism of inter-municipal cooperation shall be advanced to enhance the existing cooperation between the municipalities of Chashka and Veles, as well as to introduce the responsibilities related to Eco-DRR aspects and areas.
- Prevention/mitigation measures should be the main focus in the development of resilient municipalities and communities. Accordingly, risk and hazard assessments shall be integrated in the local strategic documents, programmes, action plans, as well as consequent allocation of financial resources for their implementation.
- Within the efforts for DRR mainstreaming and integration of Eco-DRR concepts, the Sustainable Development Goals shall be taken into consideration, especially the goals 6, 11, 13 and 15.

➤ Strengthening the capacities of the competent local institutions for Eco-DRR – The portfolio of the Project activities should include measure and activities for further strengthening of the local level authorities for Eco-DRR.

➤ Eco-DRR project should support the regulation of the regulatory functions of the forests in the context of strengthening the prevention of natural disasters, protection against erosion, regulation of climate conditions, etc. through preparation of a study on forest ecosystem services, modifications of the relevant normative frameworks, sensitization of users, education of service providers, as well as the implementation of pilot PES schemes in the project site area.

Annex I – Survey Framework (Questionnaire)

“Socio-economic Survey on Eco-DRR related information focusing In Chaska and Veles”
(Draft Report)

No	classification	classification	Questionnaire (code)	PE Hydro system Lisiche	Municipalities of Chaska (relevant administration)	Municipalities of Veles (relevant administration)	PE National Forest (local branch of Veles)	CMC-FC MC Veles	PE for drinking water supply, Municipalities of Chaska	PE for drinking water supply, Municipalities of Veles	Local irrigation authorities, Municipalities of Chaska	Local irrigation authorities, Municipalities of Veles	Small Medium Hydroelectric Power Station upper side of Lisiche	Other Local authorities/institutions (TBD)	ADKOM (Association of public utility services providers of the Republic of North Macedonia)
1	Organization information	-	<ul style="list-style-type: none"> Name Date of establishment Number of staff Capita Role of organization 	○	○	○	○	○	○	○	○	○	○	○	○
2	Personal information	-	<ul style="list-style-type: none"> gender age group ethnic affiliation education section position length of service 	○	○	○	○	○	○	○	○	○	○	○	○
3	Dam	Basic information	<ul style="list-style-type: none"> Year of establishment Construction cost Yearly Maintenance cost Service life 	○											
		Activities	<ul style="list-style-type: none"> Activities for stable water supply/water use/ flood control Details of conservation activities (content, frequency, cost) Stakeholders involved with conservation activities Necessary facilities for conservation activities (name, function, installation cost, maintenance cost, service life) 	○											
		Disaster around the dam	<ul style="list-style-type: none"> Frequent disaster Potential disaster Activities of Disaster prevention (contents, cost) Facility required for disaster prevention activities (name, function, installation cost, maintenance cost, service life) 												
4	Municipality	Activities	<ul style="list-style-type: none"> Activities for stable water supply/water use/ flood control Population, number of households, number of villages, race, religion, average annual income Urban planning, mountain area conservation planning, mountain area development planning are exist or not Main agricultural and industrial activities Agricultural products and quantity (past data) Breakdown of income and expenses Foreign country's support is exist or not (if exist, detail) Details of conservation activities (content, frequency, cost) Stakeholders involved with conservation activities Necessary facilities for conservation activities (name, function, installation cost, maintenance cost, service life) 		○	○									
		Conservation of natural environment (forest, river, water) around the dam	<ul style="list-style-type: none"> Details of conservation activities (content, frequency, cost) Stakeholders involved with conservation activities Necessary facilities for conservation activities (name, function, installation cost, maintenance cost, service life) 												
		Disaster in the city	<ul style="list-style-type: none"> Frequent disaster Potential disaster Activities of Disaster prevention (contents, cost) Facility required for disaster prevention activities (name, function, installation cost, maintenance cost, service life) 												
5	Forest, Agriculture	Forest conservation activities in managerial areas	<ul style="list-style-type: none"> Details of conservation activities (content, frequency, cost) Stakeholders involved with conservation activities Necessary facilities for conservation activities (name, function, installation cost, maintenance cost, service life) Timber/firewood/construction sales information (price/annual sales amount/ annual sales volume) Recreational use (number of users, usage fee, annual income) Rare wildlife/rare plants are existed or not Biodiversity survey result and economic evaluation are existed or not 				○			○	○				
		Disaster in managerial areas	<ul style="list-style-type: none"> Frequent disaster Potential disaster Activities of Disaster prevention (contents, cost) Facility required for disaster prevention activities (name, function, installation cost, maintenance cost, service life) 												
6	Crisis management	Conservation activities	<ul style="list-style-type: none"> Details of conservation activities (content, frequency, cost) Stakeholders involved with conservation activities Necessary facilities for conservation activities (name, function, installation cost, maintenance cost, service life) 					○							
		Disaster/Obstacle	<ul style="list-style-type: none"> Frequent disaster/obstacle Potential disaster/obstacle Activities of disaster prevention and obstacle prevention (contents, cost) 												
7	Drinking water supply	Activities	<ul style="list-style-type: none"> Activities for stable drinking water supply (contents, cost) Drinking water bill 												
		Conservation activities	<ul style="list-style-type: none"> Details of conservation activities (content, frequency, cost) Stakeholders involved with conservation activities Necessary facilities for conservation activities (name, function, installation cost, maintenance cost, service life) 					○	○						○
		Disaster/Obstacle	<ul style="list-style-type: none"> Frequent disaster/obstacle Potential disaster/obstacle Activities of disaster prevention and obstacle prevention (contents, cost) 												
8	Power station	Basic information	<ul style="list-style-type: none"> Year of establishment Construction cost Yearly Maintenance cost Service life 												
		Activities	<ul style="list-style-type: none"> Activities for stable power generation/power supply 												
		Conservation of natural environment (forest, river, water) around the power station	<ul style="list-style-type: none"> Details of conservation activities (content, frequency, cost) Stakeholders involved with conservation activities Necessary facilities for conservation activities (name, function, installation cost, maintenance cost, service life) 										○		○
		Disaster around the power station	<ul style="list-style-type: none"> Frequent disaster Potential disaster Activities of Disaster prevention (contents, cost) Facility required for disaster prevention activities (name, function, installation cost, maintenance cost, service life) 												
9	Other Local authorities/institutions (TBD)	Conservation activities	<ul style="list-style-type: none"> Details of conservation activities (content, frequency, cost) Stakeholders involved with conservation activities Necessary facilities for conservation activities (name, function, installation cost, maintenance cost, service life) 											○	○
		Disaster/Obstacle	<ul style="list-style-type: none"> Frequent disaster/obstacle Potential disaster/obstacle Activities of disaster prevention and obstacle prevention (contents, cost) 												
10	Other	-	<ul style="list-style-type: none"> Return of usage fees for power station is exist or not Subsidy system for nature conservation and disaster response is exist or not Investable amount for nature conservation and disaster response 	○	○	○	○	○	○	○	○	○	○	○	○
11	Regarding this project	-	<ul style="list-style-type: none"> Expectations about this project. (short-term, long-term) Problems or concerns of continuing this project Activities similar to this project is possible or not Comments on this project 	○	○	○	○	○	○	○	○	○	○	○	○

ANNEX II – SURVEY TOOLS

SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES

QUESTIONNAIRE for PE Hydro system Lisiche

Dear Participant,

Thank you for your participation in the **SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES** within the project “Capacity Building for Ecosystem-based Solutions for Disaster Risk Reduction through Sustainable Forest Management in Macedonia”. The purpose of this Questionnaire is to obtain appropriate input information related to the current conditions, needs and perspectives of the Lisiche Hydro system connected to the sustainability of water conservation and protection of water reservoirs from natural disasters by using Eco-DRR based measures and activities. *For that reason, we kindly request you to answer this questionnaire.*

Instruction: The Surveyor based on the answers given by the Key Informants fills the Questionnaire.

Thank you for your cooperation!

Questionnaire No. _____

Date of interview: _____

I. PERSONAL INFORMATION

1. Name (optional): _____

1.1 Institution: _____

1.2 Department/Section in the Institution: _____

1.3 Position in the institution: _____

1.4 Length of service (in years): _____

2. Gender: Male Female

3. What is your age group?

18 – 24 25 – 35 36 – 45

46 – 55 56 – 65

4. What is your ethnic affiliation?

Macedonian Albanian Turkish

Serb Bosnian Roma

Other _____

5. What is the level of your education?

- Elementary Secondary
 University and higher Other _____

II. ORGANIZATION INFORMATION

- 6.1 Date of establishment:** _____
6.2 Number of staff: _____
6.3 Annual income/budget: _____
6.4 Role of the organization: _____

III. DAM INFORMATION

III.1 Basic Information

- 7.1 Year of establishment:** _____
7.2 Construction costs: _____
7.3 Annual maintenance costs: _____
7.4 Service life: _____

III.2 Activities

- 8. Activities for stable water supply/water use/ flood control:**

III.2 Conservation of the natural environment (forest, river, water) around the dam

9.1 Details of conservation activities:

- 9.1.1 Content:** _____
9.1.2 Frequency: _____
9.1.3 Costs: _____

9.2 Stakeholders involved with conservation activities:

9.3 Necessary facilities for conservation activities:

- 9.3.1 Name:** _____
9.3.2 Function: _____
9.3.3 Installation costs: _____
9.3.4 Maintenance costs: _____
9.3.5 Service life: _____

III.3 Disasters around the dam

- 10.1 Frequent disaster:** _____

10.2 Potential disaster: _____

10.3 Activities of disaster prevention (contents, cost): _____

10.4 Facility required for disaster prevention activities:

10.4.1 Name: _____

10.4.2 Function: _____

10.4.3 Installation cost _____

10.4.4 Maintenance cost: _____

10.4.5 Service life: _____

IV. OTHER:

11. Subsidy system for nature conservation and disaster response - exists or not:

12. Investable amount for nature conservation and disaster response: _____

V. REGARDING THIS PROJECT

13. Expectations about this project:

13.1 Short term: _____

13.2 Long term: _____

14. Problems or concerns of continuing this project: _____

15. Comments on this project: _____

SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES

QUESTIONNAIRE for the Municipalities of Chashka and Veles

Dear Participant,

Thank you for your participation in the **SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES** within the project “Capacity Building for Ecosystem-based Solutions for Disaster Risk Reduction through Sustainable Forest Management in Macedonia”. The purpose of this Questionnaire is to obtain appropriate input information related to the current conditions, needs and perspectives of the Lisiche Hydro system connected to the sustainability of water conservation and protection of water reservoirs from natural disasters by using Eco-DRR based measures and activities. *For that reason, we kindly request you to answer this questionnaire.*

Instruction: The Surveyor based on the answers given by the Key Informants fills the Questionnaire.

Thank you for your cooperation!

Questionnaire No. _____

Date of interview: _____

I. PERSONAL INFORMATION

2. Name (optional): _____

1.1 Institution: _____

1.2 Department/Section in the Institution: _____

1.3 Position in the institution: _____

1.4 Length of service (in years): _____

2. Gender: Male Female

3. What is your age group?

18 – 24 25 – 35 36 – 45

46 – 55 56 – 65

4. What is your ethnic affiliation?

Macedonian Albanian Turkish

Serb Bosnian Roma

Other _____

5. What is the level of your education?

Elementary Secondary

University and higher Other _____

II. ORGANIZATION INFORMATION

- 6.1 Date of establishment: _____
6.2 Number of staff: _____
6.3 Annual budget: _____
6.4 Role of the organization: _____

III. MUNICIPALITIES

III.1 Activities

- 7.1 Activities for stable water supply/water use/ flood control: _____

- 7.2 General information:
7.2.1 Total population: _____
7.2.2 Number of households: _____
7.2.3 Number of settlements/villages: _____
7.2.5: Religion: _____
7.2.6: Annual budget for activity 7.1: _____
- 7.3 Urban planning, mountain area conservation planning, mountain area development planning - exists or not: _____
- 7.4 Main agricultural and industrial activities: _____

- 7.5 Agricultural products and quantity (past data): _____
- 7.6 Breakdown of income and expenses: _____
- 7.7 Foreign countrys' support – exists or not: _____
If exists, pls describe: _____

III.2 Conservation of natural environment (forest, river, water) around the dam

8. 1 Details of conservation activities:
8.1.1 Content: _____
8.1.2 Frequency: _____
8.1.3 Costs: _____
8. 2 Stakeholders involved with conservation activities:

8. 3 Necessary facilities for conservation activities:
8.3.1 Name: _____
8.3.2 Function: _____
8.3.3 Installation costs: _____
8.3.4 Maintenance costs: _____
8.3.5 Service life: _____

III.3 Disasters in the city

9.1 Frequent disaster: _____

9. 2 Potential disaster: _____

9. 3 Activities of disaster prevention: _____

9.3.1 Contents: _____

9.3.2 Costs: _____

9. 4 Facility required for disaster prevention activities:

9.4.1 Name: _____

9.4.2 Function: _____

9.4.3 Installation cost _____

9.4.4 Maintenance cost: _____

9.4.5 Service life: _____

IV. OTHER:

10. Subsidy system for nature conservation and disaster response - exists or not:

11. Investable amount for nature conservation and disaster response: _____

V. REGARDING THIS PROJECT

12. Expectations about this project:

12.1 Short term: _____

12.2 Long term: _____

13. Problems or concerns of continuing this project: _____

14. Comments on this project: _____

SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES

QUESTIONNAIRE for the PE NF – Local Branch Office in Veles

Dear Participant,

Thank you for your participation in the **SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES** within the project “Capacity Building for Ecosystem-based Solutions for Disaster Risk Reduction through Sustainable Forest Management in Macedonia”. The purpose of this Questionnaire is to obtain appropriate input information related to the current conditions, needs and perspectives of the Lisiche Hydro system connected to the sustainability of water conservation and protection of water reservoirs from natural disasters by using Eco-DRR based measures and activities. *For that reason, we kindly request you to answer this questionnaire.*

Instruction: The Surveyor based on the answers given by the Key Informants fills the Questionnaire.

Thank you for your cooperation!

Questionnaire No. _____

Date of interview: _____

I. PERSONAL INFORMATION

3. Name (optional): _____

1.1 Institution: _____

1.2 Department/Section in the Institution: _____

1.3 Position in the institution: _____

1.4 Length of service (in years): _____

2. Gender: Male Female

3. What is your age group?

18 – 24 25 – 35 36 – 45

46 – 55 56 – 65

4. What is your ethnic affiliation?

Macedonian Albanian Turkish

Serb Bosnian Roma

Other _____

5. What is the level of your education?

Elementary Secondary

University and higher Other _____

II. ORGANIZATION INFORMATION

- 6.1 Date of establishment:** _____
6.2 Number of staff: _____
6.3 Annual income/budget: _____
6.4 Role of the organization: _____

III. FOREST, AGRICULTURE

III.1 Forest conservation activities in managerial areas

- 7.1 Details of conservation activities:** _____
7.1.1: *Content:* _____
7.1.2: *Frequency:* _____
7.1.3: *Costs:* _____
7.2 Stakeholders involved with conservation activities: _____

7.3 Necessary facilities for conservation activities: _____
7.3.1: *Name:* _____
7.3.2: *Installation cost:* _____
7.3.3: *Maintenance cost:* _____
7.3.4: *Service life:* _____
7.4 Timber (firewood/construction) sales information: _____
7.4.1: *Price:* _____
7.4.2: *Annual sales amount:* _____
7.4.3: *Annual sales volume:* _____
7.5 Recreational use: _____
7.5.1: *Number of users:* _____
7.5.2: *Usage fee:* _____
7.5.3: *Annual income:* _____
7.6 Rare wildlife/rare plants exists or not: _____

7.7 Biodiversity survey result and economic evaluation – exists or not: _____

III.3 Disasters in managerial areas

- 8.1 Frequent disaster:** _____

8.2 Potential disaster: _____

8.3 Activities of disaster prevention: _____
8.3.1: *Contents:* _____
8.3.2: *Costs:* _____

8.4 Facility required for disaster prevention activities:

8.4.1 Name: _____

8.4.2 Function: _____

8.4.3 Installation cost _____

8.4.4 Maintenance cost: _____

8.4.5 Service life: _____

IV. OTHER:

9. Subsidy system for nature conservation and disaster response - exists or not:

10. Investable amount for nature conservation and disaster response: _____

V. REGARDING THIS PROJECT

11. Expectations about this project:

11.1 Short term: _____

11.2 Long term: _____

12. Problems or concerns of continuing this project: _____

13. Comments on this project: _____

SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES

QUESTIONNAIRE for the RCMC in Veles

Dear Participant,

Thank you for your participation in the **SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES** within the project “Capacity Building for Ecosystem-based Solutions for Disaster Risk Reduction through Sustainable Forest Management in Macedonia”. The purpose of this Questionnaire is to obtain appropriate input information related to the current conditions, needs, and perspectives of the Lisiche Hydro system connected to the sustainability of water conservation and protection of water reservoirs from natural disasters by using Eco-DRR based measures and activities. *For that reason, we kindly request you to answer this questionnaire.*

Instruction: The Surveyor based on the answers given by the Key Informants fills the Questionnaire.

Thank you for your cooperation!

Questionnaire No. _____

Date of interview: _____

I. PERSONAL INFORMATION

4. Name (optional): _____

1.1 Institution: _____

1.2 Department/Section in the Institution: _____

1.3 Position in the institution: _____

1.4 Length of service (in years): _____

2. Gender: Male Female

3. What is your age group?

18 – 24 25 – 35 36 – 45

46 – 55 56 – 65

4. What is your ethnic affiliation?

Macedonian Albanian Turkish

Serb Bosnian Roma

Other _____

5. What is the level of your education?

Elementary Secondary

University and higher Other _____

II. ORGANIZATION INFORMATION

- 6.1 Date of establishment: _____
6.2 Number of staff: _____
6.3 Annual budget: _____
6.4 Role of the organization: _____

III. CRISIS MANAGEMENT

III.1 Conservation activities in managerial areas

- 7.1 Details of conservation activities: _____
7.1.1: Content: _____
7.1.2: Frequency: _____
7.1.3: Costs: _____
7.2 Stakeholders involved with conservation activities: _____
7.3 Necessary facilities for conservation activities: _____
7.3.1: Name: _____
7.3.2 Installation cost: _____
7.3.3: Maintenance cost: _____
7.3.4: Service life: _____

III.3 Disasters

- 8.1 Frequent disasters: _____
8.2 Potential disasters: _____
8.3 Activities of disaster prevention: _____
8.3.1 Contents: _____
8.3.2 Costs: _____

IV. OTHER:

9. Subsidy system for nature conservation and disaster response - exists or not: _____
10. Investable amount for nature conservation and disaster response: _____

V. REGARDING THIS PROJECT

11. Expectations about this project:
11.1 Short term: _____
11.2 Long term: _____

12. Problems or concerns of continuing this project: _____

13. Comments on this project: _____

SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES

QUESTIONNAIRE for PCE in Chashka and Veles

Dear Participant,

Thank you for your participation in the **SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES** within the project “Capacity Building for Ecosystem-based Solutions for Disaster Risk Reduction through Sustainable Forest Management in Macedonia”. The purpose of this Questionnaire is to obtain appropriate input information related to the current conditions, needs, and perspectives of the Lisiche Hydro system connected to the sustainability of water conservation and protection of water reservoirs from natural disasters by using Eco-DRR based measures and activities. *For that reason, we kindly request you to answer this questionnaire.*

Instruction: The Surveyor based on the answers given by the Key Informants fills the Questionnaire.

Thank you for your cooperation!

Questionnaire No. _____ **Date of interview:** _____

I. PERSONAL INFORMATION

5. Name (optional): _____

1.1 Institution: _____

1.2 Department/Section in the Institution: _____

1.3 Position in the institution: _____

1.4 Length of service (in years): _____

2. Gender: Male Female

3. What is your age group?

18 – 24 25 – 35 36 – 45

46 – 55 56 – 65

4. What is your ethnic affiliation?

Macedonian Albanian Turkish

Serb Bosnian Roma

Other _____

5. What is the level of your education?

Elementary Secondary

University and higher Other _____

II. ORGANIZATION INFORMATION

- 6.1 Date of establishment: _____
6.2 Number of staff: _____
6.3 Annual budget: _____
6.4 Role of the organization: _____

III. DRINKING WATER SUPPLY

III.1 Activities

- 7.1 Activities for stable water supply: _____
7.1.1 Content: _____
7.1.2 Costs: _____
7.2 Drinking water bill: _____

III.2 Conservation activities in managerial areas

- 8.1 Details of conservation activities: _____
8.1.1: Content: _____
8.1.2: Frequency: _____
8.1.3: Costs: _____
8.2 Stakeholders involved with conservation activities: _____
8.3 Necessary facilities for conservation activities: _____
8.3.1: Name: _____
8.3.2 Installation cost: _____
8.3.3: Maintenance cost: _____
8.3.4: Service life: _____

III.3 Disasters

- 9.1 Frequent disasters: _____
9.2 Potential disasters: _____
9.3 Activities of disaster prevention: _____
9.3.1 Contents: _____
9.3.2 Costs: _____

IV. OTHER:

10. Subsidy system for nature conservation and disaster response - exists or not: _____
11. Investable amount for nature conservation and disaster response: _____

V. REGARDING THIS PROJECT

12. Expectations about this project:

12.1 Short term: _____

12.2 Long term: _____

13. Problems or concerns of continuing this project: _____

14. Comments on this project: _____

SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES

QUESTIONNAIRE for the Local Irrigation Authorities

Dear Participant,

Thank you for your participation in the **SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES** within the project “Capacity Building for Ecosystem-based Solutions for Disaster Risk Reduction through Sustainable Forest Management in Macedonia”. The purpose of this Questionnaire is to obtain appropriate input information related to the current conditions, needs and perspectives of the Lisiche Hydro system connected to the sustainability of water conservation and protection of water reservoirs from natural disasters by using Eco-DRR based measures and activities. *For that reason, we kindly request you to answer this questionnaire.*

Instruction: The Surveyor based on the answers given by the Key Informants fills the Questionnaire.

Thank you for your cooperation!

Questionnaire No. _____

Date of interview: _____

I. PERSONAL INFORMATION

6. Name (optional): _____

1.1 Institution: _____

1.2 Department/Section in the Institution: _____

1.3 Position in the institution: _____

1.4 Length of service (in years): _____

2. Gender: Male Female

3. What is your age group?

18 – 24 25 – 35 36 – 45

46 – 55 56 – 65

4. What is your ethnic affiliation?

Macedonian Albanian Turkish

Serb Bosnian Roma

Other _____

5. What is the level of your education?

Elementary Secondary

University and higher Other _____

II. ORGANIZATION INFORMATION

6.1 Date of establishment: _____

6.2 Number of staff: _____

6.3 Annual income/budget: _____

6.4 Role of the organization: _____

III. FOREST, AGRICULTURE

III.1 Forest conservation activities in managerial areas

7.1 Details of conservation activities: _____

7.1.1: *Content:* _____

7.1.2: *Frequency:* _____

7.1.3: *Costs:* _____

7.2 Stakeholders involved with conservation activities: _____

7.3 Necessary facilities for conservation activities: _____

7.3.1: *Name:* _____

7.3.2: *Installation cost:* _____

7.3.3: *Maintenance cost:* _____

7.3.4: *Service life:* _____

7.5 Recreational use: _____

7.5.1: *Number of users:* _____

7.5.2: *Usage fee:* _____

7.5.3: *Annual income:* _____

7.6 Rare wildlife/rare plants exists or not: _____

7.7 Biodiversity survey result and economic evaluation – exists or not: _____

III.3 Disasters in managerial areas

8.1 Frequent disaster: _____

8.2 Potential disaster: _____

8.3 Activities of disaster prevention: _____

8.3.1: *Contents:* _____

8.3.2: *Costs:* _____

8.4 Facility required for disaster prevention activities:

8.4.1: *Name:* _____

8.4.2: *Function:* _____

8.4.3 Installation cost _____

8.4.4 Maintenance cost: _____

8.4.5 Service life: _____

IV. OTHER:

9. Subsidy system for nature conservation and disaster response - exists or not:

10. Investable amount for nature conservation and disaster response: _____

V. REGARDING THIS PROJECT

11. Expectations about this project:

11.1 Short term: _____

11.2 Long term: _____

12. Problems or concerns of continuing this project: _____

13. Comments on this project: _____

SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES

QUESTIONNAIRE for the Small Hydro Power Plant

Dear Participant,

Thank you for your participation in the **SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES** within the project “Capacity Building for Ecosystem-based Solutions for Disaster Risk Reduction through Sustainable Forest Management in Macedonia”. The purpose of this Questionnaire is to obtain appropriate input information related to the current conditions, needs and perspectives of the Lisiche Hydro system connected to the sustainability of water conservation and protection of water reservoirs from natural disasters by using Eco-DRR based measures and activities. *For that reason, we kindly request you to answer this questionnaire.*

Instruction: The Surveyor based on the answers given by the Key Informants fills the Questionnaire.

Thank you for your cooperation!

Questionnaire No. _____

Date of interview: _____

I. PERSONAL INFORMATION

7. Name (optional): _____

1.1 Institution: _____

1.2 Department/Section in the Institution: _____

1.3 Position in the institution: _____

1.4 Length of service (in years): _____

2. Gender: Male Female

3. What is your age group?

18 – 24 25 – 35 36 – 45

46 – 55 56 – 65

4. What is your ethnic affiliation?

Macedonian Albanian Turkish

Serb Bosnian Roma

Other _____

5. What is the level of your education?

Elementary Secondary

University and higher Other _____

II. ORGANIZATION INFORMATION

- 6.1 Date of establishment: _____
6.2 Number of staff: _____
6.3 Annual income/budget: _____
6.4 Role of the organization: _____

III. POWER STATION

III.1 Basic Information

- 7.1 Years of establishment: _____
7.2 Construction cost: _____
7.3 Annual maintenance cost: _____
7.4 Service life: _____

III.2 Activities

- 8.1 Activities for stable power generation/power supply: _____

III.3 Conservation of natural environment (forest, river, water) around the power station

- 9.1 Details of conservation activities: _____
9.1.1: Content: _____
9.1.2: Frequency: _____
9.1.3: Costs: _____
9.2 Stakeholders involved with conservation activities: _____

9.3 Necessary facilities for conservation activities: _____
9.3.1: Name: _____
9.3.2 Installation cost: _____
9.3.3: Maintenance cost: _____
9.3.4: Service life: _____

III.3 Disasters around the Power Plant

- 10.1 Frequent disaster: _____

10.2 Potential disaster: _____

10.3 Activities of disaster prevention: _____
10.3.1 Contents: _____
10.3.2 Costs: _____

10.4 Facility required for disaster prevention activities:

10.4.1 Name: _____

10.4.2 Function: _____

10.4.3 Installation cost _____

10.4.4 Maintenance cost: _____

10.4.5 Service life: _____

IV. OTHER:

11. Return of usage fees for power station - exists or not: _____

12. Subsidy system for nature conservation and disaster response - exists or not:

13. Investable amount for nature conservation and disaster response: _____

V. REGARDING THIS PROJECT

14. Expectations about this project:

14.1 Short term: _____

14.2 Long term: _____

15. Problems or concerns of continuing this project: _____

16. Comments on this project: _____

SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES

QUESTIONNAIRE for other local authorities and institutions

Dear Participant,

Thank you for your participation in the **SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES** within the project “Capacity Building for Ecosystem-based Solutions for Disaster Risk Reduction through Sustainable Forest Management in Macedonia”. The purpose of this Questionnaire is to obtain appropriate input information related to the current conditions, needs and perspectives of the Lisiche Hydro system connected to the sustainability of water conservation and protection of water reservoirs from natural disasters by using Eco-DRR based measures and activities. *For that reason, we kindly request you to answer this questionnaire.*

Instruction: The Surveyor based on the answers given by the Key Informants fills the Questionnaire.

Thank you for your cooperation!

Questionnaire No. _____

Date of interview: _____

I. PERSONAL INFORMATION

8. Name (optional): _____

1.1 Institution: _____

1.2 Department/Section in the Institution: _____

1.3 Position in the institution: _____

1.4 Length of service (in years): _____

2. Gender: Male Female

3. What is your age group?

18 – 24 25 – 35 36 – 45

46 – 55 56 – 65

4. What is your ethnic affiliation?

Macedonian Albanian Turkish

Serb Bosnian Roma

Other _____

5. What is the level of your education?

Elementary Secondary

University and higher Other _____

II. ORGANIZATION INFORMATION

- 6.1 Date of establishment: _____
6.2 Number of staff: _____
6.3 Annual income/budget: _____
6.4 Role of the organization: _____

III. OTHER LOCAL INSTITUTIONS/AUTHORITIES

III.1 Conservation activities

- 7.1 Details of conservation activities: _____
7.1.1: Content: _____
7.1.2: Frequency: _____
7.1.3: Costs: _____
7.2 Stakeholders involved with conservation activities: _____
7.3 Necessary facilities for conservation activities: _____
7.3.1: Name: _____
7.3.2 Installation costs: _____
7.3.3: Maintenance costs: _____
7.3.4: Service life: _____

III.2 Disasters

- 8.1 Frequent disaster: _____
8.2 Potential disaster: _____
8.3 Activities of disaster prevention: _____
8.3.1 Contents: _____
8.3.2 Costs: _____

IV. OTHER:

9. Subsidy system for nature conservation and disaster response - exists or not: _____
10. Investable amount for nature conservation and disaster response: _____

V. REGARDING THIS PROJECT

11. Expectations about this project:
11.1 Short term: _____

11.2 Long term: _____

12. Problems or concerns of continuing this project: _____

13. Comments on this project: _____

SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES

QUESTIONNAIRE for ADKOM

Dear Participant,

Thank you for your participation in the **SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES** within the project “Capacity Building for Ecosystem-based Solutions for Disaster Risk Reduction through Sustainable Forest Management in Macedonia”. The purpose of this Questionnaire is to obtain appropriate input information related to the current conditions, needs, and perspectives of the Lisiche Hydro system connected to the sustainability of water conservation and protection of water reservoirs from natural disasters by using Eco-DRR based measures and activities. *For that reason, we kindly request you to answer this questionnaire.*

Instruction: The Surveyor based on the answers given by the Key Informants fills the Questionnaire.

Thank you for your cooperation!

Questionnaire No. _____

Date of interview: _____

I. PERSONAL INFORMATION

1. Name (optional): _____

1.1 Institution: _____

1.2 Department/Section in the Institution: _____

1.3 Position in the institution: _____

1.4 Length of service (in years): _____

2. Gender: Male Female

3. What is your age group?

18 – 24 25 – 35 36 – 45

46 – 55 56 – 65

4. What is your ethnic affiliation?

Macedonian Albanian Turkish

Serb Bosnian Roma

Other _____

5. What is the level of your education?

Elementary Secondary

University and higher Other _____

II. ORGANIZATION INFORMATION

6.1 Date of establishment: _____

6.2 Number of staff: _____

6.3 Annual budget: _____

6.4 Role of the organization: _____

III. DRINKING WATER SUPPLY

III.1 Activities

7.1 Activities for stable water supply: _____

7.1.1 Content: _____

7.1.2 Costs: _____

7.2 Drinking water bill: _____

III.2 Conservation activities in managerial areas

8.1 Details of conservation activities: _____

8.1.1: Content: _____

8.1.2: Frequency: _____

8.1.3: Costs: _____

8.2 Stakeholders involved with conservation activities: _____

8.3 Necessary facilities for conservation activities: _____

8.3.1: Name: _____

8.3.2 Installation cost: _____

8.3.3: Maintenance cost: _____

8.3.4: Service life: _____

III.3 Disasters

9.1 Frequent disasters: _____

9.2 Potential disasters: _____

9.3 Activities of disaster prevention: _____

9.3.1 Contents: _____

9.3.2 Costs: _____

IV. POWER STATION

IV.1 Basic Information

10.1 Years of establishment: _____

10.2 Construction cost: _____

10.3 Annual maintenance cost: _____

10.4 Service life: _____

IV.2 Activities

11.1 Activities for stable power generation/power supply: _____

IV.3 Conservation of natural environment (forest, river, water) around the power station

12.1 Details of conservation activities: _____

12.1.1: Content: _____

12.1.2: Frequency: _____

12.1.3: Costs: _____

13.2 Stakeholders involved with conservation activities: _____

13.3 Necessary facilities for conservation activities: _____

13.3.1: Name: _____

13.3.2 Installation cost: _____

13.3.3: Maintenance cost: _____

13.3.4: Service life: _____

IV.3 Disasters around the Power Plant

14.1 Frequent disaster: _____

14.2 Potential disaster: _____

14.3 Activities of disaster prevention: _____

14.3.1 Contents: _____

14.3.2 Costs: _____

14.4 Facility required for disaster prevention activities:

14.4.1 Name: _____

14.4.2 Function: _____

14.4.3 Installation cost _____

14.4.4 Maintenance cost: _____

14.4.5 Service life: _____

V. OTHER LOCAL INSTITUTIONS/AUTHORITIES

V.1 Conservation activities

15.1 Details of conservation activities: _____

15.1.1: *Content:* _____

15.1.2: *Frequency:* _____

15.1.3: *Costs:* _____

15.2 Stakeholders involved with conservation activities: _____

15.3 Necessary facilities for conservation activities: _____

15.3.1: *Name:* _____

15.3.2: *Installation costs:* _____

15.3.3: *Maintenance costs:* _____

15.3.4: *Service life:* _____

V.2 Disasters

16.1 Frequent disaster: _____

16.2 Potential disaster: _____

16.3 Activities of disaster prevention: _____

16.3.1: *Contents:* _____

16.3.2: *Costs:* _____

VI. OTHER:

17. Subsidy system for nature conservation and disaster response - exists or not: _____

18. Investable amount for nature conservation and disaster response: _____

VII. REGARDING THIS PROJECT

19. Expectations about this project:

19.1 *Short term:* _____

19.2 *Long term:* _____

20. Problems or concerns of continuing this project: _____

21. Comments on this project: _____

**ANNEX III - GUIDE FOR IMPLEMENTATION OF THE QUESTIONNAIRE FOR SOCIO-ECONOMIC SURVEY ON
ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES**

ANNEX IV – KEY INFORMANTS ANSWERS MATRIX

Annex V – PES Report

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**SOCIO-ECONOMIC SURVEY ON ECO-DRR RELATED INFORMATION FOCUSING IN CHASKA AND VELES
– PAYMENT FOR ENVIRONMENTAL SERVICES REPORT -**

Author: Vasko Popovski, M.A., Team Leader

October 2020

Executive Summary

Ecosystems as forests, mountains, wetlands, freshwaters, etc. provide a variety of economically valuable services (e.g. freshwater supply; irrigation and power generation; storm and erosion protection, etc.). These services are defined as ecosystem services and they provide various benefits to the people (e.g. food, water, timber, climate, water quality, soil formation, nutrient cycling, recreation, etc.). They are provided free, but there is a constant need for inputs to protect them while ensuring their sustainability. Accordingly, Payment for Environmental Services (PES) are financial mechanisms that place an economic value of the ecosystems, in support of the conservation and expansion of ecosystems and ensuring their sustainable management.

Within the framework of the development of an Eco-DRR model in North Macedonia against floods, landslides, soil erosion, and forest fire by utilization of multiple forest functions, the JICA funded project “Capacity building for ecosystem-based disaster risk reduction through sustainable forest management in Macedonia” initiated the assignment for a closer understanding of the PES concept, reviewing existing concepts and best practices in the Western Balkans countries including North Macedonia. Consequently, the Payment for Environmental Services Report (PES Report) is prepared.

Accordingly, it can be concluded that the utilization of the PES shall increase the natural protection and management of the protected areas, as well as support the attainment of the international obligations. Despite the initial definitions of the concepts and its normative regulation, application of PES is still modest, mainly through PES conceptualization and pilot interventions. Accordingly, there is a need to introduce specific normative frameworks for PES, followed by targeted development of the capacities of the interested parties. With regards to the forest ecosystem services, very limited efforts were made to promote the protective functions of the forests or to promote the forest products and services sustainably since there is still no market-oriented ecosystem service.

Consequently, there is a need for further incorporation of PES in the relevant legal framework in the fields of environment, forestry and disaster risk management, as well as more detailed operationalization of applicable procedures, tariffs and other documents with specified responsibilities and executors. In the process of European integration and complex activities for harmonization with EU standards and criteria in the field of environment, the application of PES is of great importance for assessing progress. In this context, it is strongly recommended to continue and strengthen the application of PES by all entities managing the country's natural resources per EU regulations and other good practices.

With regards to the project and its framework, it is recommended special emphasis in the second phase of the project should be on the regulation of the regulatory function of forests, in the context of strengthening control over natural disasters, protection against erosions, regulation of climate conditions, etc. Also, the Eco-DRR project should conduct an additional study/analysis related to the process of comprehensive identification and determination of forest ecosystem services and appropriately propose to the relevant partners (MAFWE and PENF) to be incorporated in the legal framework in the management of national forests with to ensure the sustainability of the project results and their synergy with the concept of PES.

ABBREVIATIONS

BIH	Bosnia and Herzegovina
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
EC	European Commission
EU	European Union
GEF	Global Environment Fund
GIZ	German Technical Cooperation
INCA	Institute of Nature Conservation of Albania
MAFWM	Ministry of Agriculture, Forestry and Physical Planning
MoEPP	Ministry of Environment and Physical Planning
PENF	Public Enterprise National Forests
PES	Payment for environmental services
SNV	Netherlands Development Organization
SDGs	Sustainable Development Goals
USAID	United States Agency for International Development
UNDP	United Nations Development Programme
UNESCO	The United Nations Educational, Scientific and Cultural Organization
WB	World Bank
WFD	European Water Framework Directive
WWF	World Wide Fund for Nature

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1. INTRODUCTION

1.1 Background

Biological diversity or the biodiversity is “the variety of plant and animal life in the world or in a particular habitat, a high level of which is usually considered to be important and desirable.”¹ It refers to the variety of life that is existing on our planet i.e. ecosystems and the differences in genes within the single species. All living things on the Earth, including humans, live together and depend on one another, being involved in complex and inter-reliant relationships called ecosystems. They are key factors for a healthy planet and healthy people and pillars of the existence. Ecosystems contribute through the provision of their services i.e. cleaning the water, regulating the climate, purifying the air, providing food, recycling nutrients, preventing the floods, stabilizing the soil, etc. Therefore, it is necessary to ensure protection and sustainable provision of these services, while supporting our existence.

In this context, one of the modalities to achieve this is through the establishment of the *payment for environmental services*, also known as *payments for ecosystem services* or *PES*. The idea behind them is to create incentives for individuals and communities to protect environmental services by compensating them for the costs incurred in managing and providing those services (Mayrand and Paquin 2004). As a mechanism for sustainable management of the ecosystems, utilization of their services using economic incentives (Kosoy and Corbera, 2010), appeared in the environmental theory and practice at the end of the last century. Nowadays, there are more than 300 PES schemes based on the natural capital (stock of renewable and non-renewable natural resources e.g., plants, animals, air, water, soils, minerals, etc. that combine to provide benefits to people).²

The PES concept is relatively new for North Macedonia and its normative framework and practitioners experiences. Until now, some initial steps were undertaken e.g. initiation of legislative formulation, conceptualization of the PES framework, piloting of schemes, etc. Nevertheless, with the ongoing approximation of the EU *acquis communautaire*³, improvement of the environmental and natural standards, attainment of global sustainable development mechanisms and objectives, sustainable management of natural resources, as well as resilient development of the society and the communities, PES is identified as one of the priorities.

Considering this, the project “Capacity building for ecosystem-based disaster risk reduction through sustainable forest management in Macedonia” funded by JICA and which main objective is to develop the Eco-DRR model in North Macedonia against floods, landslides, soil erosion, and forest fire by utilization of multiple forest functions, initiated the assignment for a closer understanding of the PES concept, reviewing existing concepts and best practices in the Western Balkans countries including North Macedonia.

1.2 Objective of the report

The objective of the overall consultancy assignment is to conduct a socio-economic survey on Eco-DRR related information focusing on the municipalities of Chashka and Veles. Accordingly, this assignment consists of the following deliverables:

¹ <https://tinyurl.com/y5hjaoxt>

² <https://www.conservation.org/blog/what-on-earth-is-natural-capital>

³ https://en.wikipedia.org/wiki/Acquis_communautaire

➤ Detailed research on the current conditions, needs and perspectives of the Lisiche Hydro system connected to the sustainability of water conservation and protection of water reservoirs from natural disasters by using Eco-DRR based measures and activities.

➤ *Collect information about PES and related activities in the Republic of North Macedonia and other five Western Balkans⁴ for further consideration of Eco-DRR methods.*

The **Payment for Environmental Services Report** includes essential information to initiate further consideration of PES mainstreaming and Eco-DRR methods. It captures the main aspects of the assignment, overall approach and methodological framework, elaboration of PES essentials (main definitions, types of PES, main stakeholders, PES and SDGs, etc.), as well as a brief overview of the status of PES within the normative framework of selected countries of the Western Balkans and selected case studies, including North Macedonia. Finally, the section on conclusions and recommendations is summarizing the way forward on how to consider them in future activities of the Project and its beneficiaries.

2. APPROACH AND METHODOLOGICAL FRAMEWORK

To implement this part of the consultancy assignment, it was necessary to define the suitable approach and use of adequate methodology in the procedure. They are in line with the subject of the assignment, its characteristics and established framework.

Approach - The assessment is summative and takes a qualitative approach to address the requirements contained in the assignment's terms of reference (Tender Document). This approach included several different tools that were structured to elicit information and to provide inputs for the report and rationales for conceptualization and design of the way forward recommendations.

Methodological framework – It is ideally balanced between the research framework and objectives to be achieved with the inclusion of methods and tools that support this. Based on the characteristic of the assignment, the following research methods were applied:

- *Content Analysis* - during the initial phase of the assignment, when contents of all submitted documents, reports, information and publications were reviewed and analyzed.
- *Comparative Analysis* - during the desk review phase to review external practices and solutions and their relation to the task requirements.
- *Qualitative Research Design* - during the capturing of the PES good practices and case studies.

3. PES ESSENTIALS – DEFINITIONS, TYPES, STAKEHOLDERS

3.1 Ecosystems and ecosystems services

From the supply of raw materials, water, food, medicines and energy, to the pollination of crops, formation of soils and protection from floods, storms and erosion, the planet's natural systems provide a range of vital services that underpin production, trade, livelihoods and consumption in every country. The natural assets that provide these services – ecosystems, species, water, rivers, seas, land, minerals and

⁴ For the purposes of this report, following countries are part of the Western Balkans: North Macedonia, Serbia, Albania, Montenegro, Bosnia and Herzegovina and Kosovo.

atmosphere – are thus an immensely valuable component of a nation’s wealth and a major factor in determining its levels of economic prosperity.⁵

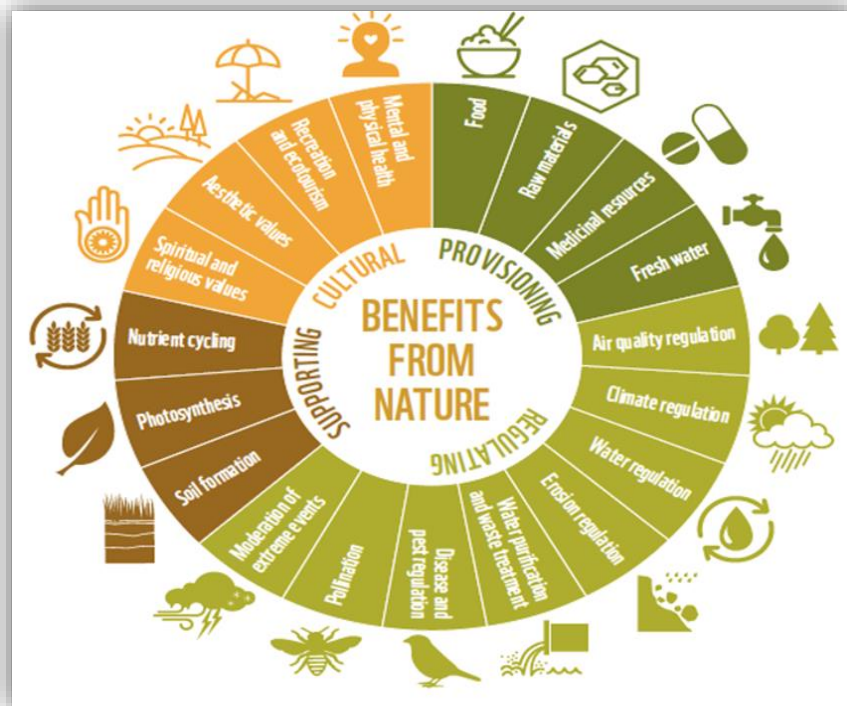


Figure – Worldwide Fund for Nature, 2018

During the recent years, the Earth started to lose its biodiversity at a high rate. Overexploitation of resources exceeded agricultural activities and fisheries, runaway consumption, use of no nature-friendly materials are leading to loss of species at an unprecedented rate. Land degradation seriously affects more than 75% of terrestrial ecosystems, affecting the well-being of almost half of the global population with huge economic costs. Only a quarter of land on Earth is substantively free of the impacts of human activities and this is projected to decline to just one-tenth by 2050. Bees, other pollinators and our soils – critical for global food security – are under increasing threat. Overfishing and plastic pollution are threatening our oceans, while pollution, habitat fragmentation and destruction have led to catastrophic declines in freshwater biodiversity.

An **ecosystem** is a dynamic complex of plant, animal and microorganism communities and their non-living environment interacting as a functional unit.⁶ Besides, an ecosystem is an interactive whole from biotic (living) and abiotic (non-living) elements in a defined area, which can be of different surface area and from different type. Ecosystems i.e. forests, mountains, wetlands, agricultural land, freshwaters, provide a variety of economically valuable services: freshwater supply for human settlements (e.g. by filtering the water from contaminants); irrigation and power generation; or storm protection and pollination. By introducing the concept of the ecosystem, a lot of research is committed to man's connection with ecosystems and what they offer for his well-being. That way it is introduced and the term ecosystem services to describe and evaluate the benefits from ecosystems.

⁵ <http://vegansustainability.com/from-ecosystem-services-to-interdependence-with-nature/>

⁶ <https://www.sdfinance.undp.org/content/sdfinance/en/home/glossary.html>

Accordingly, **ecosystem services** are the benefits people obtain from ecosystems. These include provisioning services such as food, water, timber, and fibre; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services that provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling. Ecosystem services are grouped into four main categories:

1. **Provisioning services** (the products obtained from ecosystems such as food, crops, fruit, fish, fuel and fibre, timber and wool, biochemical, natural medicines, pharmaceuticals, genetic resources for plant/animal breeding and biotechnology and ornamental resources such as flowers, shells etc.);

2. **Regulating services** (the benefits obtained from the regulation of ecosystem processes such as maintenance or air quality, climate and water regulation, erosion control, water purification and detoxification, natural hazard protection and bioremediation of waste);

3. **Cultural services** (the non-material benefits that people obtain through spiritual enrichment, cognitive development, recreation etc. (spiritual and religious value, inspiration for art, social relations, aesthetic values, cultural heritage values, recreation and ecotourism); and

4. **Supporting services** (the services that are necessary for the production of all other ecosystem services (soil formation and retention, water cycling, nutrient cycling, primary production, production of atmospheric oxygen and provision of habitat). The Millennium Ecosystem Assessment concluded that 15 out of the 24-measured ecosystem services are in serious decline, only 4 are improving and 5 are stable but threatened in some parts of the globe).

Nevertheless, to complete these tasks in the absence of regulatory provision, the communities need a financial incentive.

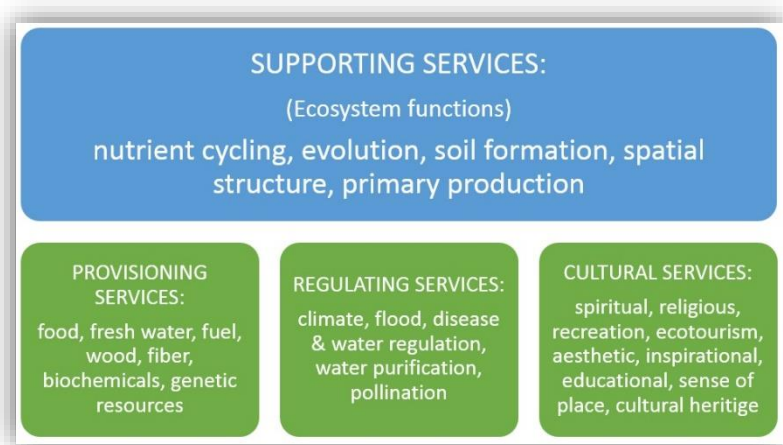


Figure - Millennium Ecosystem assessment of ecosystem services (2005)⁷

Nowadays, ecosystem services are increasingly finding their place in policy initiatives at global, regional and national levels. Such an example is an established Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES), European Union (EU) Biodiversity Strategy 2020, as an ecosystem service assessments conducted nationally. Aichi Objectives 1 and 2 of the Global Biodiversity Strategy are particularly focused on ecosystem services, which is a good start and stimulus for the formal introduction of the concept in national biodiversity strategies. Examples from Europe and the world testify to increasingly frequent valuations and economic ecosystem services assessments to arrive at a reasonable choice business scenario and a solution that will not harm nature. This proves that this concept is a practical way of balancing economic development or to achieve sustainable development in a country.

⁷ <http://www.ceeweb.org/work-areas/priority-areas/ecosystem-services/what-are-ecosystem-services/>

Detailed and most used classification of ecosystem services within the European Union is mentioned in the General International classification of ecosystem services (*Common International Classification of Ecosystem Services — CICES*, www.cices.eu). This classification has been developed based on the long-term activities implemented by the European Environment Agency. There are also other classifications used globally and/or regionally, and there are countries that have developed their national system for classification, assessment and evaluation of ecosystems and ecosystem services.

Ecosystems and the services provide useful input in the links between humans and the environment. Therefore, the ecosystem access is approved by the Convention on Biological Diversity, and the conceptual framework of the Millennium Ecosystem Assessment is complete following this approach. It defines the ecosystem approach as follows: using the ecosystem as an approach we get closer to a successful strategy for integrated land, water and other natural resources that promote conservation and sustainable use. Thus, the application of the ecosystem approach will help to achieve the balance of the three objectives of the Convention: conservation, sustainable use and fair and equitable sharing of the benefits arising from utilization of genetic resources. The analysis of ecosystems, the assessment of their potential for providing ecosystem services is desirable to do on all ecosystems identified in one country. Access to ecosystem services is not especially related to areas protected by law or not. However, if a comparison is made of the condition of certain ecosystems found within the protected area and the same ecosystems outside the borders of the protected area will encounter some differences.

3.2 PES – definitions

As mentioned above, nature provides the services free, but there is a constant need for inputs to protect the ecosystems and to ensure sustainable provision of services (e.g. food, clean air, clean water, flood protection, etc.). Actually, for the complete implementation of the services, various financial resources and incentives are needed. Payment for ecosystem services are one of them and they are the financial mechanisms that put the economic value of the ecosystems and defines the providers and users. PES involves a series of payments to land or other natural resource owners in return for a guaranteed flow of ecosystem services or certain actions likely to enhance their provision over-and-above what would otherwise be provided in the absence of payment.

PES supports the conservation and expansion of ecosystems when the latter generate services that can be valued in economic and financial terms. For example, a beverage company can pay farmers to reduce the use of chemical pesticides instead of paying higher fees for water treatment facilities. PES can be labelled according to their geographical scale (local, regional and global), the structure of the compensation (direct, indirect/public, and private), the type of ecosystem (forests, wetlands, etc.) they protect or the four types of services (see above) the payment is provided for.

In sharp contrast to the *“polluter pays principle”*, PES follows the *“beneficiary pays principle”*, compensating individuals or communities whose land use (or other decisions) influence the provision of ecosystem services. The underlying assumption is that the individual has the right to pollute and *“society”* must provide compensation to avoid pollution costs and induce non-polluting resource management decisions. The (efficient policy) minimum compensation is set to counterbalance an income loss (e.g. not farming a certain area) or the costs of undertaking a certain activity. A maximum compensation (not recommended) is equal to the value of ecosystem services provided to society due to the management regime, but not captured by the land use decision-maker. Participants can be individual landowners, farmers, communities, businesses or public entities. However, because most ecosystem services are not

traded in markets, the intervention of a regulatory agency may be needed to create those markets. The underlying economic values can be determined indirectly by a multiplicity of models and techniques, for example, shadow pricing methods such as hedonic pricing or contingent valuation. Valuations are intrinsically linked to a specific geographical and social context, thus creating challenges to the determination of global standards or price ranges for ecosystem services. Despite these challenges, technology and innovations (e.g. satellite imagery) have reduced the cost of valuations and increased the reliability of the pricing of ecosystem services.

The narrow definition of PES as a voluntary transaction negotiated among private contractors has been surpassed by the implementation of conceptually alike but broader schemes characterized by the intermediation of the Government between those who benefit and those who preserve the ecosystems' functioning. This broader definition includes direct payments by public authorities to private landowners to maintain or enhance the forest cover, for example. The payments to the landowner may be financed either

1. *Directly* by the payments of (private) beneficiaries, for example by Nestle (formerly Vittel) to stop farmers using chemicals in north-eastern France or by the City of New York to protect watersheds in the Catskill mountains; or
2. *Indirectly* by the intermediation of the public authority which—on behalf of the wider public—disburses the compensation for conservation such as in the China's Conversion of Cropland to Forest⁸ and Grassland Programme or in the Costa Rica's Environmental Services Payment Programme⁹.

To fund these expenditures, countries can either access the general budget or introduce PES-like taxation with special-purpose taxes and fees, targeting the tourism, water, electricity, transport and extractives sectors (i.e. the implied beneficiaries). Costa Rica financed its programme with the resources generated from gasoline taxes. In Vietnam, the norm of payment for forest environmental services applied for hydropower production establishment is 20 VND/kWh of commercial electricity. Clean water production businesses must contribute 40 VND/m³ of clean water, while tourism companies contribute 1% of their annual gross revenues. The fund is being used to compensate households for providing forest environmental services.¹⁰

Payments are ideally subject to the evidence of the provision of the ecosystem service (output-based payments) and should address additional concerns to reduce the cost of policy implementation. However, the output or results-based payment might be difficult to assess or require a long time lag for monitoring and verification (e.g. changes in quality of water or reduced risk of flooding). The alternative is to disburse payments based on the modification of a certain practice, for example phasing out chemical fertilizers or undertaking of certain actions, for example planting trees (input-based payments). These are activities that can be directly monitored and linked to a specific action of an individual and therefore trigger a payment.

The preparatory process of establishing a PES can be described in the subsequent steps, which are followed by the negotiation of the agreements, the actual legal structuring, the financing and the implementation.

These are:

1. Identification of the ecosystem services and geographical boundaries;

⁸ http://www.cifor.org/publications/pdf_files/articles/AArtati1701.pdf

⁹ <https://pubs.iied.org/pdfs/16514IIED.pdf>

¹⁰ <https://tinyurl.com/y6kyhcwx>

2. Identification of the sellers/providers and buyers/beneficiaries;
3. Definition of the market and the price;
4. Determination of the governance, institutional and legal arrangements;
5. Collection of the biophysical data baseline data for the monitoring system.

The functioning of the PES requires the monitoring of the interventions and the disbursement of payments. The efficiency and effectiveness depends on the willingness and capacity of the private actors to pay and on the quality of coordination/collaboration. In absence of the above, the determinant variable is the capacity of the Government to mediate among the buyers and sellers. This capacity to pay is weaker in the poorest and most fragile countries where Official Development Assistance (ODA) has been traditionally used to complement or substitute for the lack of resources.

Stakeholders

1. The *buyer/beneficiary* of an ecosystem service: the entity, either an individual/company or the Government that directly benefits from the existence of an ecosystem and is willing/capable to pay for its preservation.

2. The *seller/provider* of an ecosystem service: Any individual or community whose land use or other decision can influence the provision of ecosystem services. She/he will obtain a payment to undertake or not to undertake (e.g. not exercising certain economic rights) certain activities to preserve the provision of ecosystem services. The payment can thus compensate for a lost income (reduced gains from agriculture) or human labour and capital investment (e.g. planting trees).

3. *Public authority*: the public authority (often a local entity) might disburse payments and collect mandatory fees and taxes. PES often require the issuance of a law or Government decree/regulation if intermediated or paid by public resources. If PES are negotiated among private parties, the Government usually act as a broker or facilitator.

Affected community: Everyone who benefits from the provision of an ecosystem service. This refers to the larger population who might benefit from ecosystem services but, for many reasons, is not formally participating in the PES as a beneficiary or provider of services.

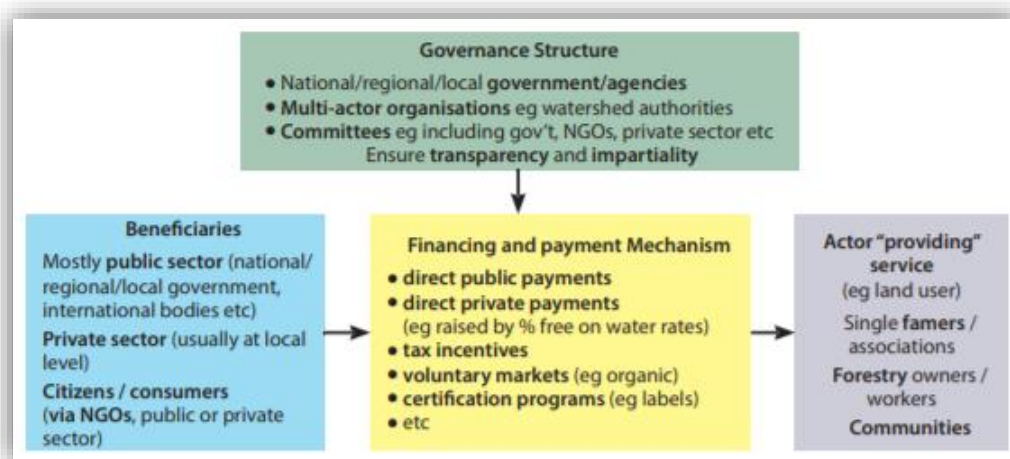


Figure - PES stakeholders and their interactions¹¹

Source: Adapted from Pagiola 2003, TEEB for national and international policymakers. Chapter 5, p. 10

Potential in monetary terms - The monetary value of PES vary widely based on the size/properties of the ecosystem and on the willingness and capacity of beneficiaries to pay for the ecosystem services. The value of global annual transactions of PES is estimated between US\$36–42 billion.¹²

Examples of payment of ecosystems services in Europe:

- France: Vittel pays for water services;
- Italy: Payment for licenses for collection of mushrooms and forest fruits, water tariffs and sports and recreation.
- Bulgaria: payment of the ecosystem services in the Danube region i.e. eco-tourism, culture.

3.3 Payment for ecosystem services: What are the pros, cons, and risks?¹³

PROS	CONS	RISKS
<ul style="list-style-type: none"> • Flexible instrument compared to command-and-control regulation, allowing high customization to local circumstances. • Behavioural changes are promoted with positive incentives rather than coercion, more likely leading to transformational change. • PES can help to correct market failures by pricing conservation efforts. 	<ul style="list-style-type: none"> • The economic valuation of ecosystem services is a difficult and still costly process, despite innovations in techniques and technology. • PES implementation might be costly due to the specifics of design, negotiation and implementation of the programme. • PES is not designed to reduce poverty but primarily to offer economic incentives to foster 	<ul style="list-style-type: none"> • Failure to monitor the effectiveness of the compensation schemes, including risks of not fulfilling the performance condition. • Risks associated with the enforcement of property rights. For example, illegal logging or land appropriation will undermine the ability of a landholder to provide the ecosystem service. Changes in land management rules and regulations may also have a

¹¹ <http://www.unece.org/fileadmin/DAM/timber/publications/SP-34Xsmall.pdf>

¹² <https://tinyurl.com/y4k9vetd>

¹³ <https://tinyurl.com/yxgm6hrx>

<ul style="list-style-type: none"> • PES provide opportunities for cash income in rural areas where poverty might be concentrated. <p>Rural communities can benefit from increased knowledge of sustainable resource use practices that are usually connected to PES through the provision of training and technical assistance.</p>	<p>the conservation of ecosystem services. Additional measures need to be enforced to make PES pro-poor.</p> <ul style="list-style-type: none"> • The efficacy of PES implementation is partially connected to the availability of data on land property, which is a known challenge in many developing countries. • PES might result in limiting the flexibility of local government and communities in making decisions on their development, particularly where easements or long-term contracts specify a narrow range of alternatives. 	<p>significant impact on ecosystem service delivery and the PES.</p> <ul style="list-style-type: none"> • Leakage can occur when the provision of ecosystem services in one location increases pressure for conversion in another. • Unintended perverse incentives that negatively affect biodiversity, for example, farmers are paid to plant non-native tree species. • Regressive distributional outcomes, especially, when limiting access to resources and land to impoverished communities. Elites might capture the largest income provided through PES. • Corruption and abuses. Like other public subsidies, PES schemes are vulnerable to corruption practices that might divert resources. • Uncontrolled liabilities. The Government might incur in commitments for conservation payments beyond its budget due to flawed legal arrangements or lack of coordination, putting the whole financial sustainability of the programme at risk.
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3.4 PES in forest ecosystem services

Strengths:	Opportunities:
<ul style="list-style-type: none"> - PES can be considered as supporting instruments of forest-related policies. - EU policies call for multifunctional forest under sustainable forest management. In this framework PES could play an important role. - PES are recognised as a key Market-Based Instrument for achieving environmental protection goals. - In most cases it is feasible the clear identification of the ecosystem service provider/seller and consumer/buyer. - Voluntary approach for some PES schemes. 	<ul style="list-style-type: none"> - EU biodiversity strategy to 2020 and other EU policies call for a framework that coordinates and ensures mobilisation of resources to support biodiversity and forest ecosystem services. - PES are potentially eligible for funding from the new EU financial instrument on Natural Capital Financing Facility (NCF). - Many good practices examples of well-functioning PES schemes – basis for development of new ones. - Setting of new markets for biodiversity “credits” and non-marketed ecosystem services such as watershed protection, etc. - The local character of PES schemes facilitates deal (transactions and players) identification.
Weaknesses:	Threats:
<ul style="list-style-type: none"> - Most of the compensation mechanisms in the PES schemes are based only on “opportunity cost”, which means lost timber income. - It is hard to measure nature values and ecosystem services. Each group of ecosystem service require specific valuation methods. - Valuation methods could introduce bias depending on assumptions and available (local) data. - Ownership and tenure rights for forests are not always clear and well identified (e.g. because of restitutions of forest land). 	<ul style="list-style-type: none"> - Issues related with efficiency of PES schemes - social inefficiency, lack of additionality, role of targeting. - Generation of negative externalities. - Market failure related to the “public good” character of some ecosystem services. - Providing ecosystem services without pricing. - Other financing models (e.g. direct private payments).

SWOT Analysis for PES in forest ecosystem services (EC JRC, 2016)¹⁴

3.5 PES and the Sustainable Development Goals

The Sustainable Development Goals are the blueprints of how to achieve a better, more sustainable and resilient future for all. 17 SDGs are aiming to transform the World¹⁵ and they address the current challenges of the modern world including poverty, inequality, climate change, environmental degradation, peace and justice, promoting prosperity while preserving the planet. The payment for environmental services is considered a very beneficial and smart solutions for supporting the sustainable development of the countries, especially through additional mobilization of public and private resources for achievement, especially financing the SDGs. Accordingly, PES is in direct relation with the following seven SDGs:

¹⁴ <https://core.ac.uk/download/pdf/81684626.pdf>

¹⁵ <https://sdgs.un.org/goals>

	<p>Goal 1: No poverty End poverty in all its forms everywhere</p>
	<p>Goal 3: Good health and well-being Ensure healthy lives and promote well-being for all at all ages</p>
	<p>Goal 5: Gender equality Achieve gender equality and empower all women and girls</p>
	<p>Goal 6: Clean water and sanitation Ensure availability and sustainable management of water and sanitation for all</p>
	<p>Goal 13: Climate action Take urgent action to combat climate change and its impacts</p>
	<p>Goal 14: Life below water Conserve and sustainably use the oceans, seas and marine resources for sustainable development</p>
	<p>Goal 15: Life on land Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss</p>

4. PES IN WESTERN BALKANS

4.1 Overview of PES interventions in the region

The region of Western Balkans is rich in natural resources and biodiversity with a variety of ecosystems and valuable natural landscapes and forest complexes. The following areas considered as the key environmental challenges on the Regional level:

- Threats to biodiversity;
- Climate change mitigation and adaptation;
- Degradation of water resources;
- High levels of air pollution;
- Infrastructure development that does not consider sustainability issues;
- Contamination of soil and water;
- Agriculture – trends towards more intensive farming;
- Waste and recycling - poorly enforced legislation;
- Mining, environmental and security concerns as well as potential transboundary risks¹⁶.

¹⁶ Sida's Helpdesk for Environment and Climate Change. *Western Balkan – Environment and Climate Change Policy Brief*. 2012. p. ii.



Map – Western Balkan countries

WB piloted the approach to estimating the countries’ capital wealth consisting of natural capital, produced capital, human capital and net foreign assets providing a comprehensive measure of changes in wealth and an indicator of the sustainability of growth. The total value of natural capital for the Western Balkan countries + Croatia is estimated at 184 billion EUR or approx. 8,150 EUR per capita. These results suggest that better management of biodiversity, ecosystems and natural resources are key inputs for ensuring sustainable and resilient development.

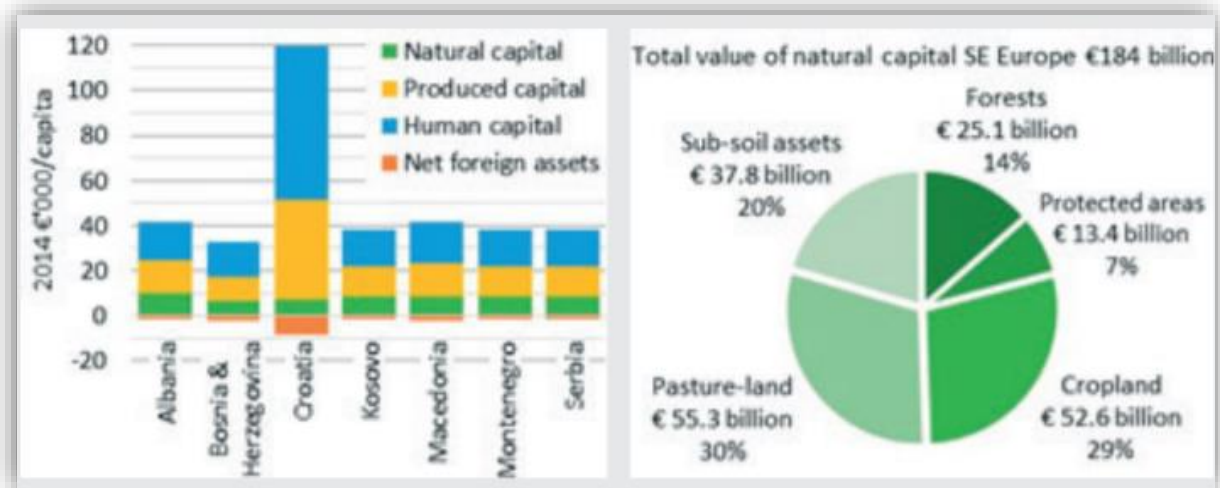


Figure – Total value of natural capital of Western Balkan countries (WB¹⁷)

¹⁷ World Bank (2006) Where is the Wealth of Nations? The World Bank, Washington DC; World Bank (2011) The changing wealth of nations: measuring sustainable development in the new millennium. The World Bank, Washington DC; World Bank (2014) Green Growth Country Assessment for FYR Macedonia. World Bank, Washington DC; Lange, G., Wodon, Q. and K. Carey (eds) (2018) The Changing Wealth of Nations 2018: Building a Sustainable Future. World Bank, Washington DC.

Accordingly, the environmental protection sector is heavily under pressure and considering that the countries have more or less similar frameworks (since they were deriving from the same former state – Socialist Federal Republic of Yugoslavia) in terms of biodiversity, nature conservation challenges, EU integration forward, it is necessary to review the existing framework for PES and to list some of the beneficial case studies. Therefore, based on a desk review of available materials and documents online, the PES review of Western Balkan countries is presented below.

In general, PES has been placed higher on the agenda of environmental protection and sustainable development, partly due to the EU integration and legislation harmonization process, as well as the overall global sustainable development mechanisms, and partly due to the national determination to mainstream the payment of environmental services across the competent sectors contributing to sustainable protection and financing of those activities.

On a regional level, some PES related programmes are being implemented out of which the project “Open Regional Fund for Southeastern Europe for the Implementation of Biodiversity Agreements”¹⁸ (managed by GIZ during the period 2015 - 2021) and the objective is to enhance the regional cooperation between Western Balkan states concerning fulfilling international and, in particular, EU-relevant obligations concerning the preservation of biodiversity. One of the activities is to assess and evaluate the ecosystem services. This measure aims to determine and disseminate the benefit of biodiversity and ecosystem services in the context of development planning in certain target sectors (such as tourism and agriculture) to improve future decision-making processes.

➤ **Albania** – It cannot be considered as an example of successful implementation of “user pays”, “polluter pays” or “cost recovery” principles. PES is not institutionalized adequately, since still there is no market for PES. Nevertheless, in the country, there is a mechanism called “bundle credits” where farmers are awarded with funds based on proven delivery of effective afforestation programmes.

➤ **Bosnia and Herzegovina** – It is a very specific case since it has several levels of government e.g. BiH, Federation of BiH, Republika Srpska, Brčko District and local levels. Water and forest management, as well as environmental protection, is organized on federal and cantonal levels, as well as Republika Srpska and Brčko District levels. Forest legislation (all Cantons have their acts or use directions from Federal Decree on Forests so the functioning on local levels is secured) recognize the “user pays” principle and the funds are used for forest improvement, management, fire protection, etc.¹⁹. These payments are close to PES principles. The Act on Waters²⁰ prescribes two types of water fees, a special water fee and a general water fee based on the “User pays” standard. Since the part of these fees are allocated for environmental protection, it is also considered as a PES like principle. Finally, the environment protection legislation²¹ enforces the “polluters pay” principle for activities with harmful consequences to the environment.

➤ **Kosovo** – There are not many available documents regarding the status of the PES in Kosovo, as well as the level of mainstreaming in the positive legislative framework and pilot project interventions. In

¹⁸ <https://www.giz.de/en/worldwide/72799.html>

¹⁹ Uredba o Šumama; Vlada Federacije Bosne i Hercegovine: Sarajevo, Bosnia and Herzegovina, 2009; pp. 1–19.

²⁰ Zakon o Vodama Federacije BiH; Vlada Federacije Bosne i Hercegovine: Sarajevo, Bosnia and Herzegovina, 2006; pp. 7653–7682.

²¹ Zakon o Zaštiti Okoliša Federacije BiH; Vlada Federacije Bosne i Hercegovine: Sarajevo, Bosnia and Herzegovina, 2003; p. 38.

that sense is the study developed by the USAID in 2018, “Kosovo Biodiversity Analysis”²² where the PES are identified as one of the actions necessary to address the drivers to the threats for the biodiversity through development of a Payment for Ecosystem Services system to contribute to the protected areas budget and to raise awareness of the importance of biodiversity conservation. Furthermore, the PES is considered as an efficient tool for strengthening the governance in the natural resources and similar sectors.

➤ **Montenegro** – There are many opportunities for utilization of the PES principle e.g. watersheds, fish breeding/nursery habitat, forests and biodiversity/landscape ecosystem services. At the moment still the PES concept, it is not fully mainstreamed and in the positive legislative framework, like in other countries in the region, predominantly the “user pays” principle is used for limited number of services. Therefore, the “*National Biodiversity Strategy with the Action Plan for the period 2016 – 2020*”²³ recognizes the need for establishing a legal, institutional and implementation framework for introducing PES under the Strategic Target C: An efficient mechanism for financing of biodiversity protection achieved, as well as a switch to sustainable biodiversity economy (as a part of the green economy) until 2020. Therefore, PES is considered as a direct contributor to sustainable development and biodiversity, protection efforts and sustainable production and consumption. PES is planned to be implemented through various models such as ecologically fiscal transfers (earmarking a part of state revenues and allocating them to local government or a local manager for the award and incentive to preserve ecosystem services which are also used outside their territory-competence) or by introducing new tariffs or charging for ecosystem dependent products or sectors (for example, supplying of the water system from springs in protected areas) or by direct use of public funds for paying for private land of importance or owner-manager who supports ecosystem services if economically justified.

➤ **Serbia** – In Serbia, the Ministry of Environment Protection is responsible for environmental protection including water and forest protection, whether the Ministry of Agriculture, Forestry and Water Management is responsible for water and forest management. The concept of PES is relatively new to Serbian context and in the key legislative acts on forests²⁴, environmental protection²⁵ and waters²⁶, it is not directly mainstreamed. These legislative acts refer to the category of user to pay for some services – “users pay” or “polluters pay” principles. Accordingly, four state funds are partially connected to the PES concept: Fund for environmental protection, Fund for waters, Fund for forests, Charges for use of protected areas and tourism in protected areas. They have some of the attributes of the PES since they are enforcing the “users pay” principle. Nevertheless, there is no systematized approach to payment for environmental services, but more as the incorporation of some of the attributes or stand-alone measures. For example, still, the forests are considered for the value of timber, land, non-timber forest products and forest functions of public interest, but not for their protective functions or as a source of ecosystem services for which users should be paid. In general, in Serbia, payments for ecosystem services are not valued and are not part of the calculation of forest benefits. Nevertheless, in Serbia, there are some financial schemes in the areas of waters, forests and environmental protection that can be an excellent foundation for designing and enforcing the PES schemes.

²² https://pdf.usaid.gov/pdf_docs/PA00WCZP.pdf

²³ <http://extwprlegs1.fao.org/docs/pdf/mne170996.pdf>

²⁴ <https://tinyurl.com/y3zvd6wy>

²⁵ http://www.pregovarackagrupa27.gov.rs/?wpfb_dl=106

²⁶ <https://tinyurl.com/yy2p55fj>

As a conclusion, we can state that the Western Balkans countries have great potential in natural resources concerning the richness of biodiversity, freshwater systems and landscape beauty. A clearer understanding of marketing for ecosystem services can serve as an additional backbone for the sustainable development but requires clear responsibilities, implementation of entrepreneurship and investment in developing a healthy system of goods from ecosystems and inclusive promotion of services. In the Western Balkan countries, the PES mechanism is not fully utilized due to various reasons. It is mainly because of the low inclusion in the positive legislative framework, lack of standards and tools for assessment of mechanisms, still low level of awareness of the policy creators and decision-makers, practitioners and the users. Furthermore, there is lack of experience and institutional capacities for integrated valuing of nature areas, water, forests and related services and how to develop PES schemes and utilize them as foundations for sustainable natural resources management and overall development.

4.2 Western Balkans Case Studies – PES programmes and projects

#	Country	Name of the project	Donor	Description	Other
1	Albania	Assisted Natural Regeneration project		Afforestation and reforestation of degraded land	Payments for forest ecosystems and biodiversity
2	Albania	Innovative Financing for Sustainable Forest Management in the Southwest Balkans ²⁷	WB, SNV	Ulza Watershed ²⁸ – erosion prevention +PES study	
3	Albania	MAES Initiative for PES	National partners	Development of carbon sequestration projects and development of payment for watershed services scheme	
4	Albania	Ecosystems mapping in protected areas	GEF, UNDP, WB	Management plans of protected areas, socio-economic valuation of ecosystems, use of environmental objective assessment	
5	Albania	‘Support to local communities to establish regional protected areas: Assessment of the most valuable areas for biodiversity within Uleza commune and opportunities for ecotourism development	INCA	Information on different ecosystem services provided in the study area	

²⁷ <https://www.profor.info/knowledge/innovative-financing-sustainable-forest-management-southwest-balkans>

²⁸ http://www.cnvp-eu.org/uploads/documents/149/PUB_23-Ulza%20Watershed%20Crosscutting%20final.pdf

6	Albania	Water resources management of the Bovilla and Ulza reservoirs	WB	Establishment of payments schemes for forest ecosystem services in Ulza and Bovilla watersheds	
7	BIH	Development of a new management policy for the Hutovo Blato wetlands	EC	Protected areas, wetland, forests, biodiversity, uniform payments for management practices, agriculture, forestry, river basin management	
8	BIH	Feasibility Study for establishing Zvijezda Mountain Protected Area	EC	a cost-benefit analysis for establishing a protected area by valuing the ecosystems of Zvijezda Mountain applying the TEEB methodology	
9	Kosovo	Innovative Financing for Sustainable Forest Management in the Southwest Balkans	WB, SNV	Wood-biomass production survey + PES component	
10	Montenegro	Catalysing Financial Sustainability of the Protected Areas in Montenegro	UNDP, GEF	Pilot a payment scheme for the National Park Durmitor	
11	Serbia	Promoting PES for ES and related sustainable financing schemes in the Danube basin	WWF, GEF/UNEP, EC	This project promotes and supports land managers who help sustain the benefits that we get from nature.	
12	Serbia	Benefits of ecosystem services of the Gjerdap National Park for the local community		Inclusion of the values of biodiversity and ecosystem services into the economic and developmental policy, planning and programmes for the promotion of sustainable management of biodiversity and ecosystem services as a form of support to the economic growth	
13	Serbia	Research on valuation of a part of ecosystem services provided by the National Park Kopaonik		Valuation of wood resources and selected non-wood forest products	
14	Serbia	Study on Bosut Forests' ecosystem services	GIZ and national partners	To present possibilities for an increase in benefits, both quantitative and qualitative, by introducing integrated planning and multipurpose utilization of the area.	Better flood protection, income from wood production and animal husbandry

15	Regional	Integrated Transboundary River Basin Management of the Sava	Dutch government	River Sava basin management, uniform payments for management practices	Croatia, B&H, Slovenia, Serbia
16	Regional	Danube Regional Project Component 1.1–9 Development of the Pilot River Basin Management Plan for the Sava	UNDP/GEF	Implementation of Water Framework Directive in the Sava basin, natural resources, water, nature protection, uniform payments for management practices	Croatia, B&H, Slovenia, Serbia, Austria, Hungary
17	Regional	DRAVA LIFE— Integrated river management	EC	Protection of water, water regulation, sectoral cooperation, uniform payments for given management practices, Natura 2000 sites, forests	Croatia, Slovenia, Serbia
18	Regional	Water management of the Drava, Mura, Danube	WWF, UNESCO, MAVA, Asamer Holding, Coca-Cola,	Transboundary UNESCO Biosphere Reserve, management of water, forest, landscape, uniform payments for management practices	Croatia, Slovenia Serbia, Austria, Hungary
19	Cross-border	FORRET-Development of Transboundary Forest Retention, Flood Risk, Environmental and Forestry Management	WWF	Water management, flood management, forest management, uniform payments for management practices	Croatia, Serbia
20	Cross-border	‘Development of Economic Transferability Study of Plitvice National Park to Una National Park		Evaluation of current economic value of the NP Una using the Total Economic Value framework and potential economic value of the NP Una.	Croatia, BIH

5. PES IN THE REPUBLIC OF NORTH MACEDONIA

5.1 Background

Since the last decade of the twentieth century, the issue of payment for environmental services has climbed the agenda of the research public and the policy creators. Initially, various best practices and case studies globally and from the broader region were presented to codify the potential lessons-learned and approaches that can be appropriate for the Macedonian context. Accordingly, the first steps have been initiated through the stand-alone interventions within the framework of the comprehensive natural

resources projects e.g. Prespa and Ohrid Lakes projects. Consequently, with the advancement of the EU approximation process and the ratification of international conventions and mainstreaming the global sustainable development mechanisms into the national normative and institutional frameworks, the concept of the payment for environmental services was profiled as one of the key principles for sustainable management of the nature and its resources.

Accordingly, there are many parallel initiatives for formulation and mainstreaming of the payment for environmental services through various areas of the ecosystem services. However, given the rate of development of the normative framework, the introduction of standards and protocols, the conservation of biodiversity in our country can not be achieved only through measures and activities in protected areas, but also through other parts of the ecosystems that are cascading in different sectors affecting various parts of the population and critical infrastructure e.g. services related to food, water, raw materials, erosion controls, etc. A typical example is the forest and agricultural ecosystems that are actively managed. By applying, the ecosystem approach in some of these ecosystems, basic environmental processes and functions can be renewed, especially those providing services that are essential to humans. Therefore, it is necessary to identify the pressures on ecosystems that provide essential services for the well-being of people. For the critical ecosystems that provide important services, it is necessary to take measures for conservation or revitalization. Indeed, protection is preferred to revitalization, which is usually more expensive and longer. Activities to reduce pressures on ecosystems, such as those from the agriculture and forestry sectors, will help in the spontaneous renewal of some of the degraded Ministry of Environment and Physical Planning ecosystems. Restoration efforts should focus, above all, on ecosystems whose services have a crucial or critical impact on human well-being. The inclusion of key stakeholders in the activities for identifying key ecosystem services and in the implementation of the revitalization activities of the ecosystems that provide them will contribute to a more equitable approach to ecosystem services. The revitalization of these ecosystems will undeniably contribute to the preservation of biodiversity in the country. Currently, the programme initiatives for conservation of nature and the protection of the Bregalnica Rivershed²⁹ are the leading ones for practical formulation and piloting of the various mechanisms for payment for environmental services. Rich and heterogeneous biodiversity and ecosystems in the country is a great foundation for the development of the fiscal aspects of the ecosystems. The current experiences in the Republic of Macedonia for the application of these methods are modest. This approach is intended to upgrade the concept of sustainable development, which is widely accepted and used in policymaking, through larger integration of the environment and the economy.

According to the Guide for mainstreaming of the ecosystem services, to support national practitioners, the integration of biodiversity and ecosystem services should be a central theme of the sustainable management of the natural resources. In that sense, for successful integration of ecosystem services in the development of other sectoral strategies it is necessary to have a relevant evidence base or record of the most important ecosystem services in the country, as well as the impact of different economic sectors on ecosystems providing such services. That is, to have information on the dependence of different economic sectors and socio-economic groups on such services.

5.2 PES in the national strategic and legal framework

In the existing normative framework, the payment for environmental services is not well mainstreamed, partially due to the novel approach in the protection of nature and environment including their

²⁹ <http://www.bregalnica-ncp.mk/?lang=en>

sustainable utilization and partially due to the lower level of awareness of the policy creators and the decision-makers. In that direction, the *EU North Macedonia Report 2019* states, that “steps have been taken to establish ecosystems services. However, it lacks sustainable and long-term funding centrally protected areas.”³⁰ Furthermore, the SDGs Voluntary National Review (2020)³¹ regarding the ecosystem approach to natural resource management states, that “the country accomplished progress in applying the principles of the ecosystem approach to managing natural resources. The first attempts at integrated management have been made Prespa and Lake Ohrid, and more recently with the Bregalnica river basin³². Ongoing activities are for the implementation of a short-term capacity building plan for all stakeholders in ecosystem services.”

Therefore, for the purposes of identification of the level of mainstreaming of the PES concept in the overall national framework, approach is two-levelled, review of strategic documents and action plans and review of existing legislative acts.

a) National strategic documents and action plans

➤ **NATIONAL STRATEGY FOR NATURE PROTECTION 2017 - 2027³³** - Establishment of the payment for ecosystem services is considered as one of the priorities of this strategic document: “National Target 3 - To embed the nature protection policies into the strategies, plans and programmes of other sectors by 2020”. The Strategy refers mainly to the protected areas and therefore the PES is considered as a source of finances for the protection areas (from the fees). The payment for ecosystem services is the implementation of the “user pays” principle and has two main objectives: mobilization of funds for the entities in charge of protected area management and providing financial incentives for landowners to engage in the preservation of ecosystems. To ensure efficient and sustainable financing of protected areas, it is necessary to introduce the following additional financial instruments:

- payments for carbon emissions,
- establishment of a Renewable Nature Fund,
- various types of trusts,
- redistribution of existing revenues from taxes, fees and payments from the production and trade in fossil fuels, from the registration of vehicles, water management, etc.,
- Public-Private Partnership,
- compensation for damage caused to ecosystems in protected areas,
- fees for bioprospecting, i.e. for the use of resources, paid by companies that cultivate
- wild species, intended for commercial purposes, etc., and using funding opportunities from Prespa-Ohrid Nature Trust.

In the Action Plan of the strategy, the ecosystem services are integrated in the National Target 3 – “To embed the nature protection policies into the strategies, plans and programmes of other sectors by 2020”, in the relevant actions:

- 3.1 Development of study on economic values of eco-system values of protected areas in the Republic of Macedonia;

³⁰ European Commission. *Working Document for the Commission’s Services. Report on North Macedonia 2019*. Brussels, 29.5.2019. <https://bit.ly/3iXj0f6>.

³¹ SDGs Voluntary National Review. May 2020. p.91. <https://bit.ly/3k2kvKo>.

³² <http://www.bregalnica-ncp.mk/?lang=en>

³³ <https://bit.ly/357p289>.

- 3.2 Introduction of procedures for assessment of ecosystem services within individual sectors and their implementation in the process of adopting strategies, plans and programmes;
- 3.3 Incorporation of procedures for the assessment of ecosystem services in the legislation.

Besides, they are part of the actions 4.3 Incentives for sustainable use of nature and 7.1 Continuous increase of financial assets for nature protection from the Budget of the Republic of Macedonia, budgets of the units of local self-government and various donations.

➤ **NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN For the period 2018 - 2023³⁴** - Payment for ecosystem services are integrated in the National Target 3: “Introduction of positive incentives for conservation and sustainable use of biological diversity following the Convention and EU related obligations and identification and correction of incentives that are harmful to affect biological diversity components” within the action 3.1.2. Analysis and introduction of incentive measures, including payment for ecosystem services towards poverty reduction through sustainable use of biological diversity and ecosystem services.

➤ **Programme for the protection of the biological diversity in the livestock (2018 – 2014)³⁵** – Ecosystems services are considered regarding the wide variety of domestic animal breeds, especially in the pasture ecosystems, as well as increased awareness, training and research in all areas of animal generic resource management including emerging areas i.e. ecosystems services

b) National legislative framework

In general, there are no legal precedents to obstruct the implementation of the schemes. Some key policy acts for the protection of nature, forest and water management are presented below to reflect the existing situation regarding the normative solutions for PES, as well as to further understand how the PES should be embedded in the existing or new normative framework.

Most prominent elaboration of the PES concept is stipulated in the **Law on protection of the nature³⁶** were in the Section: Definitions in article 6, para.1, item 61 – 63, definitions and essential of the ecosystem services are elaborated. The main consideration of the ecosystem services in this act related to the nature protected areas but refers also to all other areas and related services. Accordingly, the *ecosystem services* are services that are provided and available to all entities considering the natural characteristics of an area, which especially means the following groups of services:

a) *Support services* – They are necessary for the production of all other ecosystem services including soil formation, photosynthesis, primary production, nutrient circulation and water circulation;

b) *Supply services* – They are products obtained from ecosystems, including food, cellulose fibres, fuel, genetic resources, natural medicines and spices, raw materials for the pharmaceutical and biochemical industry and drinking water;

c) *Regulatory services* – They are all benefits derived from the regulation of ecosystem processes including air quality regulation, water purification, climate regulation, regulation and protection against natural hazards (floods, erosion, drifts and landslides), pest control and infectious diseases and pollination, and

³⁴ <https://bit.ly/3j3IXJZ>.

³⁵ <https://bit.ly/3duKIEe>.

³⁶ <https://bit.ly/357p7IZ>.

d) *Cultural services* – They are intangible benefits of the ecosystems - cultural, intellectual and spiritual benefits (through spiritual enrichment, cognition, inspiration and reflection), recreational tourism and aesthetic values, in a way that takes into account the values of the landscape.

Payment of ecosystem services is an operationalization of the principle "user pays" and implies payment of fees or other payments determined through voluntary negotiation to reach a binding agreement by users of ecosystem services on the one hand and entities that manage the protected area on the other, to maintain, protect and manage the ecosystems on the territory of the protected area by the entities that manage the protected area. *Users of ecosystem services* are legal or physical entities that perform activity or activity outside the territory of the protected area, but which due to the ecosystem services provided by it enjoy an advantage over other legal or physical entities that perform the same or similar activity or activity but do not have benefit from the ecosystem services of the protected area.

Furthermore, in the same law, in the Article 54 - Forest habitats and ecosystems, para. 1, item 3 is stipulated that the "preservation and protection of forest habitats and ecosystems in protected areas are provided according to the principles of sustainable development, preservation and maintenance of the natural composition of the species and their natural renewal, as well as provision and maintenance of *ecosystem services* and the conditions for a favourable state of conservation of species and habitats." Payment for ecosystem services are one of the resources for funding of the national parks (article 141-a, para. 1, item 10) and the nature protection (article 161, para. 1, item 12). Responsible persons for payment of the ecosystem services are legal and physical entities who are users of the services in the nature-protected areas (article 163, para. 1, item 8). The next articles 164, 165 and 166 regulates the payment of the ecosystem services and the entity that manages the protected area concludes agreements for the collection of compensation for performed ecosystem services with all performers of activities that benefit from ecosystem services, enjoy an advantage of protection and management of nature in the protected area, i.e. benefits from nature protection. The entities that manage the protected area are obliged to take care to provide the appropriate ecosystem service on an ongoing basis and to generate it at a specific level determined by the agreement. The provision of the ecosystem service is subject to continuous monitoring by the user or users of the ecosystem services that voluntarily entered into the contract. The funds from the fees are the income of the entities in charge of managing the protected area and are used for the performance of protection works and nature management in the protected area in which they are charged. The fees are determined by the management body of the protected area based on the prior consent of the Government.

The Law on the forest (64/09, 24/11, 53/11, 25/13, 79/13, 147/13 and 43/14)³⁷ does not directly stipulate the ecosystem services or payment of these services. There are only two aspects that refer to the mentioned topic. They are usage of the forest and rights of the entities that are managing the forests owned by the state. The former refers to the cutting of timber and production of forest assortments, usage of the debris, other forest products (forests fruits, herbal plants, mushrooms, lichens, moss, seeds, resin, stone, etc.), trade-in wood and other forest products, as well as usage of the forests for tourism, hunting and recreation. The latter enables the mentioned entities to make gains through collection and selling of forest assortments; collection, production and selling of forest fruits, mushrooms and herbal plants, snails and turtles; exploitation of stone, sand, gravel, hummus, etc.

³⁷ <https://bit.ly/3nW38x7>.

The Law on water³⁸ provides the general framework for the protection and sustainable management of water resources. It has environmental provisions and the EU-Water Framework Directive (WFD) 2000/60/EC, Directive 1976/160/EC, Directive 91/676/EC, Directive 98/83/EC, Directive 98/83/EC, Directive 91/271/EC, Directive 1976/ 464/EC and Directive 75/440/EC have been transposed. Nevertheless, it does not directly stipulate the ecosystem services related to water or payment of those services. Indirect payment of water services relates to the use of the water as stipulated in the article 207. Economic instruments with environmental impact incorporated into the Law include user charges for water supply and consumption, sewage and wastewater charges, and penalties.

5.3 PES in North Macedonia – existing situation and recent case studies

In this section of the report, a brief overview of the ongoing and recent project initiatives and case studies is presented, emphasizing the components related to the mainstreaming of the payment for ecosystem services in various aspects of the nature protection, environment and other relevant areas. Accordingly, the listed PES related projects are grouped into three groups: projects near establishing PES schemes, concepts of PES schemes and feasibility studies and strategies.

1) Projects near establishing PES schemes

➤ **Programme for nature conservation in Macedonia – Phase II**³⁹ (2017 – 2020) – This programme is financed by the Swiss Development Cooperation and is implemented by Pharmachem – Skopje and HELVETAS Swiss Intercooperation, participation of the Macedonian Ecological society and with various beneficiaries e.g. ministries, municipalities, centres for regional development, CSOs, etc. This programme aims to support the national efforts for the preservation of the country's exceptional biodiversity and natural eco-systems by promoting their sustainable management and use. The program will contribute to achieving the general goal of the Bregalnica region to preserve natural values and promote sustainable and inclusive socio-economic development. Furthermore, it will support MoEPP in developing an ecosystem service payment mechanism, including a methodology and guidelines for implementing the PES mechanism. In parallel with the development of the guide, the Program will provide support for strengthening the ecosystem service capacity for key stakeholders. Besides, the PES mechanism under the Program will be tested in at least one pilot area in the East Planning Region, which is the target region of this Program. The test results are expected to help in the future development of a PES rulebook by the MoEPP.

In particular, regarding the PES component, the Project engaged in learning by doing approach to establish a PES framework and to test it in a particular environment. Initially, the project has assessed the national ecosystems⁴⁰ as per indicators of the Esmeralda project⁴¹ i.e. identification of the ecosystems, assessment mapping of the potential provision of ecosystem services, possibilities on the national level, etc. Consequently, the project targeted the Municipality of Vevchani as a beneficiary for the development of PES schemes. Until now, a work plan for the establishment of the PES scheme was developed, important services on the local level were identified, protected area of Vevhanski Izvori (Vevchani Springs) was identified and mapped, a list users and provides established, opportunities and challenges identified, etc.

³⁸ <https://bit.ly/37bLsaX>.

³⁹ <https://bit.ly/2SX2cdp>.

⁴⁰ The Assessment Report is finalized by the project and submitted for review to the Ministry of Environment and Physical Planning. Once it is approved it should become publicly available until the end of the year.

⁴¹ <http://www.esmeralda-project.eu/>

As a result selection of ecosystem services was made including tourism and collection of wild plants and herbs. Public awareness survey with the local population is ongoing. Once it is completed, the activities will follow.

➤ ***GEM Balkans - Creating conditions for development of forest and catchment areas in the Balkans***⁴² - The project is funded by the Deutsche Bundesstiftung Umwelt (DBU)⁴³ and the period for implementation is 01.03.2019 – 31.10.2020. Main implementators are the Research Institute for Forest Ecology and Forestry (FAWF)⁴⁴ as the leading partner and the Connecting Natural Values and People Foundation (CNVP)⁴⁵ as the project coordinator. Other implementing partners are the Public Enterprise "National Forests" from the Republic of North Macedonia, the Public Enterprise for Forest Management "Srbijashume" from the Republic of Serbia and the Directorate for forest protection and treatment from Albania. Its main objective is to improve the existing practices in forest management planning in terms of improving forest hydrology planning within the management plans in North Macedonia and Albania. The target group are the employees in the planning department of the Public Enterprise "National Forests" - Skopje, the Directorate for Protection and Treatment of Forests from Albania and the Public Enterprise for Forest Management "Srbijashume", as well as subsidiaries and regional water companies, as well as farmers living near forest areas. The end-users will be the citizens of North Macedonia, Albania and Serbia, as well as the relevant institutions responsible for water management in those countries, ie the Ministry of Agriculture, Forestry and Water Economy of Northern Macedonia; The Ministry of Agriculture, Trade, Forestry and Water Economy of Serbia, as well as the Directorate for Protection and Treatment of Forests of Albania. Main activities are following: the establishment of two pilot areas, one in North Macedonia and one in Albania, where the proposed measures for protection against floods and erosion will be tested as part of integrated forest management in catchment areas; harmonization of forest and catchment management measures with EU standards; strengthening the capacities for planning in forestry concerning the aspects related to the protection of water resources, as well as protection from floods and erosion; raising awareness in society to increase understanding of the ecosystem services provided by forests concerning water resources.

➤ ***Macedonian Ecological Society – Component for improvement of the status of the natural values in the Bregalnica Region (2018)***⁴⁶ – Activities consisted of identification of the NATURA 2000 areas in the Bregalnica region, development of proposals for protected areas, revitalization of riparian ecosystems and *pilot testing of the mechanism for payment of ecosystem services*. The latter one consisted of the adoption of adequate methodology for the process of analysis of the ecosystems in the country and assessment of their status through the selection based on adequate indicators. Accordingly, the process continued with the identification of indicators and parameters for the analysis of the ecosystems and establishment of the mechanisms for pilot testing of the PES.

II) Concepts of PES schemes

➤ ***Private Forests for Positive Changes in the Popolgo Planning Region (SP)***⁴⁷ – This project was implemented as a small grant component within the framework of the project "Strong civil society

⁴² <https://bit.ly/2T1mzGp>.

⁴³ https://www.dbu.de/projekt_34842/01_db_2848.html

⁴⁴ <https://fawf.wald-rlp.de/>

⁴⁵ <http://www.cnvp-eu.org/eng/index.php>

⁴⁶ <https://bit.ly/37bJSpu>.

⁴⁷ <https://bit.ly/31eLM4G>.

organizations for positive social change” funded by the European Union and implemented by the Foundation for the development of the local community – Shtip, Institute for the community development - Tetovo and the Centre for sustainable development – Alka from Skopje. The main goal of the small grant component was to achieve increased involvement of local civil society organizations in decision-making processes at the local level to conserve forest resources and their ecosystem services in the Polog region. It was implemented by REFORD - Regional Center for Forestry and Rural Development and NAPFO - National Association of private forest owners, The small grant component was implemented for five months during 2019. Accordingly, achieved results were following: identified level of cooperation between owners of private forests and local/national institutions; established municipal branch of private forest owners from Vrapchiste, Tearce and Jegunovce within the NGO “Private Forests” for joint action in areas of interest to the owners of private forests and the wider community; increased knowledge of the owners of private forests on their rights and responsibilities for participation in policy-making and decision making at the local level; and established cooperation and responsibility between private forest owners and local governments in the Polog planning region. Aspects of the environmental services were also covered within the field survey with the owners of private forests and the municipal authorities. The former still do not see the prevention function of the forest and want to utilize it for the supply of wood for heating. The latter ones do not integrate the private forests in their plans and competencies.

➤ **Project for modernization of the agriculture**⁴⁸ is financed by the WB during the period 2020 – 2024 and it is implemented by the Ministry of Agriculture, forestry and water management. It aims to improve the competitiveness of the agricultural sector in North Macedonia and to strengthen public institutions within of the country's EU accession process. The proposed goal for project development is to improve competitiveness in selected sub-sectors and to strengthen public institutions in the agricultural sector by implementing the following components: improving the competitiveness of the agricultural sector at the farm level and encouraging the aggregation of agricultural products and market integration; strengthening the institutional capacity to support the public sector and complete coordination and implementation of project activities (Platform for agricultural food in Skopje, collection and air conditioning station in Resen, collection and air conditioning station in Strumica and animal by-products processing system and their safe removal. Accordingly, the ecosystem principle is part of the assessment process for financing of the pilot projects through the “change of ecologically important areas, including wetlands, natural forests, pastures and others, as well as “critical” natural habitats and ecosystem services.

➤ **Nature Park “Ezerani”**⁴⁹ – The “Ezerani” Nature Park management project provides a good example of how the concept of ecosystem services can be applied in the management of degraded ecosystems in protected areas. In the Plan for Management of the Nature park “Ezerani” 2012 – 2021, according to the answers to respondents during the Ezerani Study survey, these are the most used ecosystem services within the Nature Park “Ezerani”: use of sand, gravel and clay, reed, water, use of wet meadows for grazing livestock, bird hunting, recreation and bird watching, collection of mushrooms, medicinal and other plants and trees. The types of ecosystems described offer a range of ecosystem services, which are used by the local and the population from the wider region. What needs to be done before introducing payment procedures for ecosystem services is their prior identification. But the current situation testifies that quite a bit ecosystem services such as water, wood, sand, gravel, fish, birds, meadows, reeds are used directly without any compensation. Accordingly, it is required to introduce a transparent mechanism by which to ensure that all those using ecosystem services of the type directly accessible (sand, gravel, water, reeds, food) must pay a certain amount.

⁴⁸ <https://bit.ly/31ceYcu>.

⁴⁹ <https://bit.ly/3dynyrm>.

III) PES feasibility studies and strategies

➤ **Local Environmental Action Plan of the City of Skopje (2020 – 2026)**⁵⁰ - Ecosystem approach is mainstreamed in the nature and environment areas and services that under the competence of the City of Skopje. Since, in the Park-forest Vodno, many cultural and historical monuments have left an important mark in the history of Skopje and beyond and they are a key foundation for the development of *cultural ecosystem services* in the protected area of the Park-forest. Also, in the Action Plan, it is stipulated that within the comprehensive activities for improvement of the control conditions against the destruction of public green areas, ecosystem services of the tree planned to be cut would be determined.

➤ **Nature Protection of the Shara Mountain and the Osogovo Mountains** – The Government has adopted the initiative for protection of these mountainous areas i.e. the Shara Mountain as a National Park and the Osogovo Mountains as a Protected area (Category V of protection). Following the normative framework for declaration of the protection areas status, public discussion with the interested stakeholders and the local population are ongoing and accordingly, outputs of these discussions shall be incorporated in the final proposal for declaration of the status of the protected areas. This new status shall contain a high level of biological and cultural values of the protected areas and fulfilment of the national and international obligations for the protection of the area diversities and biodiversity. Furthermore, the great potential of the local economies shall be used through sustainable management of these areas and provision of ecosystems services including eco-tourism.

In the context of the initiative for the protection of the Shara Mountain, it is necessary to refer to the **“Study on the valorization of the natural values of the Shara Mountain and the assessment of their market values”** (Melovski & Hristovski, 2008) where for the first time the economic valuation of the Shara Mountain values that can not be measured by the market was done. Within the framework of this approach, a survey was conducted with the participation of the population on various issues including the willingness and readiness to pay for the services. Nevertheless, the majority of the respondents (27% of 323) answered that they would not pay for any services deriving from the natural environment of the mountain, whether the majority of respondents (73%) is ready to pay for the services, ranging from small to more significant contributions.

➤ **“BLUE and GREEN versus BLACK and GRAY” Project (Study: Integrated Ecosystem Approach for the Lake Ohrid Basin as a Tool for Conservation and Protection of Natural Resources)**⁵¹ – The overall objective of the project is to facilitate effective and responsible use of the natural resources in the cross-border region around the Ohrid Lake, thus enhancing the sustainable development in the area. It was implemented during the period 2013 by the Local Development Agency (LDA) from Struga, North Macedonia and Euro Partners Development and Eco Partners for Sustainable Development from Albania. The objective of this research is to develop an integrated ecosystem approach for the Lake Ohrid basin as a mechanism for conservation and protection of the natural resources and biodiversity through developing effective measures and cooperation between Albania and North Macedonia for the joint environmental management of the watershed.

⁵⁰ <https://bit.ly/37dm0BY>.

⁵¹ <https://bit.ly/2SXUL63>.

➤ **Integrated Water Resource Management at Dojran Lake in Macedonia⁵² - Framework proposal for development and implementation of Payments for Ecosystem Services scheme at Dojran Lake (2016)**

⁵³- Its overall aim is to present a feasibility study for the design and implementation of PES at Dojran Lake. Identifying the potential for PES in an area is the first activity in the process of setting up a fully operational scheme. Based on the already identified elements constituting a PES scheme, the following response options are further taken into consideration: restoration of forest belts, lake restoration through reed management and ecotourism. The objective of the restoration of the forest belts is to prevent the soil erosion and through reforestation of abandoned agricultural lands to strengthen the functions of ecosystems for erosion control, water quality and thus ensure suitable habitat for biodiversity. Oak, ash or elm trees will maintain the scenic landscape and biodiversity for recreational benefits for the local population and tourists

5.4 PES in North Macedonia - way forward

Accordingly, a brief action plan is prepared containing the essential actions/measures that need to be implemented for further integration of PES in

#	Action/measure	Stakeholders	Priority
1	Understanding of the regulatory functions of the forests in the context of strengthening control over natural disasters, protection against erosion, regulation of climate condition, etc.	CMC, PENF, MoEPP, MAFWE	Short-term
2	Study on comprehensive identification and determination of forest ecosystem services and appropriately propose to the relevant partners to be incorporated in the legal framework in the management of national forests	CMC, PENF, MAFWE, MoEPP	Short-term
3	Understanding of the needs of the local stakeholders and the PES demand-supply ratio	CMC, PENF, MoEPP, MAFWE	Short-term
4	Capacity-building of the key project stakeholders on the PES contextual frameworks, mechanisms and benefits for the local communities.	CMC, PENF, municipalities, Babuna, MAFWE	Short-term
5	Sensitization of users of environmental services is essential for these to recognize the cost of producing environmental services and to increase their willingness to pay for these services	CMC, PENF, MAFWE, Babuna, municipalities	Short-term
6	Codification of the project best practices & lessons learned	CMC, PENF	Short-term
7	Review and mainstreaming of PES in essential normative framework	MoEPP, CMC, PENF, MAFWE, etc.	Mid-term
8	Capacity building of key national institutions on PES	CMC and key national institutions	Mid-term

⁵² <https://www.cepf.net/sites/default/files/final-report-63842.pdf>

⁵³ <https://bit.ly/37akLTZ>.

#	Action/measure	Stakeholders	Priority
9	Water quality PES schemes (e.g. constructed wetlands for dealing with wastewater discharges, PES schemes to address increased nutrient pollution from development, etc.) Buyers: Government, PCEs, private business. Providers: Land-owners, Pes, etc. Intermediaries: NGOs, farming industry. Associations.	CMC, MoEPP, MAFWE, municipalities, PCEs, PEs.	Long-term
10	Flood risk management PES schemes (e.g. alteration, restoration or use of landscape features, mechanisms include storing water using landscape features, increasing soil infiltration, and slowing water by interrupting and increasing resistance to its flow, etc.) Investors: Local authorities, developers, PCEs, PEs, private businesses. Providers: Land-owners/managers. Intermediaries: National and local authorities, regional centres, NGOs, associations, etc.	CMC, MoEPP, MAFWE, municipalities, PCEs, PEs.	Long-term
11	Forestry PES schemes (e.g. afforestation and planting programmes, creation of new urban forests, sustainable forest management and practices, investments in forests for carbon sequestration purposes, visitor payback schemes, etc.) Buyers: governments (national/local, visitors, downstream beneficiaries, businesses, PCEs, PES, etc. Providers: PE NF, private forest and land-owners, businesses, etc. Intermediaries: NGOs, environmental organizations and associations, forest carbon brokers, etc.	CMC, PENF, MAFWE, MoEPP, municipalities, PCEs, PEs.	Long-term

8.4 Pilot PES solutions for the project site

Within the framework of the assignment, based on the outputs from the survey, the existing situation regarding PES in the country and identified needs, the following realistic pilot solutions are recommended for the broader area of the project site i.e. Lisiche Dam:

➤ Broader perimeter of the area surrounding the water accumulation, the Lisiche Lake, is categorized as a forest land and is managed by the PE NF. Current risks are related to the forest fires and soil movement which contribute to the process of transportation of the sediment to the water accumulation. As mentioned previously this situation significantly is impacting the stable water supply. Accordingly, this process in the short- and medium- terms can be significantly reduced through afforestation and strengthening of the forest vegetation within the competent FMU.

Recommendation: The PE Lisiche Hydro-system should find a modality for allocation of funds aimed at subsidizing the forest seedlings at the PE NF nursery and to introduce and conduct regular annual afforestation campaigns. These funds can be calculated in the end-user service accounts such as PES.

➤ The PE Lisiche Hydro-system manages two artificial water reservoirs – Lisiche and Mladost. Accordingly, in direct or indirect forms, it delivers various services to the citizens, such as water supply, irrigation, recreational, sports, fishing, catering and other services.

Recommendation: Part of the fees for these services should be allocated as contributions of the newly established PES Fund, that will provide stable and regular financing for afforestation and increasing of the forest vegetation in the narrow and the broader areas of the water reservoirs to increase the quality of existing and introduction of additional services.

➤ PCE “Derven” – Veles supplies the citizens of Veles and surrounding settlements with drinking water from the Lsisiche Hydr-system.

Recommendation: Potential consideration of allocation of a small percentage from the water bill amount of the legal and physical entities for subsidization of the environmental services around the broader area of the water accumulation and alongside the water supply system from the accumulation to the city.

Furthermore, for the mainstreaming and piloting of the PES services related to the project site, two more general recommendations are formulated:

➤ ADKOM, as an association of public utility providers through its mechanisms for the strengthening of the capacities of its members (PCEs) to consider the possibility of initiating expert discussions and an initiative for changes in the legislation on communal activities and water supply to introduce the PES approach and to support PES related capacity development in its members.

➤ The Eco-DRR project, within its project activities to transfer good practice and experiences for PES from Japan and other relevant countries and to propose their incorporation in the normative framework for sustainable forest management in the Republic of North Macedonia.

6. CONCLUSIONS AND RECOMMENDATIONS - WAY FORWARD FOR PES IMPLEMENTATION

Following the goals and objectives arising from the TOR, a comprehensive analysis of the situation and perspectives regarding the policies, the legal framework, as well as the application of the PES in the countries of the Western Balkan region and especially in the Republic of North Macedonia was conducted. Based on the desk review analysis of the content of the available documents and the existing application in the practice, the following conclusions and recommendations can be drawn:

6.1 Conclusions

➤ Ecosystem service is very important for the economic valorization of natural values, and hence for the functioning and management of protected areas, but it will help the country to fulfil its obligations for protection and conservation of nature arising from various international documents (conventions and contracts).

➤ The establishment of a payment system for ecosystem services (ESP) is of great importance for the economic valuation of natural resources and as such is properly recognized in the National Strategy for Nature Conservation and the revised National Strategy for Biodiversity with the accompanying Action Plan. Additionally, this mechanism is stipulated in the Law on Nature Protection, as well as in some other documents, primarily produced by projects in the field of environment.

➤ From the conducted desk review analysis of the existing documents, it can be concluded that there is a definition of ecosystem services in the Republic of North Macedonia in several categories, as support, supply, regulatory and cultural, which is a solid basis for further adjustment of the specific functions of each category. Nevertheless, despite these attempts, the application of the concept of ecosystem services in the management of ecosystems in the country is still modest. Accordingly, there is a need to introduce specific normative frameworks for PES, as well as to define the ecosystem services market and

beneficiaries. In the creation of a normative framework for PES, regulations must be based on concrete experiences which have shown to be successful in the region and the country itself.

➤ Alongside the existing normative framework for PES mainstreaming, also the capacities of national and local authorities, as well as the users of the environmental services are weak. The responsible authorities cannot identify which services can be sustainably provided to the users and the users of the environmental services cannot recognize the cost of the services and they are not willing to pay for them.

➤ With regards the forest ecosystem services, until now very limited efforts were made either to promote the protective functions of the forests or to promote the forest products and services sustainably since there is still no market-oriented ecosystem service. Furthermore, the forestry planning system still has not the ecosystem approach leading not only to the provision of services and payment for them, but also to increase the biodiversity in the forests and its protection.

➤ Furthermore, PES is not mainstreamed in other sectors where ecosystem services potentially can be utilized e.g. climate change, DRR, smart agriculture, sustainable water management, etc.

➤ Since the PES can be implemented on two levels of government i.e. national (e.g. compensation of fixed changes in agricultural practice or sustainable forest management practices or watershed protection) and local (e.g. additional taxation of water bills, municipal bonds, fixed payments for protection of the ecosystems), it can be a tool for the consolidation of decentralization processes since these consolidate and strengthen local institutions, among other benefits and especially with regards to the natural hazards.

6.2 Recommendations

➤ Ecosystem services should be considered as a role for integrated use of natural resources and adequate payment of services.

➤ The Republic of North Macedonia has set full membership in the European Union as its key strategic priority. In the process of European integration and complex activities for harmonization with EU standards and criteria in the field of environment, the application of PES is of great importance for assessing progress. In this context, it is strongly recommended to continue and strengthen the application of PES by all entities managing the country's natural resources per EU regulations and other good practices.

➤ Having in mind the initial categorization of ecosystem services which is found in the National Strategy for Biodiversity with Action Plan (2018-2023) and in the Law on Nature Protection as supportive, supply, regulatory and cultural, and guided by the goals of Eco-DRR project recommends that special emphasis in the second phase of the project be paid to the regulation of the regulatory function of forests, in the context of strengthening control over natural disasters, protection against erosion, regulation of climate condition, etc.

➤ It is recommended that the Eco-DRR project conduct an additional study/analysis related to the process of comprehensive identification and determination of forest ecosystem services and appropriately propose to the relevant partners (MAFWE and PENF) to be incorporated in the legal framework in the management of national forests with to ensure the sustainability of the project results and their synergy with the concept of PES.

- PES systems may act as instruments to raise environmental awareness in the country especially in the areas of sustainable ecosystem and forest management, by allocating tangible economic values to services or externalities, which generally have no price assigned to them.
- Sensitization of users of environmental services is essential for these to recognize the cost of producing environmental services and to increase their willingness to pay for these services.

- As for service providers, education programs may improve the adoption of techniques contributing to the production of environmental services. Nevertheless, the education programmes are not the only mechanism, but they need to be combined with the provision of incentives mechanism.

- To find appropriate zoning for ecosystem services and defining hotspots for specific ecosystem services can support an appropriate planning mechanism and targeted and efficient financing of target needs and goods.

- To create cross-sectoral platforms for policymaking and decision-making. Fragmented decision-making does not correspond to the integrity of ecosystems and their services. If forests, water and soil are divided into political and administrative responsibilities, integrated natural resource management is impossible. New ways of managing natural resources, such as inter-ministerial exchange forums, regional, international ecosystem access forums, and integrated field planning tools, can encourage better integration and help reduce inadequate land and natural use incentives, resources.

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Japan International Cooperation Agency



Crisis Management Center

МКФФИС АДМИНИСТРАЦИЈА

МАРТ 2023
ТРИНИТИ СИСТЕМИ

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1. Вовед во ГИС

Географскиот Информациски Систем (ГИС) е збир од програми кои ви овозможуваат да креирате, визуелизирате, испитувате и да ги анализирате геопросторните податоци. Геопросторните податоци се однесуваат на информацијата за географската локација на ентитетот. Ова често вклучува употреба на географски координати, како вредноста на географска ширина или должина. Просторни податоци се еден од најчесто користените термини, како што се: географски податоци, ГИС податоци, податоци за мапата, податоците за локација, податоци за координатите и просторни геометриски податоци.

Апликациите за употреба на геопросторни податоци извршуваат различни функции. Изготвување на мапа е најлесно разбирлива функција на геопросторните апликации. Програмите за мапи ги преземаат геопросторните податоци и ги прикажуваат во форма која е видлива за луѓето, обично на компјутерски екран или на печатена страница. Апликациите можат да презентираат статички мапи (едноставна слика) или динамички мапи кои корисникот ги прилагодува за прикажување преку десктоп или веб апликација.

Многу луѓе имаат погрешна претстава за геопросторните апликации, односно дека само произведуваат мапи, но анализата на геопросторните податоци е уште една примарна функција на геопросторните апликации:

1. растојанието помеѓу географските локации
2. износот на површината (на пример, квадратни метри) во одреден географски регион
3. кои географски карактеристики се преклопуваат со други карактеристики
4. износот на преклопување помеѓу карактеристиките
5. бројот на локации со одредена оддалеченост еден од друг
6. и така натаму...

Ова може да изгледа едноставно, но може да се примени во сите видови методи низ многу дисциплини. Резултатот на анализите можат да се прикажат на мапа, но најчесто се во форма на табела во извештај за поддршка на одлуките на менаџментот.

Неодамнешната појава на локациски-базирани услуги ветува дека ќе ги запознаеме и сите видови на други карактеристики, но многу ќе се базираат на комбинација на мапи и анализи. На пример, имате мобилен телефон кој ја одредува вашата географската локација. Ако го имате вистинскиот софтвер, вашиот телефон ќе ви каже и какви видови на ресторанти има во вашата околина.

2. Геопросторни податоци

Накучо, денес постојат два типа на геопросторните податоци во широка употреба. Ова е дополнување на традиционалните табеларни податоци, кои исто така широко се користат од страна на геопросторните апликации.

2.1. Растер податоци

Еден тип на геопросторни податоци се нарекува растерски податоци или едноставно "растер". Најпозната форма на растерски податоци се дигитални сателитски снимки или

фотографии од воздух. Елевациско засенчување или дигитални елевациски модели се исто така типично претставени како растерски податоци. Секаков вид на карактеристика на мапата може да биде претставен како растерски податок, но постојат ограничувања. Растер е обична мрежа составена од ќелии или пиксели ако се работи за слики. Тие имаат фиксен број на редови и колони. Секоја ќелија има нумеричка вредност и има одредени географски големина (на пример 30x30 метри во големина).

Повеќекратни преклопувачки растер мапи се користат да се претстават слики со користење на повеќе од една вредност за боја (односно, еден растер за секоја група на црвена, зелена и сина вредности се комбинира за да се создаде слика во боја). Сателитски снимки, исто така, претставува податоци во повеќе "опсези". Секој опсег во суштина е посебен просторно преклопувачки растер, каде секој опсег има вредности на одредени бранови должини на светлината. Како што можете да си замислите, голем растер зафаќа повеќе простор во датотеката. Растер со помали ќелии може да обезбеди повеќе детали, но зафаќа повеќе простор. Трикот е да се најде вистинската рамнотежа меѓу големината на ќелиите наменети за складирање и големината на ќелии наменети за анализа или мапирање.

2.2. Векторски податоци

Векторски податоци исто така се користат во геопросторни апликации. Во својот наједноставен облик, векторите претставуваат начин на опишување на локација со помош на сет од координати. Секоја координата се однесува на географска локација со користење на систем на вредности за x и y . Постојат различни начини на претставување на овие географски координати во зависност од вашата цел.

Векторските податоци завземаат три форми. Секоја е прогресивно посложена и се надградува на претходната.

- Точки - една координата (x y) претставува одредената географска локација
- Линии - Повеќекратни координати (x_1 y_1 , x_2 y_2 , x_3 y_3 , ... x_n y_n) во низа, заедно во одреден ред, како цртање линија од точка (x_1 y_1) до точка (x_2 y_2) и така натаму. Овие делови помеѓу секоја точка се сметаат за линиски сегменти. Тие имаат должина и линијата може да се каже дека има правец врз основа на редоследот на точки. Технички, една линија е еден пар на координати поврзани заедно, додека линија во низа се повеќе линии поврзани заедно.
- Полигони - Кога линиите се во низа заедно со повеќе од две точки, а последната точка е на истата локација како првата, тоа го нарекуваме многуаголник... триаголник, круг, правоаголник, итн..односно полигони. Основната карактеристика на полигоните е дека завземаат фиксна површина.

3. Како да започнете

Ова поглавје дава краток преглед на ВЕБ ГИС апликација на МКФФИС, за постапката при најава и главните компоненти на апликацијата.


3.1. Преглед

Главната функционалност на МКФФИС веб апликацији е да се прикажат и искористат просторните податоци, како што се векторските и растерските мапи. Апликацијата работи заедно со Geoserver (<http://geoserver.org>) и PostgreSQL (<http://www.postgresql.org/>) за да го комплетира сеопфатниот систем за прикажување мапи. Прво, векторските и растерските мапи, или кратко слоеви, се објавуваат на Геосерверот со сите потребни параметри, како што се име, опис, стил, CRS (координатен референтен систем), на секој слој. Кога сите овие параметри се поставени, апликацијата МКФФИС се користи за прикажување на овие слоеви, промена на нивниот стил, промена на нивото на транспарентност, гледање, поставувања, печатење на мапи и др. Во следниве поглавја сите функционалности на апликацијата ќе се дискутираат во детали.

3.2. Постапка за најава

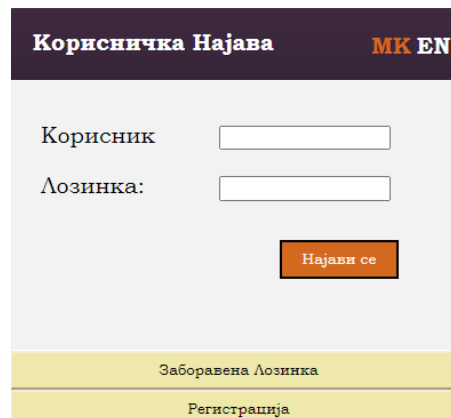
МКФФИС е веб-базирана апликација. Тоа значи дека на апликацијата и се пристапува преку било кој веб прелистувач како што се Mozilla Firefox или Google Chrome. Апликацијата е достапна на Македонски и Англиски јазик. Во десниот агол горе со кликање на едно од знаменцата може да се избере јазикот во кој ќе се прикажува апликацијата.

До апликацијата може да се пристапи преку внесување <https://mkffis2.cuk.gov.mk> во веб прелистувачот. По внесување на адресата, се прикажува апликацијата во приказ кој што е достапен за секој корисник што не е најаван (Јавен пристап) Слика 1. Овој приказ е со

ограничени функционалности. Пред знаменцата се наоѓа иконата  на која ако кликнете се отвора екран за регистрација на нов корисник или за најава на корисник кој е веќе регистриран Слика 2.



Слика 1: Главна страница



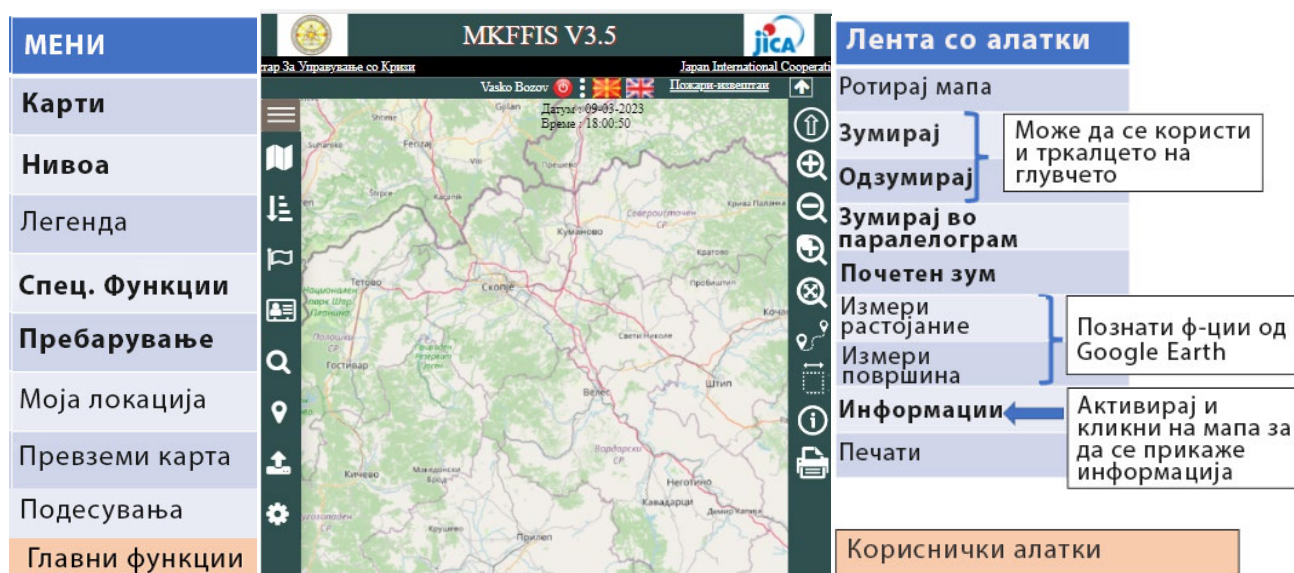
Слика 2: Екран за најава

МКФФИС АДМИНИСТРАЦИЈА

Апликацијата е поделена во три главни делови: Прозорец за мапи (map window), лента со алатки (toolbar) и операционо паѓачко мени (operational dropdown menu). Прозорецот за мапи, како што навестува и самото име, е наменет за прикажување на мапите. Лентата со алатки (toolbar) содржи одреден број на алатки за манипулација со мапите, како што се зумирање, ротирање, освежување итн. На левата страна од екранот е менито кои содржи приказ на мапи, пребарување, проекции, корисници итн. Во следните поглавја подетално ќе навлеземе во секој од трите делови и нивните функционалности.

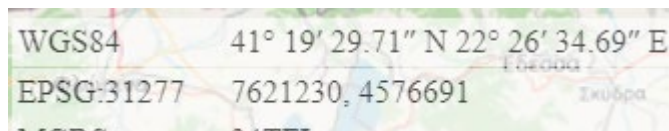
4. Прозорец за мапи

Прозорецот за мапи обезбедува основен простор за приказ на сите слоеви кои треба да се додадат во апликацијата МКФФИС. Содржината на прозорецот за мапи се конфигурира преку менито и лентата со алатки.



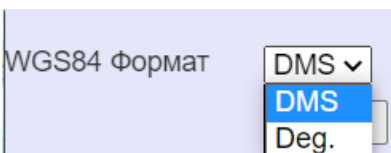
Слика 3: Преглед на МКФФИС

На прозорецот за мапи во долниот централен дел се наоѓа поле за приказ на координати на моменталната поставеност на курсорот врз мапата. Овој приказ е даден во два координатни системи WGS84 (интернационален универзален стандард) и EPSG 31277 (национален координатен систем) Слика 4.



Слика 4: Приказ на координати

5. Промена на приказ на формат на координати



Слика 5: Приказ на координати






При вклучување на апликацијата, приказот на координатите на позицијата на курсорот врз мапата во WGS84 координатниот систем е во формат DMS (степени, минути и секунди). Со лев клик на прозорецот за приказ на координатите, се појавува нов прозорец со избор на форматот на приказ на координатите во WGS84 координатниот систем како што е прикажано на Слика 5. Со избор на опцијата Deg. форматот на приказ на позицијата



на курсорот врз мапата во WGS84 координатниот систем се менува во формат Deg (степени).

6. Лента со алатки

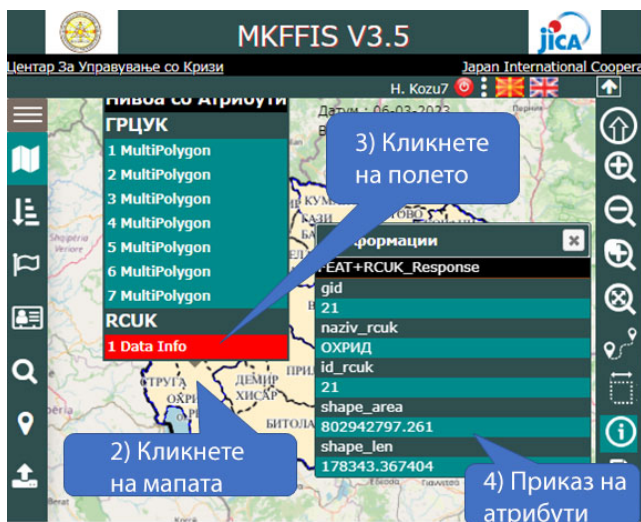
Функционалноста на секоја алатка од лентата со алатки е прикажана во Табела 1.

Табела 1. Опис на алатките

Копче	Име	Објаснување
	Ротирање	Ротирање на мапата (0-360 степени)
	Зумирај	Го зголемува нивото на зум за еден
	Одзумирај	Го намалува нивото на зум за еден
	Зумирање област	Зумирање на мапата до обем дефиниран од корисникот
	Основна екстензија	Враќање во почетната положба на мапата

	<p>Измери</p>	<p>Мерење на растојание или област во прозорецот за мапи Мерењето се завршува со притискање на двоен клик</p>
	<p>Печати</p>	<p>Печатење на мапа</p>

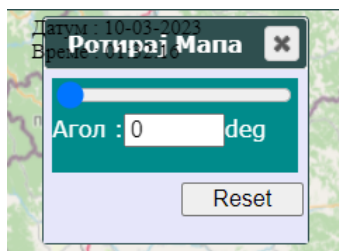
6.1. Алатка Информации




Алатката Информации ги прикажува атрибутите на отворените мапи (слоеве). За да ја користите алатката Информации треба да ја активирате и да кликнете на мапата. Ќе се прикаже листа на слоеви на местото каде сте кликнуле. Изберете едно поле од листата и кликнете на него за да го видите нејзиниот атрибут. За да го затворите атрибутот, треба да ја исклучите алатката за информации.

Слика 6: Алатка Информации

6.2. Копче за ротирање



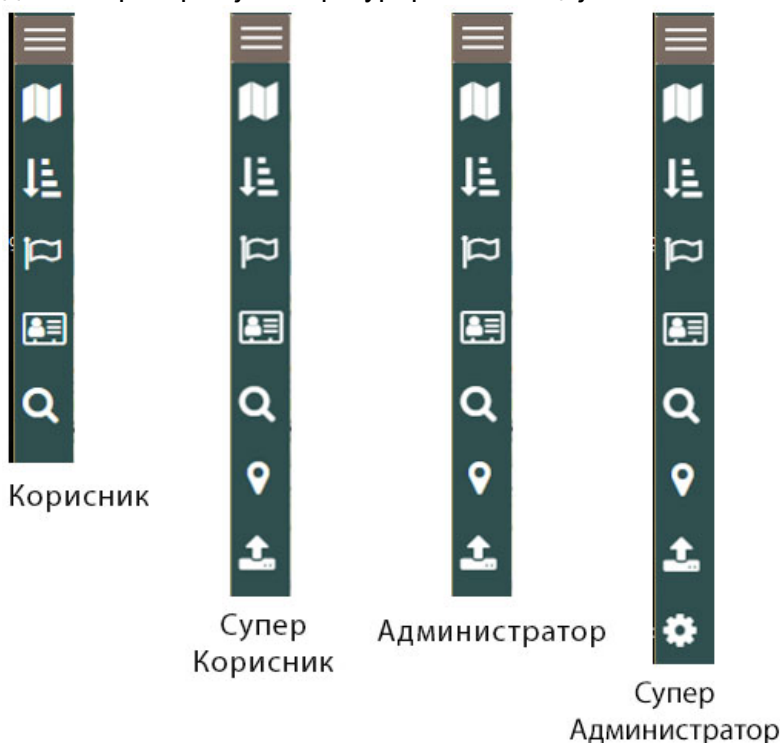
Копчето  повикува поп-уп прозорец каде што може да се постави ротација на мапата за одреден степен. Ова е прикажано на (Слика 7).

Слика 7: Прозорец за ротирање на мапа

6.3. Дополнителни алатки

МКФФИС корисниците се поделени во четири групи: корисник, супер корисник, администратор и супер администратор. Секоја група на корисници има пристап до различни алатки.

1. На групата 'Корисник' припаѓаат корисниците кои не се регистрирани. Овие корисници имаат најмалку привилегии, имаат ограничен преглед на апликацијата и не можат да прават измени во апликацијата.
2. Во групата 'Супер корисник' спаѓаат корисниците кои се регистрирале во апликацијата индивидуално преку интернет мрежата. Тие имаат помалку привилегии во одредени функционалности во однос на групата 'Администратор'.
3. Во групата 'Администратор' спаѓаат корисниците кои можат да ги користат сите функционалности во апликацијата сем 'Подесување'. Регистрацијата на овие корисници ја прави 'Супер Администраторот'.
4. Групата 'Супер Администратор' има најголеми привилегии, регистрира корисници во групата 'Администратор' и ја конфигурира апликацијата. Слика 8.















Слика 8: Разлика на алатки од менито по корисничка група

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Функционалностите на секоја од овие дополнителни алатки се опишани во Табела 2.

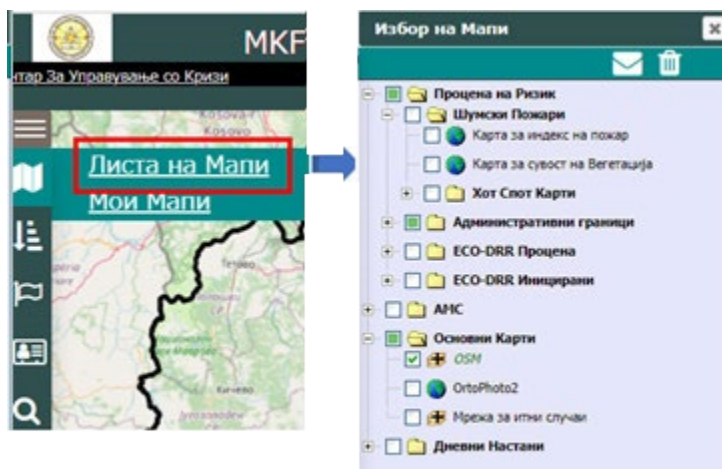
Табела 2. Дополнителни алатки за цртање и операции врз објекти

Копче	Име	Објаснување
	Избор на објект	При избирање на оваа функција и кликање со глумчето врз даден објект се отвара нов прозор со основни податоци за објектот, атрибути и документи врзани за тој објект.
	Копирај објект	При избирање на оваа функција и кликање со глумчето врз даден објект кој не мора да биде дел од активната мапа на која се црта, се копира тој објект во активната мапа за цртање.
	Избриши објект	При избирање на оваа функција и кликање со глумчето врз даден објект од активната мапа, истиот се брише од мапата.
	Нацртај Точка	Исцртување на Точка
	Нацртај Линија	Исцртување на Линија
	Нацртај Полигон	Исцртување на Полигон
	Промени Објект	Модификација на исцртан објект
	Буфер	Исцртување на буфер полигон. При избор на оваа функција и селектирање на објект, се појавува нов прозорец за внес на растојание на буферот.
	Унија	Унија на два полигони
	Пресек	Пресек на два објекти

	Разлика	Разлика на два објекти
	Импортирање на вектор	Импортирање на вектор од даден документ.

7. Операционо паѓачко мени

7.1. Прикажување на мапи




Со кликање на левото копче од глумчето врз иконата за приказ на мапи, се отвара ново под-мени Прикажување на мапи што е прикажано на Слика 9. Во под-менито Листа на Мапи прикажани се групи на мапи за полесен и побрз пристап, поголема прегледност и подобра организираност на мапите. Формирањето на групи и прикачувањето на мапи е овозможено за администраторите на апликацијата. Со кликање на било која од понудените главни групи на мапи, во прозорецот се прикажува листа на мапи поставени во избраната група како што е

Слика 9: Мени Мапи и под-мени Листа на Мапи


прикажано на Слика 9.

Во горниот дел од прозорот за приказ на мапи се наоѓа лента со алатки чија функционалност е прикажана во Табела3.


Табела 3. Опис на алатките во менито за избор на мапи

Копче	Име	Објаснување
	Зачувај моментален преглед на мапи	Зачувување на приказ на сите моментално вклучени нивоа, нивен редослед и транспарентност

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	Врати предефиниран преглед на мапи	Се брише снимениот приказ на мапи од корисникот и се враќа предефинираниот приказ
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Прикажувањето на одредена мапа на мапата се прави со едноставно кликање на полето за избор, со што истото се штиклира, а мапата се појавува како најгорниот слој на мапата. Доколку одредена мапа е вклучена, со кликање на полето за избор, истото се одштиклира, а слојот на избраната мапа се брише од мапата.

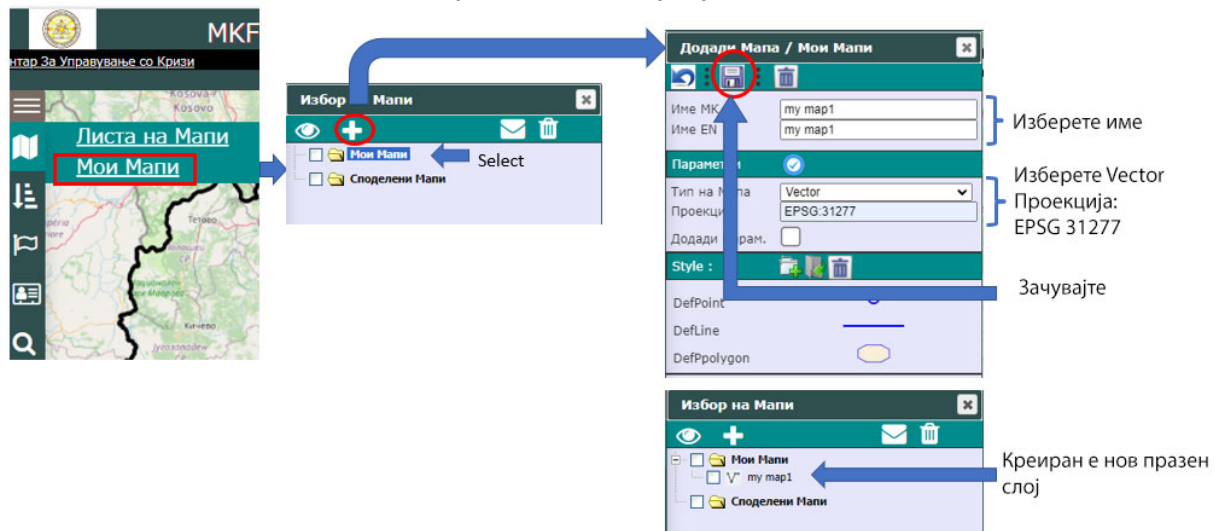
Секоја папка во дрвото е означена со  иконата, додека мапите во дрвото, зависно од типот се означени со следните икони:

-  - WMS map type
-  - WFS map type
-  - Script map type
-  - Vector map type
-  - Image map type

Векторскиот тип на мапи имаат дополнителна функционалност која овозможува цртање на објекти и одредени векторски операции над објекти.

7.1.1. Под – мени Мои Мапи




Групата Мои Мапи претставува збир од мапи креирани од самиот корисник или споделени од други корисници. За да креирате нова мапа кликнете на под-менито Мои Мапи. Во прозорецот Избор на Мапи селектирајте ја папката Мои Мапи и активирајте ја алатката Нова Група / Мапа. Се отвора прозорец Додади Мапа / Мои Мапи. Во овој прозорец внесете име на мапата, изберете тип на мапа Вектор, проекција EPSG: 31277 и зачувајте ја. Во прозорецот Мои Мапи се прикажува новиот слој кој што е празен.

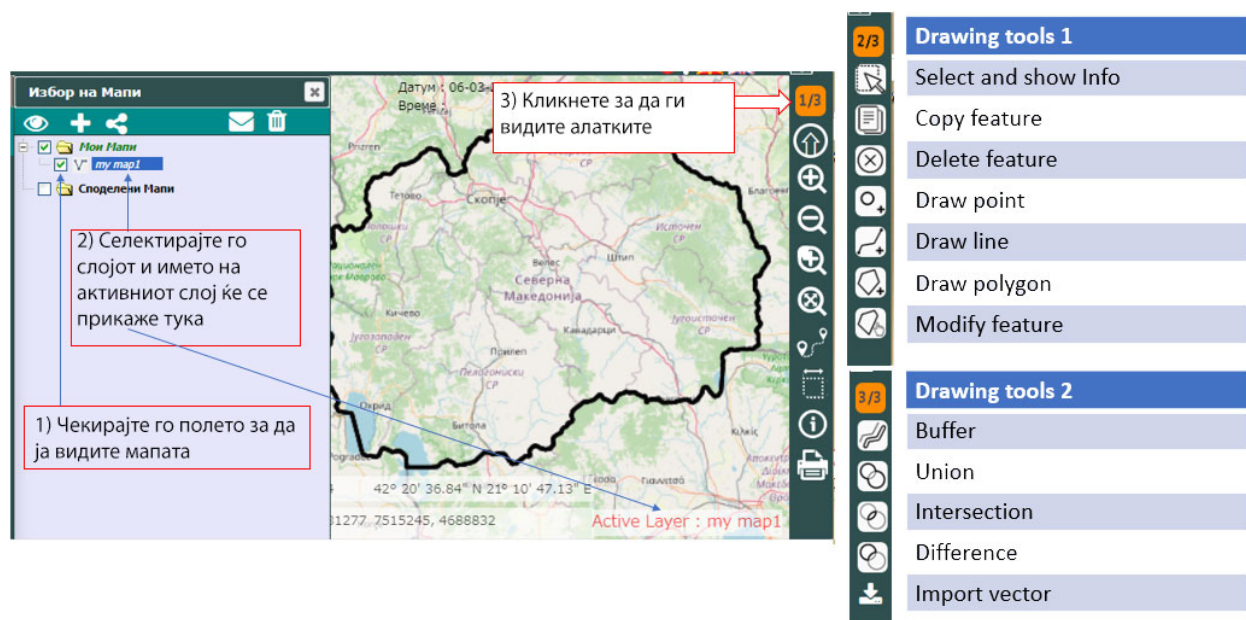


Слика 10: Креирање на нов слој

Алатките за фунлционалностите на прозорецот Избор на Мапи се прикажани во Табела 4.

Табела 4. Опис на алатките во под менито Мои Мапи

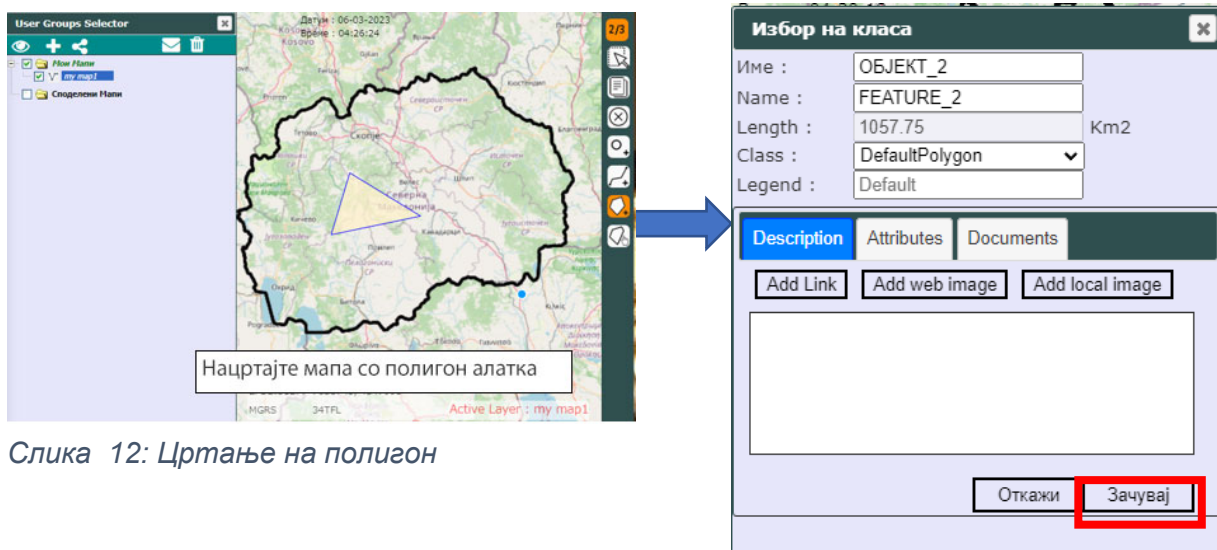
Копче	Име	Објаснување
	Прегледај подесувања	Преглед на подесувања на мапа
	Нова Мапа	Додади нова мапа
	Сподели	Сподели избрана мапа



Слика 11: Активирање на слој и приказ на достапни алатки

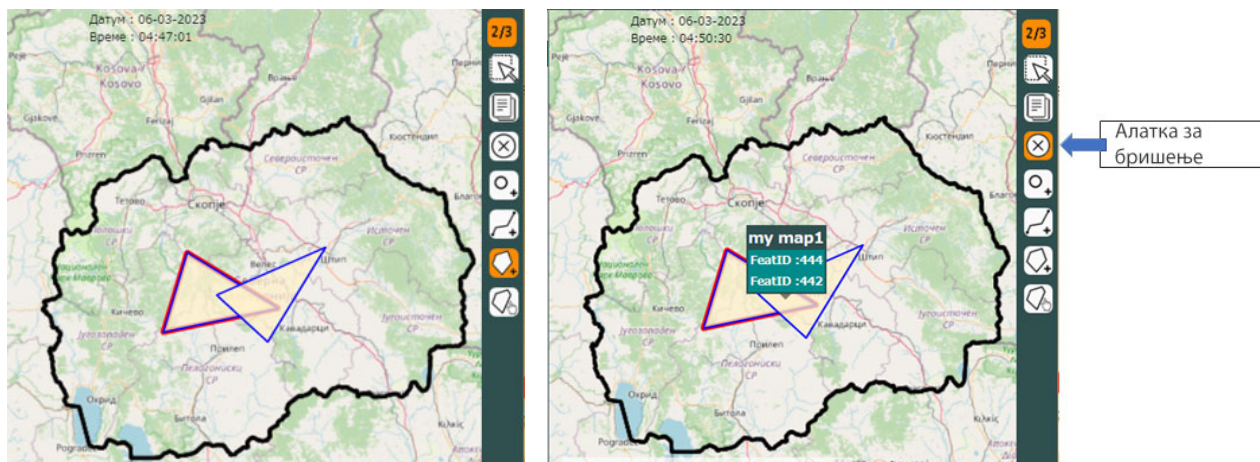
Цртање мапа со алатката полигон. Од лентата со алатки изберете ја алатката полигон. Кога ќе нацртате полигон веднаш кога ќе кликнете двојно за да го затворите полигонот, ќе се прикаже дијалог прозорец во кој може да внесете дополнителни информации за вашата мапа како што се опис, линк, слика, кориснички атрибути и други документи. На крај зачувајте ја мапата.

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Слика 12: Цртање на полигон

Ако нацртате два полигона кои се преклопуваат и сакате да избришете еден од нив тогаш ако ја активирате алатката за бришење и кликнете на ден од полигоните во делот во кој нема преклопување, ќе се појави дијалог прозорец кој ќе ве праша дали навистина сакате да го избришете полигонот. Ако потврдите, полигонот кој сте го селектирале се брише. Но ако ја активирате алатката за бришење и кликнете на местото каде полигоните се преклопуваат тогаш се појавува дијалог прозорец во кој можете да изберете кој полигон сакате да го избришете.



Слика 13: Бришење на полигон



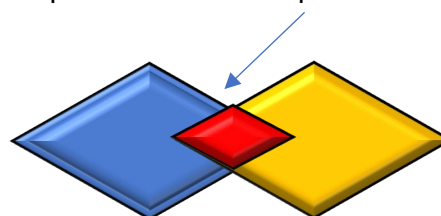
Унија, Пресек и Разлика се алатки за работа со два полигона.

Откако ќе изберете алатка, **кликнете во делот каде што се преклопуваат полигоните.**

Ќе се креира нов полигон од двата оригинални полигони.

Треба сами да ги отстраните оригиналните полигони.

Новосозданиот полигон е Пресек на оригиналните

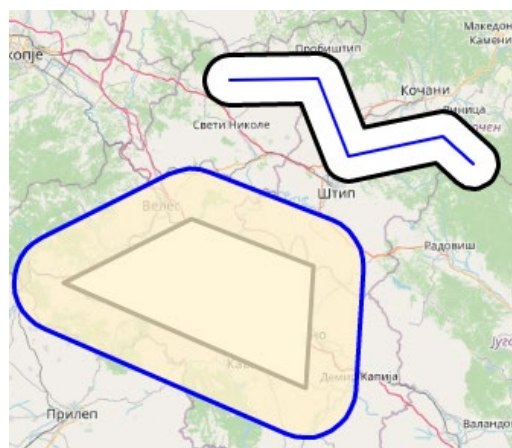


Оригинални полигони

Слика 14: Користење на алатките Унија, Пресек и Разлика



Главна цел за користење на алатката Копирај е превземање на карактеристика во некој друг слој. Ако се копира карактеристиката во истиот слој, новата карактеристика само ќе ја преклопи постоечката на оригиналната мапа, што нема смисол.

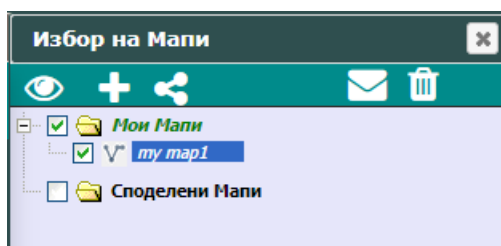


Баферот создава нов полигон околу оригиналната карактеристика.

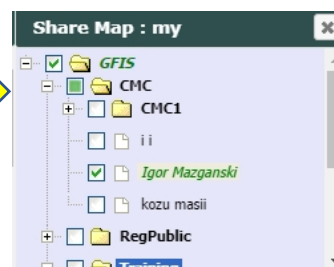
Слика 15: Користење на алатката Копирај и Бафер

Векторската мапа креирана во групата Моја Мапа можете да ја споделите со друг корисник на апликацијата.


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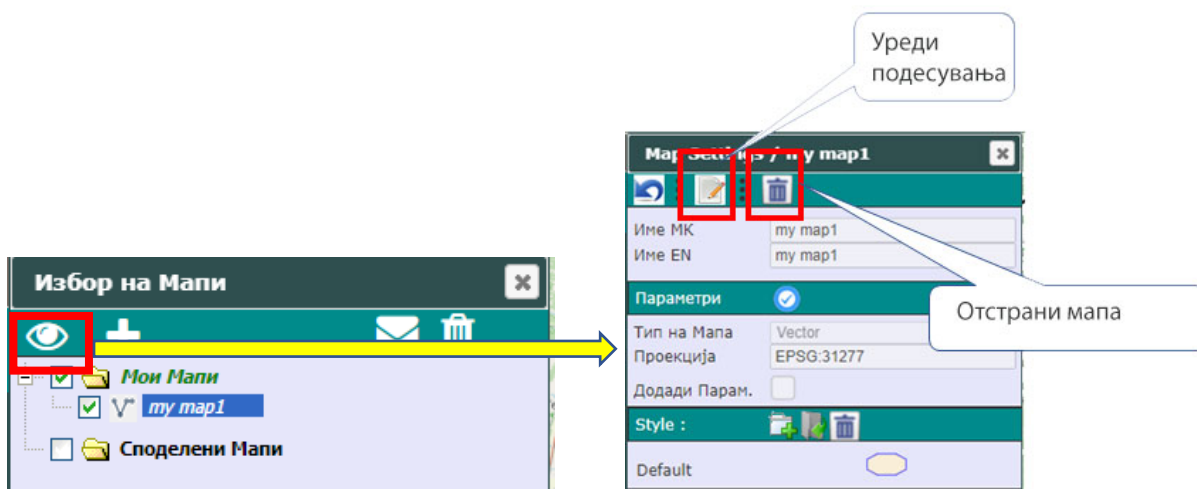


Слика 16: Споделување на Мапа



Селектирајте го корисникот со кој сакате да ја споделите мапата.

За да се видат подесувањата на одредена мапа, мапата треба да биде селектирана и алатката Прегледај Подесувања активирана .



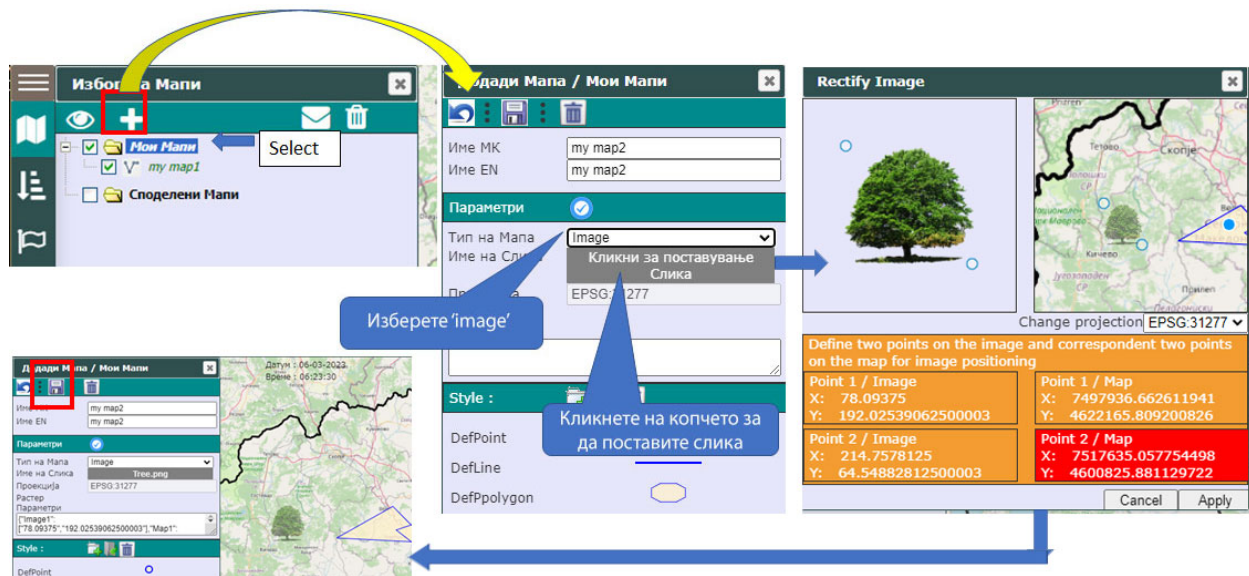
Слика 17: Преглед на подесувања

Постапката за поставување на слика на мапа во под – менито Мои Мапи е следната:

- Фолдерот Мои Мапи треба да е означен и селектиран
- Алатката Нова Група/Мапа треба да ја активирате
- Се отвора дијалог прозорец Додади Мапа / Мои Мапи во кој треба да внесете име на мапата, за Тип на Мапа да изберете 'image' и да кликнете на копчето Кликни за поставување на Слика
- Во прозорецот што се отвора означете две точки на сликата и соодветно две точки на мапата, на местото каде што сакате да се постави сликата

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- Кликнете 'Apply' за да се постави сликата на мапата
- Во прозорецот Додади Мапа / Мои Мапи кликнете на 'Save' за да ја зачувате сликата

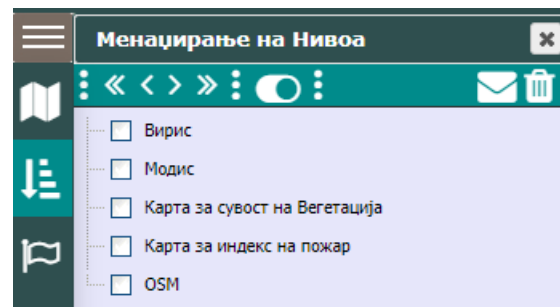


Слика 18: Поставување на слика на мапата


7.2. Менаџирање на нивоа

Со кликање на левото копче од глумчето врз иконата за менаџирање на нивоа, се отвара нов прозорец како што е прикажано на Слика 19.

Во овој прозорец на горната страна има лента со алатки, а под неа поле со приказ на сите во моментот вклучени мапи на мапата. Редоследот на оваа листа на мапи го претставува редоследот на нивоата на мапата, така што најгорните мапи се најгорни нивоа на мапата. Во ова мени можна е промена на редоследот на нивоата и тоа на два начина:





Слика 19: Менаџирање на нивоа

- Со користењето на алатките во лентата за алатки 
- Со одбирање на одредено ниво со глумчето и негово влечење на саканата позиција на истото во однос на другите нивоа

Со промената на редоследот на мапите во прозорецот се менува и редоследот на нивоата на мапата соодветно.

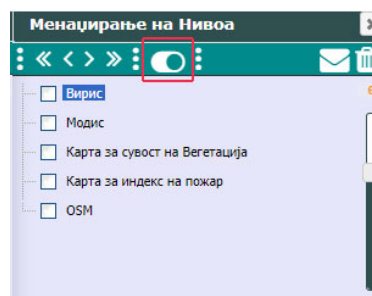
Алатките и нивните функционалности во овој прозорец се прикажани во Табела 5

Табела 5. Опис на алатките во менито за менаџирање на нивоа

Копче	Име	Објаснување
	Премести ја мапата на најгорно ниво	Ја преместува селектираната мапа на најгорно ниво на мапата
	Премести ја мапата едно ниво погоре	Ја преместува селектираната мапа за едно ниво погоре на мапата
	Премести ја мапата едно ниво подоле	Ја преместува селектираната мапа за едно ниво подоле на мапата
	Премести ја мапата на најдолно ниво	Ја преместува селектираната мапа на најдолно ниво на мапата
	Подеси транспарентност на мапа	Подесување на транспарентност на селектираната мапа
	Зачувај моментален преглед на мапи	Зачувување на приказ на сите моментално вклучени нивоа, нивен редослед и транспарентност
	Врати предефиниран преглед на мапи	Се брише снимениот приказ на мапи од корисникот и се враќа предефинираниот приказ

7.2.1. Подесување на транспарентност на мапа

Со селектирање на одредена мапа во прозорецот за менаџирање на нивоа и со кликање на копчето за подесување на транспарентност, се отвара нов прозорец со лизгач за подесување на транспарентноста како на Слика 20. Со поместување на лизгачот со глумчето горе долу, се менува и транспарентноста на селектираната мапа на мапата. Над самиот лизгач се наоѓа скала која ја покажува моменталната транспарентност на мапата изразена во проценти.

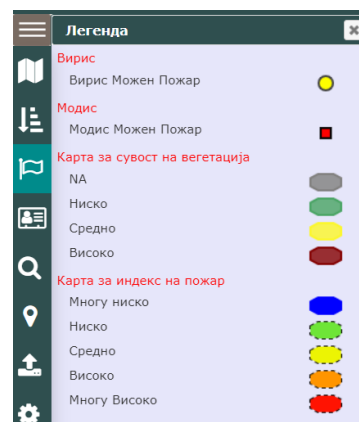


Слика 20: Подесување на транспарентност

7.3. Легенда

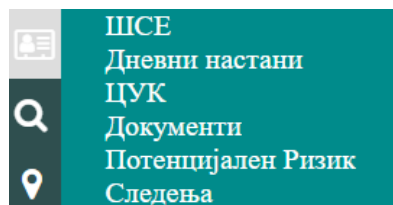
Со кликање на левото копче од глуфчето врз иконата за легенда, се отвара нов прозорец со легенда за секоја активна мапа на мапата за која истата е дефинирана како што е прикажано на Слика 21.

Дефинирањето на легендата на секоја мапа се врши од страна на администраторот на апликацијата, сем за мапите генерирани од специјални функции за кои легендата се креира од страна на самата функција.



Слика 21: Легенда

7.4. Специјални Функции



Под-менито Спец. функции е прикажано на Слика 22. Во ова под-мени се вклучени Шумско стопанските единици (ШСЕ), Дневни настани, ЦУК (Објекти/ресурси), Документи, Потенцијален ризик и Следења.

Слика 22: Под – мени Специјални функции

7.4.1. ШСЕ – Шумско Стопански Единици

Со избор на оваа функција се отвара нов прозорец со приказ на дрво со листа на сите управни единици и оддели. За секој оддел дефинирани се следниве мапи: Граница, Оддели, Пододели, Планиран пат и Постоечки пат. Слика 23.


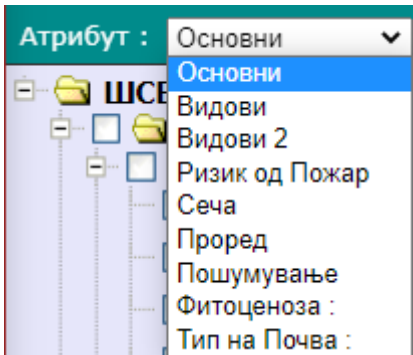
Вклучувањето и исклучувањето на одредена мапа се прави со кликање на квадратчето за избор.

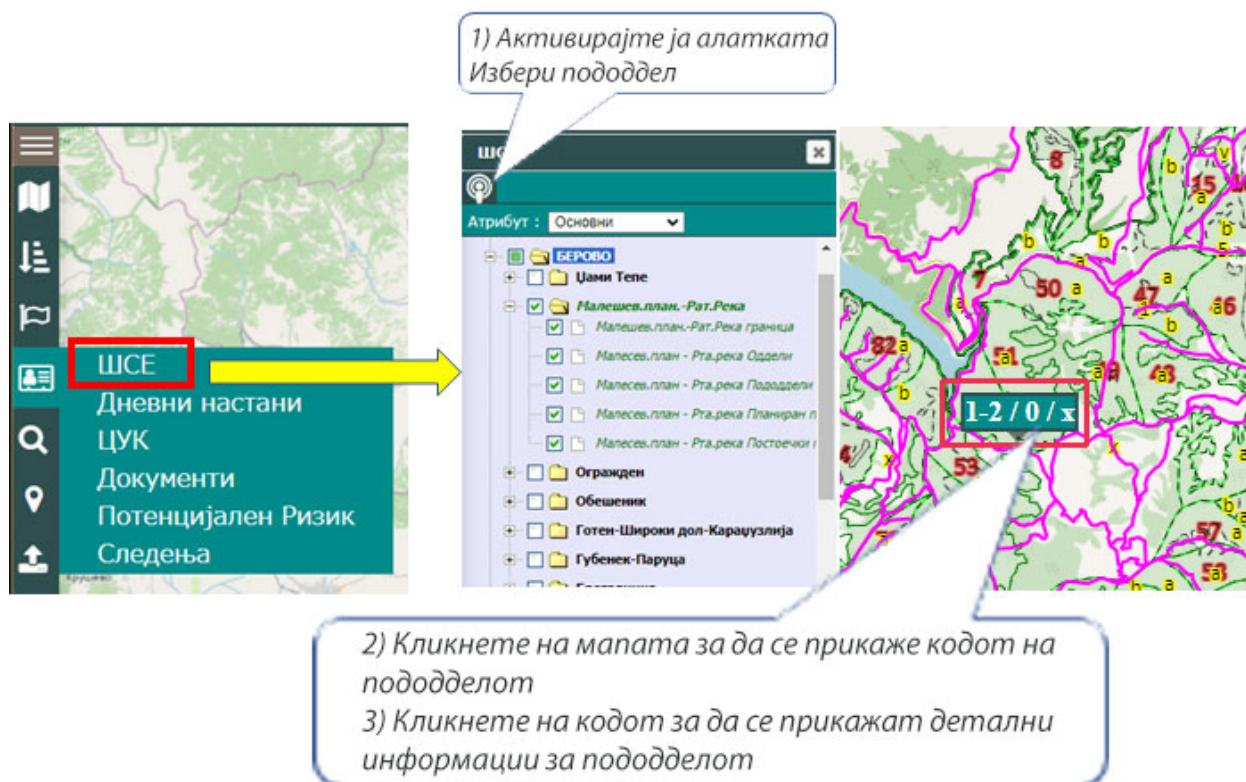
Носител за сите детални податоци за насади е мапата на Пододдели.

Во лентата за алатки можни се следните функционалности:

МКФФИС АДМИНИСТРАЦИЈА

Табела 6. Опис на алатките во менито за ШСЕ

Копче	Име	Објаснување
	Избери пододдел	Преглед на податоци за избран пододдел на мапа.
	Боене атрибут по	Боене на мапа по атрибут



Слика 23: Под – мени ШСЕ

Се отвора прозор Спецификација на Поддодел.

4) Друга врска до деталната спецификација на видовите е во оваа картичка.

5) Кликнете двапати на запис за вид

ББ / бел бор		
Состав	Бонитет	Прираст (м3)
0.6000	III	2.6000
Класа по Дебелина	Бр.Дрва	Др.Маса (м3)
II	2	0.0000
III	29	12.0000
IV	38	41.0000
V	42	58.0000
VI	8	18.0000
VII	1	4.0000
VIII	0	0.0000

Дрво	Бонитет	Состав	Бр.Дрва	Др.Маса	Прираст
ББ	III	0.8000	482	264	5.1000
БК	III	0.2000	233	58	2.1000
Вкупно на хектар			715	322	7.2

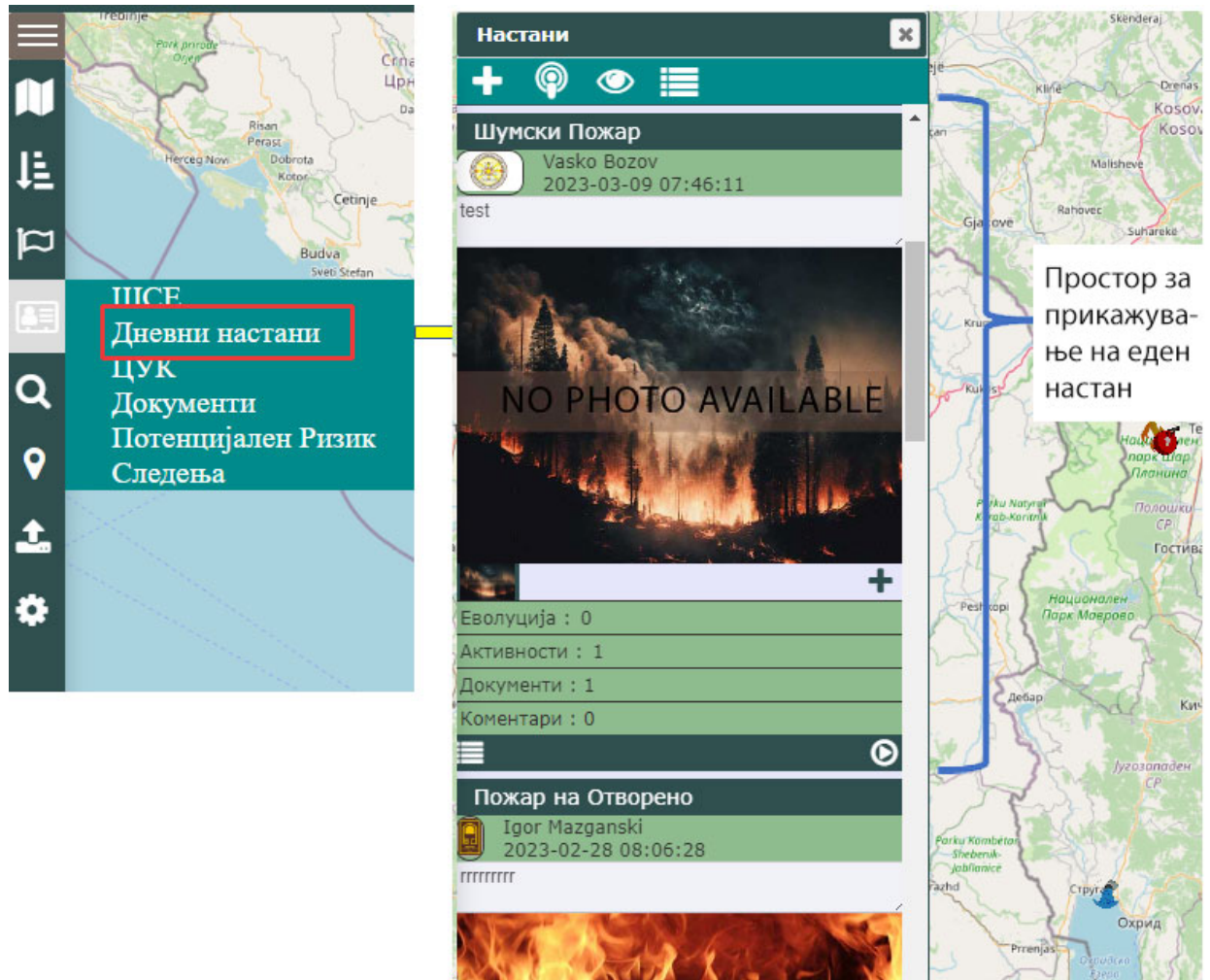
Слика 24: Спецификација на поддодел

7.4.2. Дневни настани

Специјална функција: Дневните настани обезбедува флексибилен кориснички интерфејс со кој корисникот може брзо да креира извештај за катастрофи и лесно да управува со еволуцијата и активностите по временски редослед.

Кога ќе се пристапи на под-менито Настани се отвора прозорецот со листа на настани подредени според времето на случување. За секој настан е обезбедено поле во кое се прикажани следните податоци за настанот:


- Категорија во која спаѓа настанот, на пр. Шумски Пожар, Пожар на Отворено, Поплави од Езера, Електрична енергија Најавен итн.
- Кој го поставил настанот и време кога е поставен настанот
- Слика или повеќе слики од настанот. До колку нема слика од настанот се поставува слика доделена на категоријата на настанот кој се објавува
- Еволуција на настанот која вклучува: име на корисникот, време на вклучување, поставување на слика и текст за развој на настанот
- Активности кои се превземаат за санирање на појавата
- Поле Документи каде може корисникот да внесе, прегледа, отстрани документ или превземе документ.
- Коментар е простор оставен за вклучување на регистрираните корисници со коментари и слики за поефикасно решавање на настанатата ситуација.
- Поле со три копчиња: копче за затворање на настанот, копче за преглед на настаните во листа и печатење на листата и копче за автоматски континуиран преглед на сите случувања во настанот со текот на времето.






Слика 25: Под-мени Дневни настани

Во лентата со мени следните функции се овозможени:

Табела 7. Опис на алатките во менито за дневни настани

Копче	Име	Објаснување
	Додади нов Настан	Додавање и дефинирање на нов настан

МКФФИС АДМИНИСТРАЦИЈА

	Означи настан на мапа	Со избирање на оваа функција се овозможува избор на одреден настан на мапа, при што истиот се означува со црвен круг а листата на настани се наведува до избраниот настан.
	Пребарување на настан	Пребарување според временски период, тип и под тип на настан.
	Прикажи дрво на настани	Преглед на дрвото на тип на настани во кое одредени типови можат да се вклучуваат и исклучуваат од прегледот на настани

Управувањето со Дневни Настани може да се направи на два начина: традиционално управување (стар МКФФИС) и ново управување со настаните (МКФФИС v3.5). И двата начини се достапни.

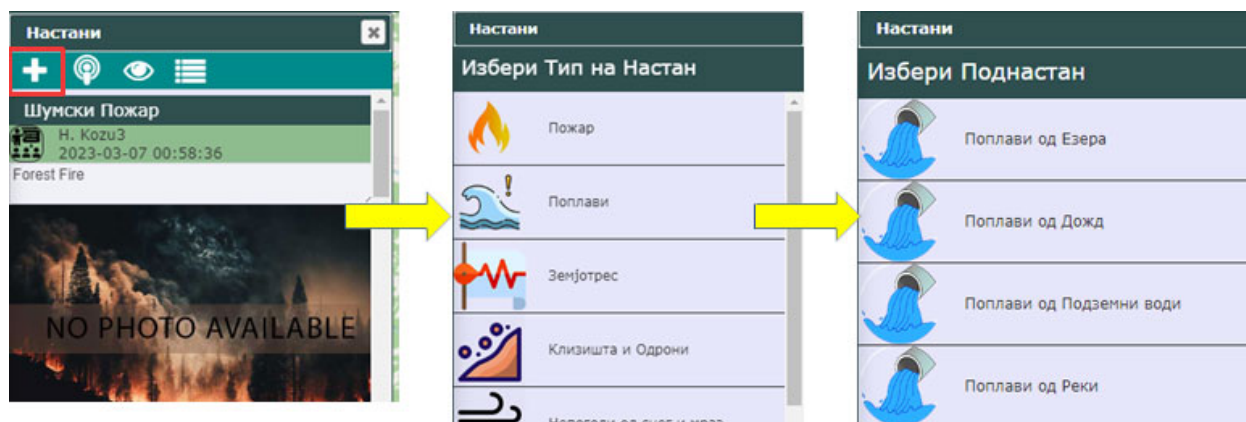
- Традиционално управување со настан (сè уште е достапно)
 - Ориентирано на точка каде се појавил настанот
 - Прво мора да се наведе точката на случување на настанот
 - Но, точката на појавата не секогаш е јасна за настани со широк опсег. (Ковид инфекција, земјотрес итн.)
 - Локалитет
 - Со еден настан со широк опсег управува одговорна организација во секоја област, така што секоја одговорна организација креира извештај за настанот поединечно.
 - Тешко е да се управува соработка на повеќе организации.
- Ново управување со настани (МКФФИС v3.5)
 - Ориентирано кон настанот
 - Прво, мора да наведете тип на настан.
 - Не е задолжително да се наведе точка на појавата за да се започне со управување со настанот.
 - Глобалност
 - Еден настан може да биде споделен и управуван од повеќе одговорни организации.
 - Управувањето со настани со широк опсег стана полесно.

Постапката за додавање на нов настан по традиционален начин на управување со настани е следната:

- Кликнете на иконата 'Објави Нов Настан' Слика 26
- Се отвора прозорецот 'Избери тип на настан' во кој треба да се селектира типот на настанот што сакате да го додадете.

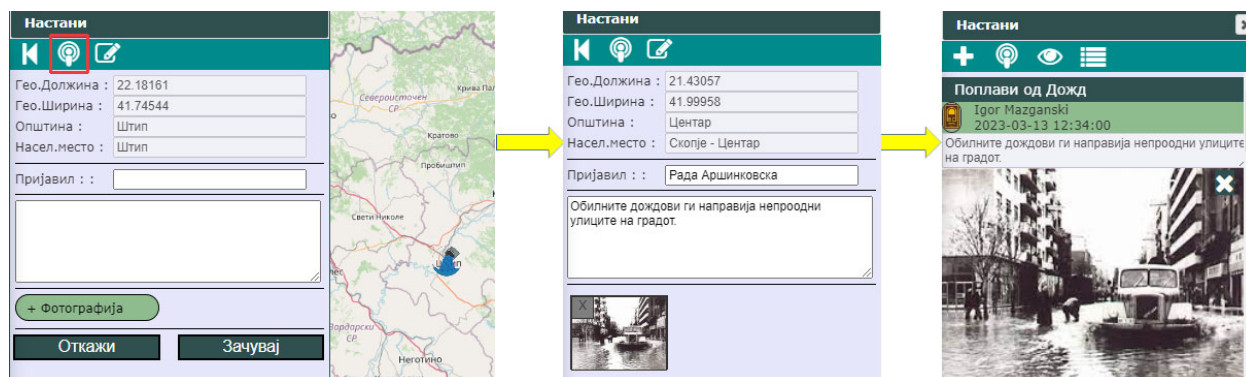
МКFFIS АДМИНИСТРАЦИЈА

- Кога ќе изберете тип на настан ќе се отвори нов прозорец 'Избери Поднастан'. Селектирајте поднастан за настанот што сакате да го додадете.



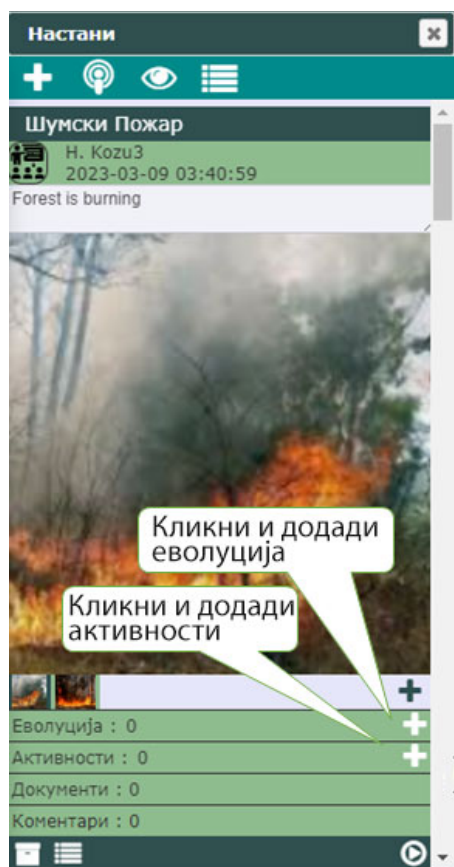
Слика 26: Избор на тип на настан и поднастан

- Во прозорецот Настани кликнете на иконата 'Означи Местоположба на Мапа' и кликнете на мапата на локацијата на настанот. Во овој прозорец автоматски ќе се запишат податоците за Гео. Ширина, Гео. Должина, Општина и Населено место. Слика 27
- Внесете податоци за лицето кое го пријавило настанот и опис на настанот.
- Ако располагате со слика кликнете на копчето Фотографија и внесете слика за настанот. Доколку немате на располагање слика од настанот тогаш прескочете го овој чекор. Соодветна слика ќе биде прикачена од самата апликација.
- Кликнете на копчето зачувај за да го додадете настанот.

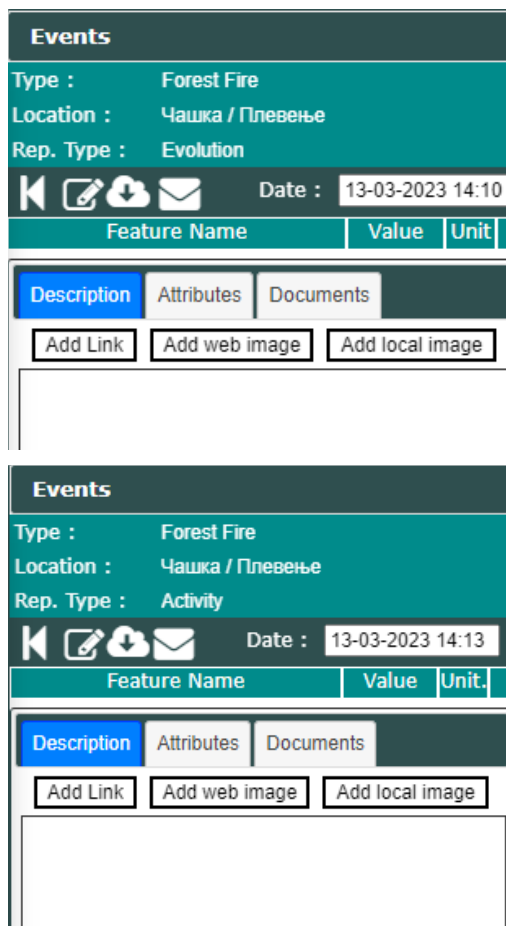


Слика 27: Внесување на податоци и слика за настанот

За секој настан може да се додадат информации за еволуција и активности при управување со настан. Слика 28 За додавање на овие информации се користи ист кориснички интерфејс. Слика 29





Слика 28: Додавање еволуција и активности





Слика 29: Информации за настан

Во горниот дел за внесување на еволуција и активности сместени се податоци за типот на настанот, локација на настанот, типот на податоците: еволуција или активности и алатки за внесување на податоци.

Табела 8. Опис на алатките во менио за еволуција и активности

Копче	Име	Објаснување
	Назад	Го враќа претходниот екран
	Уреди / Edit	Ако на корисникот му е дозволено да уредува и менува податоци за тој Дневен настан ова копче ќе биде овозможено.

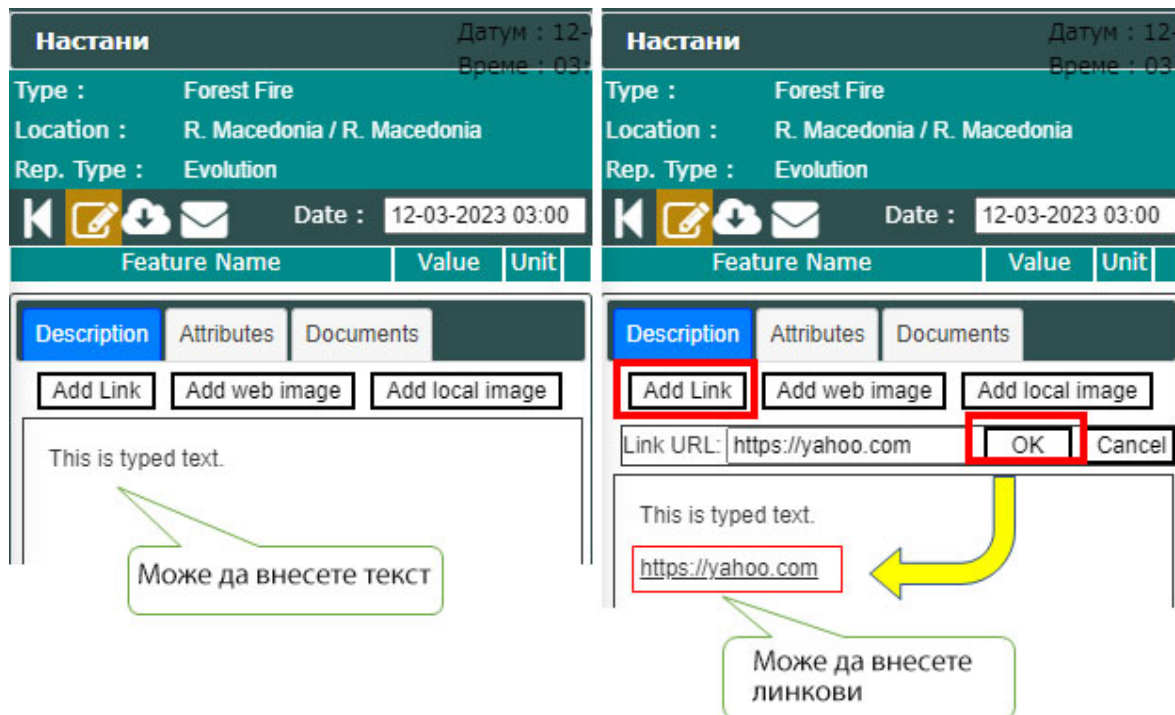
МКФФИС АДМИНИСТРАЦИЈА

	Импорт вектор	Алатката овозможува корисникот да превземе некој вектор и да го уреди
	Зачувај	Ако корисникот ги уредувал и сменил податоците во Дневниот настан ова копче ќе биде овозможено за зачувување на промените.

Долниот дел од прозорецот е поделен во повеќе табови и во секое од нив се наоѓаат различни податоци за настанот. Расположиви се следните табови:

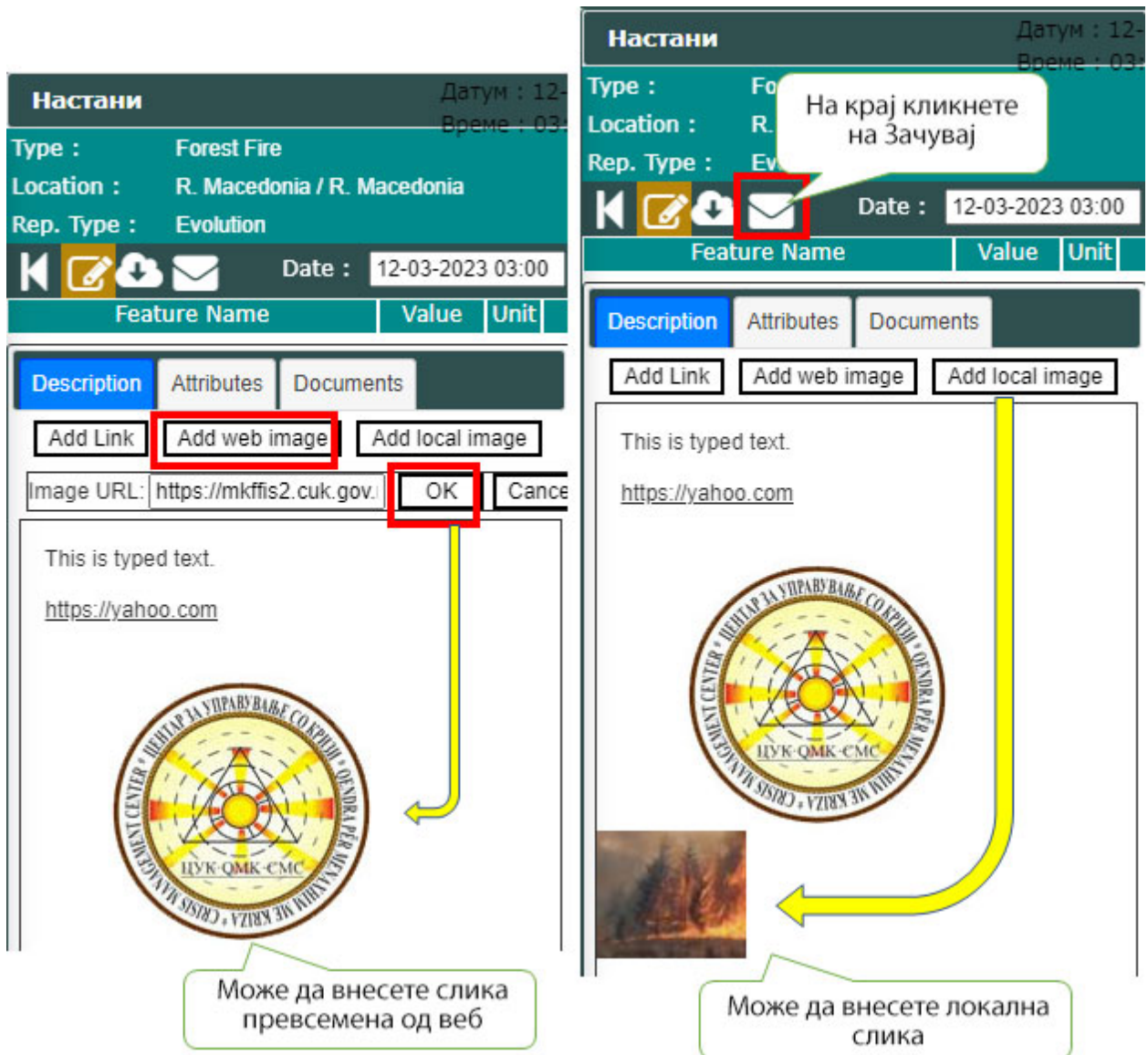
- **Опис** - Општ опис за дефинираниот Настан
- **Атрибути** - Атрибути за дефинираниот настан односно кој го пријавил настанот, поврзаност со друг настан и Причина за појава на настанот.
- **Документи** – Листа на документи поврзани со дадениот дневен настан.

Во табот Опис / Description корисникот може да внесува текст или линкови до одредени страници на интернет. Слика 30



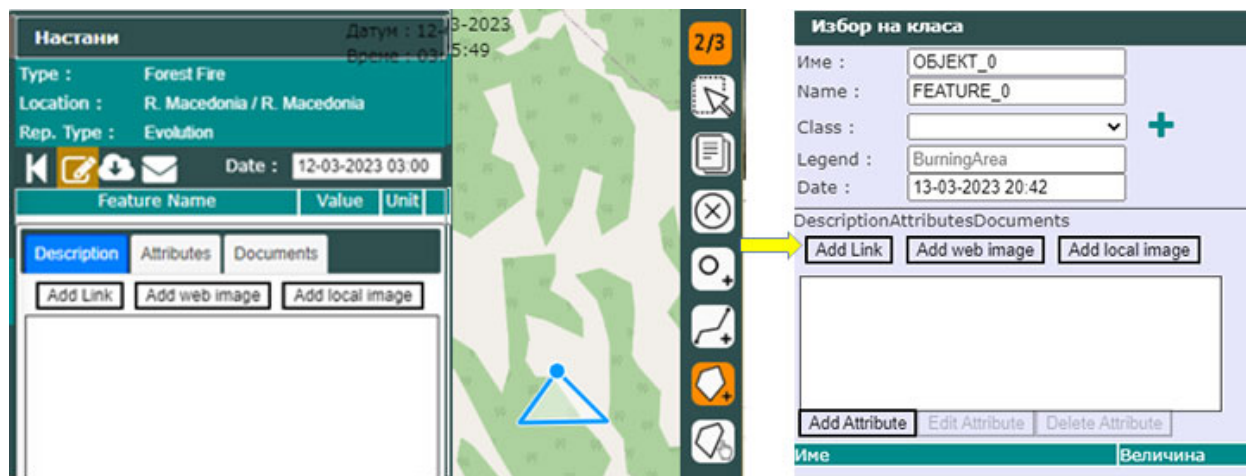
Слика 30: Таб Опис во Еволуција / Активности

Исто така во табот Опис / Description корисникот може да внесува слика од веб страна и слика од локален диск. Слика 31



Слика 31: Таб Опис во Еволуција / Активности

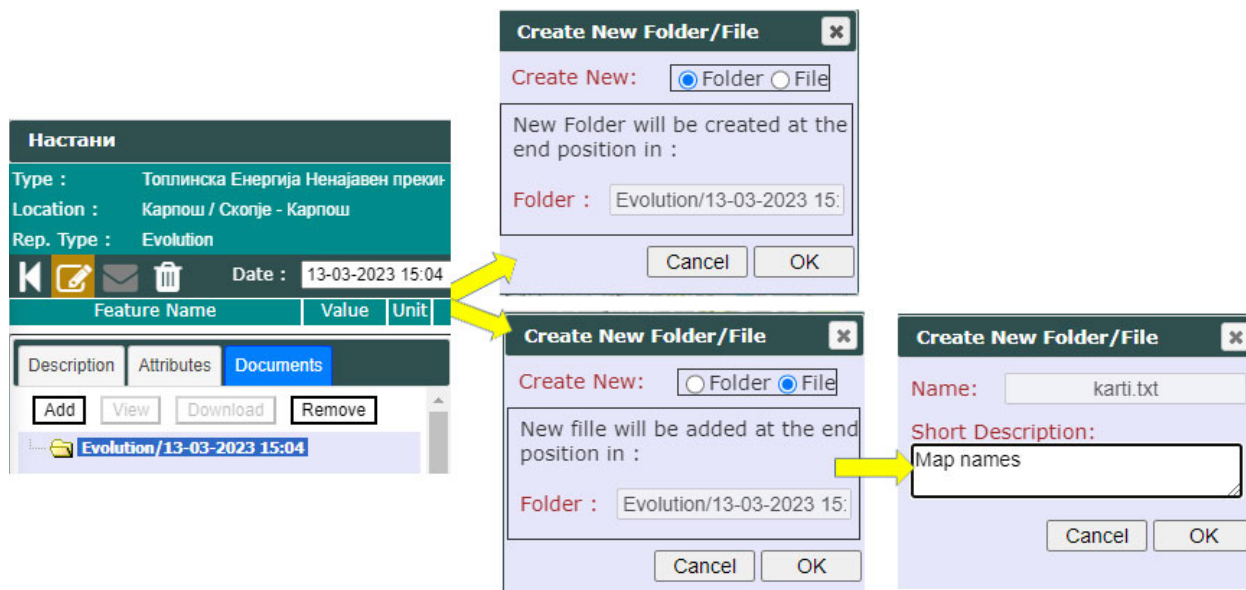
Во дијалог прозорецот за Еволуција или Активности алатките за цртање се овозможени така да корисникот може да црта мапа на ист начин како што е објаснето во под-менито Мои Мапи. Корисникот прво треба да ја нацрта мапата, а потоа да внесе атрибути во дијалог прозорецот што се отвора кога ќе се затвори полигонот со двоен клик или ако претходно е нацтан полигонот тогаш дијалог прозорецот се отвора со селектирање на полигонот. Слика 32



Слика 32: Цртање мапа за некој настан

Во табот Документи корисниците можат да прикачат за одреден настан папки за организација и датотеки од следниве типови: xls, xlsx, dos, docx, pdf, png, jpg, gif, kml и geotiff.

За додавање папка или документ, корисникот треба да ја избере матичната папка каде што сака да ја постави новата папката или документ и да кликне додади. Ќе се појави нов прозорец. Во овој прозорец, корисникот треба да избере дали сака да создаде нова папка или нов документ како на сликата 33.




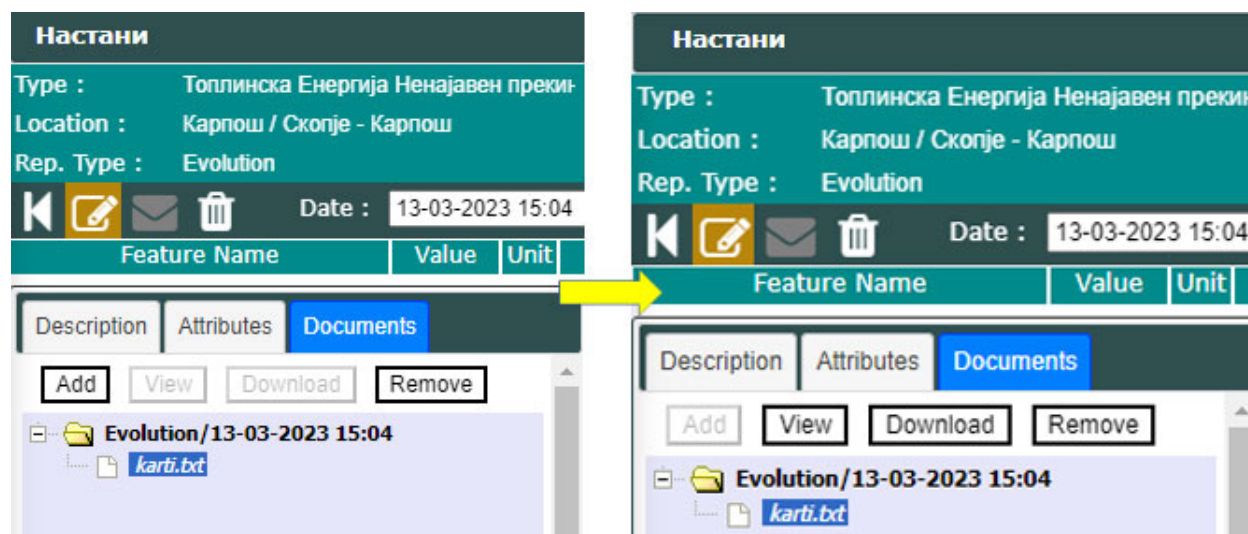
Слика 33: Нова папка / документ

Со кликање на копчето ОК, скокачкиот прозорец се затвора и ако е избрана опцијата за нова папка, се појавува нов прозорец за внесување на име и опис на папката. Ако е избрано креирање документ, се појавува прозорец од кој треба да се избере документ од локалниот диск. После изборот на документ се отвора прозорец во кој е внесено името на избраниот документ, а треба да се внесе опис како на сликата 33.



Сите документи кои се додадени за одреден настан се организирани во дрво на документи заради лесна пристапност.

Доколку одреден документ е селектиран од дрвото, во горниот дел достапни се следните опции: (Слика 34)

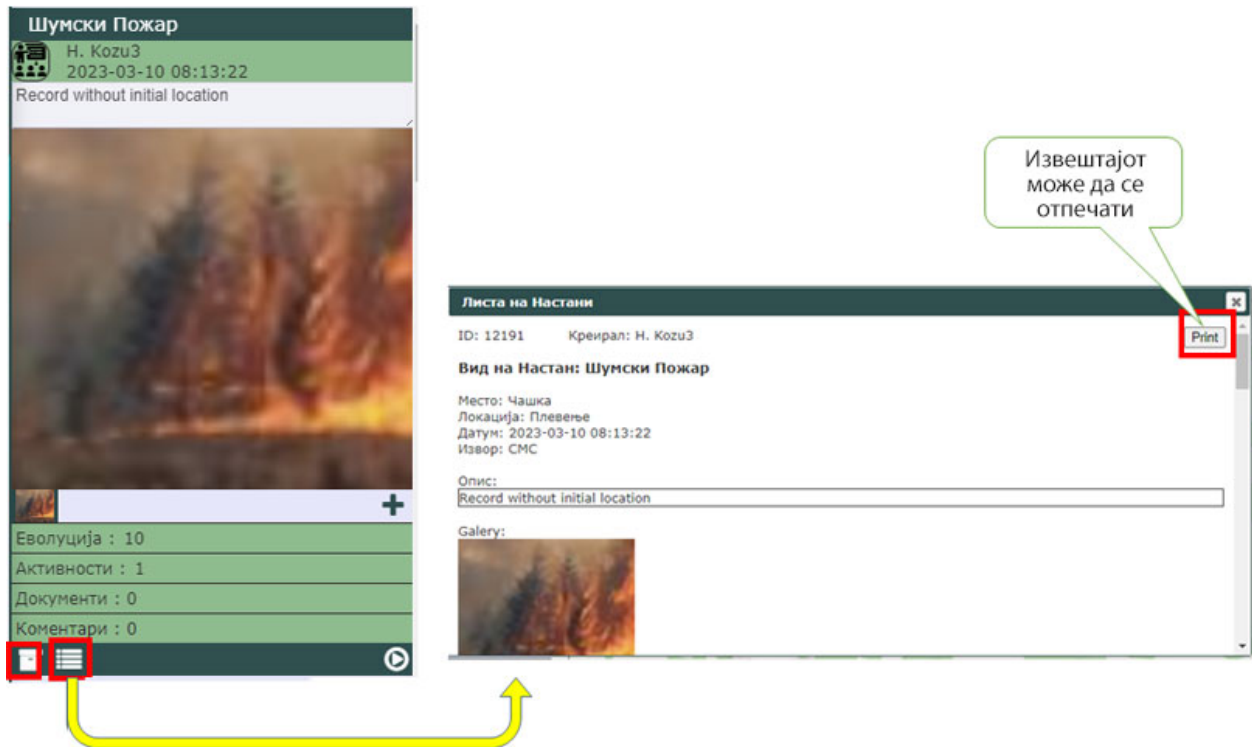
- Преглед – Прегледување на документот. Доколку тој е од типот xls,xlsx, dos, docx, pdf, png, jpg, gif, се отвора нов прозорец во кој се прикажува документот, додека ако типот на документот е kml или geotiff истиот се исцртува на мапата. Во случај на преглед на документ kml или geotiff, во горниот десен агол на мапата се појавува копчето  кое може да се исклучи приказот на документот. Приказот може да се исклучи и со копчето Escape од тастатурата.
- Превзemi – Документот се превзема на локалниот компјутер
- Одстрани - Бришење на документот
- Уреди – Ова копче се јавува само во случај да е избран geotiff документ и служи за дефинирање на бои и легенда на отворениот документ.



Слика 34: Прикачување на документ и достапни опции кога документот е селектиран.

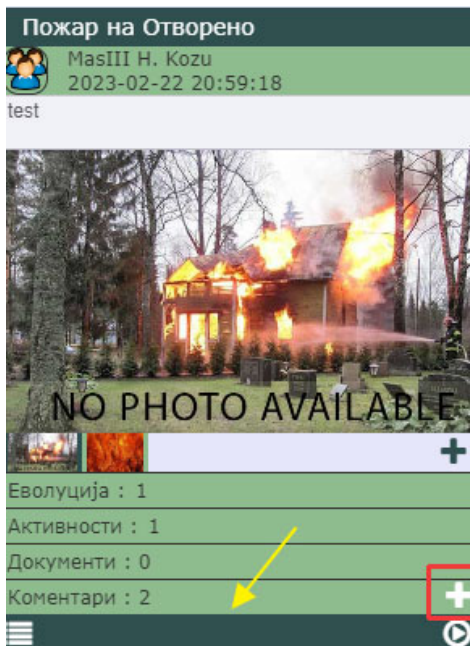
Супер Администраторот може да затвори било кој настан. Само Администраторот кој го креирал настанот може да го затвори истиот. Копчето за затворање на настан  се наоѓа во полето за прикажување на настанот, во прозорецот Настани. (Слика 35) Во истиот прозорец е сместено и копчето за прикажување на извештај за конкретниот настан .

МКФФИС АДМИНИСТРАЦИЈА



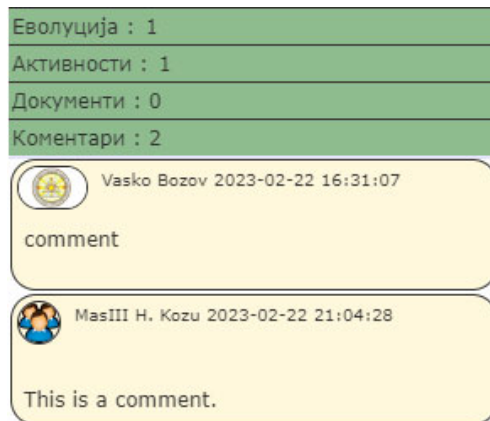
Слика 35: Копче за затворање на настан и приказ на извештај

Во прозорецот Настан има можност регистрираните корисници да внесуваат коментари.



Слика 36: Поле за отворање на поставени коментари

Со кликање на полето Коментари (Слика 36) се отвора приказ на веќе поставените коментари (Слика 37). Со кликање на знакот плус (+) се отвора поле во кое може да се внесе нов коментар за настанот и слика од настанот (Слика 38).



Слика 37: Приказ на поставените коментари

МКФФИС АДМИНИСТРАЦИЈА



Ако имате слика кликнете на копчето Додади Слика. Ќе се отвори дијалог во кој можете да селектирате слика. Потоа внесете коментар и кога ќе завршите кликнете на Enter за да се додаде коментарот.

Слика 38: Приказ за поставување на коментар

Користење на алатката Филтер за пребарување на настани и алатката Лист за преглед на настаните: (Слика 39)

Филтер според периодот во кој Настаните се активни

Филтер според типот на настанот и поднастанот



ID	Kreiral	Vid na Nastan	Mesto	Lokacija	Datum	Izvor	Opis
12183	MasIII H. Kozu	Пожар на Отворено	Прилеп	Дуге	2023-03-14 00:18:57	test	test
12181	Vasko Bozov	Шумски Пожар	Радовиш	Сулдурици	2023-03-13 21:57:00	test	test test ova e test za da se vidi dolg text . Test 1 test 2 test 3 test 4.
12191	H. Kozu3	Шумски Пожар	Чашка	Плевање	2023-03-13 14:46:00	СМС	Record without initial location
12190	Vasko Bozov	Шумски Пожар	Македонски Брод	Сушица	2023-03-09 14:19:00	test	test
12185	Igor Mazganski	Пожар на Отворено	Боговиње	Јеловјане	2023-03-07 00:35:00	r	rrrrrrrr
12186	Igor Mazganski	Шумски Пожар	Тетово	Вешала	2023-02-28 08:16:00	test	test

Слика 39: Приказ за пребарување на настан и приказ на листа на настани

7.4.3. СУК – Ресурси



Специјална функција: ЦУК е за прикажување на различни објекти во земјата што може да се однесуваат на активности за спречување катастрофи или контрамерки при катастрофи. Активирањето на функцијата Ресурси отвара нов прозор со листа на објекти и ресурси организирани во структура на дрво, како на Слика 40. Ова дрво е организирано во папки во кои се сместени документи заради подобра прегледност. Пред секоја папка или документ поставено е поле за избор со чие селектирање или одселектирање се вклучуваат или исклучуваат позициите на мапата на даден објект или ресурс. Доколку се селектира одредена папка, на мапата се прикажуваат позициите на сите документи во таа папка. При селекција на одреден документ, било од дрвото на објекти, било од дрвото на ресурси, како поддокументи се појавува листа на сите објекти кои се исцртани на мапата. Иконите со кои се претставени објектите на мапата зависат од видот на објектот и истите се дадени и во дрвото на ресурси. Со селекција на одреден поддокумент, соодветниот објект на мапата се означува со црвен круг околу иконата. Со двоен клик на одреден поддокумент за исцртаниот ресурс, се прикажува прозорецот со детали (атрибути) за истиот.

Табела 9. Опис на алатките во менито за ресурси

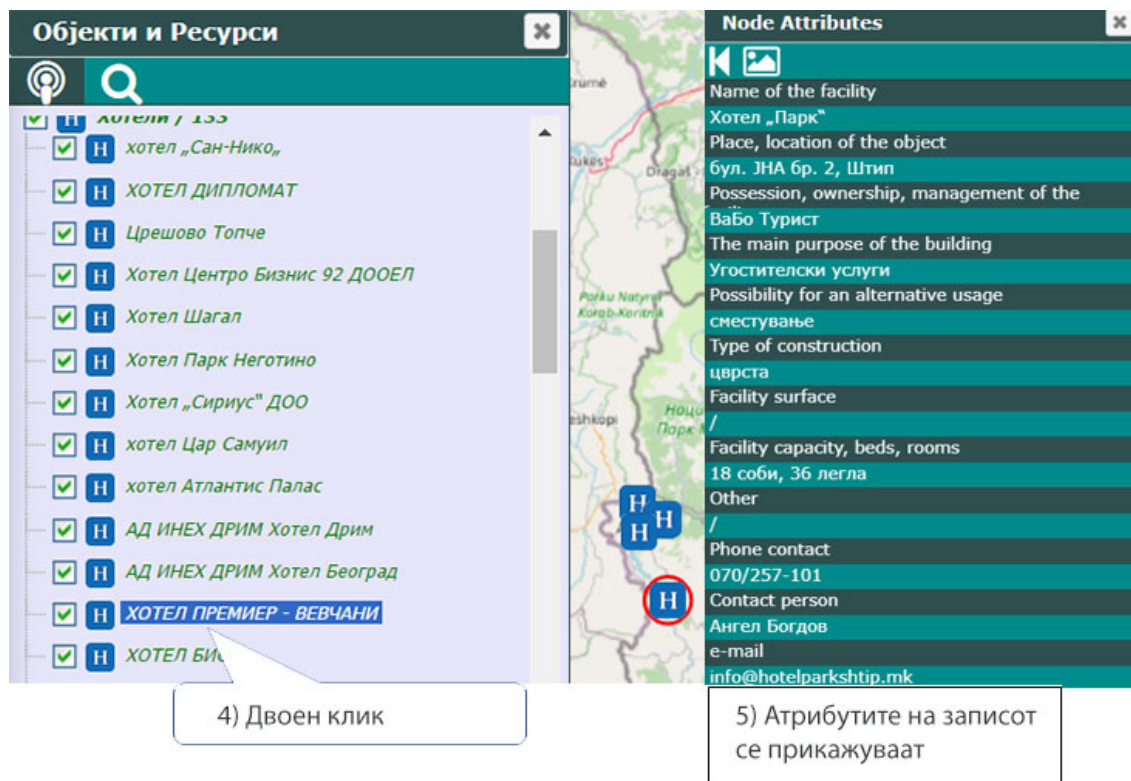
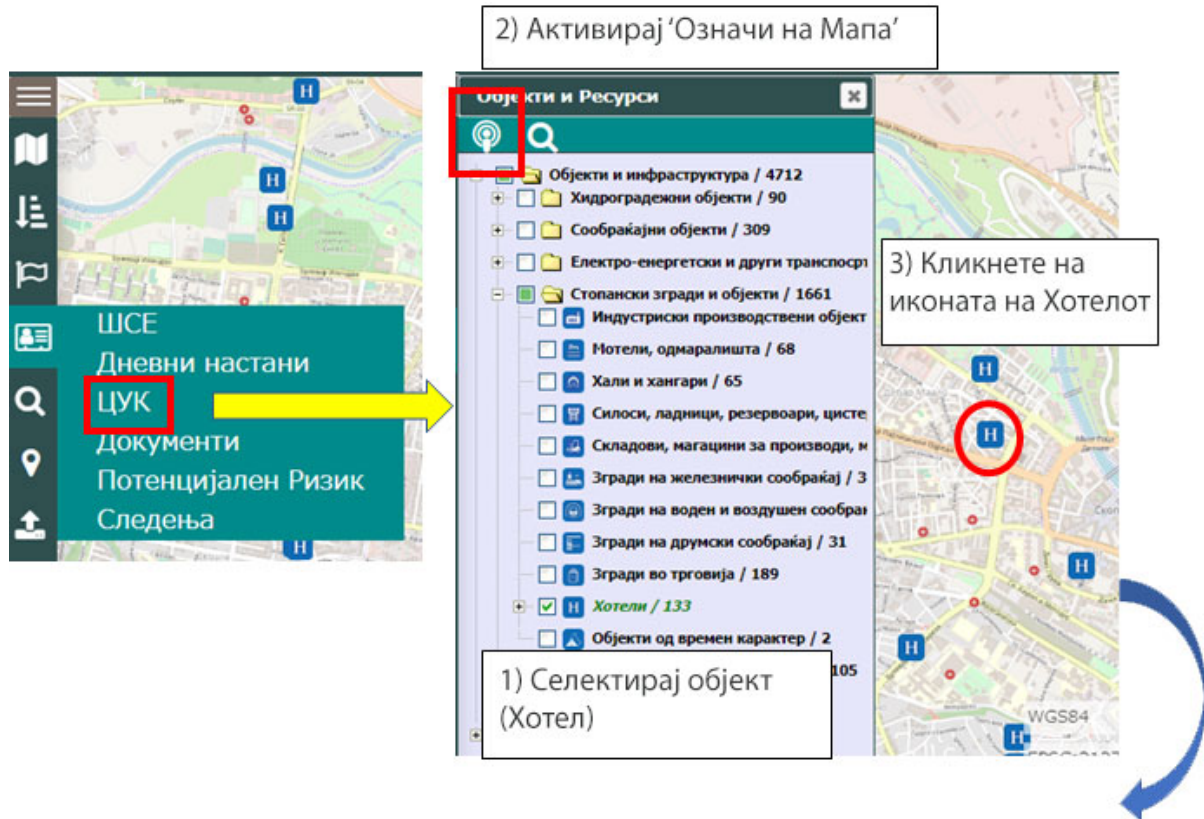
Копче	Име	Објаснување
	Означи на мапа	Со активирање на оваа функција се овозможува избор на прикажан ресурс на мапата, при што истиот се означува и во дрвото за ресурси.
	Филтер по вектор	Со активирање на оваа функција се отвара нов прозорец во кој е овозможено цртање или избор на полигон од друго ниво по кој ќе се филтрираат прикажаните ресурси.

Во прозорецот за прикажување на детали за ресурс Node Attributs, има лента со две алатки. Описот на овие алатки е даден во Табела 10.

Табела 10. Опис на алатките во менито за детали за ресурс

Копче	Име	Објаснување
	Назад кон листа на Ресурси	Враќање кон приказот за листа на ресурси
	Прикажи слики	Приказ на слики за избраниот ресурс. Секоја слика е со поглед од различна страна на светот.

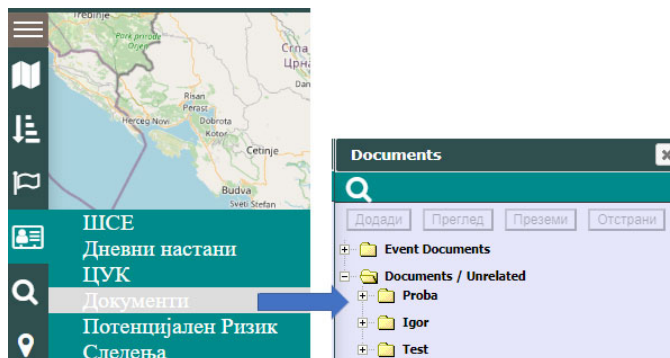
МКФФИС АДМИНИСТРАЦИЈА



Слика 40: Под-мени ЦУК

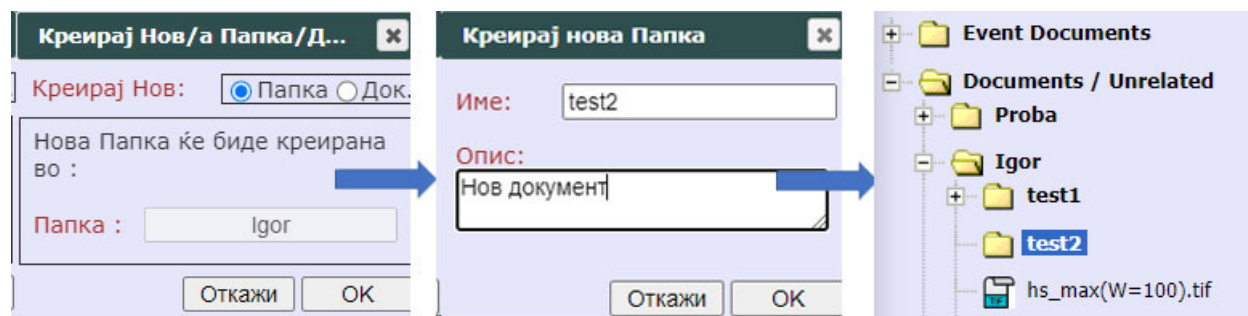
7.4.4. Документи

Специјална функција Документи е за споделување на секаков вид документ меѓу корисниците. Корисниците можат да додадат, прегледуваат и пребаруваат документ поврзан со некои карактеристики. Ако документот има соодветен прегледувач, документот ќе се прикажете, во спротивно може да се превземе. Кога ќе се отвори под – менито Документи се прикажува прозорец со лента на мени и дрво од датотеки организирани во фолдери. (Слика 41) Првиот јазол на врвот од дрвото е поврзан со извештаи за катастрофи и тој е достапен само за читање. Во вториот јазол е фолдер за споделување на документи. Администраторите на апликацијата имаат привилегија да додат, прегледаат превземат и избришат документи. За додавање субфолдер или документ, корисникот треба да избере матичен фолдер каде што сака да постави нова папка или документ и да кликне 'Додади'. Се отвора нов скокачки прозорец. Во овој прозорец, корисникот треба да избере дали сака да создаде нова папка или нов документ. Слика 42



Слика 41: Под – мени Документи

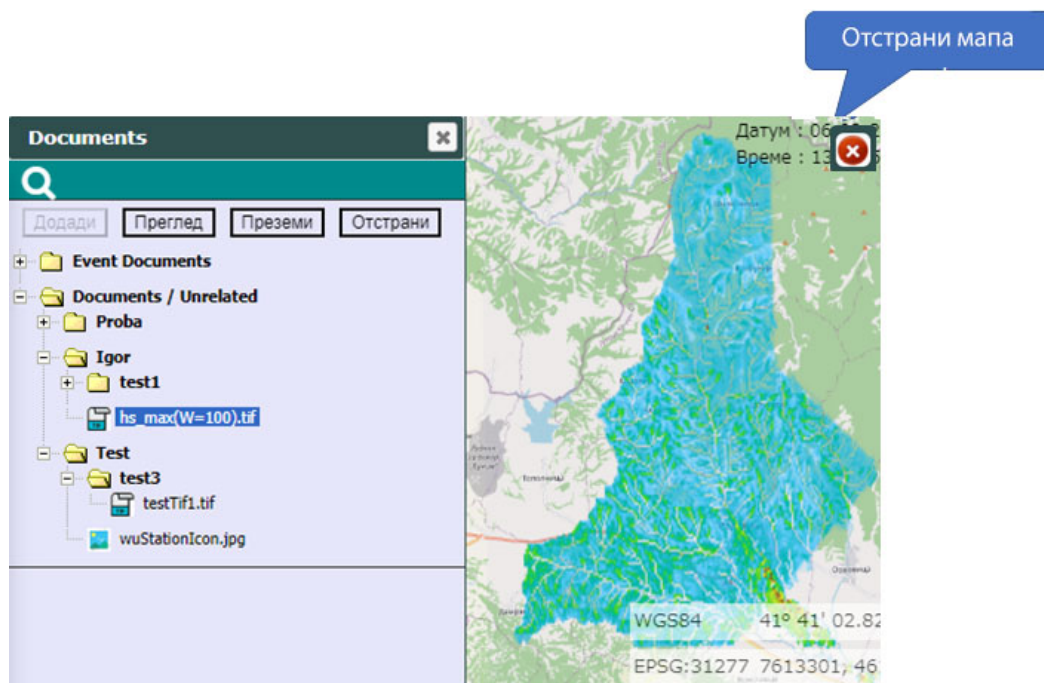
Првиот јазол на врвот од дрвото е поврзан со извештаи за катастрофи и тој е достапен само за читање. Во вториот јазол е фолдер за споделување на документи. Администраторите на апликацијата имаат привилегија да додат, прегледаат превземат и избришат документи. За додавање субфолдер или документ, корисникот треба да избере матичен фолдер каде што сака да постави нова папка или документ и да кликне 'Додади'. Се отвора нов скокачки прозорец. Во овој прозорец, корисникот треба да избере дали сака да создаде нова папка или нов документ. Слика 42



Слика 42: Додади нов фолдер или документ

Ако е избрано креирање на документ, се појавува прозорец за избор на документ од локален диск и по изборот на документот се појавува нов прозорецот за внесување на опис. Кога е избран некој документ во дрвото со документи, неколку опции се достапни, преглед, преземање и отстранување. Ако документот е од типот xls, xlsx, dos, docx, pdf, png, jpg, gif, со кликување на преглед, прегледот на документот ќе се појави на целиот екран. Ако документот е од типот kml или geotiff, на мапата ќе се креира нов слој и на мапата ќе бидат прикажани географски информации.

На слика 43 е даден приказ на GeoTiff документ на мапата.



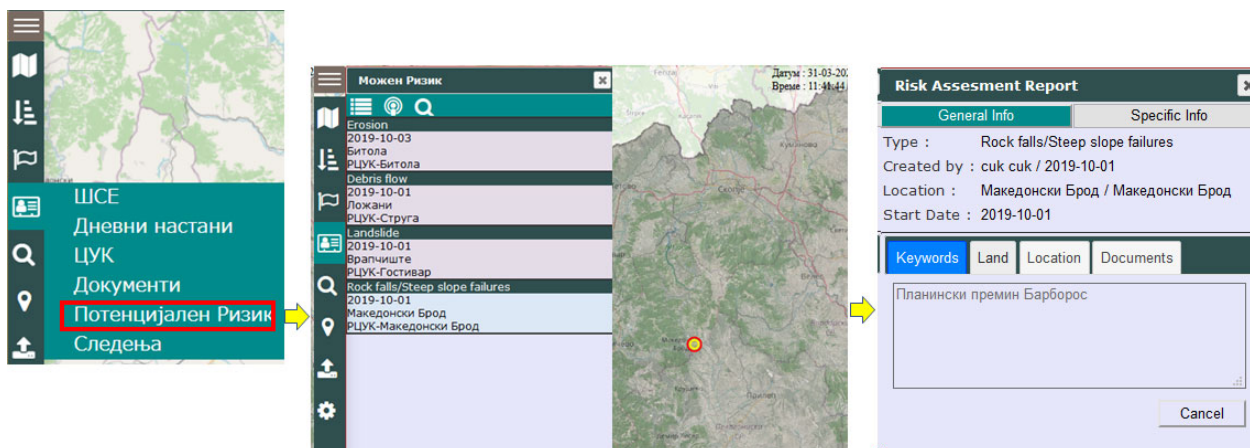
Слика 43: GeoTiff документ прикажан на мапа

7.4.5. Потенцијален ризик

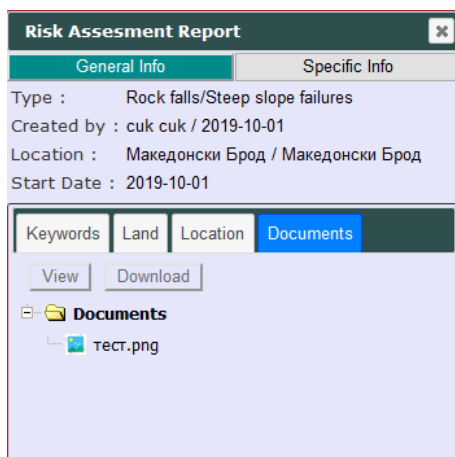
Во подменито „Потенцијален ризик“ корисниците можат да видат и пребаруваат евиденции за проценка на потенцијален ризик.

Кога ќе се отвори под - менито Потенцијален ризик се појавува прозорец со лента со мени и листа на потенцијалните ризици за тековната година со главни атрибути. За секој потенцијален ризик наведен во овој прозорец, соодветна точка е поврзана и прикажана на мапата. Со кликување на некој настан во листата, тој настан е избран и придружната точка е обележана со црвен круг, означувајќи го местото на таа катастрофа.

Со двојно кликување на селектираниот ризик, се појавува нов прозорец што ги прикажува General Info / Општите информации и Specific Info / Специфичните информации за тој ризик. Сите податоци се структурирани во табови што покажуваат клучни зборови, земја, локација и придружни документи со тој ризик. Слика 44



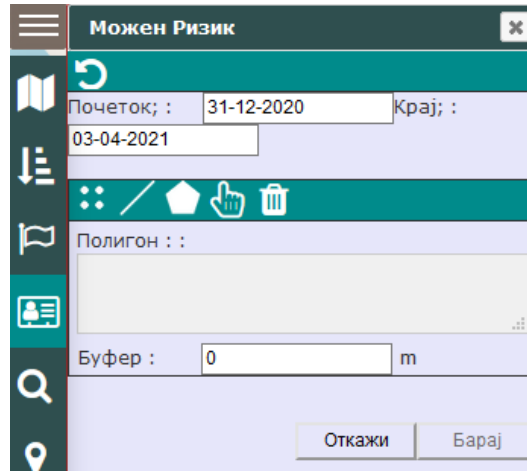
Слика 44: Потенцијален ризик – Општи и Специфични информации за ризикот



Слика 45: Документи придружени на ризикот

Во табот за документи, придружните документи се само излистани и не се организирани во фолдери. Бидејќи ова е само преглед. За избраниот документ се достапни само Опциите за преглед и преземање, слика 45. Со избирање документ и кликување на преглед, ќе се појави нов скокачки прозорец на цел екран што ќе ја прикаже содржина на документот. Со избирање на документот и кликување на преземи, ќе се преземе копија од документот.

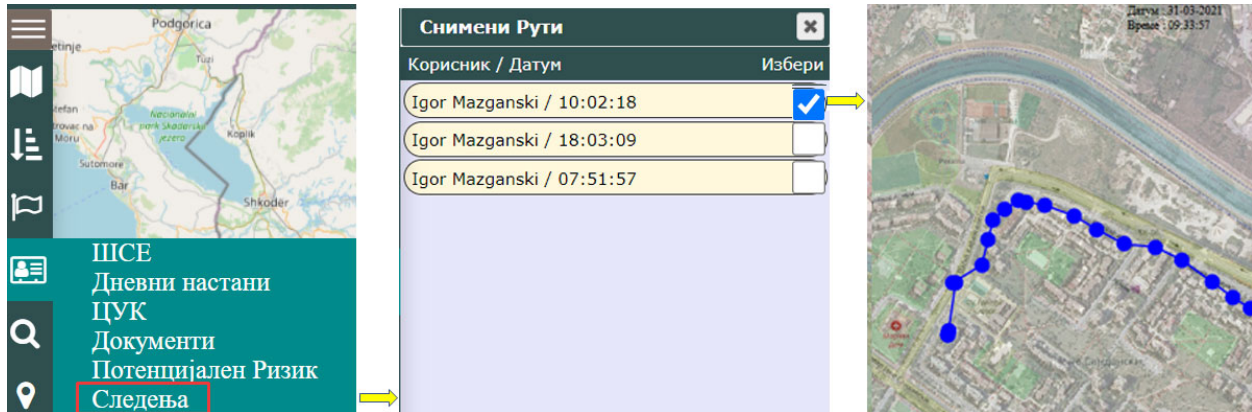
Во прозорецот Можен Ризик алатката за пребарување овозможува пребарување на потенцијалени ризици за одреден период и полигон. Слика 46



Слика 46: Пребарување на ризик

7.4.6. Следења

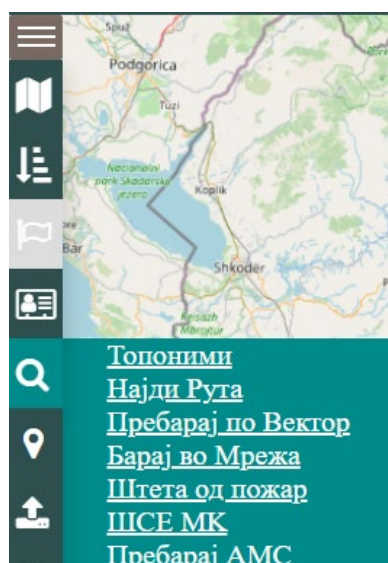
Со активирање на оваа функција се отвара нов прозор во кој се прикажани сите снимени рути и активни снимања. Овие рути се подредени така да најновите се наоѓаат најгоре. Секоја рута е опишана со името на корисникот и времето на почеток на снимање на рутата. Од десната страна на секоја рута има поле за избор со кое секоја од нив може да се вклучи или исклучи на мапата. Слика 47. Активните рути чие следење не е завршено се со црвена боја. При активно снимање, секоја промена на локација на корисникот веднаш е достапна на сите корисници на апликацијата.



Слика 47: Следење на рути

7.5. Пребарувања

Со избирање на полето Барај во менито се отвара ново подмени со повеќе функционалности како на Слика 48. На секоја од овие функционалности ќе се осврнеме поодделно.



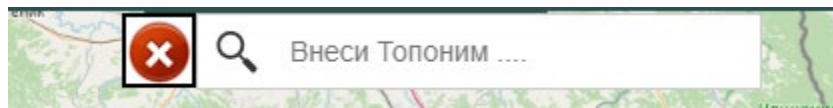
Слика 48: Под-мени Пребарување

Мени	Содржина
Топоними	Пребарување по име на локација како google map
Најди Рута	Пребарување по рута
Пребарај по вектор	Пребарување на векторски слој во полигон, точка или линија со бафер
Барај во Мрежа	Пребарување на Објект и Ресурси во Специјална Ф-ција на ЦУК во Мрежа за Итни Случаи
Штета од пожар	Пребарување и сумирање на штетата од пожар во полигон, линија и точка со бафер.
ШСЕ МК	Креирање на резиме на ШСЕ по тип на дрво или фитоценоза
Пребарај АМС	Преглед на набљудуваните вредности на АМС, сумирање на вредностите и цртање на графикон

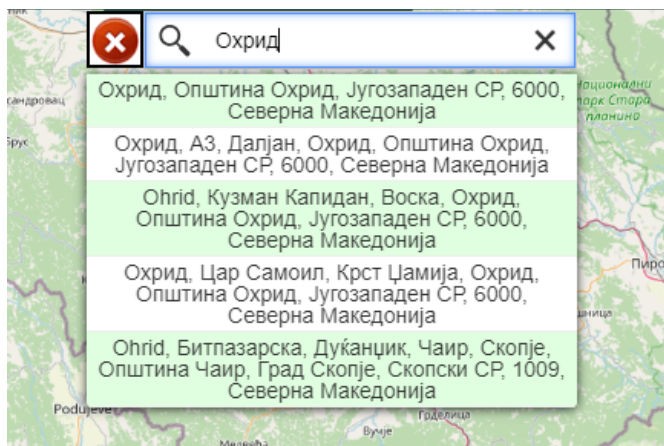
На секоја од овие функционалности ќе се осврнеме поодделно.

7.5.1. Топоними

Функционалноста Топоними служи за пребарување на мапата по одреден топоним кој го внесува корисникот. Со избирање на оваа функционалност, се отвара ново поле во горниот средишен дел на мапата како на слика 49.



Слика 49: Пребарување по топоними

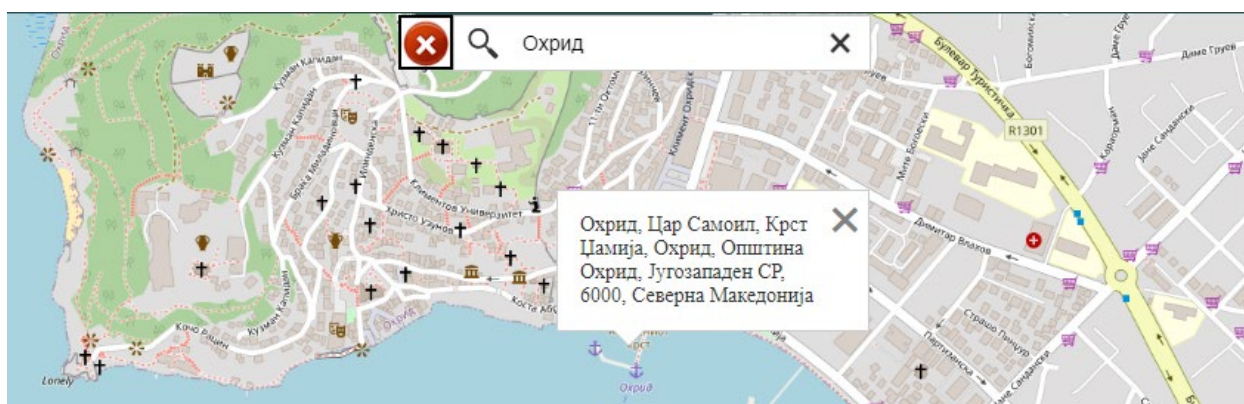


Слика 50: Пребарување по топоним внесен од корисникот

Со внесување на одреден збор во полето Внеси Топоним и притискање на Enter, под полето се појавува листа на пронајдени точки за впишаниот топоним, слика 50.

Со избор на еден од понудените пронајдени точки, мапата се зумира на пронајдената точка и се маркира точката со мало прозорче со опис на топонимот како на Слика 51.

Исклучувањето на оваа функционалност се врши на црвеното копче со знакот X.



Слика 51: Навигација на баран топоним

7.5.2. Најди рута

Со избор на оваа функционалност се појавува нов прозорец како на Слика 52 за пронаоѓање на рута на движење. Овој прозорец е составен од повеќе табови и тоа:

- Рута – Таб во кој се дефинираат параметрите и се бара рутата
- Насоки – Таб во кој описно се даваат насоки за движење по рутата
- Инфо – Таб со информации за должина на рутата и времетраење на патувањето
- Извези – Таб во кој рутата може да се извезе со цел префрлање во друга апликација или уред. Извозот е можен во еден од следните формати: .gpx и .wpt

Во табот за пронаоѓање на рута во горниот дел се наоѓаат опции за додавање на почетна точка, крајна точка и меѓуточки. Со зелениот маркер се означува почетокот на рутата а со црвениот маркер крајот на рутата.

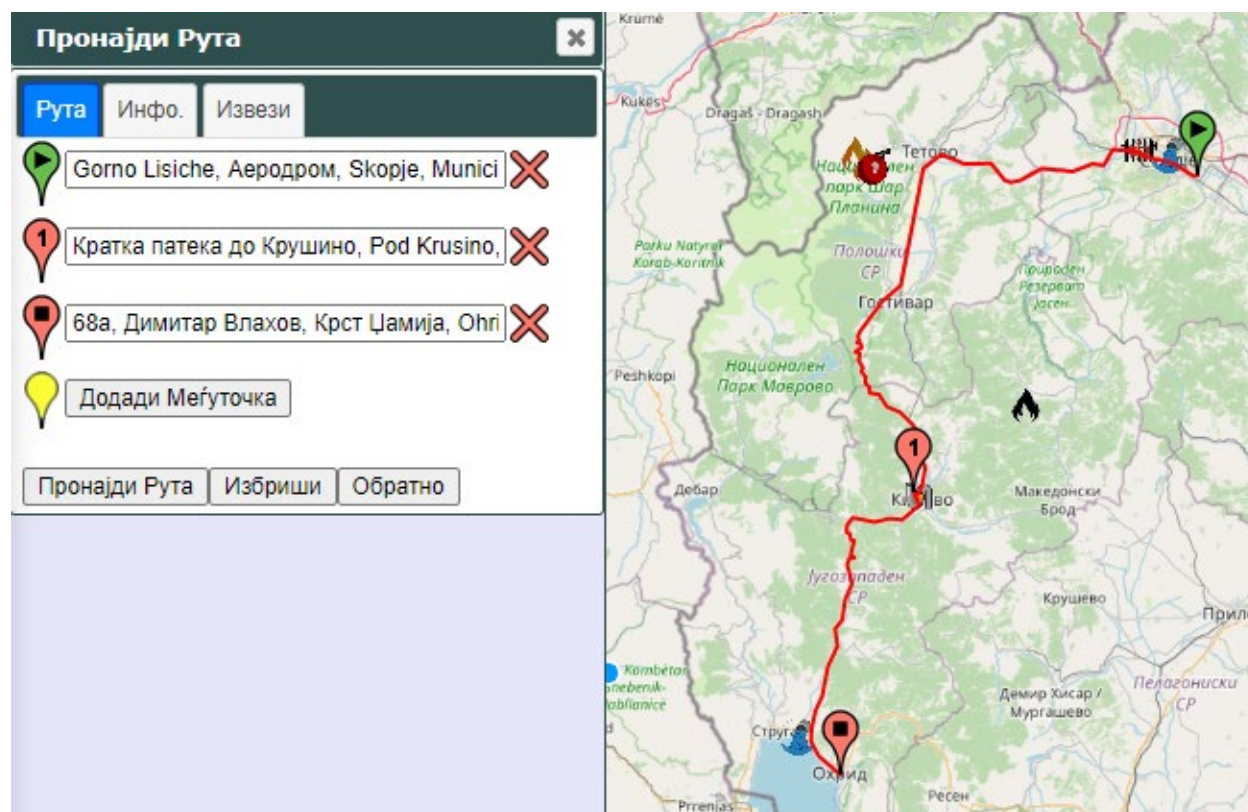
Со притискање на жолтиот маркер се додава нова меѓуточка за точно прецизирање на пожелната рута.

За бришење на некој маркер се притиска на црвениот X знак покрај маркерот.

Во подолниот дел под маркерите се наоѓаат неколку избори за дефинирање на тип на превоз и за избор на тип на рутирање (најбрз или најкраток).

Во најдолниот дел од овој таб се наоѓаат неколку копчиња со следните функционалности:

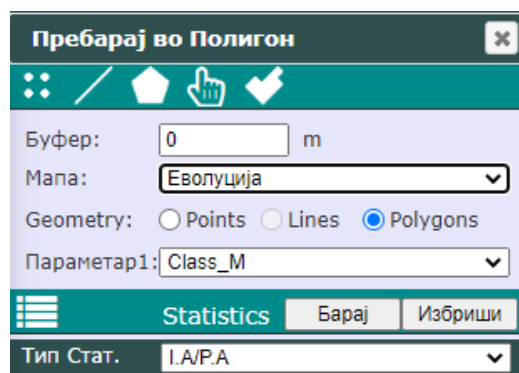
- Пронајди Рута – Пронаоѓање на рута откако маркерите се дефинирани
- Избриши – Бришење на рутата од мапата
- Обратно – Промена на крајната со почетната точка



Слика 52: Пронаоѓање на рута




7.5.3. Пребарај по вектор

Функционалноста „Пребарај по Вектор“ овозможува филтрирање на објекти од одредена векторска мапа во одреден полигон кој го задава корисникот и прикажување на нивните атрибути. Со вклучување на оваа функционалност се појавува прозор како на Слика 53. Алатките во лентата за алатки на овој прозорец се дадени во Табела 11.



Слика 53: Прозорец Пребарај по вектор

Табела 11. Опис на алатките во менито пребарај по вектор

Копче	Име	Објаснување
	Нацртај Точка	Цртање на точка на мапата
	Нацртај Линија	Цртање на линија на мапата
	Нацртај Полигон	Цртање на полигон на мапата
	Избери полигон за ограничување	Според привилегиите на одредена група на корисници има ограничување на простор во кој не можат да креираат полигон
	Промени Геометрија	Промена на геометријата на нацртан објект

Функционалноста „Пребарај по Вектор“ овозможува филтрирање на објекти од одредена векторска мапа во одреден полигон кој го задава корисникот и прикажување на нивните атрибути. Со вклучување на оваа функционалност се појавува прозор како на Слика 54. Алатките во лентата за алатки на оваа функционалност се дадени во Табела 11.

Под лентата за алатки се наоѓаат следните можности за дефинирање на пребарувањето:

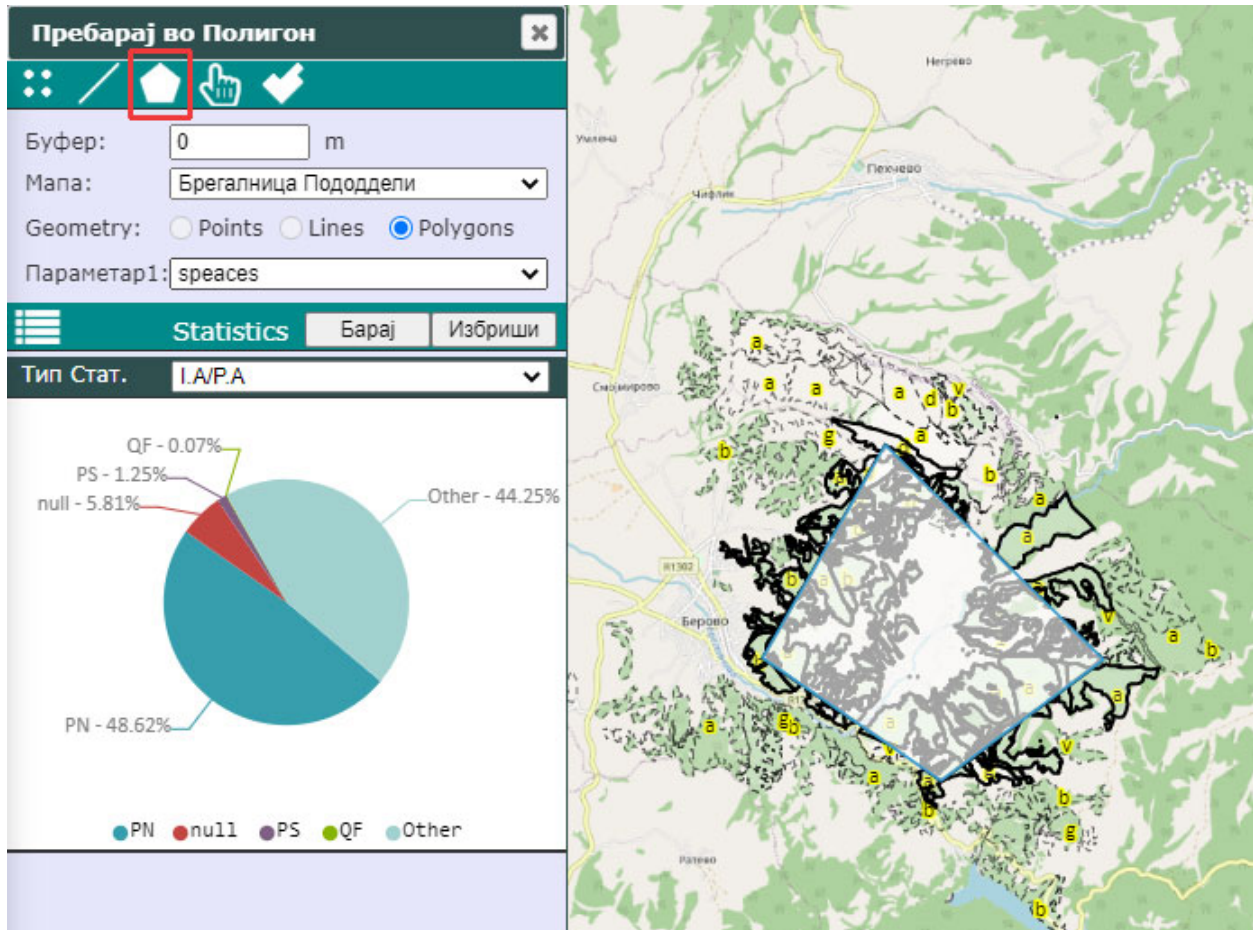
- Бафер – Ја означува околината на исцртаната геометрија изразена во метри, која ќе биде вклучна во пребарувањето.
- Мапа – Ја означува векторската мапа во која се наоѓаат објектите кои се цел на пребарувањето.
- Параметар – Го означува параметарот (атрибутот) по кој ќе се излистаат пронајдените објекти.

Под овие полиња за избор се наоѓаат две функционални копчиња:

- Барај – Го иницира извршувањето на пребарувањето кога сите параметри се подесени.
- Избриши – Ги брише резултатите од пребарувањето.

Пример 1 : Пребарување по вектор за анализа на составот на избраниот атрибут во нацртан полигон.

- За да направите пребарување по вектор прво треба да прикажете одреден пододдел на мапата.
- Потоа во прозорецот Пребарај по Полигон треба да изберете начин на кој ќе ја цртате мапата во определена област, на пр. полигон.
- Кога ќе го нацртате полигонот анализата започнува автоматски и во прозорецот се прикажува графикон.

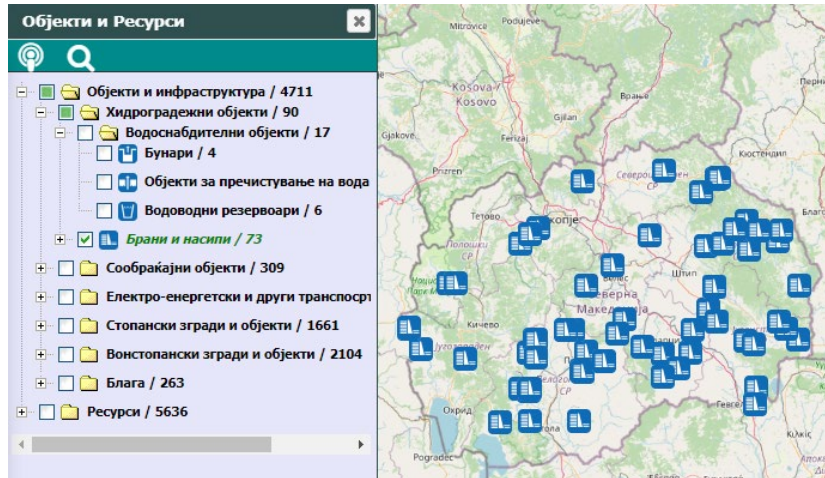


Слика 54: Пребарување на селектирани атрибути во полигон

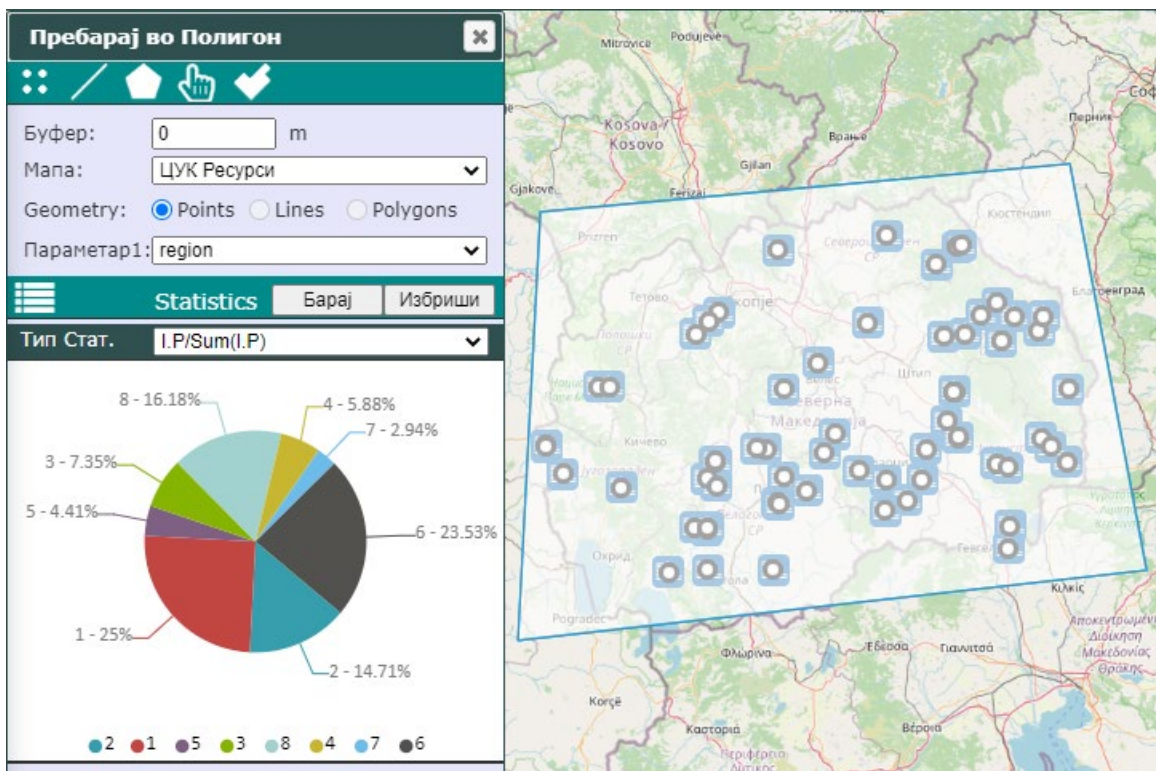
МКФФИС АДМИНИСТРАЦИЈА

Пример 2: Споредување на региони според бројот на брани во тие региони

- Прво треба да ги прикажете сите брани користејќи ја специјалната ф-ја ЦУК



- Потоа во прозорецот Пребарај по Вектор да подесите го параметарот на 'region'
- Нацртајте полигон околу цела Македонија
- Анализата покажува дека во регион 1 се наоѓа четвртина од вкупниот број на брани



Слика 55: Споредување на региони

МКФФИС АДМИНИСТРАЦИЈА

Истиот пример може да се искористи за прикажување на пребарување според одредена карактеристика (во овој пример - брана)

Пребарај во Полигон

Буфер: 0 m

Мапа: ЦУК Ресурси

Geometry: Points Lines Polygons

Параметар1: region

Statistics Барај Избриши

Тип Стат.: I P/Sum(I P)

Поставете приказ на листа

3 - 7.35%	5 - 23.53%
2 - 14.71%	1 - 25%

Двоен клик на некој ред за да се прикажат неговите атрибути

No.	region	Area	Intersect
1	1	1	1
2	1	1	1
3	1	1	1
4	2	1	1
5	2	1	1
6	2	1	1
7	3	1	1
8	1	1	1
9	1	1	1
10	1	1	1
11	1	1	1

Секој ред одговара на карактеристика (брана во овој пример)

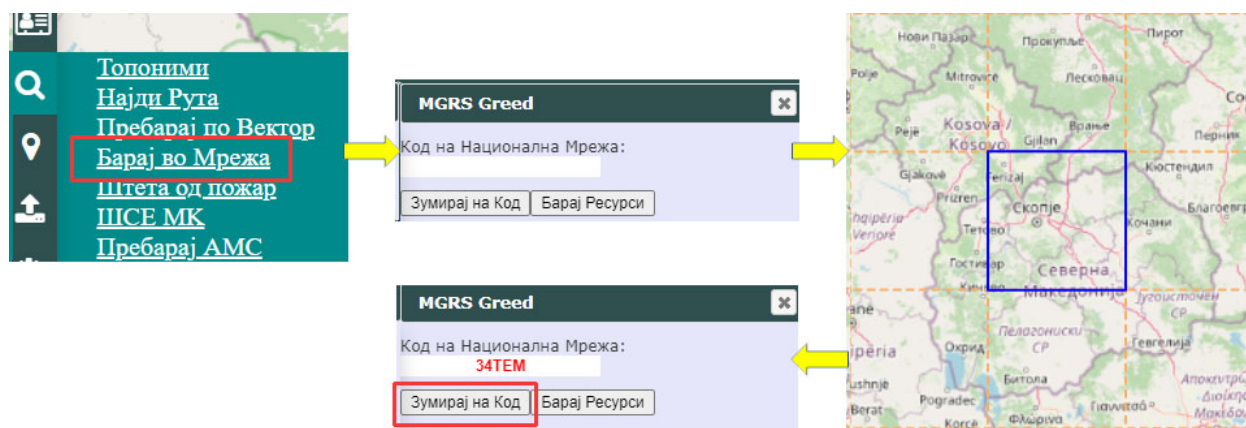
Пребарај во Полигон

- geometry
- [object Object]
- geo_width
- 41.480081
- geo_length
- 21.510819
- id
- 156
- asset
- 9
- place
- 990
- municipality
- 3
- area
- 2
- region
- 1
- geo_height
- 744.000000
- created_at
- 2012-04-09 00:00:00.000
- created_by
- 87
- created_by_rcuk
- 2
- updated_by
- 87
- updated_by_rcuk
- 2
- updated_at
- 2013-04-01 10:57:28.030
- attributes
- Десово ЗС,Десово-ЕЛС
- ДолнениВодостопанство Прилепско поле-
- ПрилепВодоводно претпријатие со

Слика 56: Пребарување според одредена карактеристика

7.5.4. Барај во мрежа

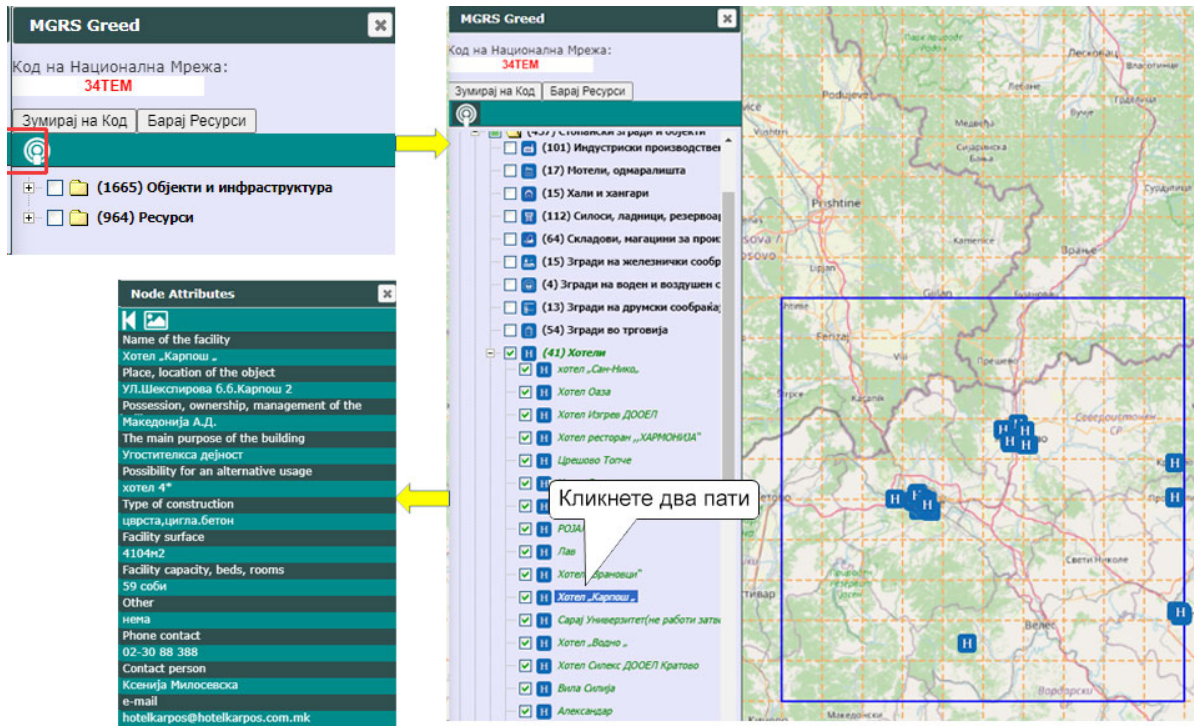
Пребарувањето во мрежа е пребарување на ЦУК ресурси во мрежа. За да го направите ова пребарување отворете го под-менито Барај во Мрежа. Се отвора поле за внесување на Код на Национална Мрежа. Ако не е даден кодот тогаш кликнете на картата во мрежата каде сакате да направите пребарување. Кодот ќе се ископира во соодветното поле. Кликнете на копчето Зумирај на код за да се зумира мапата на вашата цел за пребарување. Слика 57.



Слика 57: Код на Национална Мрежа

Кликнете на копчето Барај Ресурси и резултатите од пребарувањето ќе се прикажат. Кликнете на алатката за да направите селекција на мапата. Отворете го дрвото на ресурси. Изберете го ресурсот кој сакате да го истражите и кликнете два пати на него. Ќе се прикаже листа на атрибути за избраниот ресурс. Слика 58

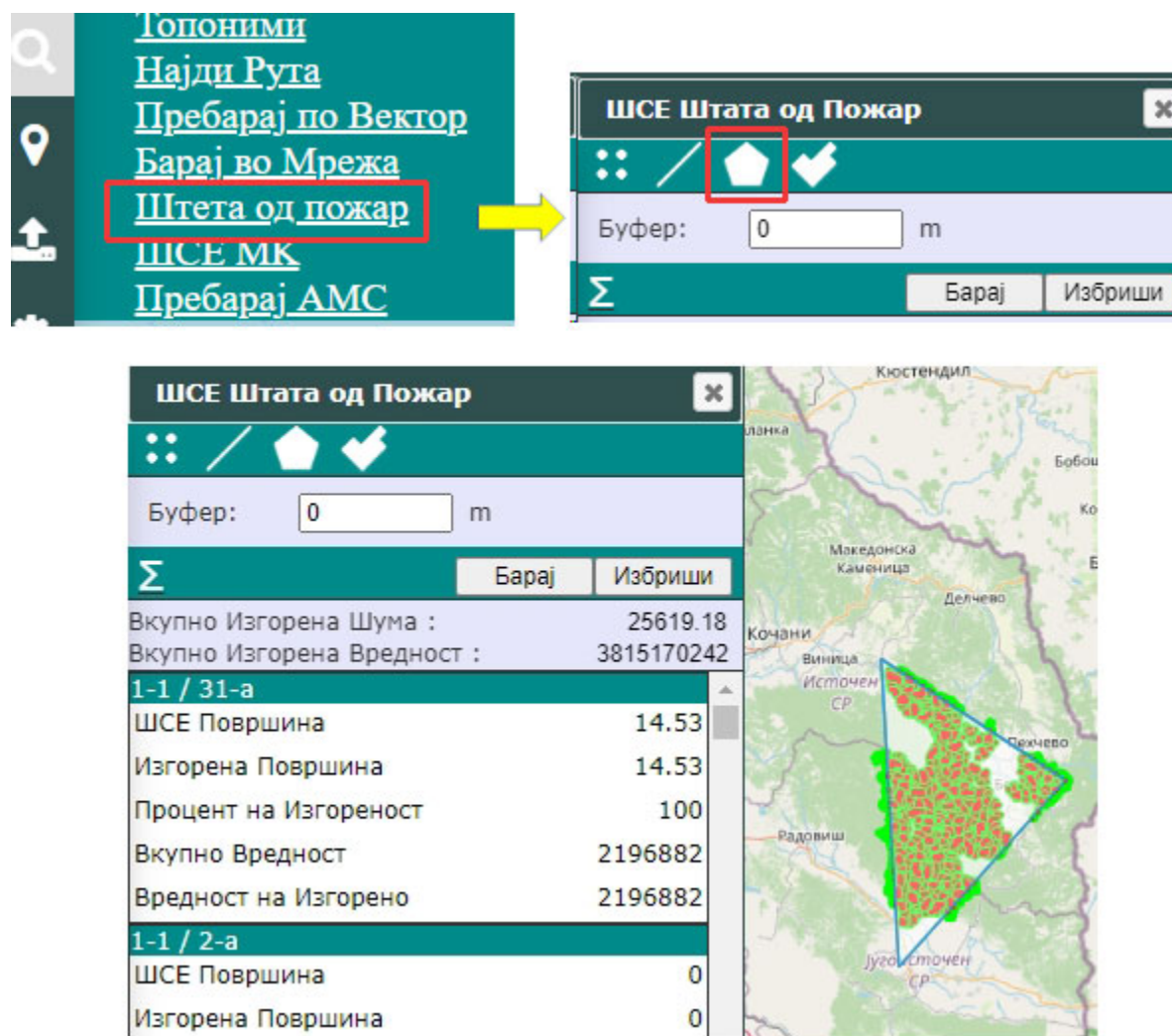
МКFFIS АДМИНИСТРАЦИЈА



Слика 58: Пребарување во мрежа

7.5.5. Штета од пожар

Штета од пожар е специјално векторско пребарување за сумирање на штетите од пожар. Кога ќе го отворите под-менито Штета од пожар се отвора прозорецот ШСЕ Штета од Пожар во кој можете да изберете цртање со точка, линија или полигон. Ако изберете линија треба да внесете бафер должина. Изберете полигон и нацртајте го на мапата. Во прозорецот ШСЕ Штета од Пожар ќе се прикаже резиме од штетите. Резултатот од пребарувањето ќе се прикаже и на мапата. Слика 59



Слика 59: Векторско пребарување за штета од пожар

7.5.6. ШСЕ МК

ШСЕ МК е за сумирање на ШСЕ по тип на дрво или Фитоценоза.

Селектирајте ја алатката за да се прикаже пододделот на мапата

Селектирајте место во МК

Направете избор и веднаш стартава

Изберете:
 - Вид на дрво
 -- Фотоценоза
 - не дефинирано

ВКУПНО :
 Површина :
 Бр. Дрва :
 Дрвна Маса :
 Прираст :

Стопанска	Класа	Дрвна Маса
Л		4215 м ³
В		34371 м ³
Г		33802 м ³
М1		3352 м ³
М2		1744 м ³

По Вид на Почва :

Вид Почва	Површина	Дрвна Маса
ЕК	605 ha	41009 м ³
ДК	354 ha	36475 м ³

По Класификација на дрво :

Цел.	Тех.	Огр.	Отп.
0 м ³	756 м ³	68947 м ³	7780 м ³

Планирана Сеча :

Тип на Сеча	Дрвна Маса
проредни сечи	24 м ³
чиста сеча	7997 м ³

Единицата м³ може да се промени во процент

За селектираниот запис се прикажува пододделот

08-03-2023
01:25:15

ВКУПНО :
 Површина : 959.06 ha
 Бр. Дрва : 184354
 Дрвна Маса : 77484 м³
 Прираст : 1096 м³

Стопанска Класа	Дрвна Маса
Л	4215 м ³
В	34371 м ³
Г	33802 м ³
М1	3352 м ³
М2	1744 м ³

По Вид на Почва :

Вид Почва	Површина	Дрвна Маса
ЕК	605 ha	41009 м ³
ДК	354 ha	36475 м ³

По Класификација на дрво :

Цел.	Тех.	Огр.	Отп.
0 м ³	756 м ³	68947 м ³	7780 м ³

Планирана Сеча :

Тип на Сеча	Дрвна Маса
проредни сечи	24 м ³
чиста сеча	7997 м ³

Ако е селектирана алатката Листа се прикажува Преглед во листа

ВКУПНО :
 Површина : 959.06 ha
 Бр. Дрва : 184354
 Дрвна Маса : 77484 м³
 Прираст : 1096 м³

Готен-широки дол Караузлија / 47-в	
FMU Arrea	11.67
Validity	2019-01-01 / 2028-12-31
Готен-широки дол Караузлија / 54-б	
FMU Arrea	8.6
Validity	2019-01-01 / 2028-12-31
Готен-широки дол Караузлија / 121-а	
FMU Arrea	16.27
Validity	2019-01-01 / 2028-12-31
Готен-широки дол Караузлија / 122-а	
FMU Arrea	16.06
Validity	2019-01-01 / 2028-12-31
Готен-широки дол Караузлија / 113-а	

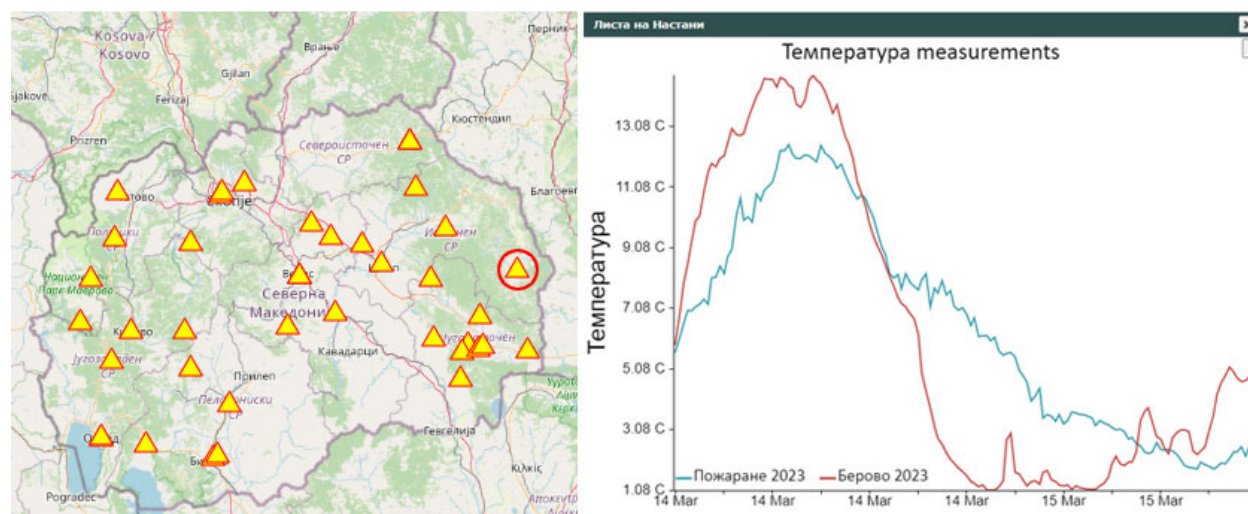
Слика 60: ШСЕ МК пребарување

7.5.7. Пребарај AMC

Пребарување AMC функција е за преземање на временските параметри од AMC и цртање графикон или прикажување на најновата вредност на AMC.

Слика 61: Внесување на податоци за AMC пребарување

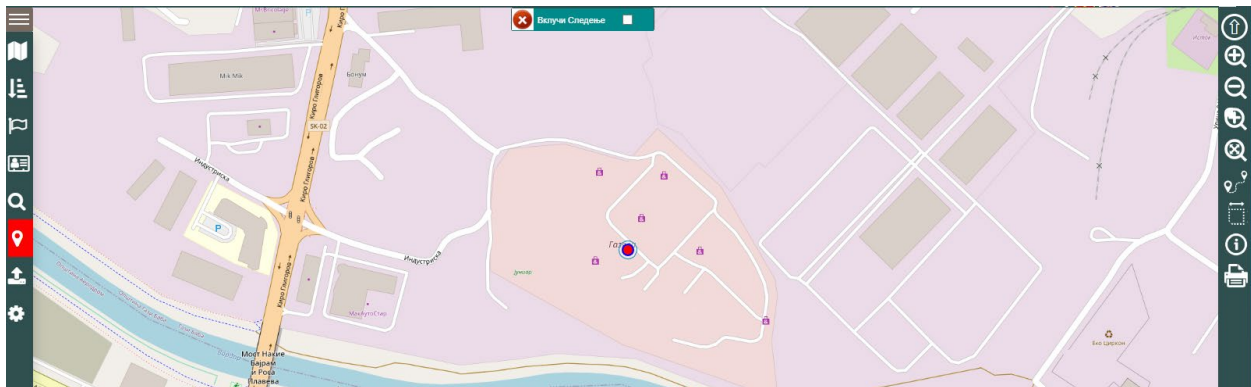
За да направите пребарување AMC треба во прозорецот Метео Станици да изберете AMC од листата или да кликнете на мапата. Внесете параметар по кој ќе направите пребарување и времетраење на графиконот. На мапата ќе се прикажат метеоролошките станици. Кликнете на копчето Графикон за да се прикаже графикон во одделен прозорец.



Слика 62: Резултати од AMC пребарување

7.6. Моја локација

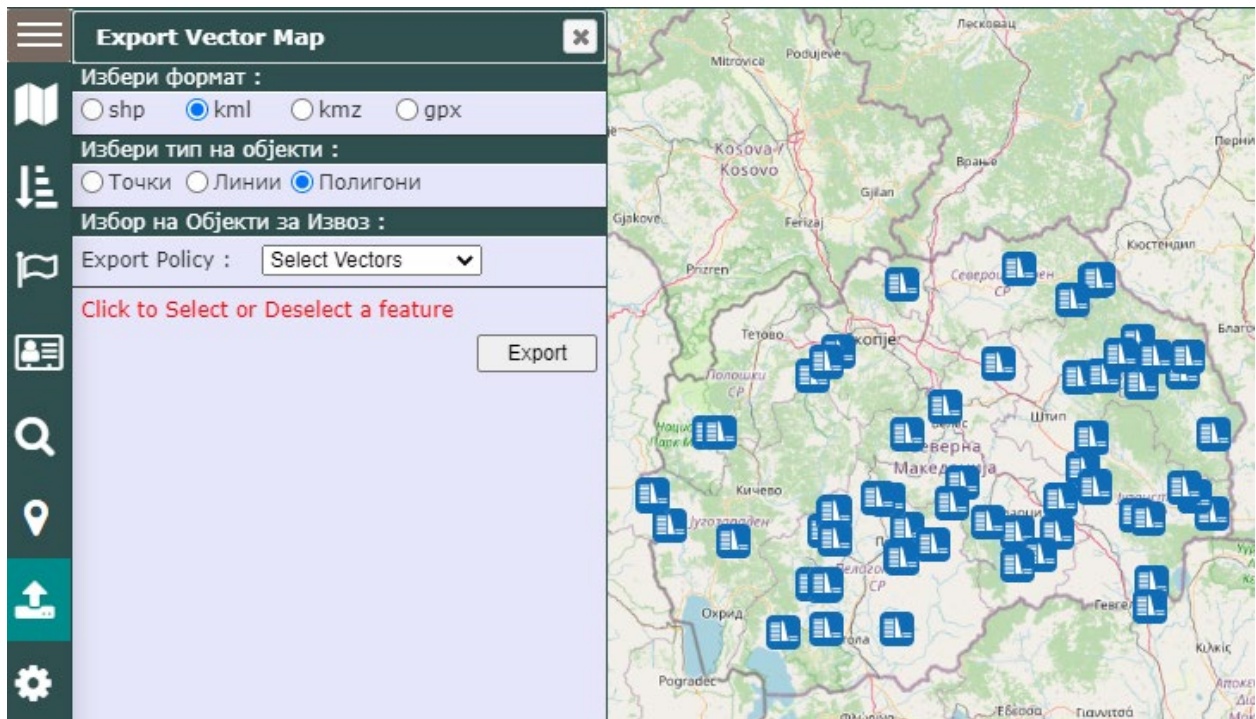
Функцијата моја локација, Слика 63, служи за одредување на локацијата на корисникот на мапата. Со вклучување на оваа функција се превзема локацијата на корисникот, било од GPS уредот на мобилниот телефон, било од интернет функционалноста, и на мапата се исцртува црвена точка со добиите координати. Дополнително се исцртува и круг околу оваа точка чии радиус го претставува несигурноста на мерењето. На ваков начин се добива и добар осет за прецизноста за измерените координати. При исцртувањето на локацијата на корисникот, мапата се зумира на означената локација. Додека функцијата е активна, алатката Моја локација е на црвена позиција, нејзиното исклучување се врши со повторно кликање на иконата. Ако функцијата е активна, секоја промена на локацијата на корисникот значи бришење на претходната точка и исцртување на нова.



Слика 63: Моја локација

7.7. Извоз / Export

Кога е избрана иконата Извоз / Export се прикажува можност за избор на форматот на мапата, типот на објектот и избор за извоз на сите вектори, сите вектори од еден слој или сите вектори на мапата, слика 64. Со притискање на копчето Export се отвора дијалог прозорец за избор на локација каде ќе се зачува извезенот документ.



Слика 64: Извоз на векторска мапа ЦУК брани

7.8. Администрација на апликацијата

Со кликање на последната икона во менито Подесувања, на место од старото мени се појавува ново мени за администрација на апликацијата, како што е прикажано на Слика 65. Ова мени содржи 4 по-менија чија функционалност е опишана во Табела 12.

Табела 12. Опис на алатките за администрација на апликацијата

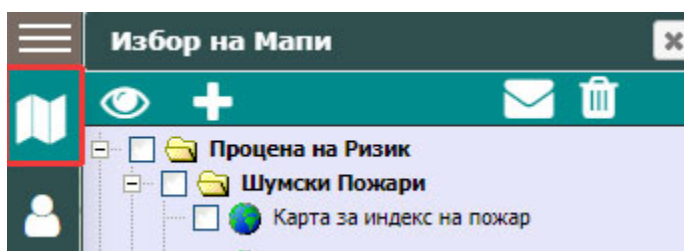


Слика 65

Под-мени	Име	Објаснување
	Мапи	Влез во менито за администрација на мапи
	Корисници	Влез во менито за администрација на корисници
	Проекции	Влез во менито за администрација на проекции
	Подесувања	Излез од менито за подесувања

7.8.1. Администрација на мапи



Со отварањето на менито Мапи се отвара ист прозорец како и при менито Прикажување на мапи во кориснички мод, со сите функционалности претходно опишани и некои дополнителни алатки, како што е прикажано на Слика 66.



Слика 66: Мени за администрација на мапи

Дополнителните алатки се опишани во Табела 13.

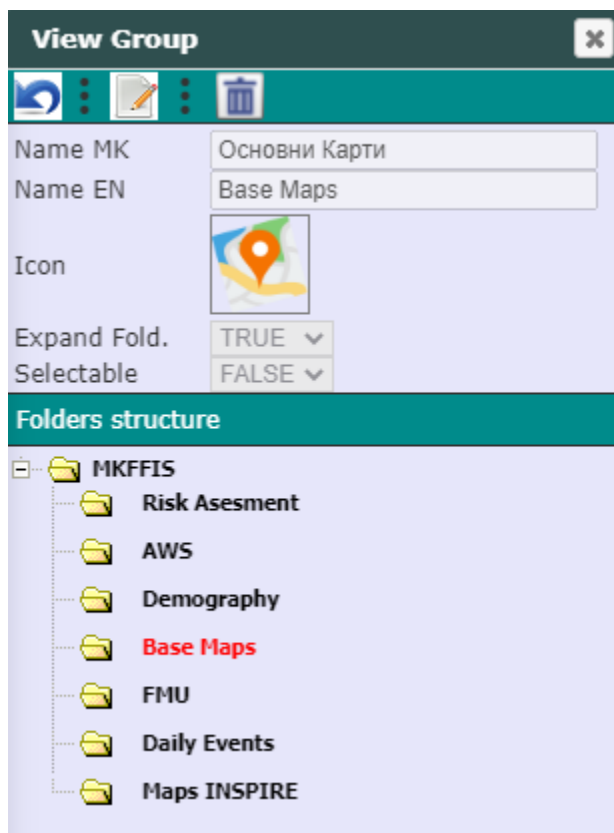
Табела 13. Опис на алатките за администрација на мапи

Копче	Име	Објаснување
	Прегледај подесувања	Преглед на поставени подесувања за избрана група на мапи или мапа
	Нова Група/Мапа	Додавање на нова група на мапи или мапа

7.8.2. Преглед на подесувања на група на мапи




Формирањето на папки, односно групи на мапи во апликацијата МКФФИС нема посебна улога сем полесна прегледност и полесно пронаоѓање на одредена мапа.

При селектирање на некоја група на мапи и активирање на функционалноста Преглед на подесувања, се отвара нов прозорец, како на слика 67, каде се прикажани сите параметри и подесувања за една група. Алатките во лентата за алатки во овој прозорец се опишани во Табела 14.



Слика 67: Подесување параметри на група

Табела 14. Опис на алатките за администрација на апликацијата

Копче	Име	Објаснување
	Назад кон листа на мапи	Враќање кон прозорец за преглед на мапи
	Измени Група/Мапа	Влез во мод за промена на параметри на Група/Мапа
	Избриши Група/Мапа	Бришење на избрана Група/Мапа

Во горниот дел од прозорот се прикажани следните параметри за групата:

- Име на македонски јазик – Се прикажува кога за апликацијата е избран приказ на македонски јазик.
- Име на англиски јазик - Се прикажува кога за апликацијата е избран приказ на англиски јазик.
- Икона – Се прикажува само доколку групата се наоѓа на нулто ниво во дрвото
- Отвори Група – За овој параметар има избор на две опции, Да (при првично отварање на листата на мапи групата е отворена и се прикажуваат сите мапи во неа) и Не (при првично отварање на листата на мапи групата е затворена - неекспандирана).
- Групно Вклучување – Ако за групата е избрана опцијата ДА, овозможено е штиклирање на групата и сите мапи во истата се отвараат едновремено.

Во вториот дел од прозорот овозможен е приказ на местоположбата на групата во однос на другите групи.

При прегледот на групата сите параметри се заклучени и не е можна нивна промена. За вршење на било какви промени на параметрите на групата потребно е да се активира функцијата Измени Група/Мапа. Во тој случај сите параметри се отклучуваат и можна е нивна промена. Воедно наместо копчето „Измени Група/Мапа“ се појавува ново копче „Зачувај“ кое по направените промени треба да се кликне за да се зачуваат промените во базата на податоци и да бидат видливи за сите корисници на апликацијата.

7.8.3. Преглед на подесувања на мапа

При селектирање на некоја мапа и активирање на функционалноста „Преглед на подесувања“, се отвара нов прозорец, како на Слика 68, каде се прикажани сите параметри и подесувања за една мапа. Алатките во лентата за алатки во овој прозорец се истите како и во преглед на група и се опишани во Табела 14.

Прозорецот за преглед на подесувања на мапа е поделен во 3 дела. Во првиот дел се прикажани два параметри:

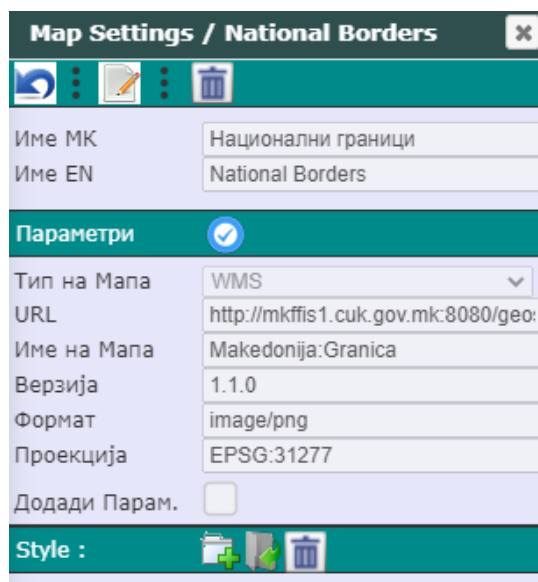
- Име на македонски јазик – Се прикажува кога за апликацијата е избран приказ на македонски јазик.
- Име на англиски јазик - Се прикажува кога за апликацијата е избран приказ на англиски јазик.

Во вториот дел се прикажани параметрите од каде и на кој начин се учитува мапата. Возможни се учитувања на мапи во повеќе формати:

- WMS – учитување на мапа од геосевер во формат на слика
- WFS - учитување на мапа од геосевер во формат на вектор
- Script – генерирање на мапа преку код
- Vector – креирање на векторска мапа
- Image – проектирање на мапа од непроегирана слика



Зависно од кој формат е избран, се дефинираат и различни параметри за мапата.


Во последниот дел се дефинира стилот за исцртување на вектори и/или стилови за приказ во легендата на мапата. Овој дел има и посебна лента за алатки чии функционалности се опишани во Табела 15.



Слика 68: Преглед на подесување на мапа

Табела 15. Алатки за дефинирање стил на вектори на мапа

Копче	Име	Објаснување
	Дефинирај нов стил	Дефинирање и додавање на нов стил на мапата
	Промени стил	Промена на веќе дефиниран стил на мапата

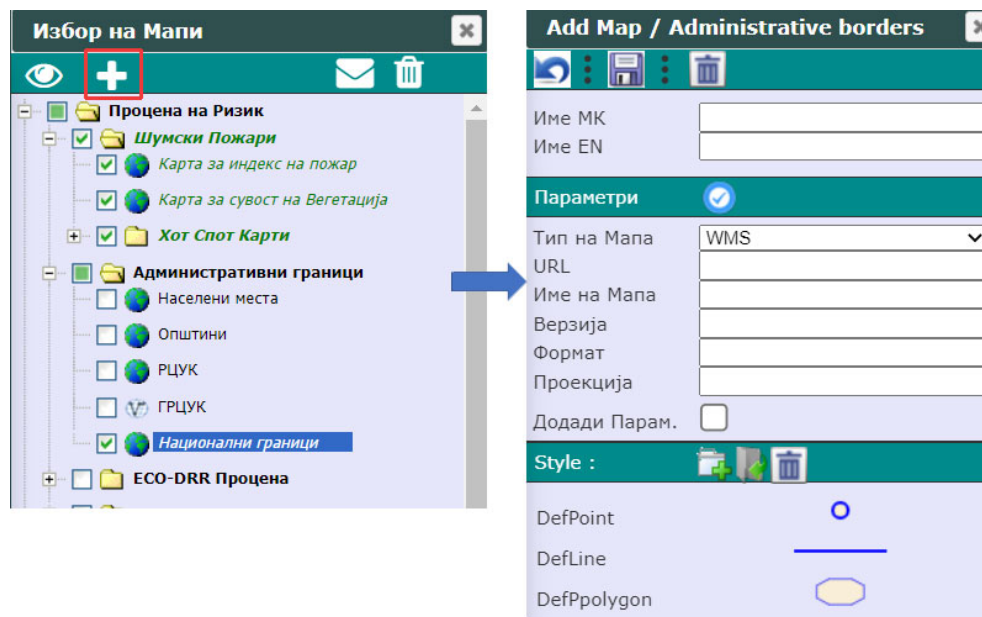
	Избриши стил	Бришење на дефиниран стил
---	--------------	---------------------------

Сите горенаведени алатки се достапни само кога е вклучена опцијата за промена на параметрите на мапата.

При прегледот на мапата сите параметри се заклучени и не е можна нивна промена. За вршење на било какви промени на параметрите на мапата потребно е да се активира функцијата Измени Група/Мапа. Во тој случај сите параметри се отклучуваат и можна е нивна промена. Воедно наместо копчето „Измени Група/Мапа“ се појавува ново копче „Зачувај“ кое по направените промени треба да се кликне за да се зачуваат во базата на податоци и да бидат видливи за сите корисници на апликацијата.

7.8.4. Додавање на нова Група / Мапа

За да се додаде нова група / мапа, пред се треба да се селектира една група или една мапа во листата на мапи. Со тоа функцијата за додавање на група / мапа, опишана во Табела 13 станува активна. Доколку е селектирана мапа, со притискање на ова копче „+“ веднаш се отвара нов прозор како на Слика 69 со сите полиња празни. По пополнување на веќе опишаните параметри, се стиска копчето за зачувување и мапата станува достапна за сите корисници и е лоцирана во истата група со мапата која беше селектирана.



Слика 69: Додавање на нова мапа

Доколку е селектирана одредена група, по активирање на копчето за додавање група / мапа, се појавува нов прозорец, во кој треба да се избере дали сакаме да додадеме група или мапа. Доколку се избере опцијата Група, се појавува прозорец со сите празни полиња. По пополнување на параметрите се клика на копчето Зачувај и групата е зачувана. Групата во ваков случај ќе биде како подгрупа на селектираната група. Слика 70



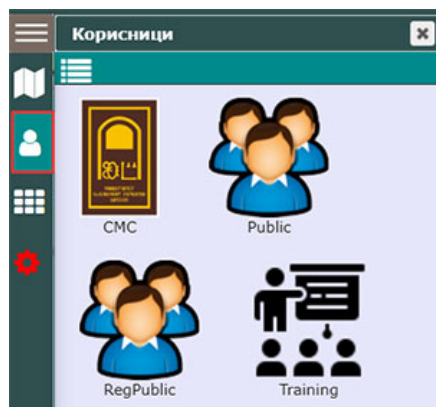
Слика 70: Креирање на подгрупа

Доколку се избере опцијата Мапа, на веќе опишаниот начин се креира мапа во селектираната група.

7.9. Администрација на корисници

Корисниците во МКФФИС се организираат на 4 главни нивоа:

- Супер администратор - корисници со неограничени права
- Администратори - корисници со неограничени права во рамките на една група
- Супер корисници - корисниците на кои им е дозволено да ги гледаат и внесуваат податоците
- Корисници - дозволен е само преглед на податоци




Слика 71: Подмени за администрација на корисници

Дополнително, корисниците се организирани во групи и подгрупи. Группи дефинирани според правата за пристап до мапите и ограничени полигони за внесување на податоци.

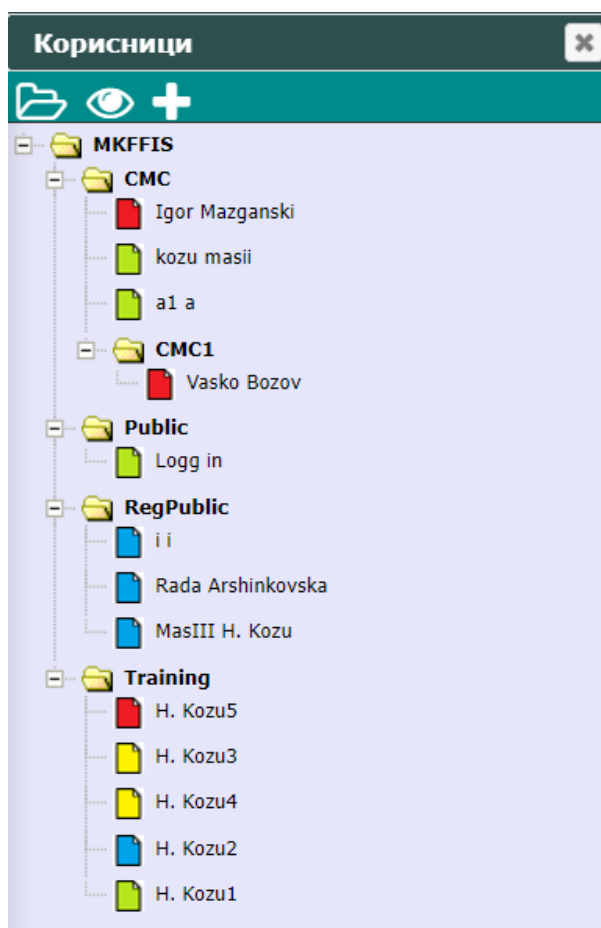
Опцијата за пристап до корисниците во главното мени им е дозволена само на Супер администраторите и администраторите. Кога опцијата Корисници е избрана од главното мени, се појавува ново мени со икони од главните групи на корисници. Види Слика 71.

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Табела 16. Опцијата за пристап до корисниците

Копче	Име	Објаснување
	Листа	Комплетна листа на корисници




Со кликување на некоја група се прикажува дрвото за организација на корисниците од таа главна група. Со кликување на функцијата за приказ на листа, во лентата со мени, сите корисници организирани во поголемите групи се прикажани во дрвото. Види слика 72. Супер администраторите имаат пристап до сите корисници, а администраторите имаат пристап само до нивните групи со права на администрација. Еден корисник може да биде администратор во повеќе групи.



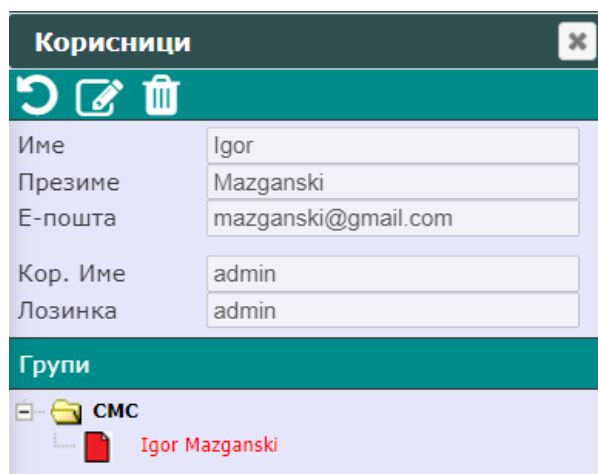
Слика 72: Листа на корисници

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Табела 17. Опис на алатките за администрација на корисници

Копче	Име	Објаснување
	Групи Корисници	Приказ на главните групи на корисници
	Преглед	Преглед на параметри на Група / Корисник
	Нова Група / Корисник	Додавање на нова Група / Корисник

Во прозорецот за организација на корисници, корисниците се излистани според нивните права. Од лентата со мени, може да се вратите на поголемите групи на корисници, да ги гледате специфични податоци за корисничките групи, да гледате специфични податоци за корисниците, да додадете нова корисничка група и да додадете нов корисник. Со кликување на првата икона во менито, прозорецот ќе се врати на списокот со главните групи.

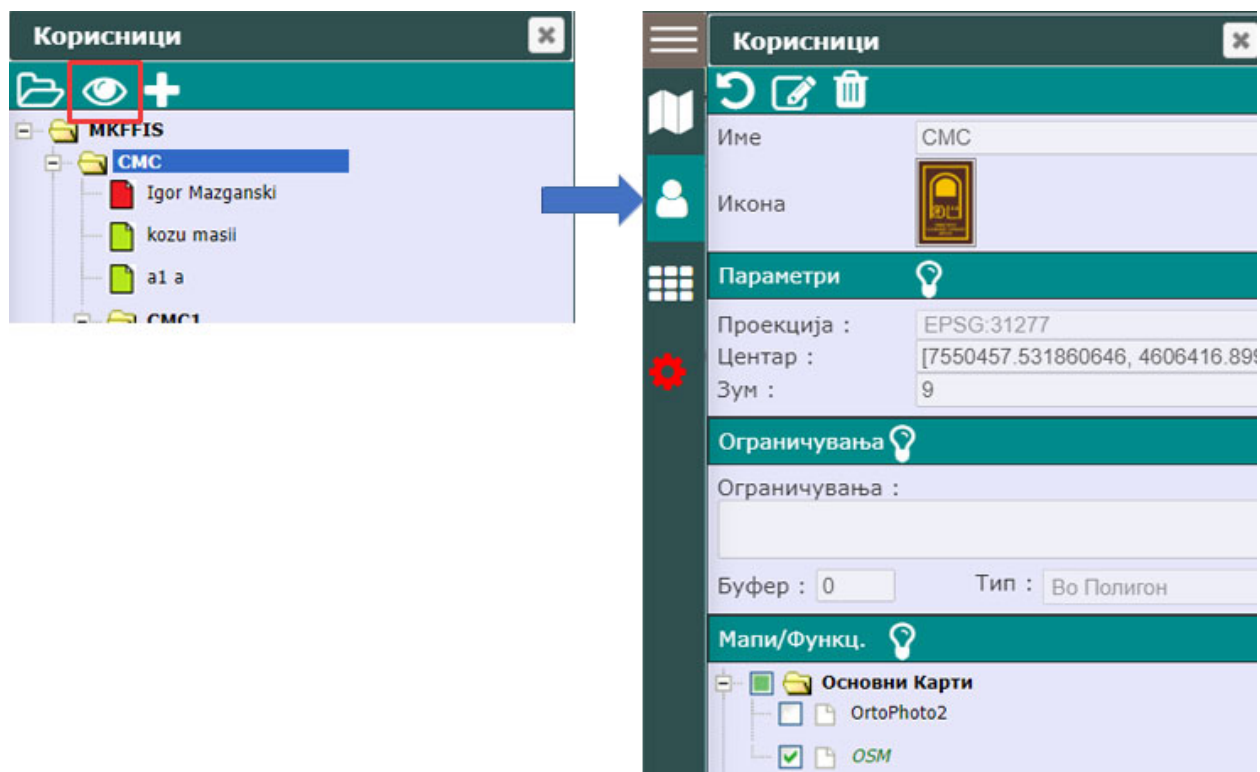


Со избирање на корисник и кликување на втората икона во лентата со мени, се појавуваат нови прозорци со податоци за одреден корисник. Види слика 73. Во него, сите податоци за корисникот се наведени, како име, презиме, е-пошта, корисничко име, лозинка и учество во групи и права на корисници. Сите овие поставки се менливи со кликување на копчето за уредување во лентата со мени.

Слика 73: Приказ на параметри за корисник

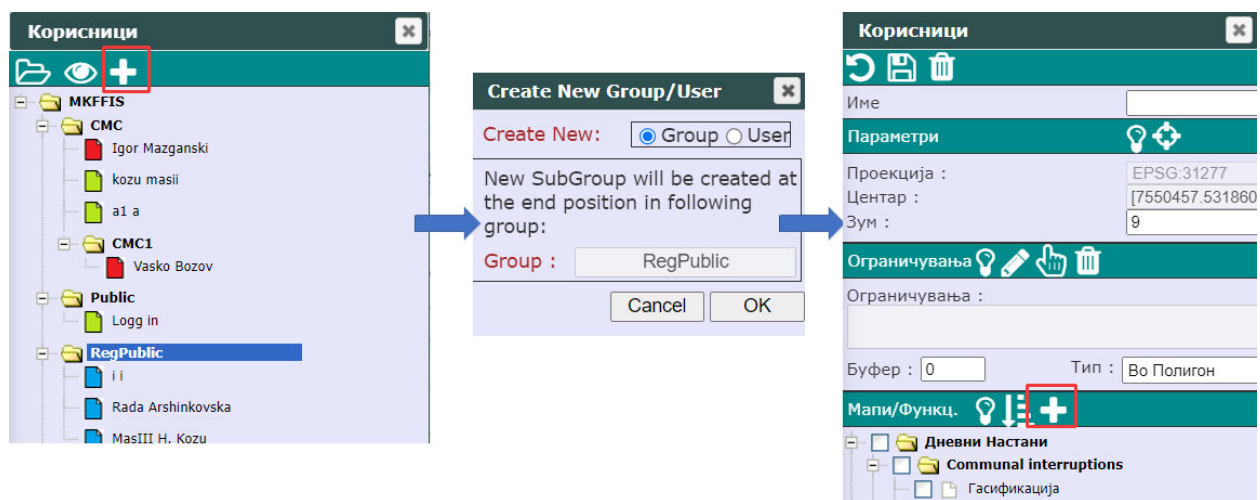
Со избирање група и кликување на втората икона во лентата со мени, се појавуваат нови прозорци со приказ на параметри за одредена група. Види слика 74. Во него, наведени се сите податоци за групата, како име на групата, Центар за проекција и зум за првиот поглед на мапата, полигон за ограничување и придружни мапи за таа група. Сите овие поставки се менливи со кликување на копчето за уредување во лентата со мени.

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Слика 74: Приказ на параметри на група на корисници

Со избирање на папка родител и кликување на иконата “New” / „Нов“ во лентата со мени, се појавува нов прозорец каде администраторот може да создаде нова група или нов корисник.



Слика 75: Креирање на група или корисник

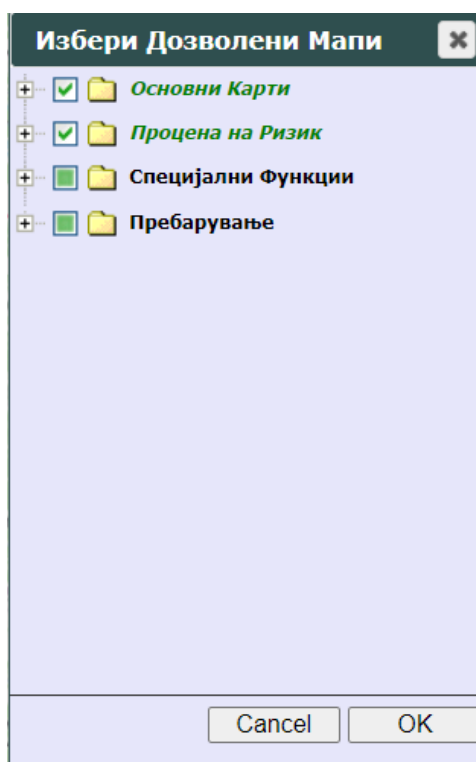
Ако е избрана нова група и кликнете на ОК, се појавува нов прозорец за внесување податоци за групата на корисници. Види слика 75. Во овој прозорец, администраторот треба да го внесе името на групата што е задолжително. Проекцијата и приказот

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стандардно е преземена од групата родител, но доколку администраторот сака да ја смени проекцијата тогаш треба да ја избере таа проекција од паѓачкото мени, да избере точка на мапата за центар и да додаде ниво на зумирање.

Дополнително, полигонот за ограничување може да се собере или одбере од некој векторски слој. Може да се избераат бафер и вид на ограничување. Постојат два вида ограничувања, внатре во полигон и во полигонот на пресек.

На дното на овој прозорец, може да се додадат, отстранат и избираат достапните мапи, специјалните функции и опциите за пребарување, за прв преглед. Слика 76.



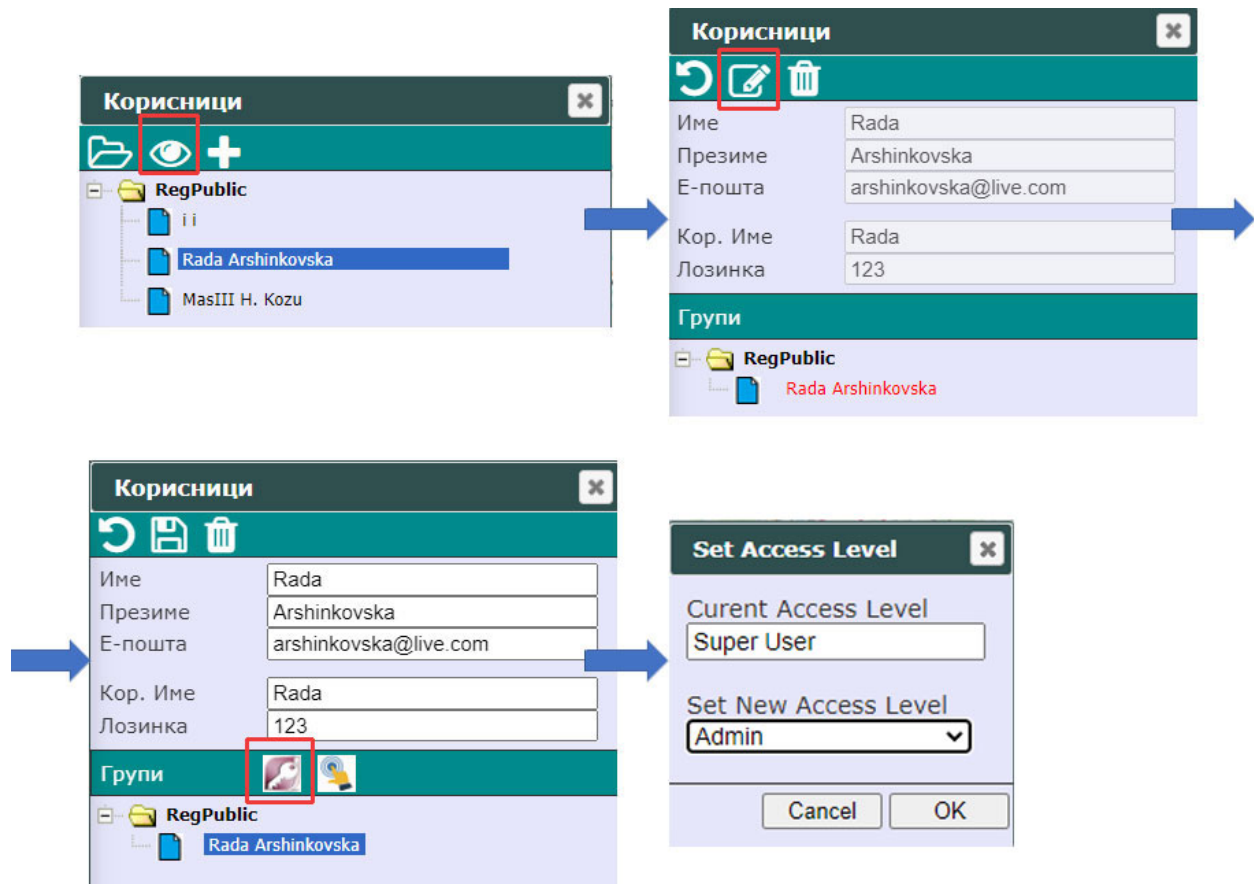
Слика 76: Придружни мапи и специјални функции на групата

Слика 77: Креирање на нов корисник

Ако е избрана опцијата New User / Нов корисник и кликнете на ОК, се појавува нов прозорец за внесување податоци за корисникот. Погледнете Слика 77. Во овој прозорец, администраторот треба да внесе податоци, корисничко име и лозинка за новиот корисник. Дополнително, може да се постават права за пристап за корисникот.

Администраторот може да додели права на корисникот кога го креира, но може да менува права и на веќе креиран корисник. Види слика 78

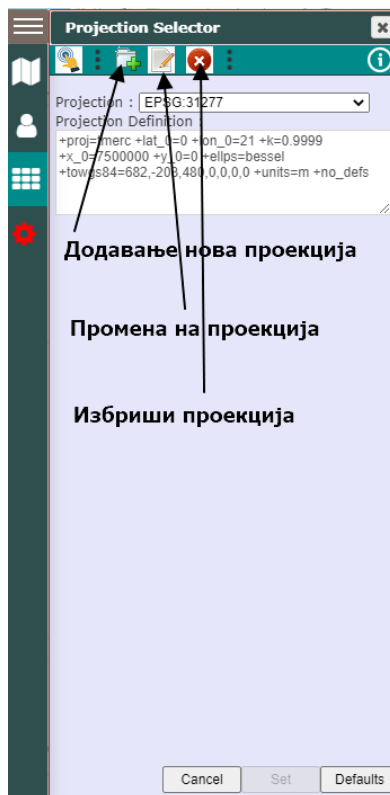
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Слика 78: Дефинирање ниво на пристап на корисник

7.10. Избор на проекција

Во под-менито **Избор на проекција** корисникот може да избере проекција, да додаде нова, да измени постоечка проекција или да избрише проекција (Слика 79).



Слика 79: Администрирање на проекции