

CHAPTER 2 AGRICULTURAL LAND USE CLASSIFICATION

XI.8 Rationale of the Analysis

To evaluate an irrigation development project, indices of the project area should be studied before and after the project. Employed indices for the evaluation are usually the irrigated area, the irrigable area, the crop planted area, etc. Though there are some method to collect these data, the remote sensing technique with satellite images helps the study to gather them.

The field survey covering the project area is one way of data collection. In case the irrigated area data can be collected during the irrigation period in the field, which covers the whole project area, the data has a high reliability. Though, if the project area is huge, it is inefficient to conduct the field survey so that the enormous manpower and huge time investment is needed. The period and the budget of a survey is normally limited.

The use of satellites image is efficient to collect the data of the agricultural land use. The remote sensing technology using satellite images has been developed from 1960s. Hundreds of satellites have been launched and captured the earth every day. The multispectral images obtained by sensors on-board the satellites can be utilized to identify the crop planted area, the irrigated area, and so on. Some of the images are available at no charge on the internet and it is also possible to request satellite management institutes to take images involving the project area at a specified period if required.

In this survey, the team analyzed the multispectral imageries obtained by 2 satellites in order to classify the agricultural land use in MMIP area in 2015 - 2016 season. The analysis focused on the cropping area of paddy, maize and tree crop. The result of this analysis is to be one of endline indices for the construction completed area and to be one of the baseline indices to evaluate the project after the construction.

XI.9 Target Area of the Analysis

MMIP area consists of 4 irrigation service areas, i.e. Maridagao Service Area, Upper Malitubog Service Area (Stage I and II), Pagalungan Extension Service Area, and Lower Malitubog Service Area, which cover approximate 17,000 ha in total. In addition, Lower Malitubog SA are divided to into 4 areas based on the commencement of its construction. MMIP Service Areas belong to 5 municipalities, i.e. Pikit, Carmen, Datu Montwal (former Pagagawan), Pagalungan, and Aleosan, and 52 Barangays. Figure XI.2.1 shows whole MMIP area and the Municipality¹. The major part of MMIP Service Area is

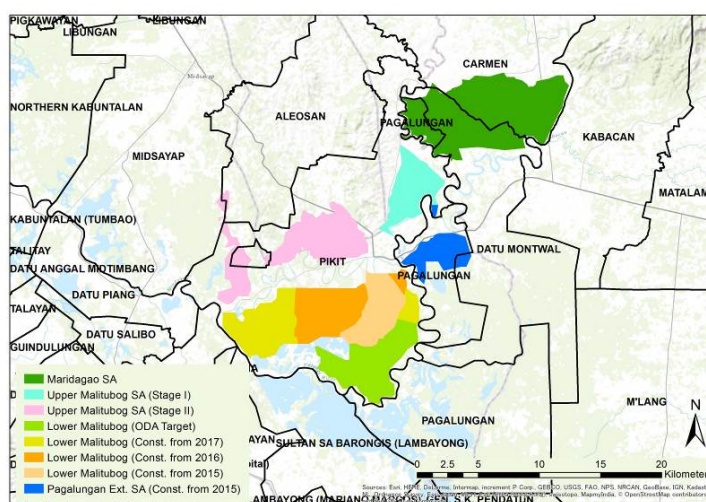


Figure XI.2.1 Municipality Boundary Covering MMIP Area

Source: JICA Survey Team

¹ The data of Municipality boundary was downloaded from the website of HDX (Humanitarian Data Exchange, <https://data.humdata.org/dataset/regional-admin1-boundaries-of-the-philippines-june2016>). The data was contributed from UN-OCHA Philippines (United Nations Office for the Coordination of Humanitarian Affairs, Philippines) and created by the Philippine Statistics Authority (PSA) in the context of the 2015 population census

included in Pikit Municipality.

To roughly grasp the land cover of MMIP area, the global study of land cover by European Space Agency (ESA) is helpful. ESA had released "GlobCover2009" on its website² on 21st December 2010, as is shown in Figure XI.2.2. The spatial resolution of GrobCover2009 is 300 meter. On the basis of ESA's classification process, this GlobCover was created from MERIS product (Medium-spectral Resolution Imaging Spectrometer) mounted on Envisat satellite.

GlobCover2009 classified MMIP area into 8 classes, namely Irrigated croplands, Rainfed croplands, Mosaic Croplands (50-70%) / Vegetation(20-50%), Mosaic Vegetaion (50-70%) / Croplands (20-50%), Closed to open broadleaved evergreen or semi-deciduous forest, Closed to open shrubland, Closed to open broadleaved forest regularly flooded, and Water bodies. It could be recognized by GlobCover that MMIP area exists on the diverse land.

According to GlobCover2009, all Maridagao SA and Upper Malitubog SA (Stage I) were not irrigated as of 2009. Most of Maridagao SA and Upper Malitubog SA (Stage I and II) were classified as Rainfed croplands or Mosaic Croplands / Vegetation. Regarding Lower Malitubog SA, it can be observed that south half of it was covered by Water bodies. Part of Pagalungan Ext. SA was categorized as the shrublands, so that it was expected that the croplands were limited in this area.

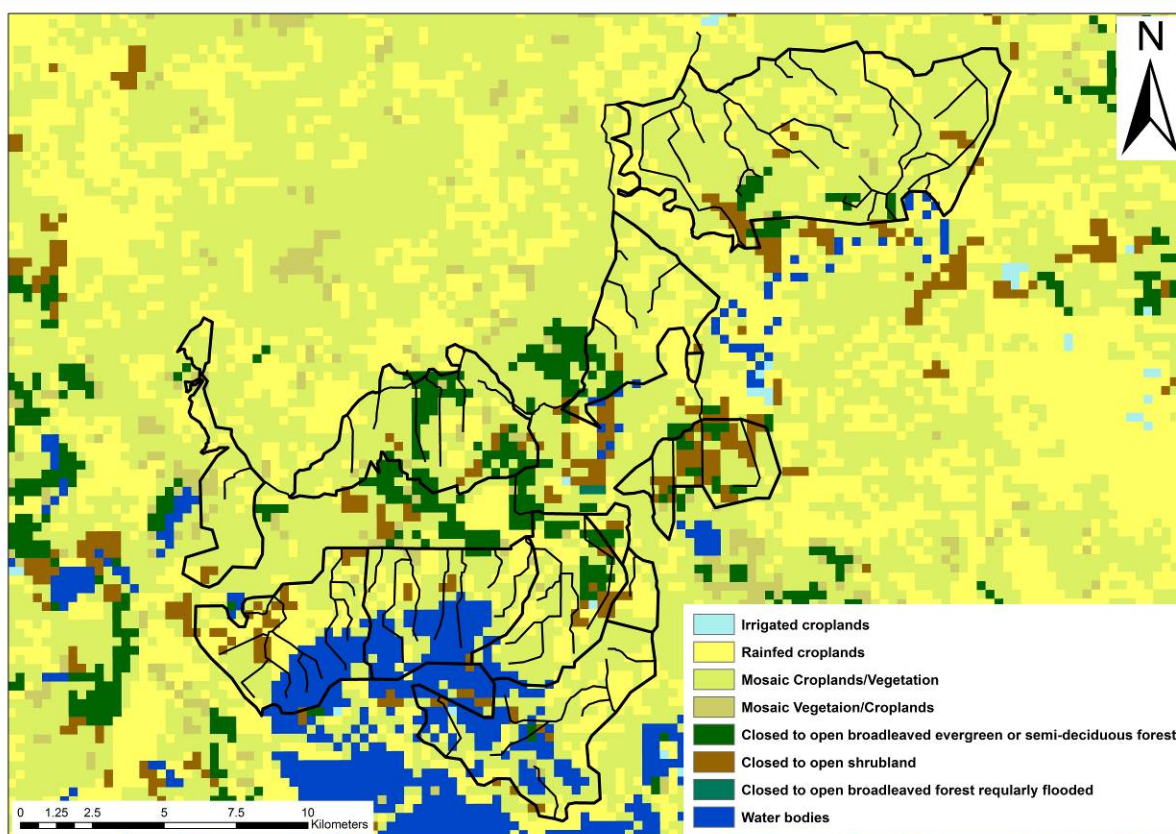


Figure XI.2.2 GlobCover2009

Source: European Space Agency

XI.10 Satellite Images Applied for the Analysis

XI.10.1 Satellite Vehicles and Imaging Sensors

In this analysis, the team exploited free satellite images which are available on the internet. The

² http://due.esrin.esa.int/page_globcover.php

images were obtained from 2 satellites, namely Landsat 8 and Sentinel-2A. Both of them are equipped with multispectral imaging sensors, go around the earth, and capture the ground frequently.

The Landsat 8 satellite was launched in February 2013 and is administered by National Aeronautics and Space Administration (NASA) and United States Geological Survey (USGS). The Landsat 8 images the entire earth every 16 days by the Operation Land Imager (OLI). The imageries collected by OLI are available to be downloaded at no charge from USGS's website.³ The spatial resolution of the image is 15 or 30 meters as Table XI.2.1.

The Sentinel-2A satellite was launched in June 2015 and is operated by European Space Agency (ESA). The satellites are equipped with the Multispectral Instrument (MSI) and captures the surface of the world from 56 degree South to 84 degree North. ESA processed the raw image obtained by MSI to Level-1C product and release it on the internet for free.⁴ The spatial resolution of the product is different from each band (See Table XI.2.1).

Table XI.2.1 Wavelength and Spatial Resolution of LANDSAT8/OLI and SENTINEL-2/MSI

Landsat 8			Sentinel-2A		
Band No	Wavelength Range, μm	Resolution	Band No	Central Wavelength, μm	Resolution
OLI 1	0.433–0.453(coastal/aerosol)	30 m	MSI 1	0.443 (aerosol)	60m
OLI 2	0.450–0.515(blue)	30 m	MSI 2	0.490 (blue)	10m
OLI 3	0.525–0.600(green)	30 m	MSI 3	0.560 (green)	10m
OLI 4	0.630–0.680(red)	30 m	MSI 4	0.665 (red)	10m
-	-	-	MSI 5	0.705 (vegetation classification)	20m
-	-	-	MSI 6	0.740 (vegetation classification)	20m
-	-	-	MSI 7	0.783 (vegetation classification)	20m
OLI 5	0.845–0.885(NIR)	30 m	MSI 8	0.842 (NIR)	10m
-	-	-	MSI 8A	0.865 (vegetation classification)	20m
-	-	-	MSI 9	0.945 (water vapor)	60m
-	-	-	MSI 10	1.375 (cirrus)	60m
OLI 6	1.560–1.660(SWIR-1)	30 m	MSI 11	1.610 (SWIR)	20m
OLI 7	2.100–2.300(SWIR-2)	30 m	-	-	-
OLI 8	0.500–0.680(Pan)	15 m	-	-	-
OLI 9	1.360–1.390(Cirrus)	30 m	-	-	-
-	-	-	MSI 12	2.190 (snow/ice/cloud)	20m

Source: <https://landsat.usgs.gov/what-are-band-designations-landsat-satellites>

<https://earth.esa.int/web/sentinel/user-guides/sentinel-2-msi/resolutions/spatial>

Each operating agency assigns the numbers to each footprint of an image. USGS put WRS Path No. and WRS Row No. on each image and ESA allocated Tile No. for all products. WRS is an abbreviation of "World Reference System", which is a global notation system for Landsat data. WRS (Path, Row) = (113, 55), (112, 55) were employed in this analysis. For the Tile Number of MSI, T51NXH veils the MMIP area. Figure XI.2.3 shows the footprint of WRS No. and Tile No. of OLI and MSI respectively.

Table XI.2.2 shows OLI Level-1 products and MSI Level-1C products applied for the analysis. The analysis was separately conducted for each irrigation service area, i.e. Marigadao SA, Stage I Upper Malitubog SA, Stage II Upper Malitubog SA, Pagalungan Extension SA, and Lower Malitubog SA. The

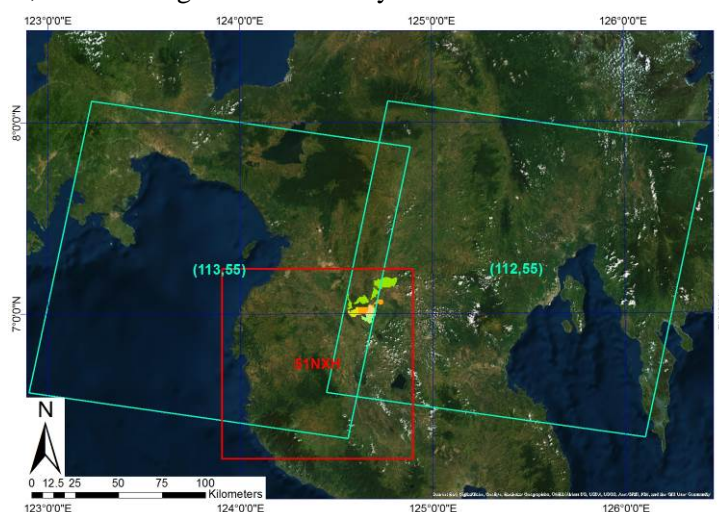


Figure XI.2.3 WRS No. and Tile No. of Applied Images over MMIP Area

Source: JICA Survey Team

³ <https://landsatlook.usgs.gov/>

⁴ <https://scihub.copernicus.eu/dhus/#/home>

images were selected based on the cloud cover over each area and whether they were captured during assumed cropping season of paddy.

Based on the methodology of the analysis mentioned in Section XI.11, as many scenes covering each irrigation service area during the cropping season as possible should be applied for the analysis. Although, due to the climate in Mindanao area, there were much clouds seen in the satellite images. Applied images showed in Table XI.2.2 contains relatively less clouds. The total numbers of utilized scenes were 15 for Maridagao SA, 18 for Upper Malitubog SA (Stage I), 19 for Upper Malitubog SA (Stage II), 10 for Lower Malitubog SA, and 20 for Pagalungan Ext. SA. Especially for Lower Malitubog SA, the number of available images was less than any other service areas due to much clouds.

Table XI.2.2 List of OLI Products and MSI Products Applied for the Analysis

Acquisition Date			Satellite ¹	Stage I		Stage II		
yyyy	mm	dd		Maridagao ²	Upper Malitubog	Upper Malitubog	Lower Malitubog	Pagalungan Ext.
2015	10	28	L				✓	✓
2015	11	13	L					✓
2015	11	29	L					✓
2015	12	04	S	✓	✓	✓	✓	✓
2015	12	15	L					✓
2015	12	22	L	✓	✓	✓	✓	✓
2015	12	31	L					
2016	02	01	L	✓	✓	✓		✓
2016	02	08	L		✓	✓	✓	✓
2016	02	17	L			✓		
2016	02	24	L		✓			✓
2016	03	03	S	✓	✓	✓		✓
2016	04	02	S	✓	✓	✓	✓	✓
2016	04	05	L	✓	✓	✓		✓
2016	04	12	L		✓			
2016	05	07	L	✓	✓	✓		
2016	05	14	L			✓		
2016	05	25	S	✓	✓			✓
2016	07	21	S	✓	✓	✓	✓	✓
2016	08	02	L		✓	✓	✓	✓
2016	08	11	L	✓	✓	✓		✓
2016	08	30	S	✓	✓	✓	✓	✓
2016	10	09	S	✓		✓	✓	✓
2016	11	22	L			✓	✓	✓
2016	11	28	S	✓	✓	✓		✓
2016	12	01	L	✓	✓	✓		
2016	12	25	S		✓	✓		
2016	12	28	S	✓				

Source: JICA Survey Team

Note: 1) L = Landsat8 / OLI, S = Sentinel-2A / MSI

2) Maridagao SA sometimes straddles the footprint frame of OLI products, so that 2 images of 22-31 Dec, 2015 and 1-8 Feb, 2016 were mosaiced.

XI.10.2 Image Preprocessing

As OLI Level-1 product and MSI Level-1C product downloaded from USGS's website and ESA's website respectively are the row data, it requires the calibration before proceeding the analysis. The calibration comprised following 2 steps, i.e. 1) Radiometric Calibration and 2) Dark Subtraction.

3) Seamless Mosaic below was conducted for only Maridagao Service Area because the area sometimes straddles the footprints of OLI product. Besides, 4) Resampling was conducted for OLI product and its pixel size was altered from 30 meter to 10 meter as the spatial resolution of OLI product is different from that of MSI product (See Table XI.2.1). Finally, both of products often contains the cloud cover over the target area. To avoid the effect of clouds on the analysis, 5) Cloud Mask was conducted for both of OLI products and MSI products.

1) Radiometric Calibration

The radiometric calibration attempts to compensate the radiometric errors from sensor's defects, the variations in the scan angle, and system noise and produces an image which represents the true spectral radiance at the sensor location. Landsat Level-1 product includes Metadata (MTL file) together with the image data. It helps the calibration of the imagery to radiance, reflectance, or brightness temperatures with available options depending on what the metadata of the imagery includes.

2) Dark Subtraction

Dark subtraction is to remove the effects of atmospheric scattering by subtracting a pixel value that represents a background signature from each band of an image. It is conducted by Band Minimum Subtraction to gain a minimum DN (Digital Number) value of each spectral band.

3) Seamless Mosaic

Maridagao Service Area sometimes straddles (113, 55) and (112, 55) of OLI footprint. Seamless mosaic was conducted by overlapping 2 images for only Maridagao Service Area. The individual bands were mosaiced with feathering technique to blend image boundaries with 15 pixel of distance. Only 2 mosaic images of December 2015 and February 2016 were created for Maridagao Service Area (See Table XI.2.2).

4) Resampling

The pixel size of OLI product was converted from 30 meter into 10 meter by resampling in order to conduct the pixel-based statistics between OLI product and MSI product. OLI product was resampled based on Nearest Neighbor Assignment which determine the location of the closest cell center on the input image and assign the value of that cell to the cell on the output image.

5) Cloud Mask

Scattered clouds and their shadows were often seen in the images covering the MMIP area. It was necessary to mask the clouds and the shadows as they affect the result of the analysis. The cloud and their shadows have the effect on the vegetation index and the water index respectively which were employed for this analysis (see Section XI.11.1). The masks of clouds and shadows were visually created on the GIS software and they were erased from the image. Though MSI Level-1C product owns the cloud mask information and it can be used for removing the cloud on the image processing software, the cloud shadow cannot subtract from the image by that method. The cloud mask data on the product has not utilized in this analysis.

XI.11 Methodology and Algorithm for Identifying Crops

XI.11.1 Methodology

1) Calculation of NDVI and NDWI

Two (2) indices employed in this analysis were Normalized Difference Vegetation Index (NDVI) and Normalized Difference Water Index (NDWI). These indices are very popular and fundamental among the remote sensing technology. They are calculated by the simple band operation between multispectral bands. In the analysis, NDVI images and NDWI images covering the cropping season were generated from each original image and were utilized for identifying crops.

NDVI is calculated by using the two bands of the electromagnetic spectrum, i.e. the visible red (OLI 4 and MSI 4) and the near-infrared (OLI 5 and MSI 8) as is shown by following equation. This

calculation yields a value between -1 and 1 (Tucker, 1979⁵). NDVI assess whether the pixel contains live green vegetation or not.⁶

$$\begin{aligned} \text{NDVI} &= (\text{NIR} - \text{Red}) / (\text{NIR} + \text{Red}) \\ &= (\text{OLI 5} - \text{OLI 4}) / (\text{OLI 5} + \text{OLI 4}) \quad \text{for Landsat 8 Level-1 Product} \\ &= (\text{MSI 8} - \text{MSI 4}) / (\text{MSI 8} + \text{MSI 4}) \quad \text{for Sentinel-2A Level-1C Product} \end{aligned}$$

NDWI enhances the spectral reflectance of surface water bodies. By utilizing NDWI, the open water and the submersion of paddy can be found out. NDWI was calculated by 2 bands, namely green band (OLI 3 and MSI 3) and the shortwave infrared band (OLI 6 and MSI 11). The formula is similar to that of NDVI and yields a value from -1 to 1.

$$\begin{aligned} \text{NDWI} &= (\text{Green} - \text{SWIR}) / (\text{Green} + \text{SWIR}) \\ &= (\text{OLI 3} - \text{OLI 6}) / (\text{OLI 3} + \text{OLI 6}) \quad \text{for Landsat 8 Level-1 Product} \\ &= (\text{MSI 3} - \text{MSI 11}) / (\text{MSI 3} + \text{MSI 11}) \quad \text{for Sentinel-2A Level-1C Product} \end{aligned}$$

2) Change of NDVI and NDWI

During the cropping season, paddy, maize and tree crops, e.g. coconut, mango, rubber, and oil palm are planted in the MMIP area. To classify each crop, the range of NDVI change and the high NDWI, i.e. existing of water surface must be observed. Shown in Figure XI.2.5 is the actual NDVI change and NDWI change in Maridagao SA of rainy season and Lower Malitubog SA of dry season. Sampling point in the Figure was put for each land use area and NDVI and NDWI were sampled on the point from series of images covering the assumed cropping season (see Figure XI.2.8).

NDVI is influenced by the active vegetation, so that, in cropped area of paddy and maize, it shows low value at the beginning of cropping season, high value in the maturing season, and low value before and after the harvesting season. For cropped area, the range of this NDVI change is high. Tree crop and forest exist in low range area. In case of the non-cropped area, the range is middle. In Figure XI.2.4, the image describing the range of NDVI change in Maridagao SA and Lower Malitubog SA is shown.

High NDWI value was employed for distinguishing paddy from the cropped area including maize. The submersion must be seen on paddy during planting season, so that if the area shows high range of NDVI change and high NDWI at the beginning of cropping season, the area was categorized as paddy. In case no water body was observed, maize must be planted in that area. (see Figure XI.2.4)

⁵ <https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19780024582.pdf>

⁶ <https://earthobservatory.nasa.gov/Features/MeasuringVegetation/>

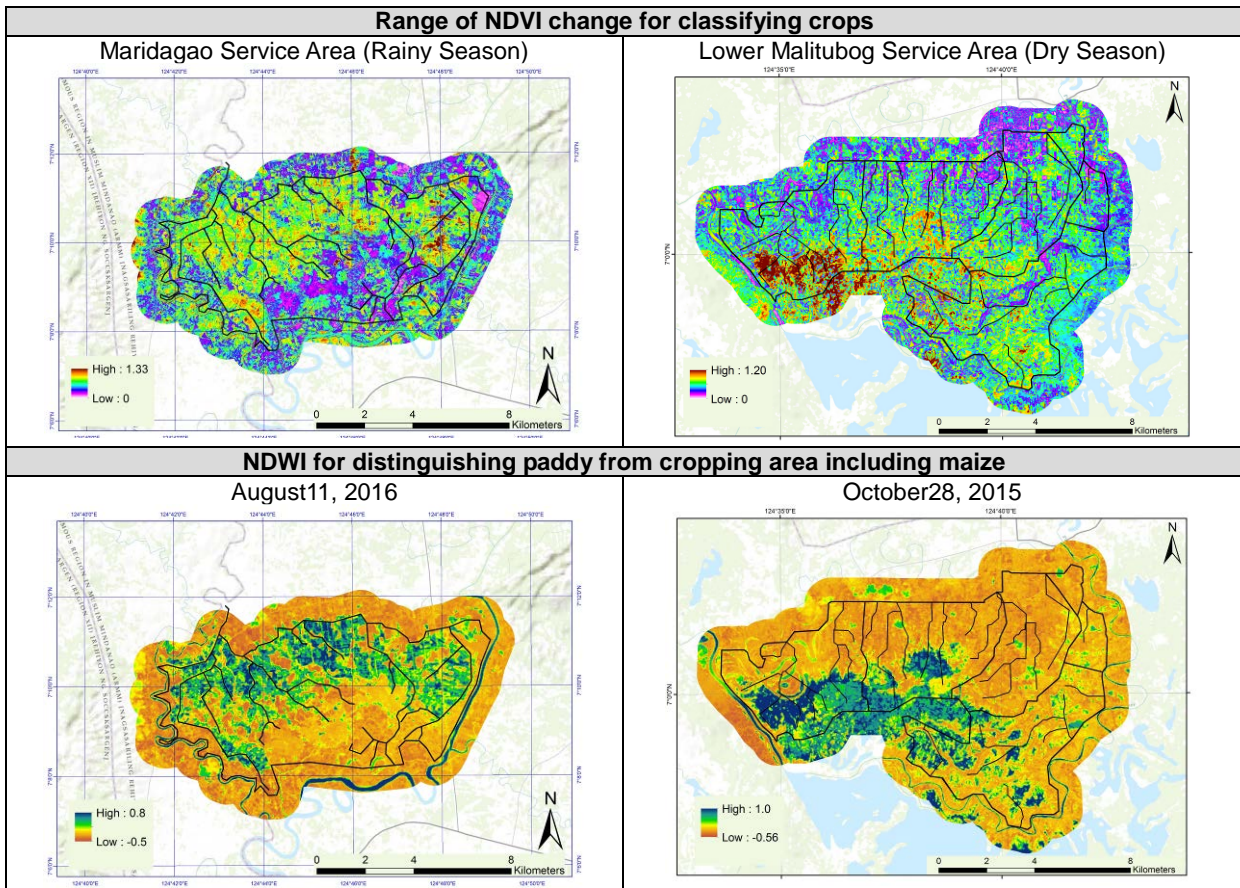
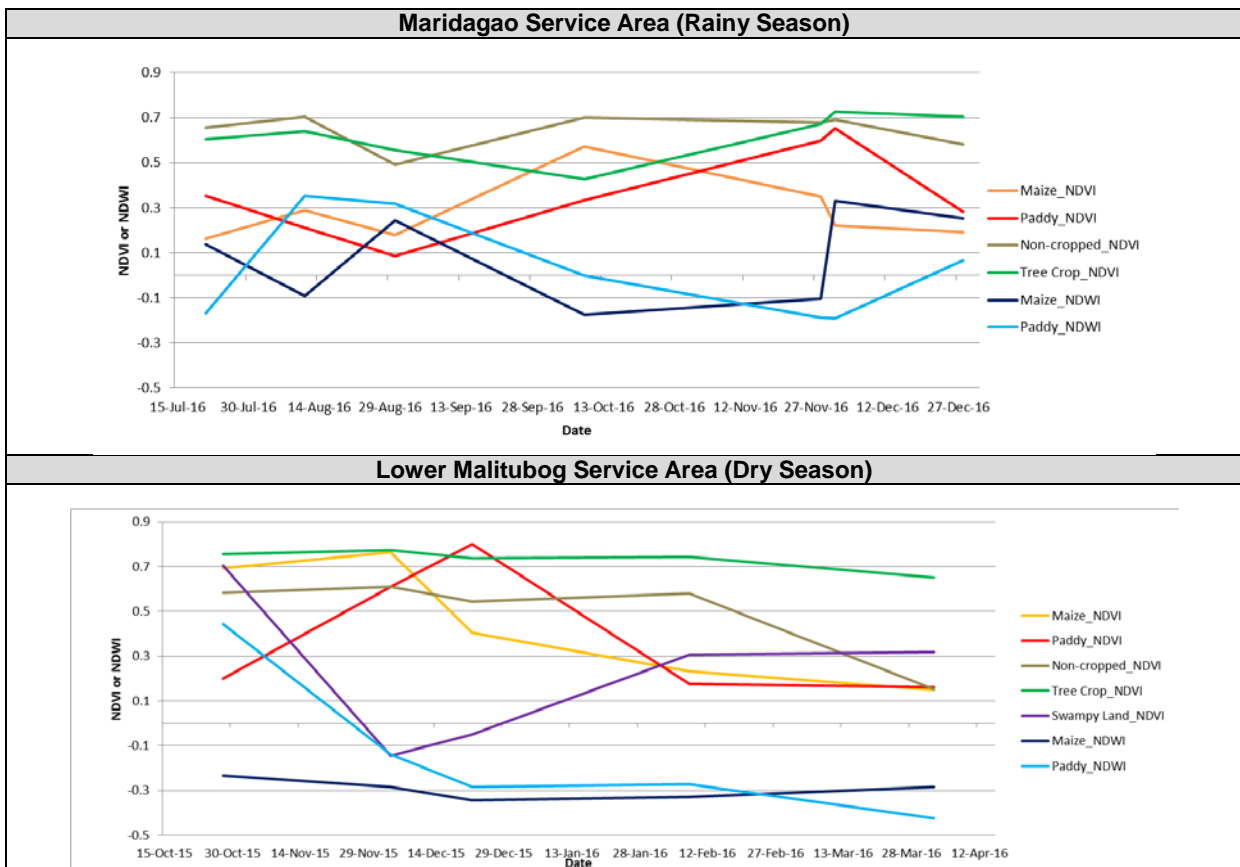
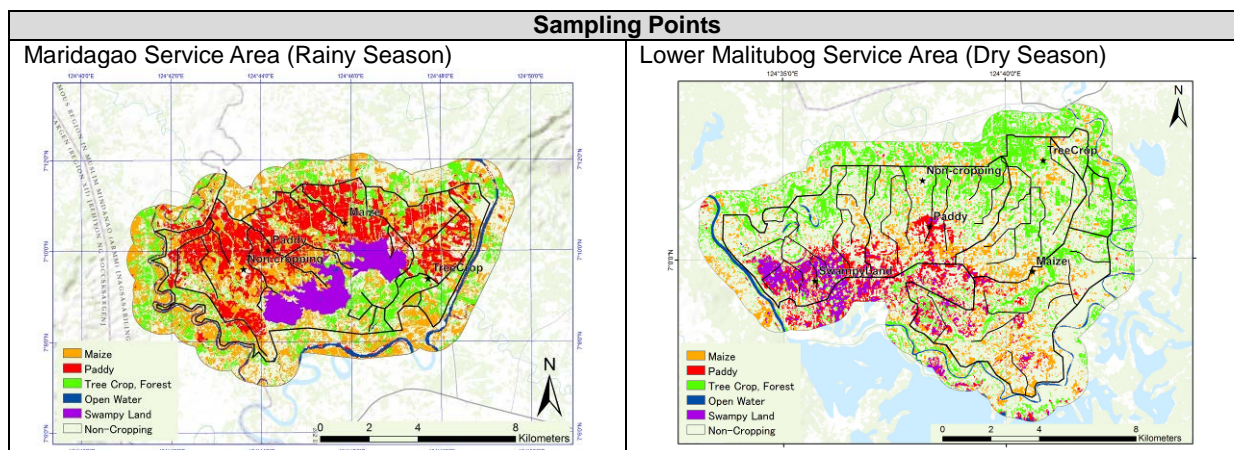


Figure XI.2.4 Range of NDVI change and NDWI of Planting Season

Source: JICA Survey Team





Note: Swampy Land in Malidagao SA was visually identified, so that no index was sampled.

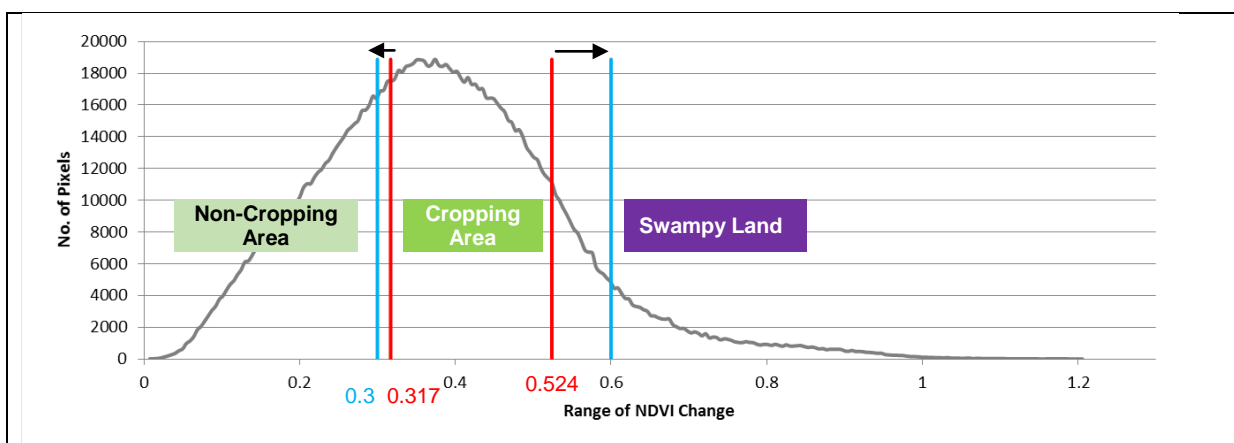
Figure XI.2.5 Actual NDVI change and NDWI change

Source: JICA Survey Team

3) Threshold

The threshold for the range of NDVI change and NDWI value must be set for classifying the land use, i.e. Maize, Paddy, Tree Crop or Forest, Non-cropping, and Swampy Land, and for determining the area of Open Water respectively. In this analysis, the thresholds were basically decided by Jenks Natural Breaks algorithm and increased or decreased slightly based on seeing Sentinel-2A images and images available on Google Earth.

Jenks Natural Breaks algorithm⁷ is based on the natural groupings inherent in the data. Class breaks are identified that best group similar values and that maximize the differences between classes. The range of NDVI and NDWI value are divided into classes whose boundaries are set where there are relatively big differences in the data values. Figure XI.2.6 describes the example of original Jenks Natural Breaks and the adjustment of threshold for classifying Lower Malitbog Service Area of dry season into Cropping area (Maize or Paddy), Non-cropping area, and Swampy Land. This classification was employed for the algorithm shown in Figure XI.2.12.



⁷ The detail of Jenks Natural Breaks Algorithm is available at following online book. http://www.spatialanalysisonline.com/HTML/?classification_and_clustering.htm

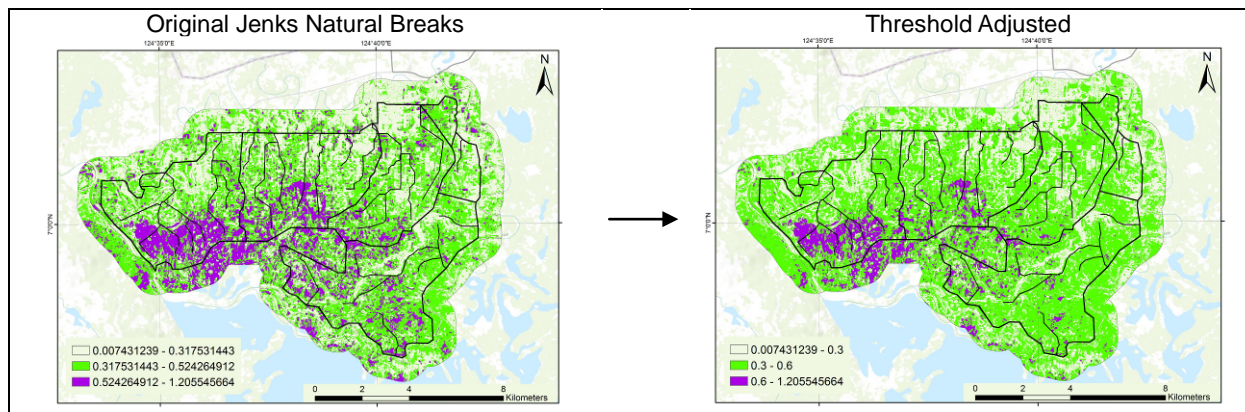


Figure XI.2.6 Example of Adjustment of Threshold (LMSA of Dry Season)

Source: JICA Survey Team

4) Field Survey

Normally, above mentioned adjustment of threshold should be conducted with the field survey. Although, because of the security problem and the flood in the project area, the team visited the limited area for only 2 days. So, the adjustment in this analysis was done by looking at available satellite images of sentinel-2A products or on Google Earth. Pictures shown in this section were taken within the 2-day field survey and are the assumed scenes which were utilized for the key of the classification, e.g. the submersion of paddy, maize production, tree crop area, swampy land, and open water.

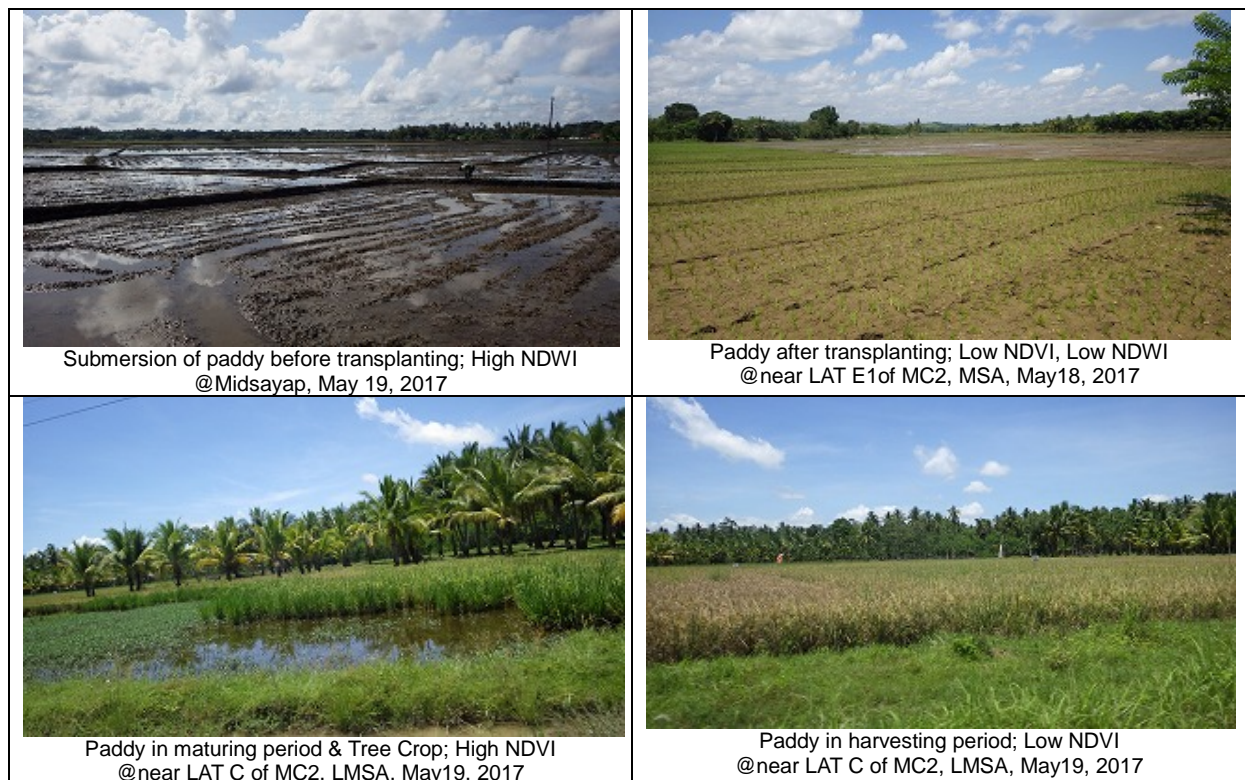




Figure XI.2.7 Scenes of the Key of Analysis

Source: JICA Survey Team

XI.11.2 Algorithms for Each Irrigation Service Area

The algorithms for identifying crops are different among service areas due to the availability of images. Figure XI.2.8 shows the supposed cropping pattern of each service area and the availability of images. The algorithms of each service area follow the figure.

For the irrigated area, namely Maridagao SA and Upper Malitubog SA (Stage I and II), the submersion of paddy during transplanting season could be seen by high NDWI in February to March and July to August. Thanks to the irrigation water, the surface water appears on the field at the same time in short period especially in Maridagao SA and Stage I Upper Malitubog SA where the construction had been completed before. Regarding Stage I Upper Malitubog SA, though its construction has also finished, the water distribution for the area might be limited in 2015 – 2016 season. The clearer spread of surface water on the field could not be observed in Stage II Upper Malitubog SA than that of aforementioned two service areas.

In non-irrigate area, i.e. Lower Malitubog SA and Pagalungan Extension SA, it was supposed in this analysis that the cropping season of rainfed rice is from October to March and from June to November, namely dry season paddy and rainy season paddy respectively. Although it is expected that each farmer in this area decides the timing of planting by, for example, weather condition of the season, it was considered in this analysis that dry season paddy and rainy season paddy are started to be planted by residual moisture of rainy season and by the rain in the beginning of rainy season respectively. These cropping period might be major among the Project area.

Supposed Cropping Pattern in Maridagao SA and Upper Malitubog SA

Crop	2015	2016												Remarks	
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Tree Crop	[Green bar spanning Dec 2015 to Dec 2016]												Banana, Coconut, Oil Palm, Mango, Rubber, etc		
Irrigated Rice		[Light green bar: Jan-Mar 2016]						[Light green bar: Aug-Sep 2016]							
Maize		[Yellow bar: Jan-Mar 2016]						[Yellow bar: Aug-Sep 2016]							No Clear Cropping Pattern
Irrigation Water		[Blue arrow: Jan-Mar 2016]						[Blue arrow: Aug-Sep 2016]							

Image Availability

Maridagao	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲				
(Date)	4	22	31	1-8	3	2,5	7	25		21	11	30	9	28	1	28		
Upper Malitubog(Ph1)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲		
(Date)	4	22		1,8	24	3	2,5	12	7	25		21	2,11	30		28	1	25
Upper Malitubog (Ph2)	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
(Date)	4	22		1,8	17	3	2,5	7,14		21	2,11	30	9	22,28	1	25		

Supposed Cropping Pattern in Lower Malitubog SA and Pagalungan Ext. SA

Crop	2015	2016												Remarks	
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct		Nov
Tree Crop	[Green bar spanning Oct 2015 to Nov 2016]												Banana, Coconut, Oil Palm, Mango, Rubber, etc		
Rainfed Rice		[Light green bar: Oct-Dec 2015]						[Light green bar: Jul-Sep 2016]							
Maize		[Yellow bar: Oct-Dec 2015]						[Yellow bar: Jul-Sep 2016]							No Clear Cropping Pattern

Image Availability

Lower Malitubog	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲					
(Date)	28		4	22		8		2		21	2	30	9	22					
Pagalungan Ext.	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲					
(Date)	28	13	29	4	15	22		1,8	24	3	2,5	25		21	2,11	30	9	22	28

Figure XI.2.8 Supposed Cropping Pattern and Image Availability

Source: JICA Survey Team

The major difference among following flowcharts is the way of classifying Swampy Land. Swampy Land in Maridagao SA, Stage II Upper Malitubog SA, and Pagalungan Extension SA was visually categorized with utilizing Google Earth images. Because its range of NDVI change is low and the same as that of tree crop or forest, namely it keeps green throughout a year, it was unfeasible to employ the range of NDVI change to categorize it. On the other hand, swampy land in Lower Malitubog SA changes its shape every month as LMSA exists in Liguasan marsh. The inundation occurs frequently and the water weed appears on farmlands. Because the swampy land had tendency to show higher range of NDVI change than that of other area, high range of NDVI change was utilized in this analysis. (refer to Figure XI.2.4)

1) Maridagao Service Area

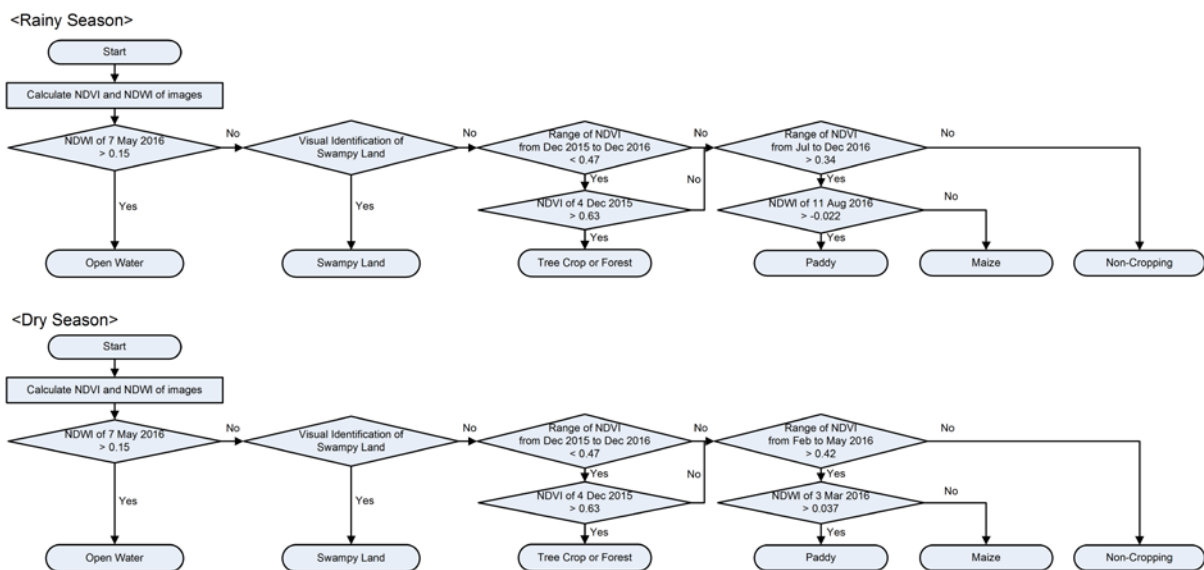


Figure XI.2.9 Algorithm for Maridagao Service Area

Source: JICA Survey Team

2) Stage I Upper Malitubog Service Area

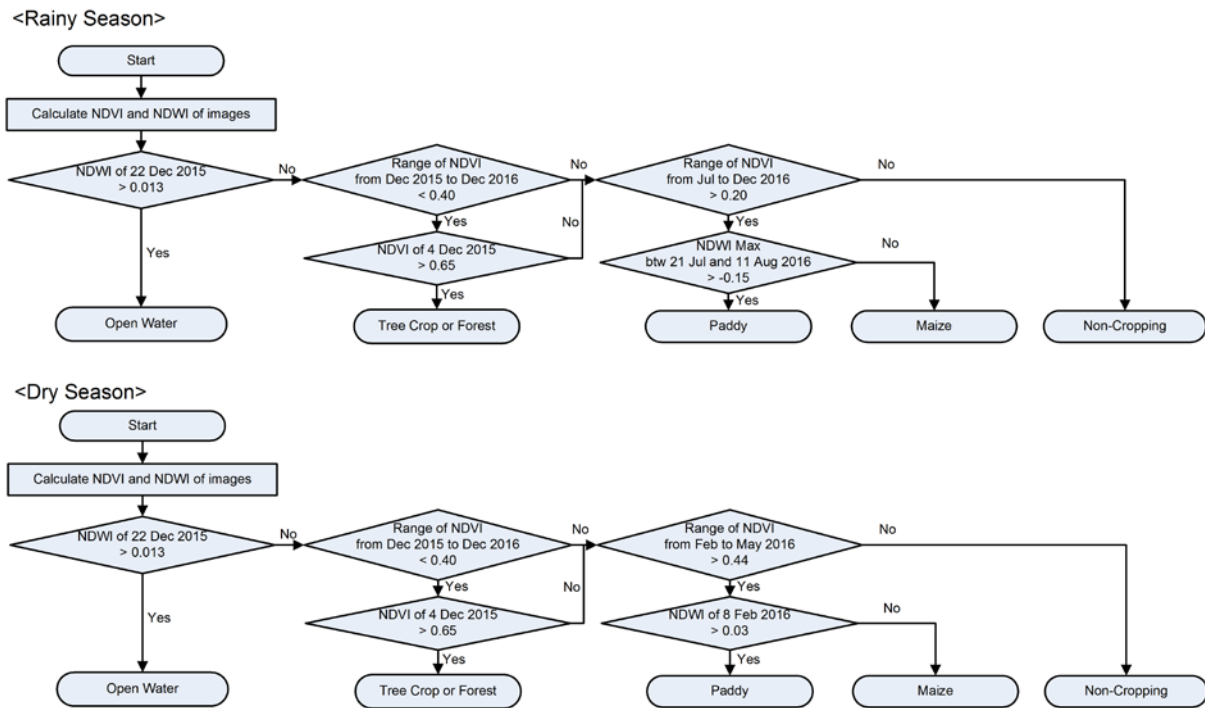


Figure XI.2.10 Algorithm for Stage I Upper Malitubog Service Area

Source: JICA Survey Team

3) Stage II Upper Malitubog Service Area

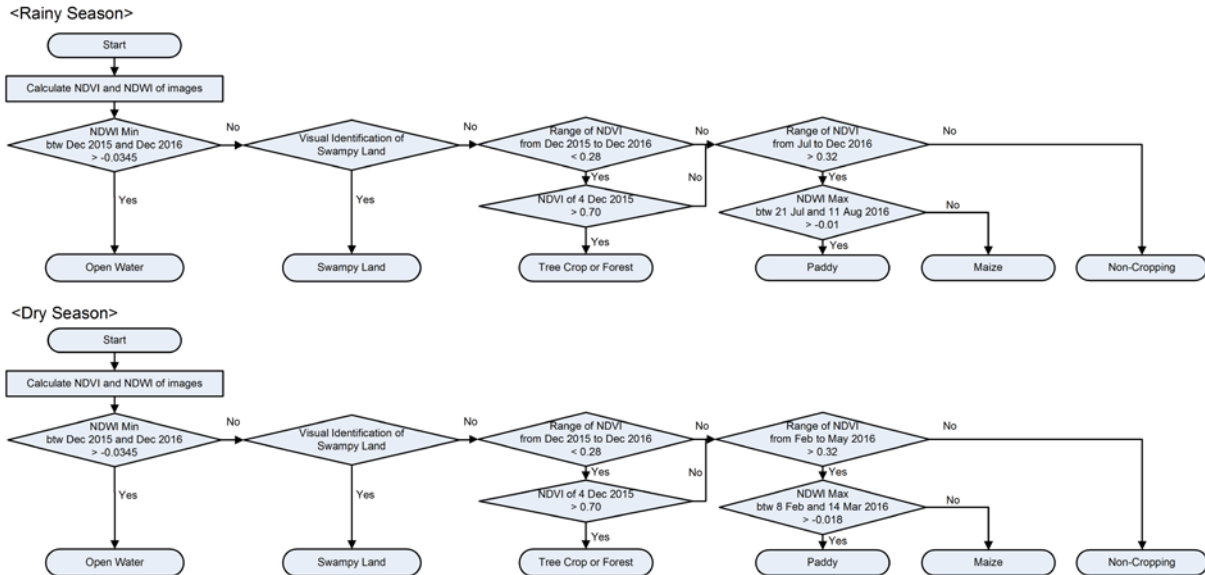


Figure XI.2.11 Algorithm for Stage II Upper Malitubog Service Area

Source: JICA Survey Team

4) Lower Malitubog Service Area

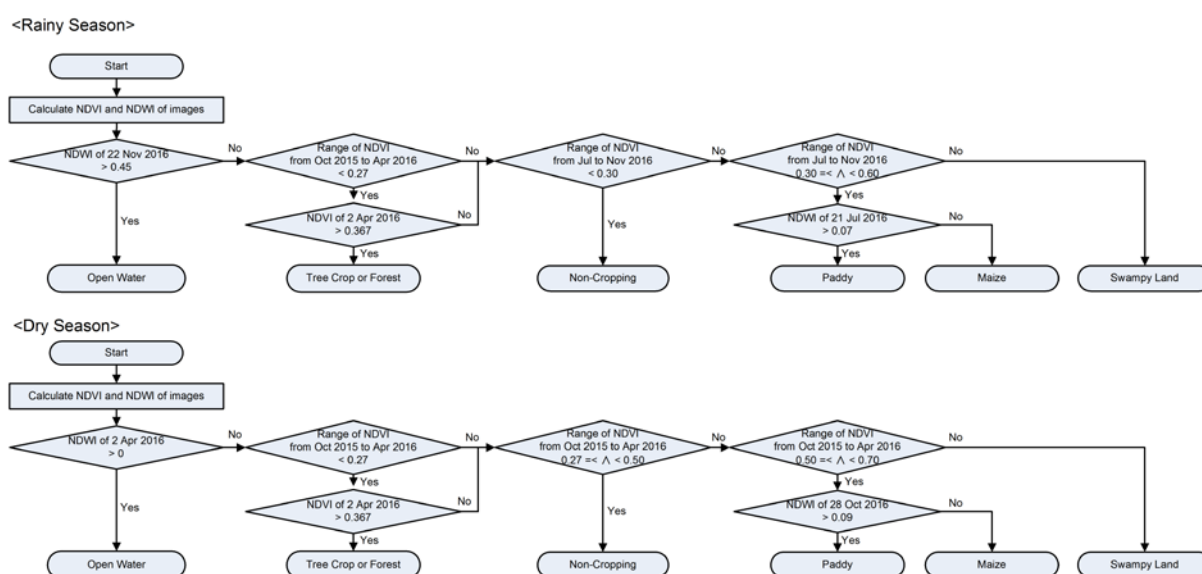


Figure XI.2.12 Algorithm for Lower Malitubog Service Area

Source: JICA Survey Team

5) Pagalungan Extension Service Area

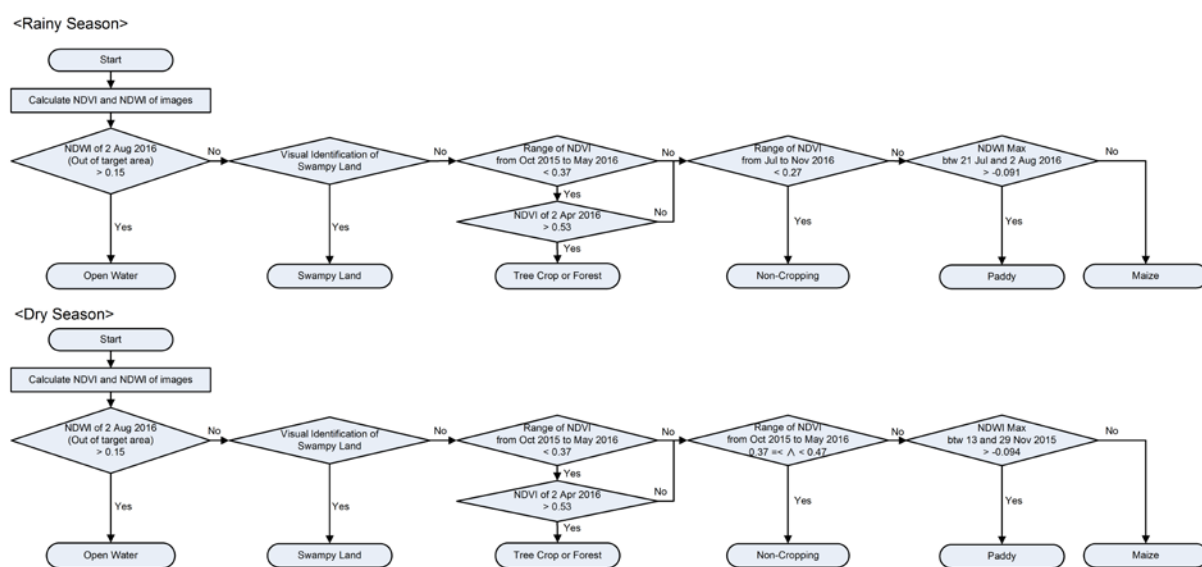


Figure XI.2.13 Algorithm for Pagalungan Extension Service Area

Source: JICA Survey Team

XI.12 Quantitative Evaluation of Agricultural Land Use

Agricultural land use of each service area in rainy season and dry season analyzed from satellite images is described in Section 2.3.2 of Main Report. Shown here is the additional information derived from this analysis.

XI.12.1 Agricultural Land Use of MMIP Area by Municipalities

As can be seen in Figure XI.2.1, MMIP area exists in 5 municipalities, i.e. Pikit, Carmen, Datu Montwal (former Pagagawan), Pagalungan, and Alesan. Table XI. 2.3 shows the agricultural land use of MMIP area in each Municipality. As is mentioned in Section 2.3.1 of Main Report, the statistical data of crop production in Pikit Municipality should alternate the crop production in the Project area.

In comparison with the harvested area of paddy from the statistical data, i.e. 5,922.7 ha in a year, the total cropped area of paddy in Pikit Municipality derived from this analysis, i.e. 4,216 ha in a year, covers 71% of it. In case of maize production in Pikit Municipality, the result of this analysis, i.e. 4,594 ha per year, covers 62% of the statistical data, i.e. 7393.6 ha per year (see Table 2.3.1 in Main Report). It is guessed that Pikit Municipality owes the paddy production to MMIP area in comparison to the maize production.

Table XI.2.3 Agricultural Land Use of MMIP Area in Each Municipality, ha

Municipality	Season	Cropped		Non-cropped	Tree crop, Forest	Swampy Land	Open Water
		Paddy	Maize				
Pikit	Rainy	2,000	2,538	6,081	1,909	217	1,394
	Dry	2,216	2,056	7,508	1,978	360	22
Carmen	Rainy	1,122	666	875	495	349	8
	Dry	1,198	623	842	495	349	8
Datu Montawal	Rainy	551	548	615	296	357	4
	Dry	582	512	623	296	357	4
Pagalungan	Rainy	354	344	805	245	0	0
	Dry	467	246	790	245	0	0
Aleosan	Rainy	22	45	205	31	0	0
	Dry	0	102	171	31	0	0

Source: JICA Survey Team

XI.12.2 Cropping System of Each Service Area

Overlaying the agricultural land use images of rainy season and dry season makes it possible to export the map describing the cropping system. Maize cropped area, paddy cropped area and non-cropped area were picked from each land use map and each area of rainy season was crossed with that of dry season. As a result, each area was categorized into 9 types of cropping system (see Table XI.2.4). In case of Lower Malitubog SA, “NonCropping” area includes not only non-cropped area but also open water area and swampy land area because there is some possibility that farmers use the land under water or water weed in rainy season as farms in dry season. The contrary is also possible.

Table XI.2.4 shows the area of each cropping system in MMIP area exported from the maps in Figure XI.2.13. Although the maps include 1,000 meter buffer area with the service area, the numbers shown in the table cover only the service area. Cropped or non-cropped area in 1,000 meter buffer area is not included in this table.

Regarding Maridagao SA and Upper Malitubog SA (Stage I), Paddy – Paddy cropping is major among the cropping systems. 29 % and 41 % of MSA and UMSA (I) respectively were covered by Paddy – Paddy cropping. On the other hand, though the construction of UMSA (II) was also completed, Paddy – Paddy cropping covers no more than 11 % in 2016. For LMSA and PSA where the construction is being conducted or to be conducted, 42 % and 46% of total area is cropped in present situation respectively. It is expected that these area will be converted to Paddy – Paddy cropping in the future.

Table XI.2.4 Area of Each Cropping System in MMIP Area, ha

Cropping System		Service Area				
Rainy Season	- Dry Season	Maridagao	Upper Maritubog (I)	Upper Malitubog (II)	Lower Malitubog	Pagalungan Ext.
Paddy	- Paddy	1,406	600	361	105	62
Maize	- Maize	482	95	167	302	119
Maize	- Paddy	378	131	214	48	3
Paddy	- Maize	424	94	141	70	40
Maize	- NonCropping	533	130	336	1,161	61
Paddy	- NonCropping	33	35	287	336	62
NonCropping	- Maize	391	46	581	700	115
NonCropping	- Paddy	207	114	124	502	21

NonCropping	-	NonCropping	1,017	235	1,076	4,449	569
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Source: JICA Survey Team

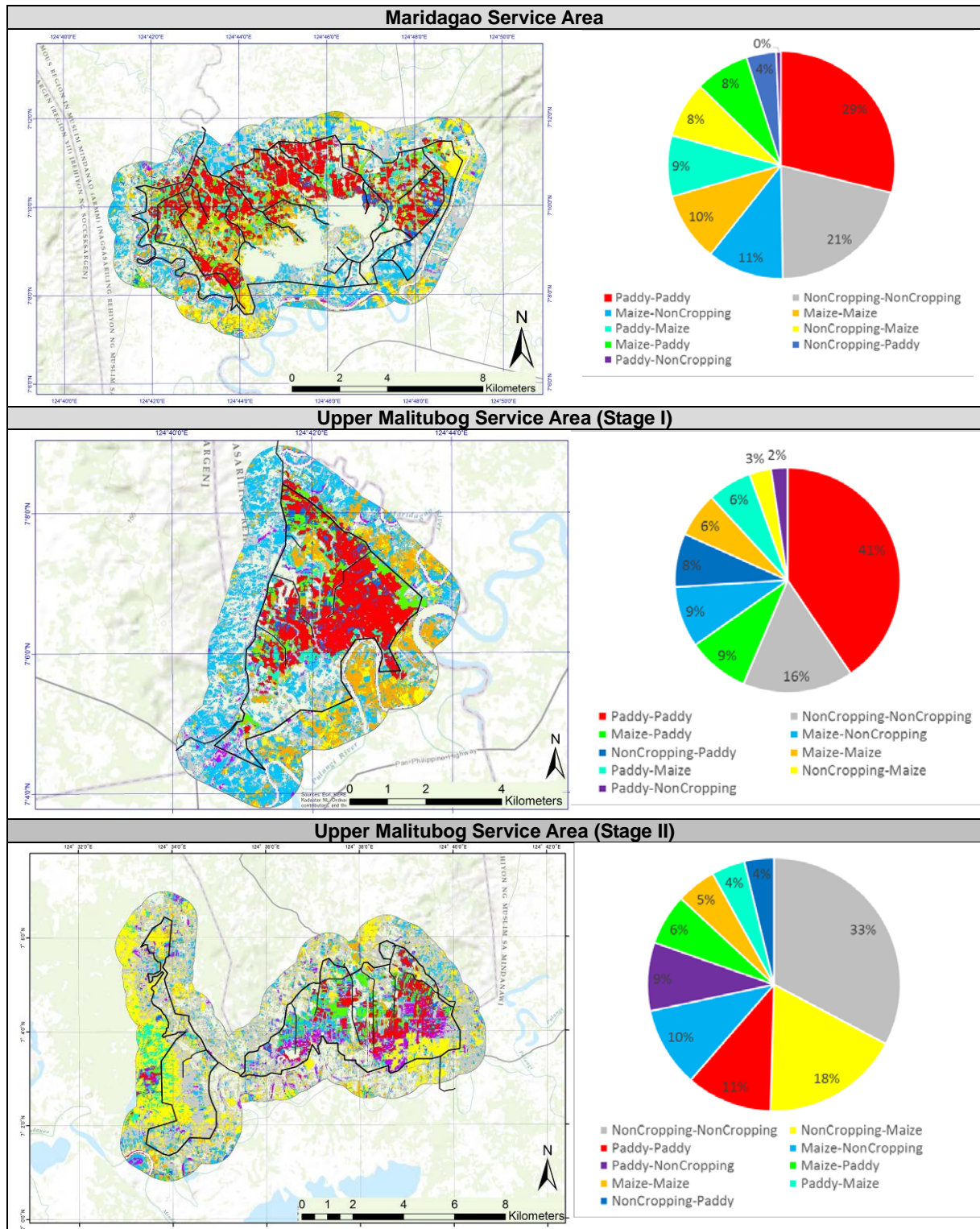


Figure XI.2.14 Cropping System of Each Service Area (1/2)

Source: JICA Survey Team

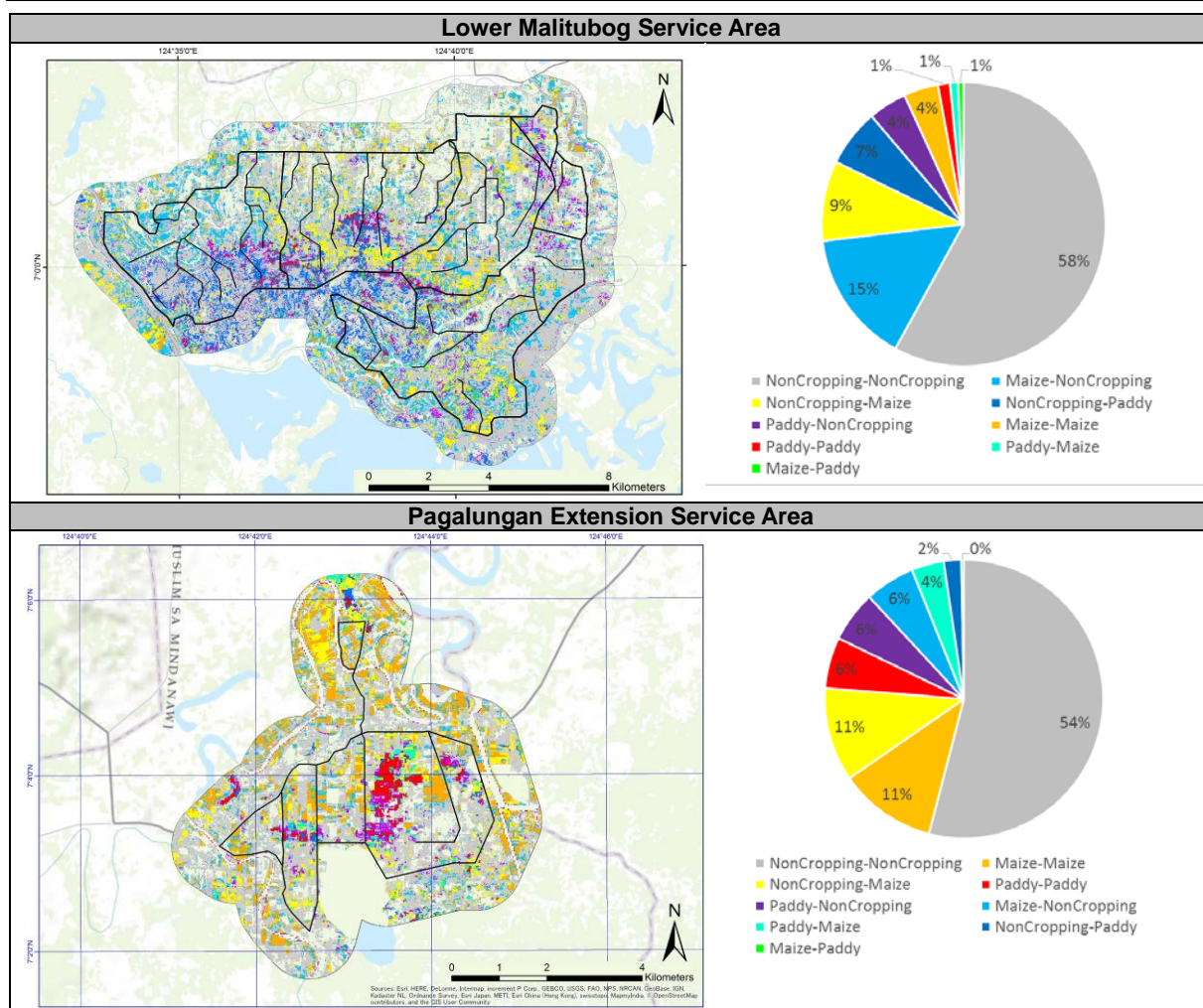


Figure XI.2.14 Cropping System of Each Service Area (2/2)

Source: JICA Survey Team

XI.13 Maps

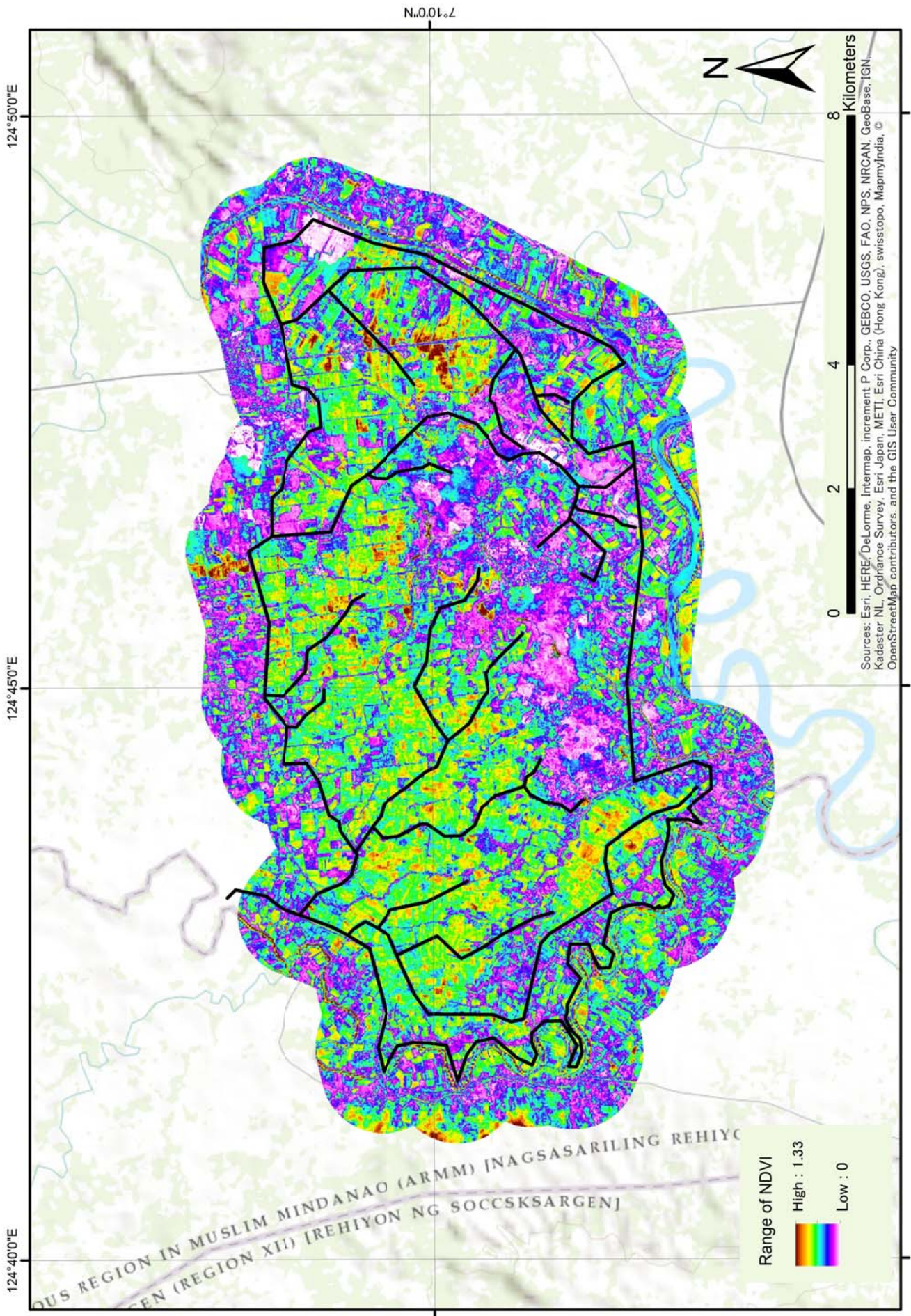
Maps attached herewith are showing 1) range of NDVI change which were employed to classify cropped area and non-cropped area, 2) NDWI which utilized to distinguish paddy from cropping area including maize, and 3) the agricultural land use map in rainy season and dry season.

Table XI.2.5 List of Maps

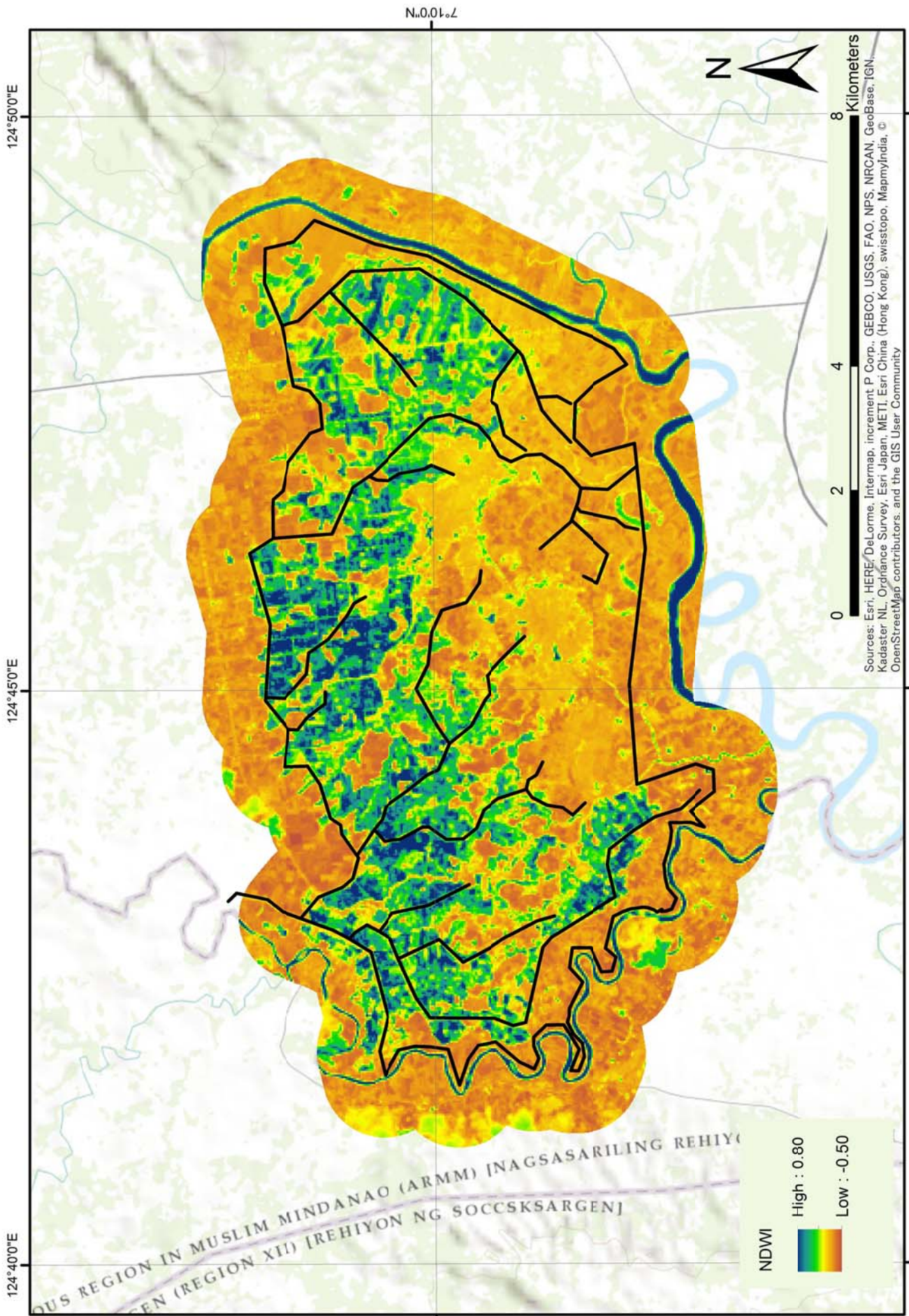
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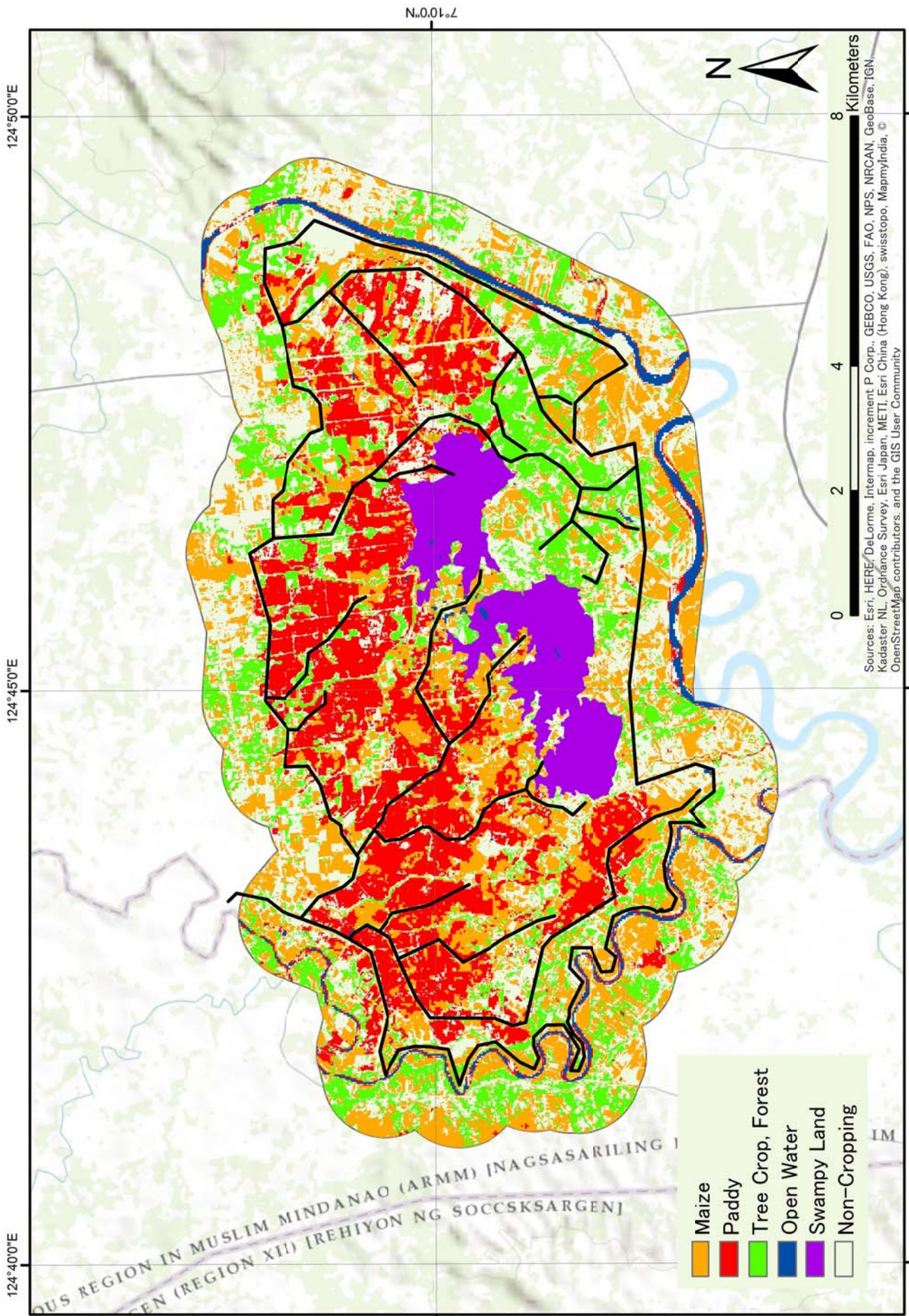
XI. 2. 16	Range of NDVI Change from Feb to May 2016 of Stage II Upper Malitubog Service Area	XI-80
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Source: JICA Survey Team

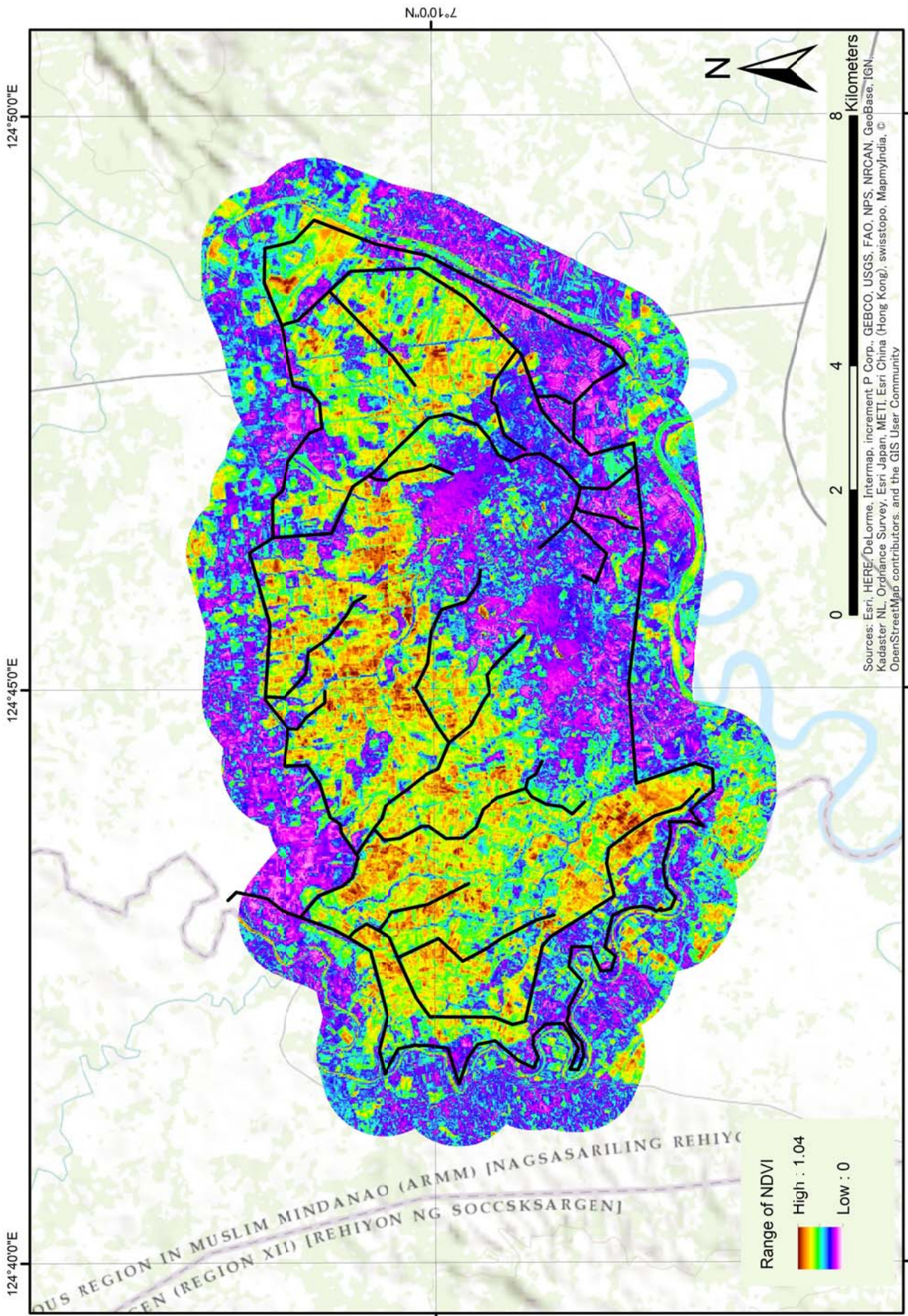


Map XI.2.1 Range of NDVI Change from Jul to Dec 2016 of Maridagao Service Area

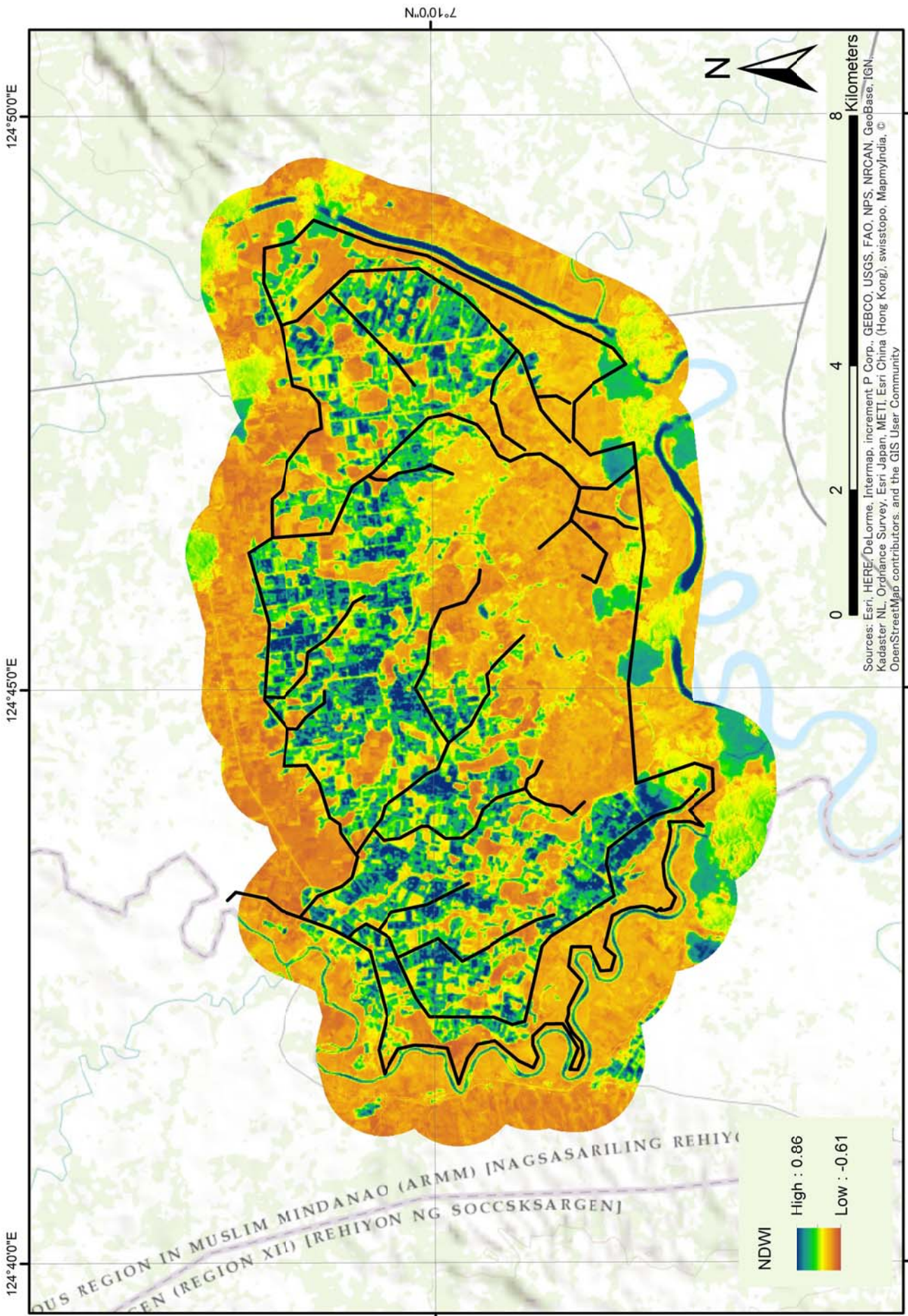




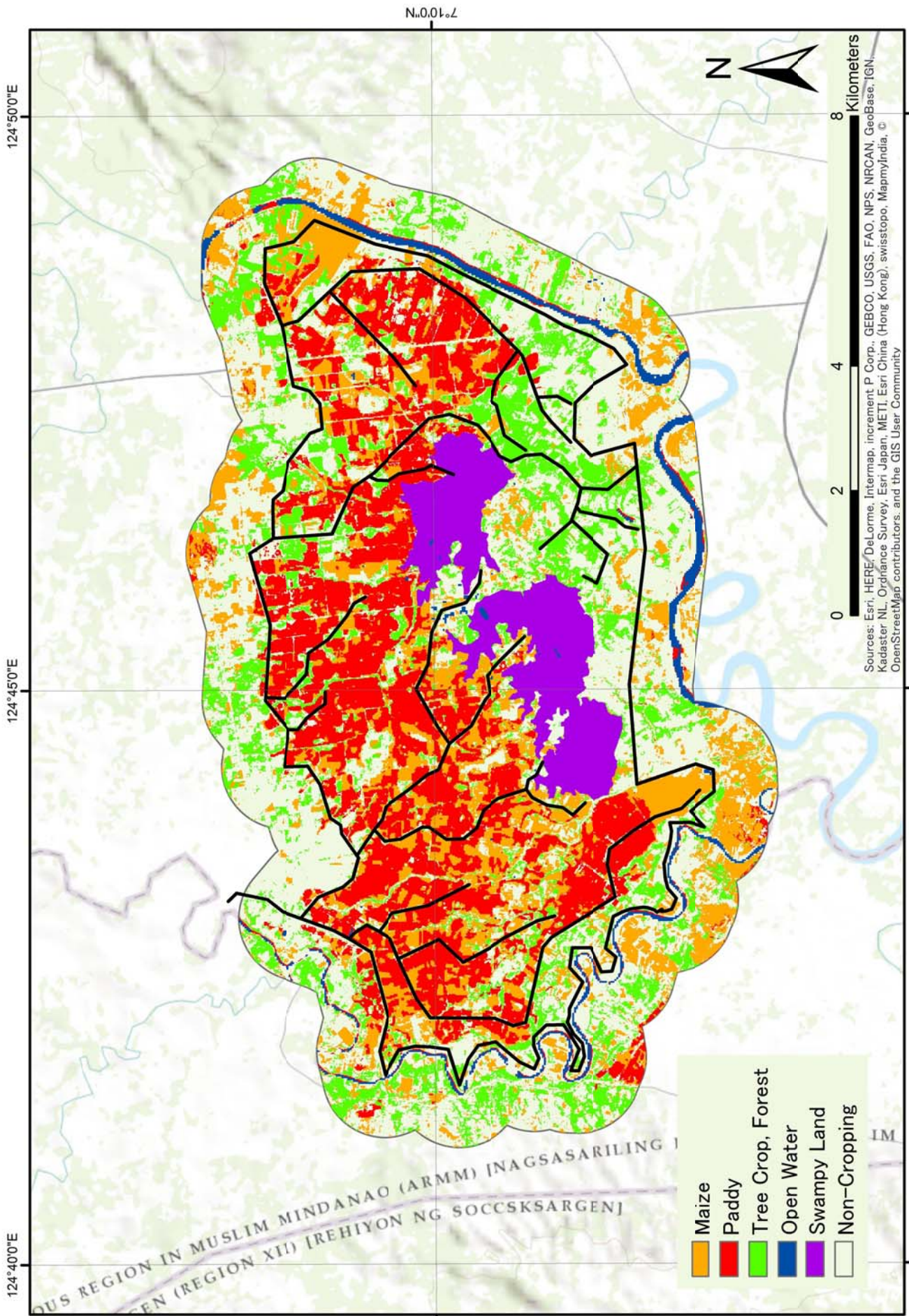
Map XI.2.3 Agricultural Land Use of Maridagao Service Area in Rainy Season, 2016



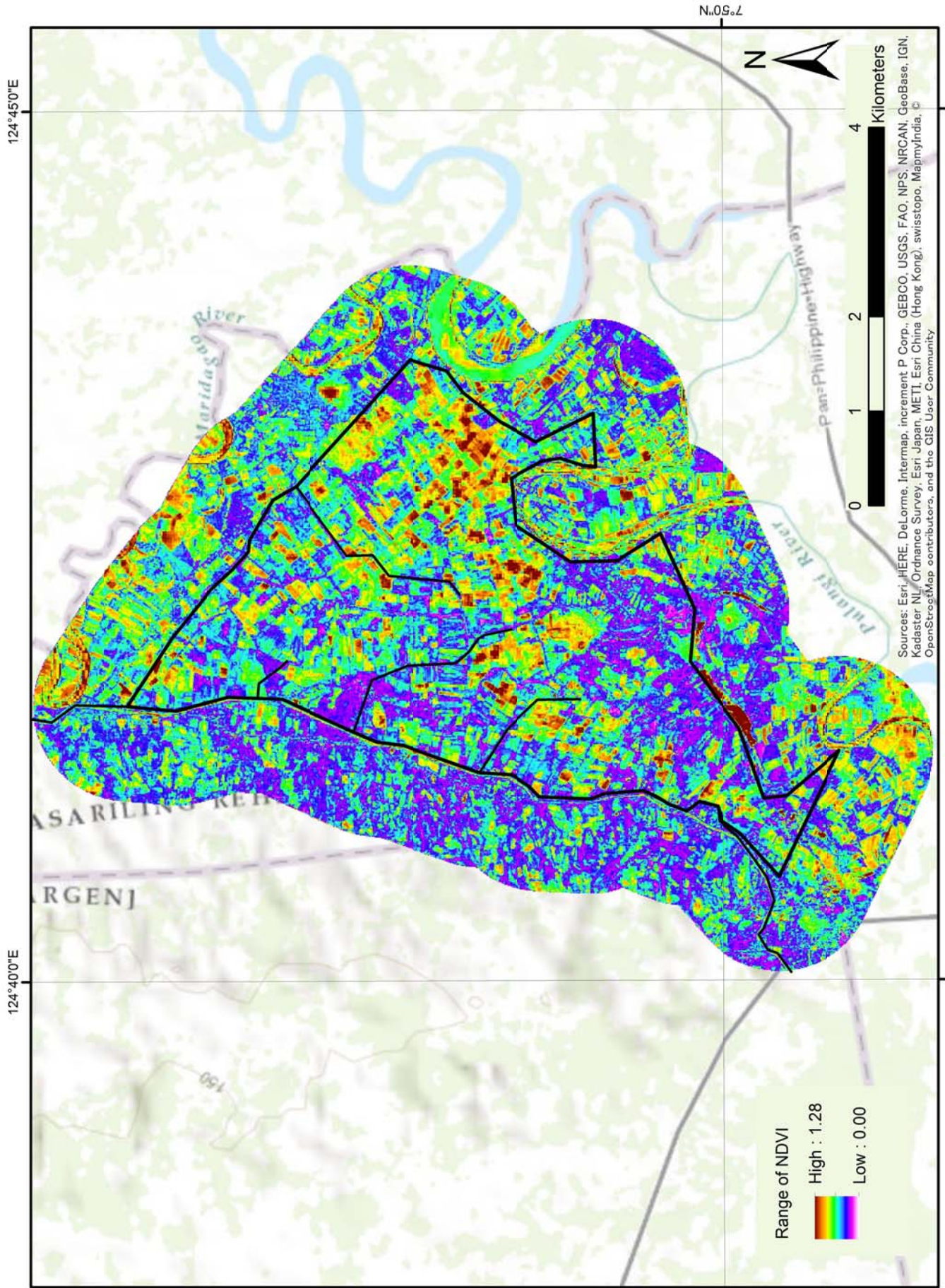
Map XI.2.4 Range of NDVI Change from Feb to May 2016 of Maridagao Service Area



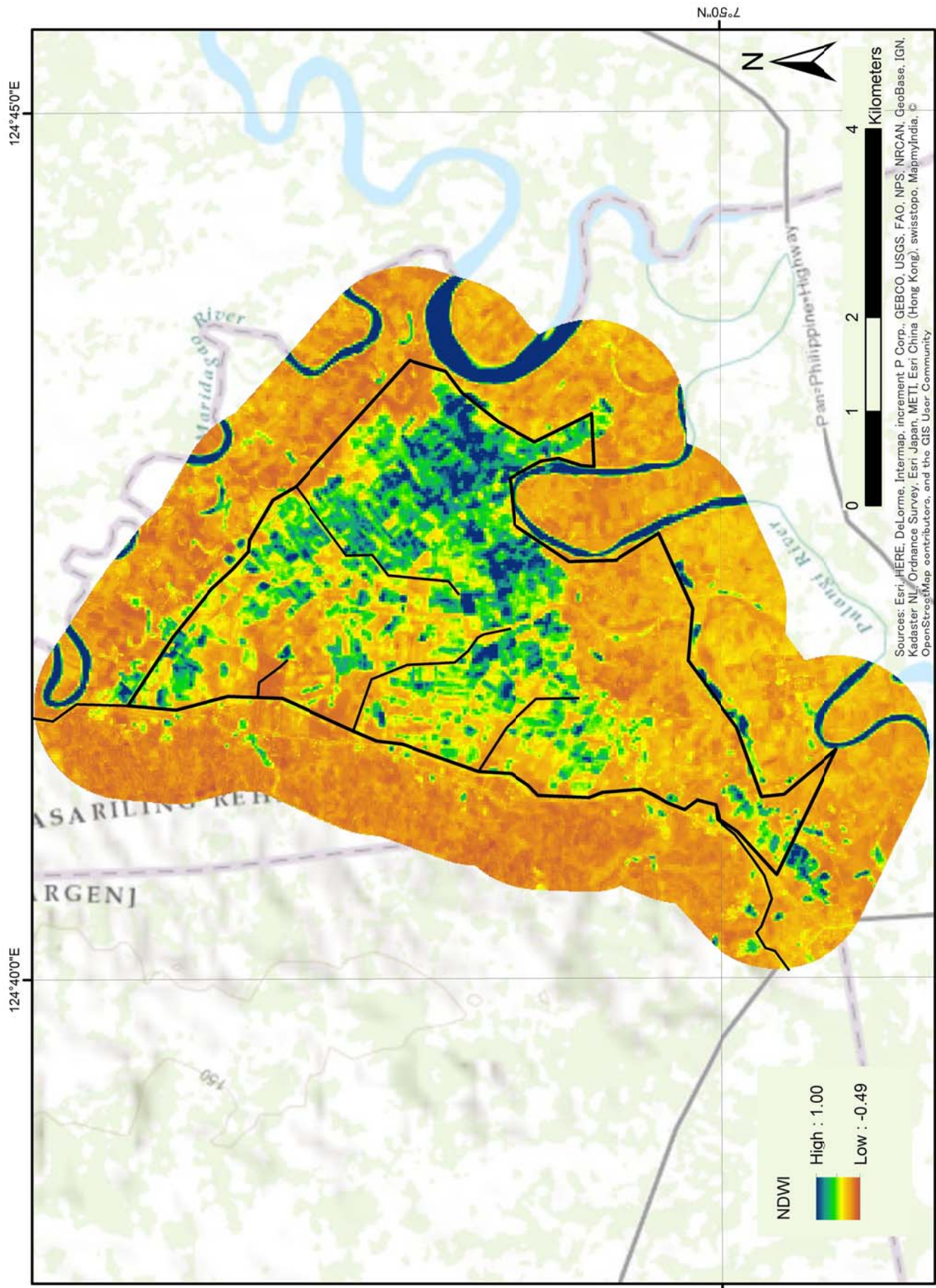
Map XI.2.5 NDWI of Maridagao Service Area (before cloud mask)



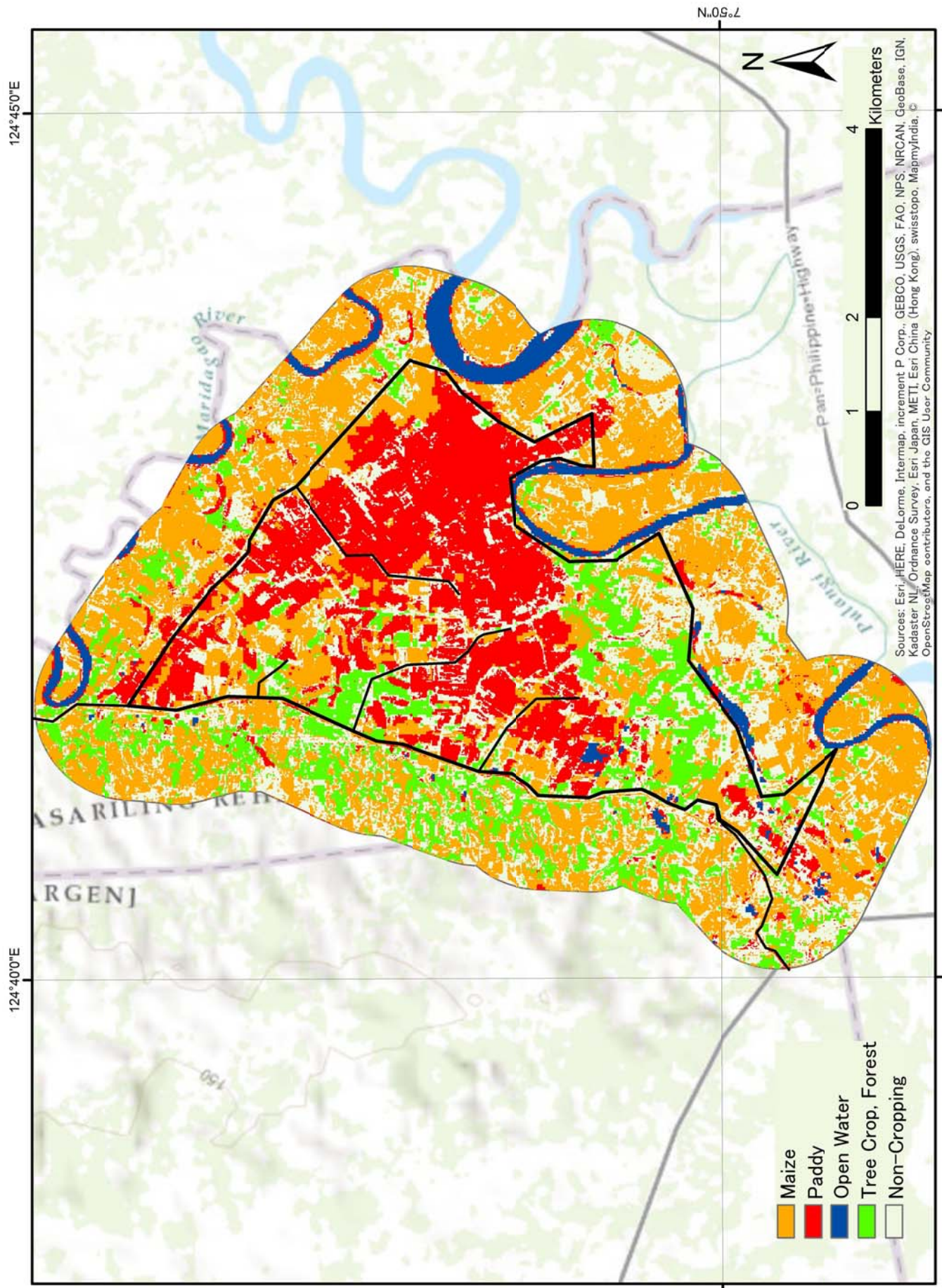
Map XI.2.6 Agricultural Land Use of Maridagao Service Area in Dry Season, 2016

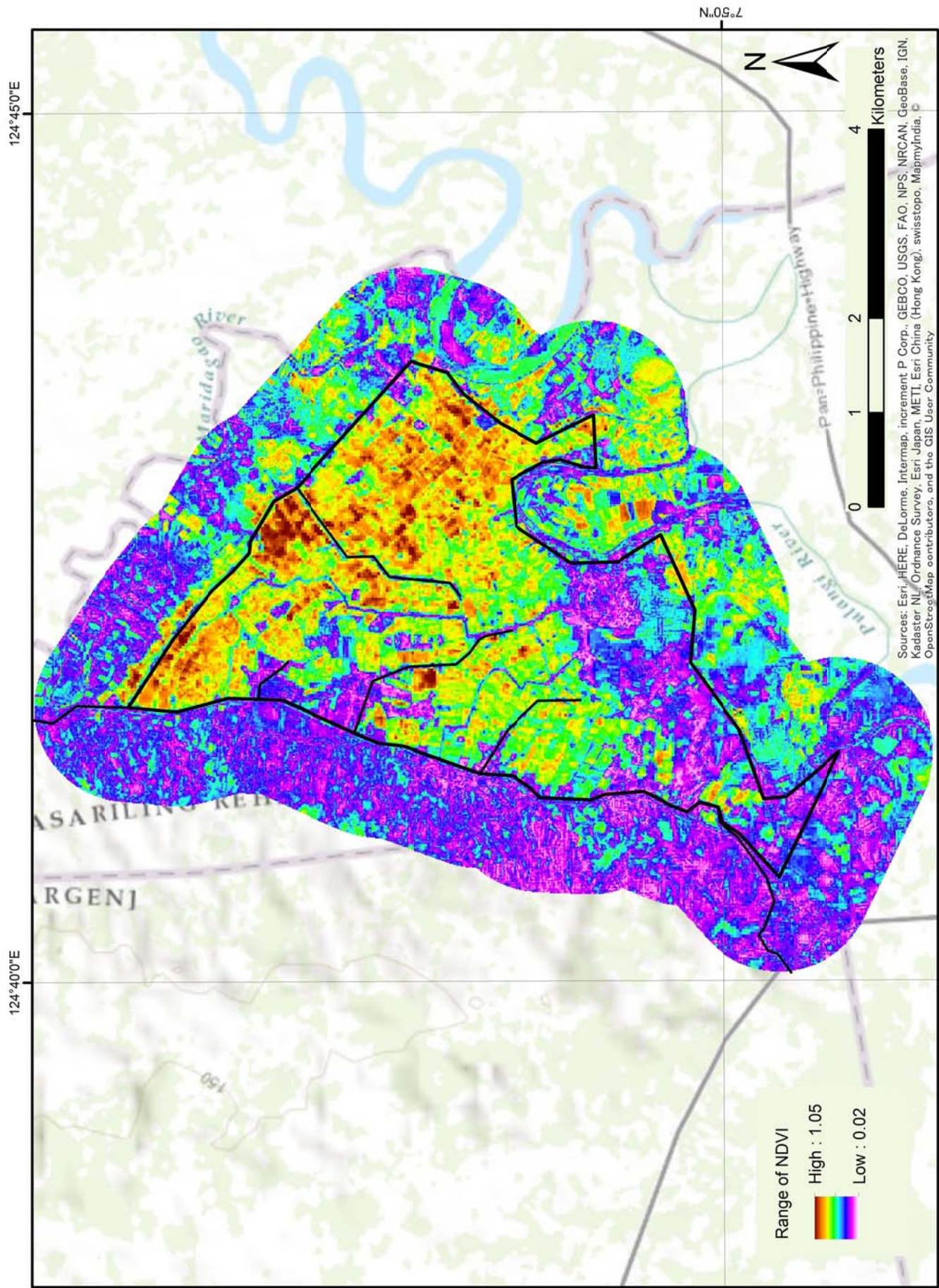


Map XI.2.7 Range of NDVI Change from Jul to Dec 2016 of Stage I Upper Malitubog Service Area

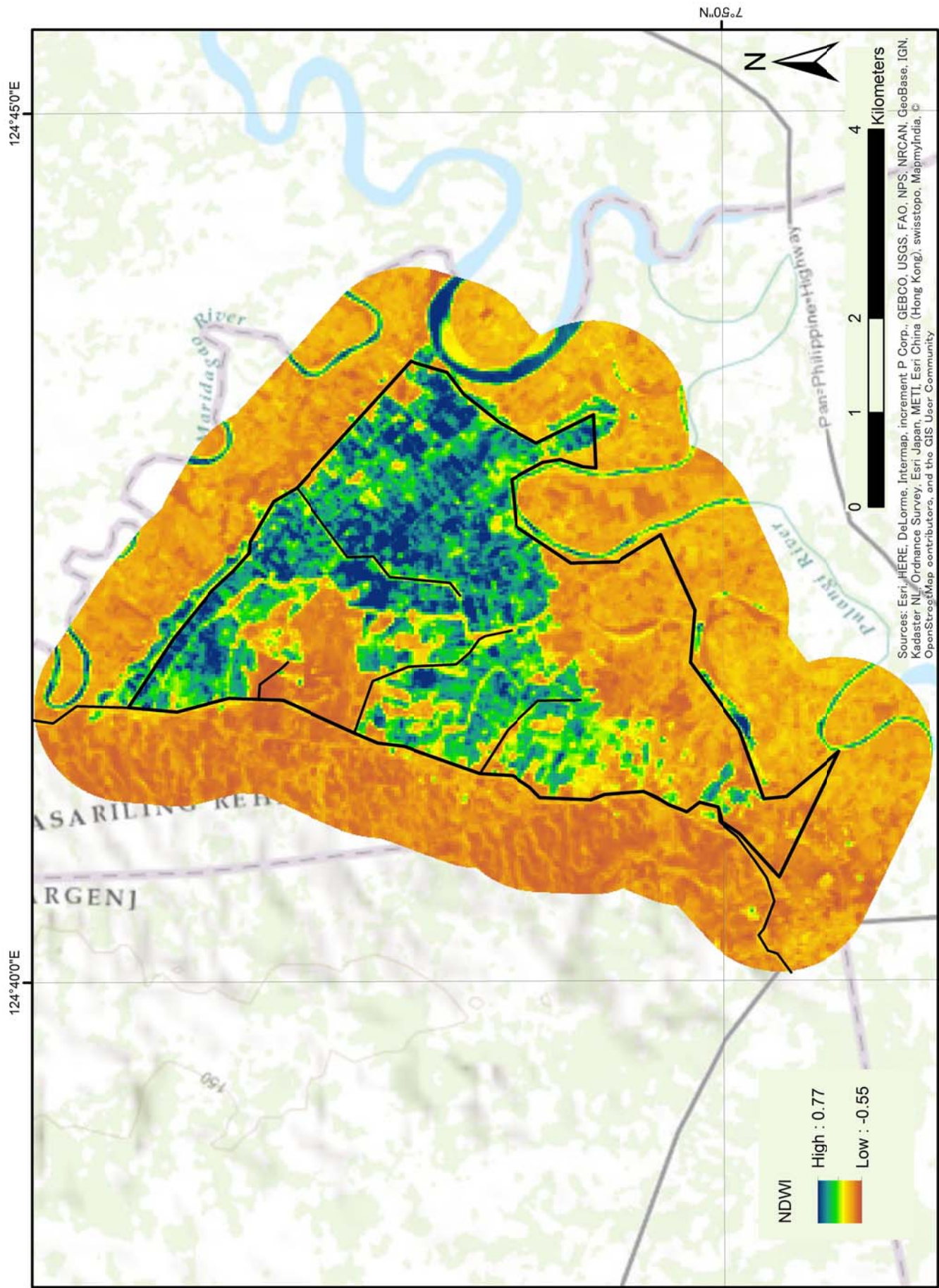


Map XI.2.8 Max. NDWI btw 21 Jul and 11 Aug 2016 of Stage I Upper Malitubog Service Area

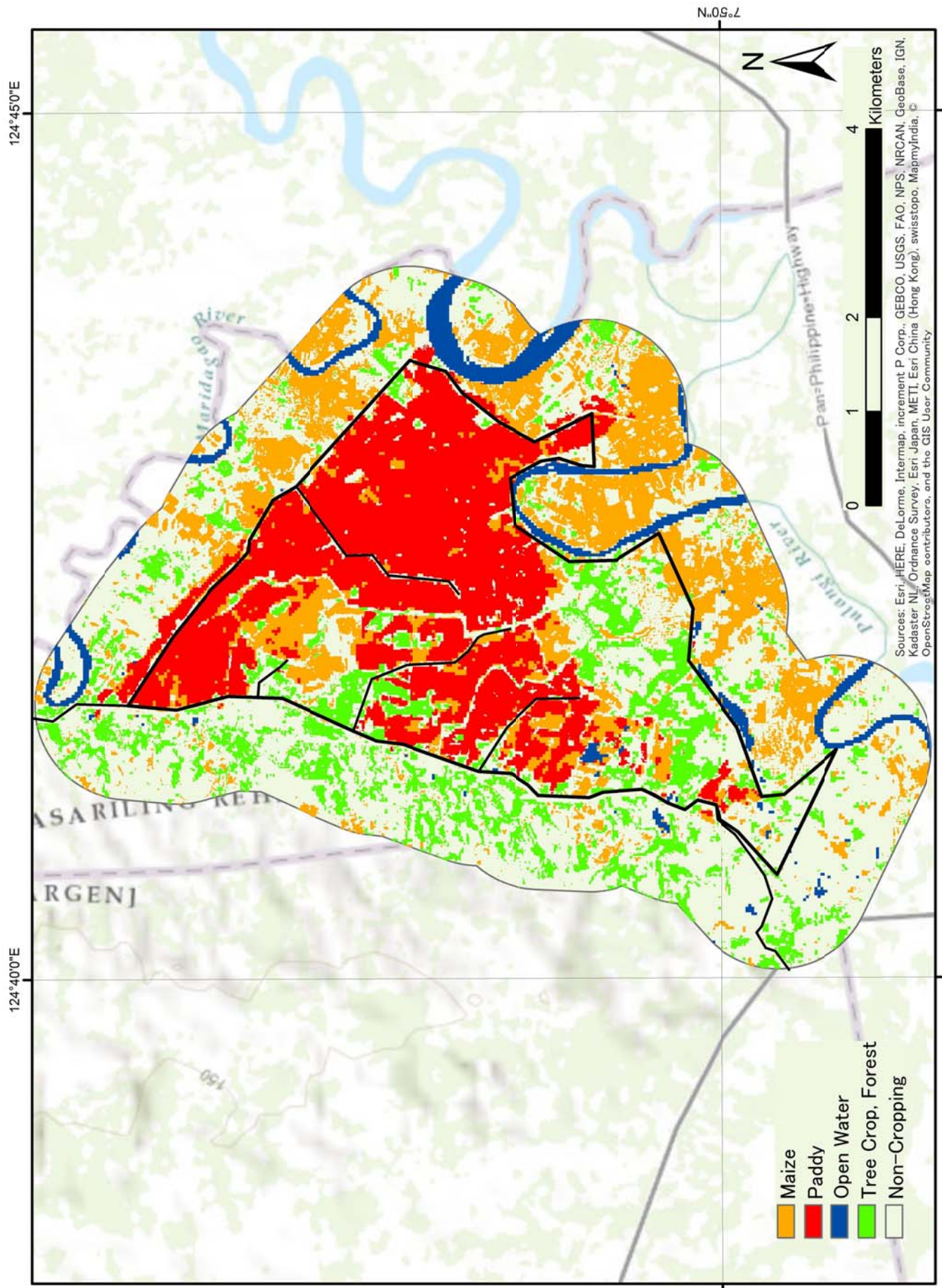




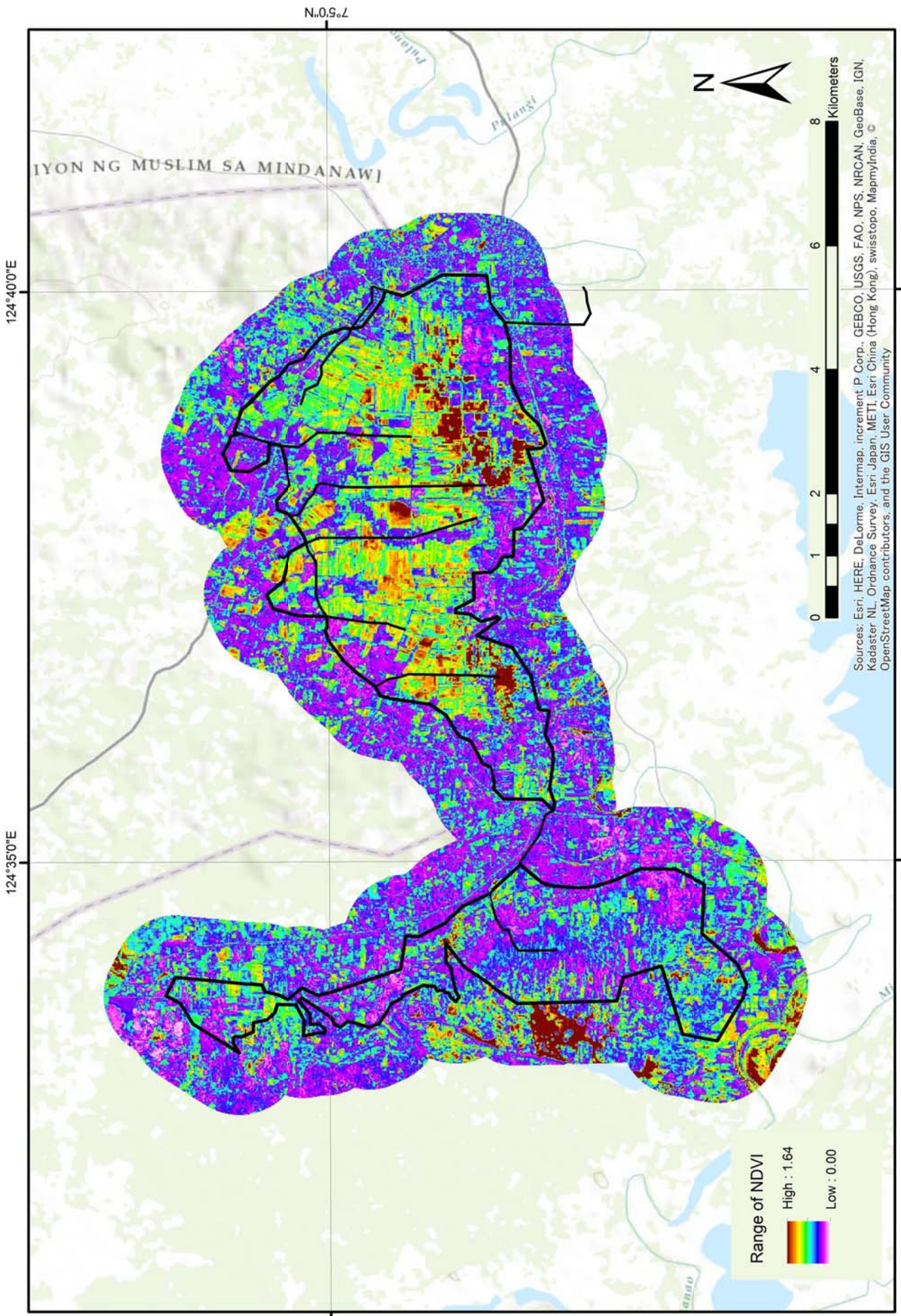
Map XI.2.10 Range of NDVI Change from Feb to May 2016 of Stage I Upper Malitubog Service Area



Map XI.2.11 NDWI of Stage I Upper Malitubog Service Area

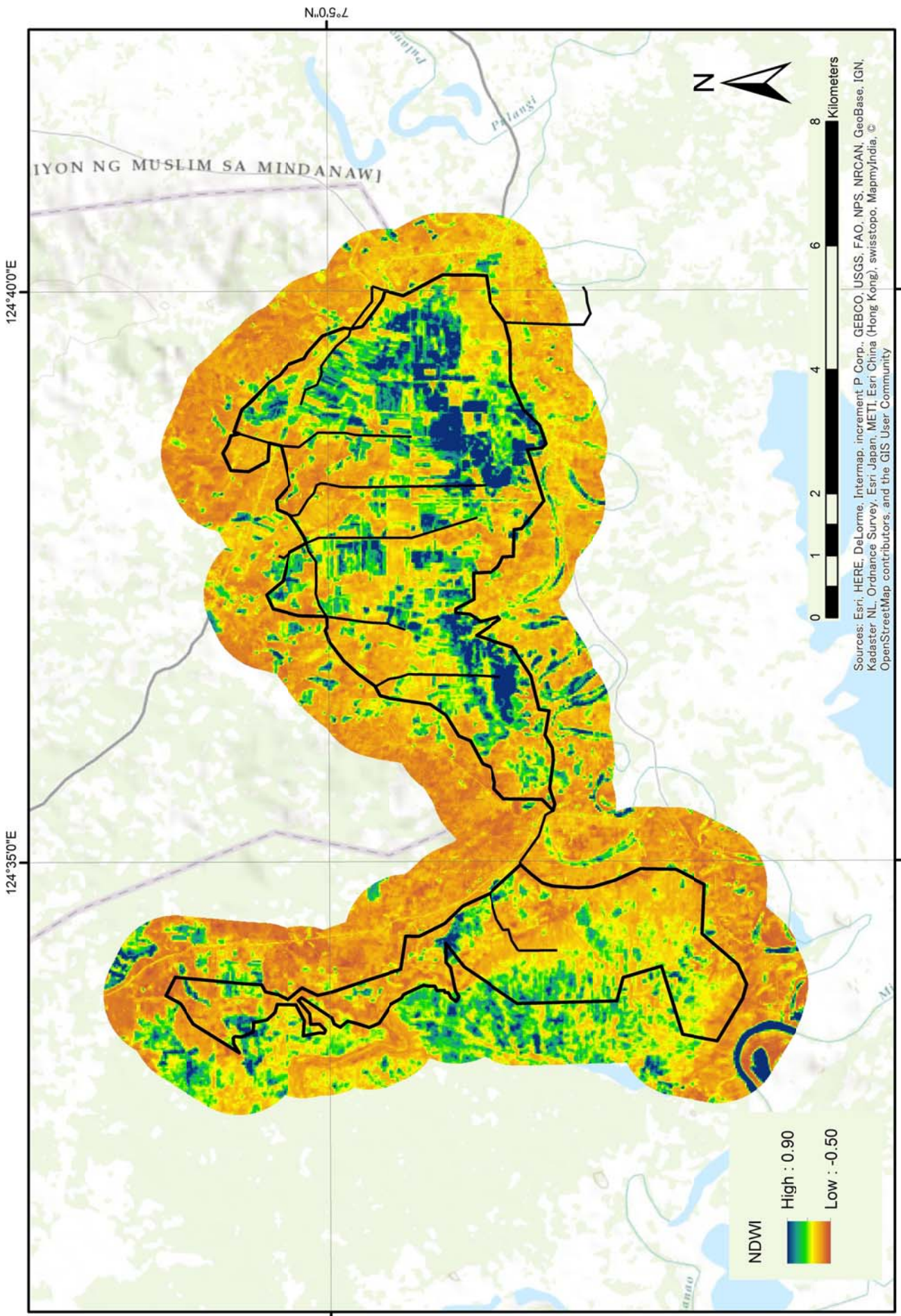


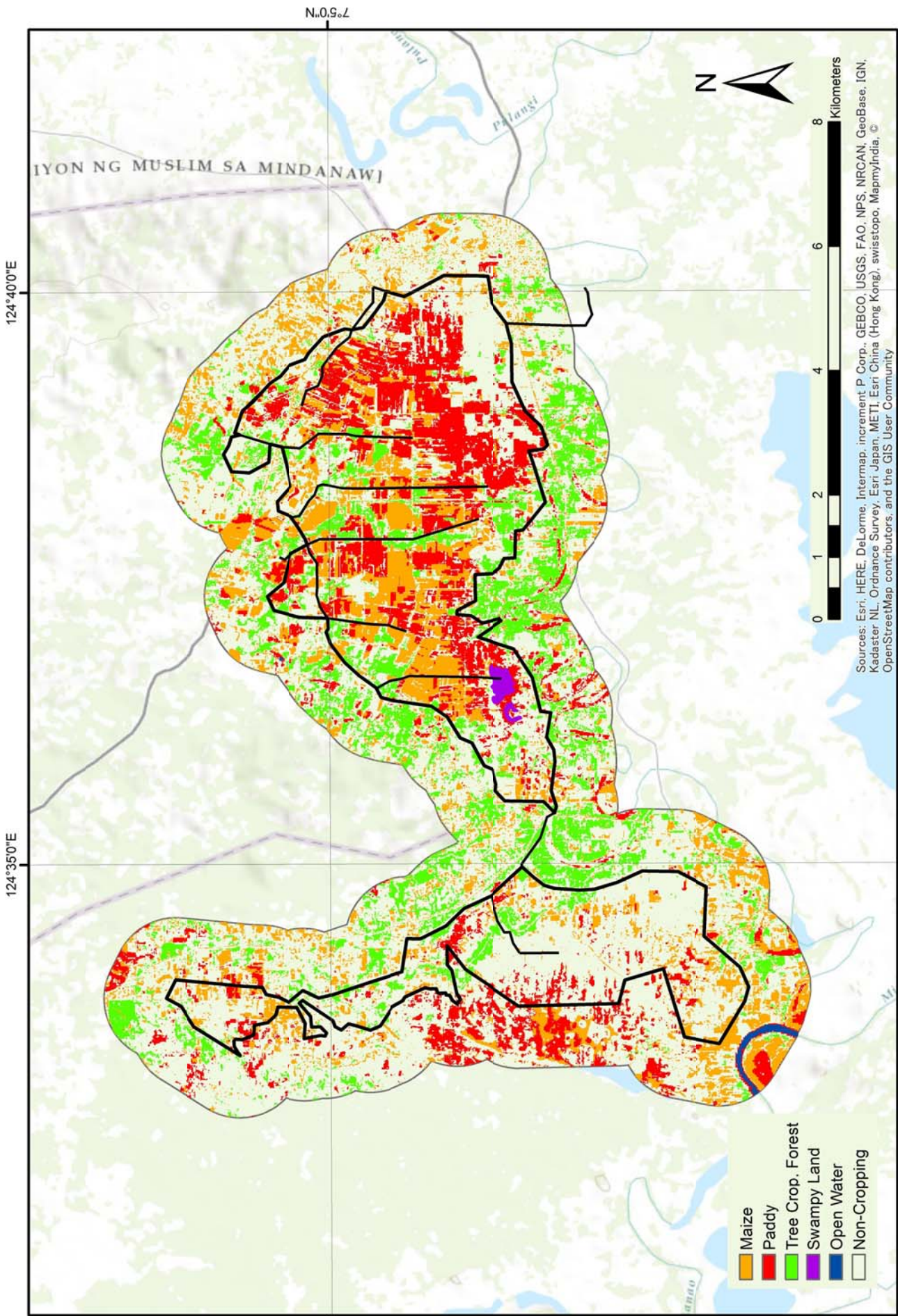
Map XI.2.12 Agricultural Land Use of Stage I Upper Malitubog Service Area in Dry Season, 2016



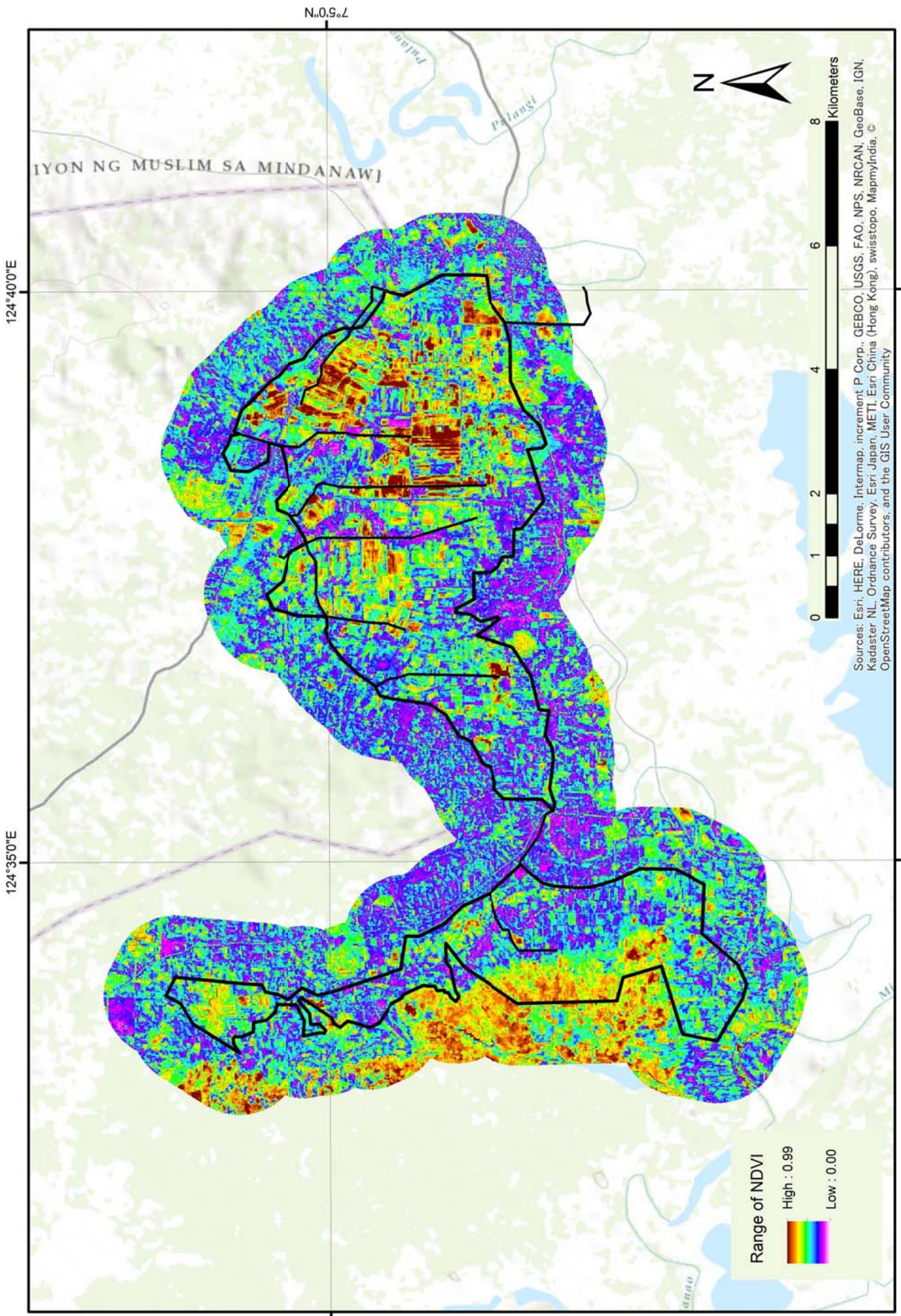
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri, Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

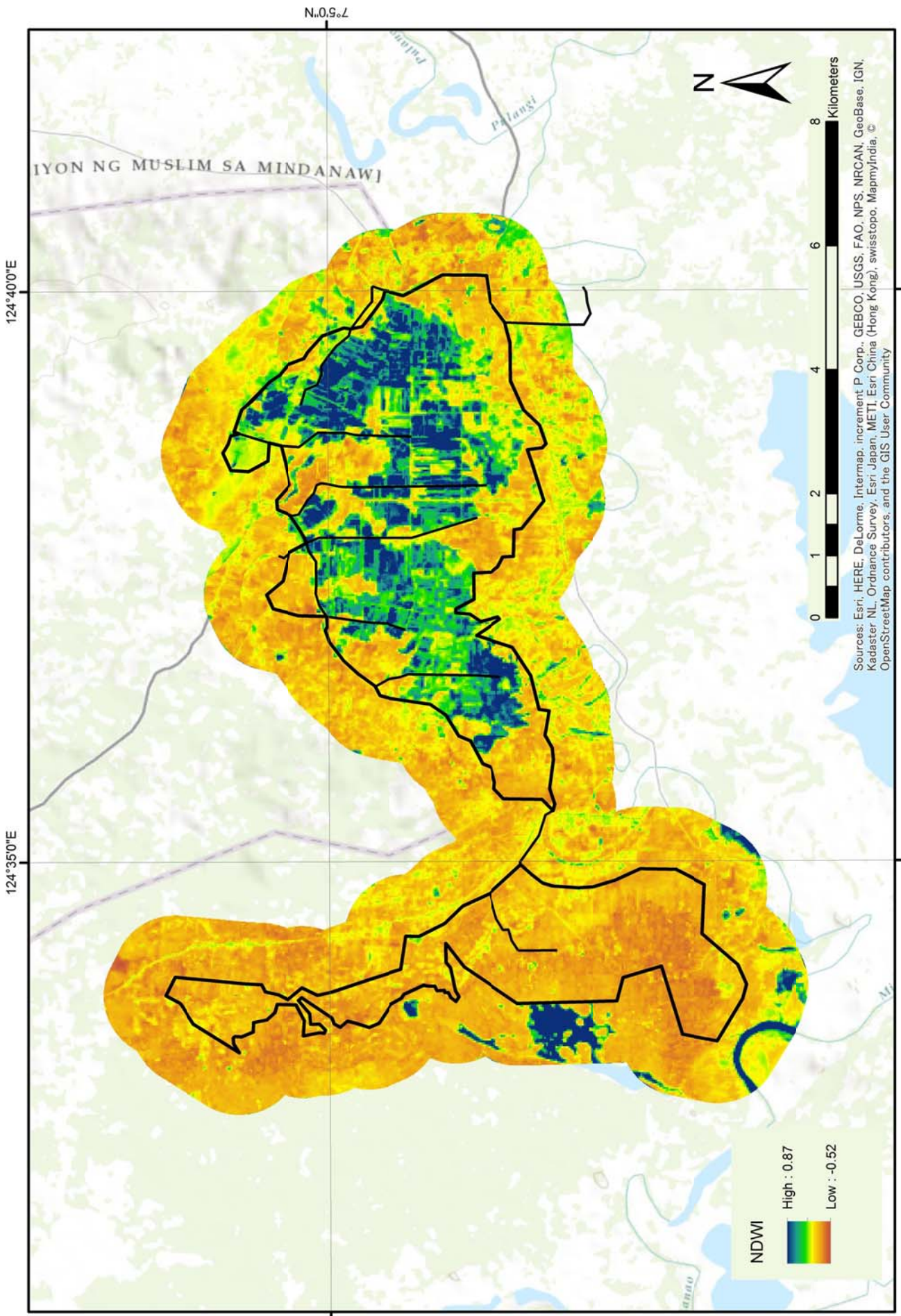
Map XI.2.13 Range of NDVI Change from Jul to Dec 2016 of Stage II Upper Malitubog Service Area



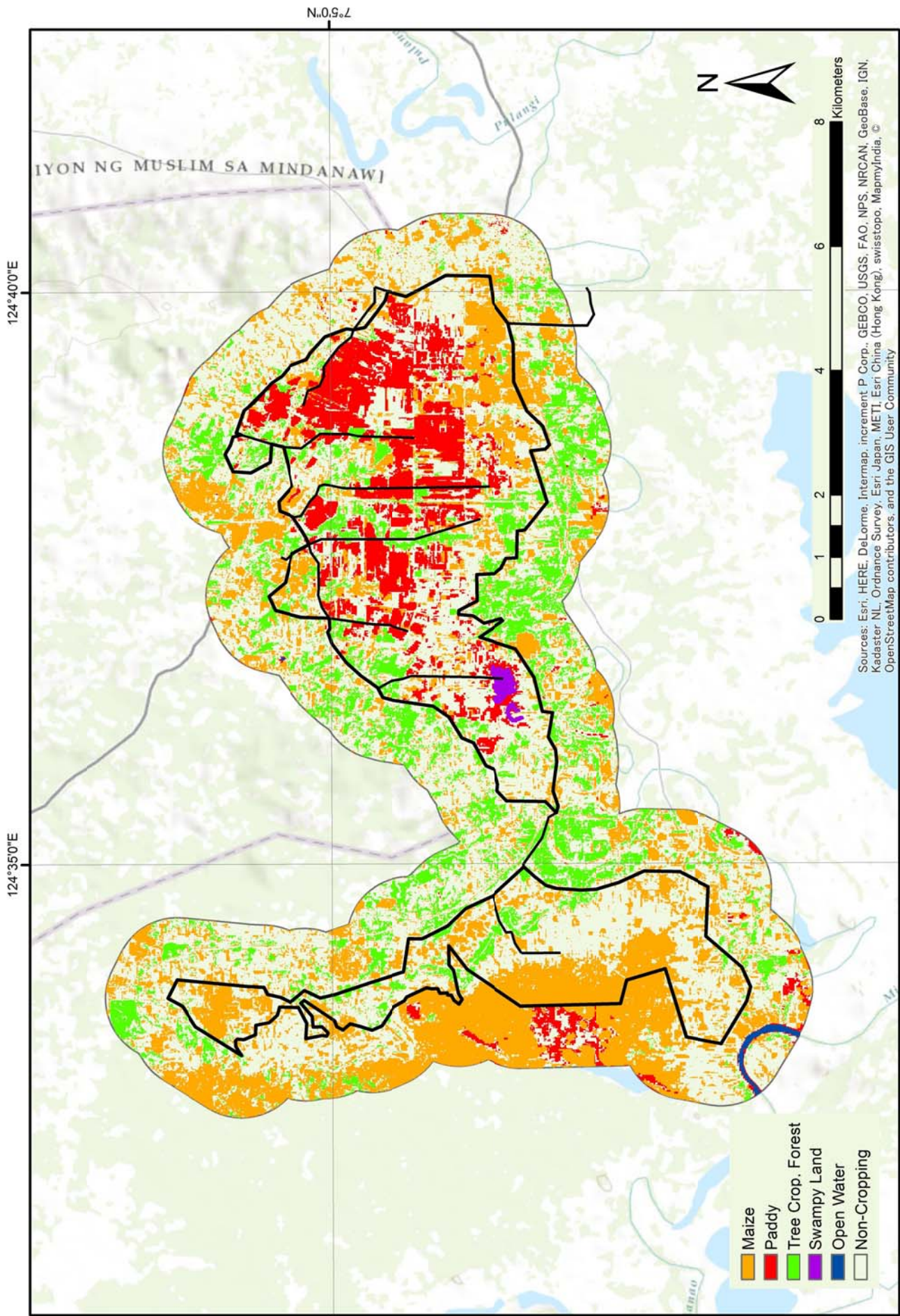


Map XI.2.15 Agricultural Land Use of Stage II Upper Malitubog Service Area in Rainy Season, 2016

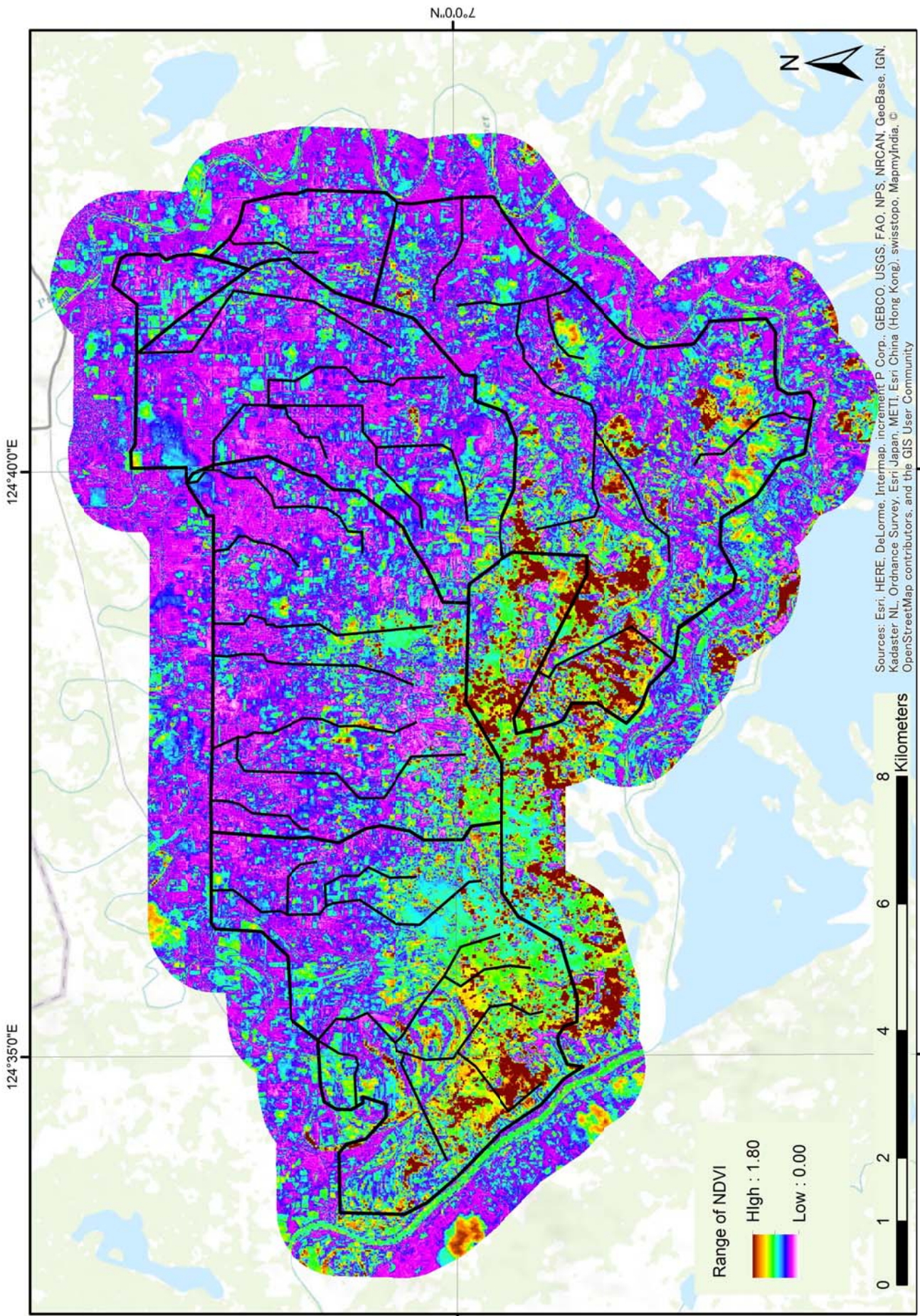




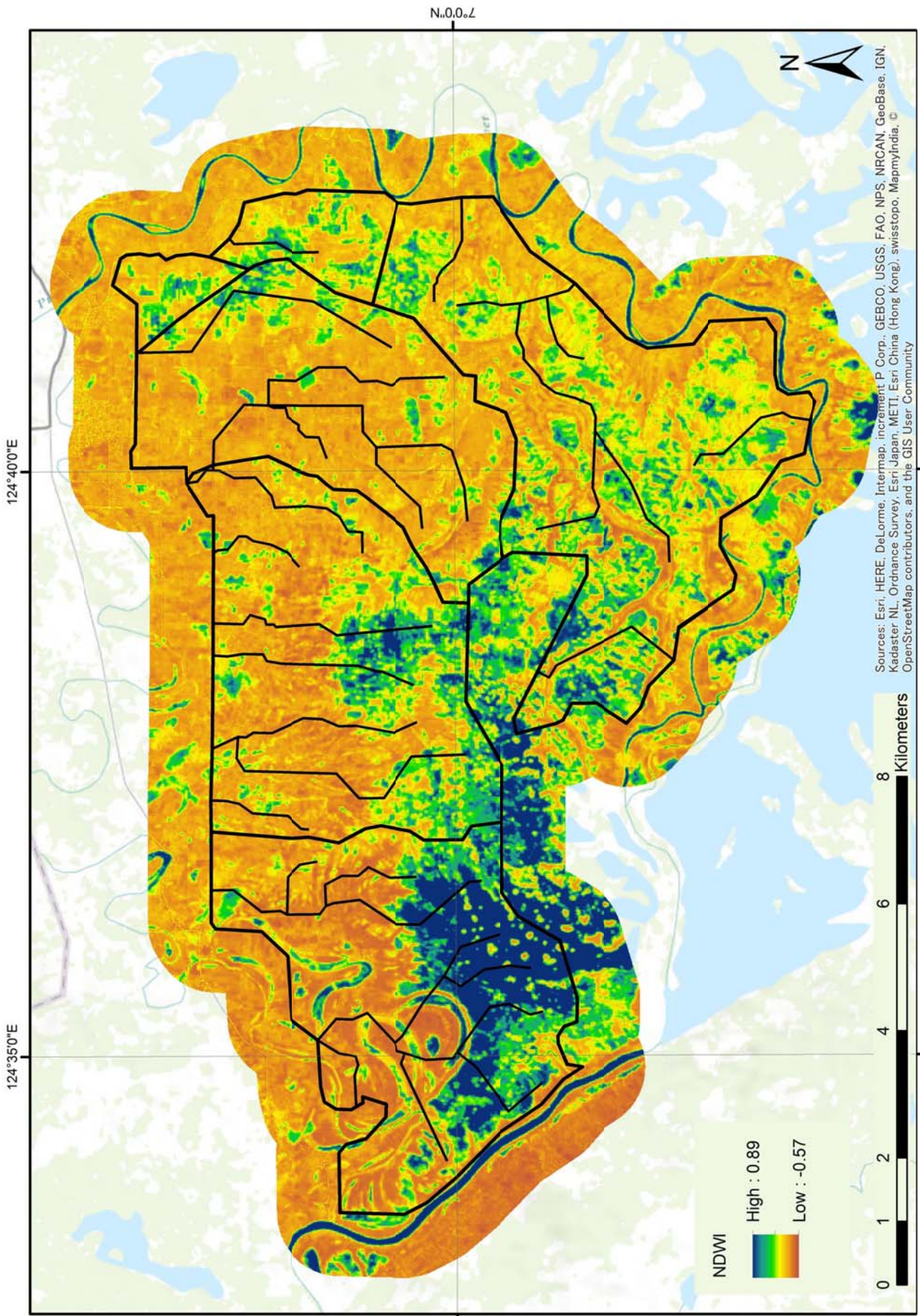
Map XI.2.17 Max. NDWI btw 8 Feb and 14 Mar 2016 of Stage II Upper Malitbog Service Area



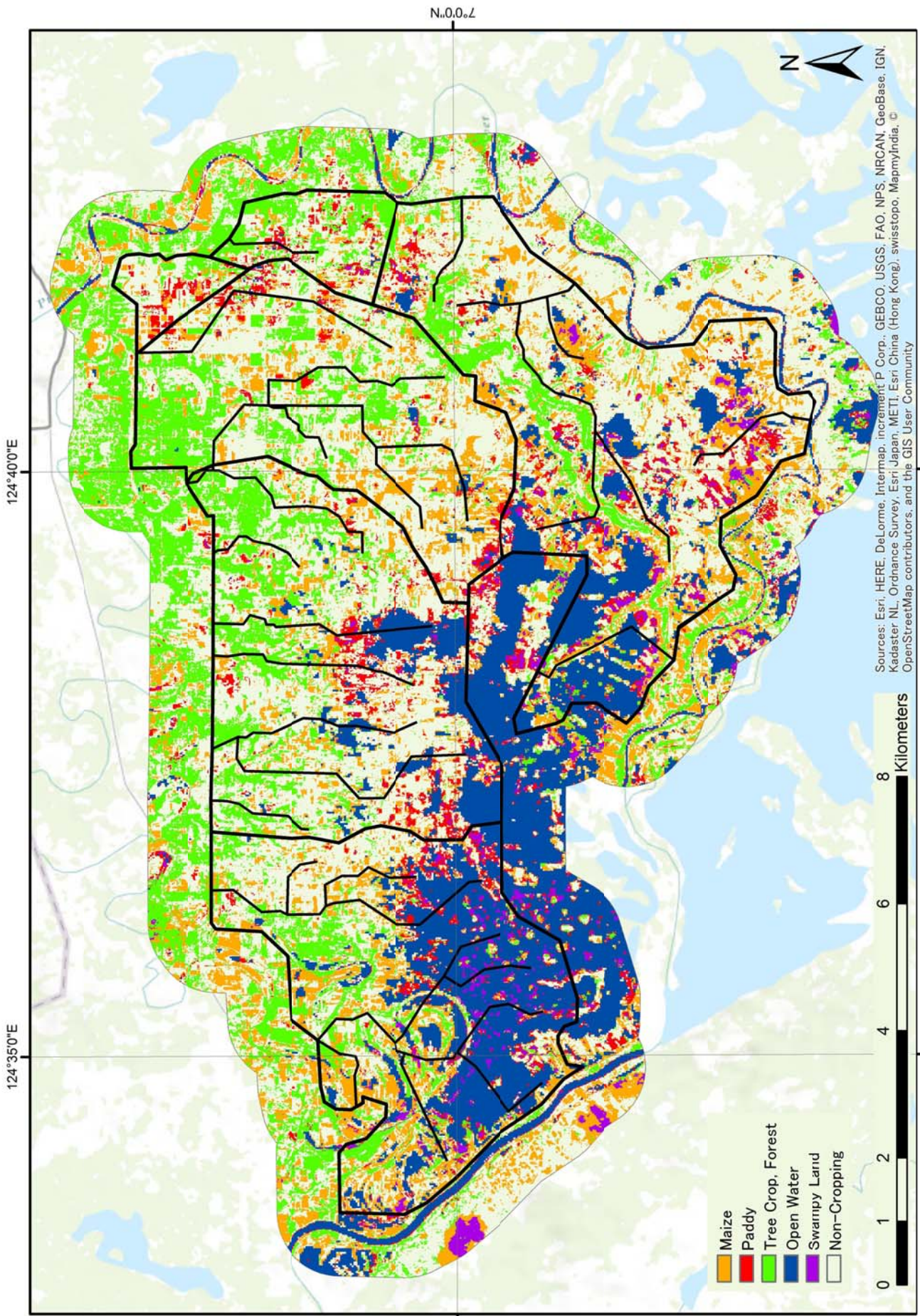
Map XI.2.18 Agricultural Land Use of Stage II Upper Malitubog Service Area in Dry Season, 2016

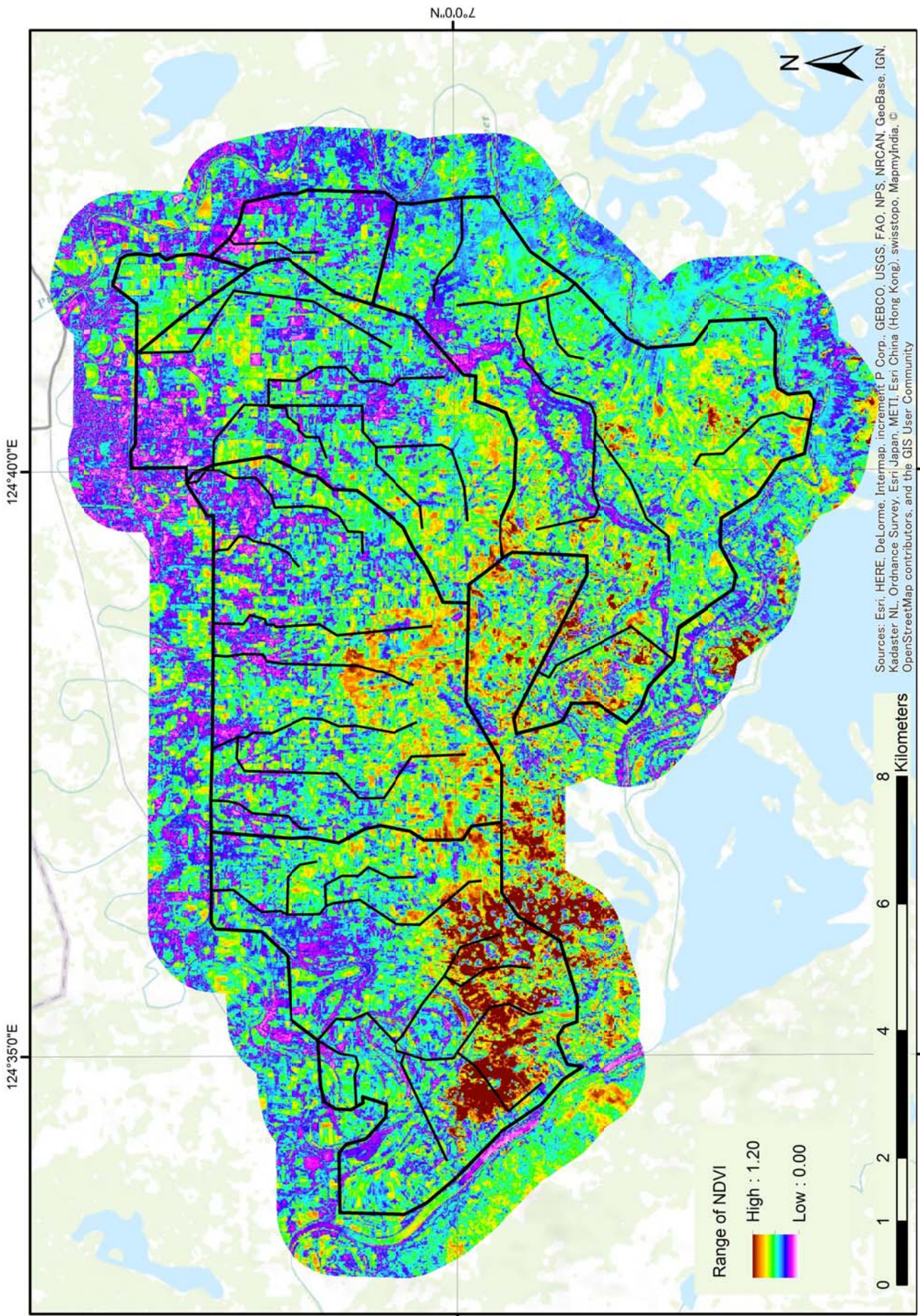


Map XI.2.19 Range of NDVI Change from Jul to Nov 2016 of Lower Malitubog Service Area

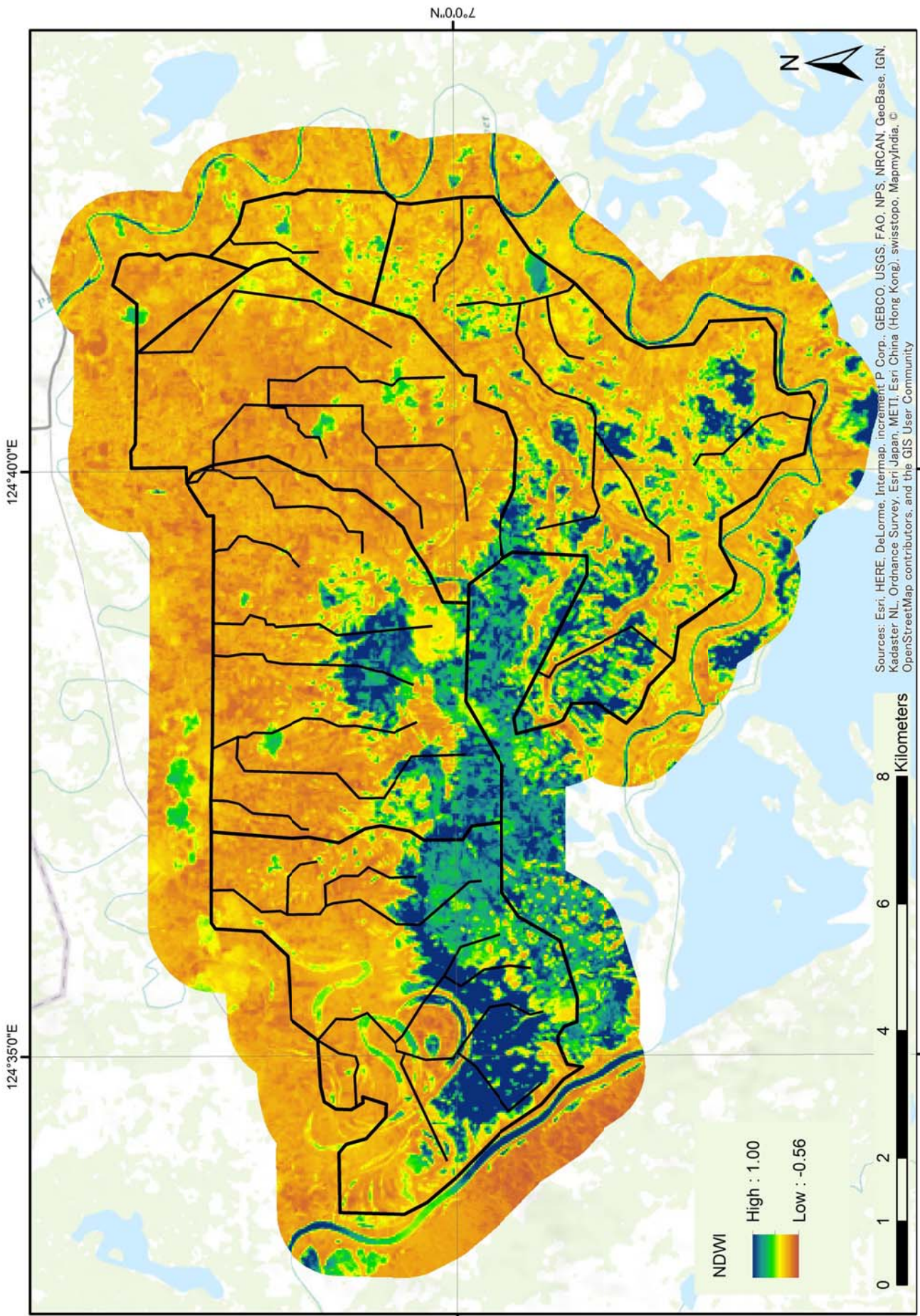


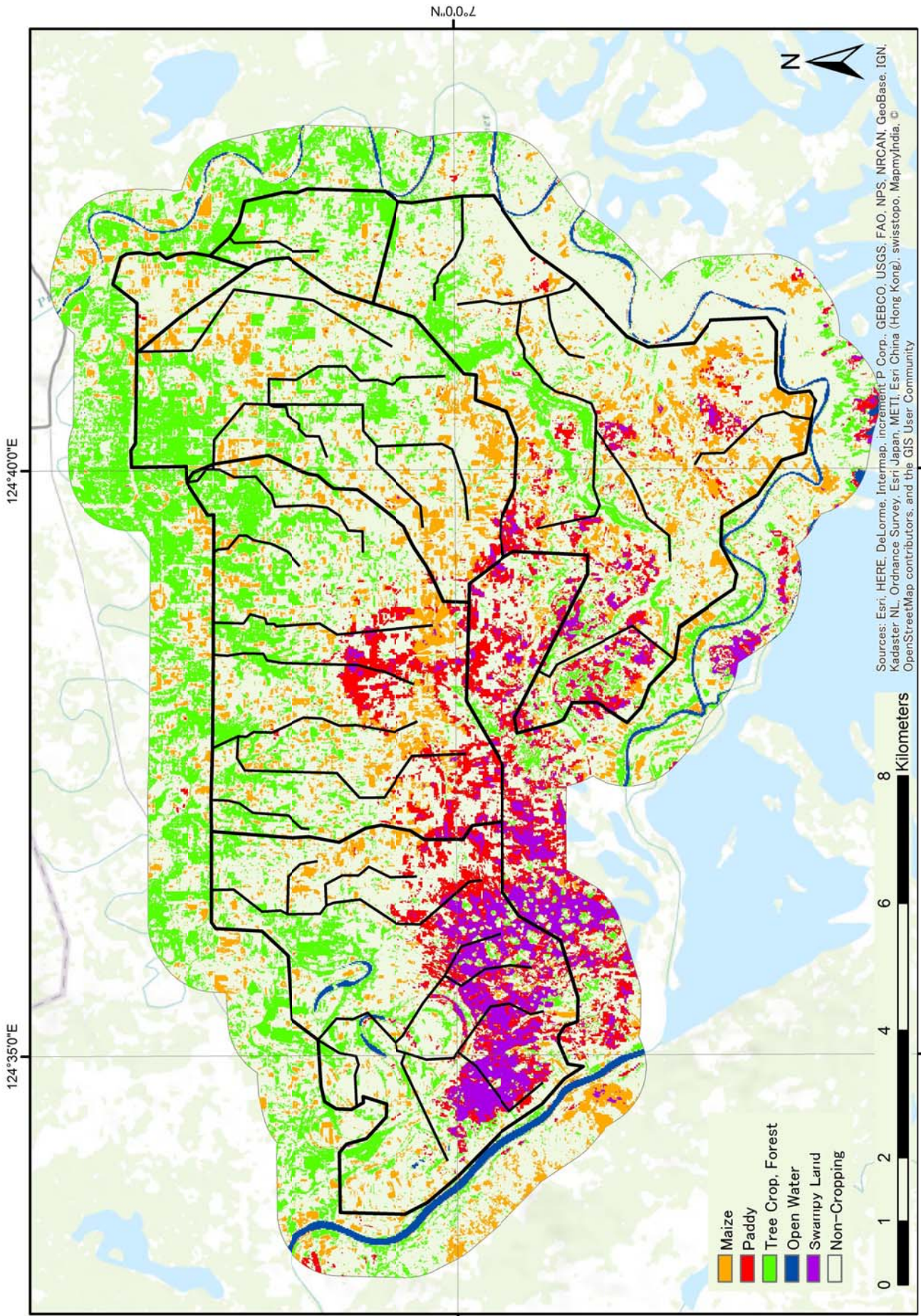
Map XI.2.20 NDWI of 21 Jul 2016 of Lower Malitubog Service Area

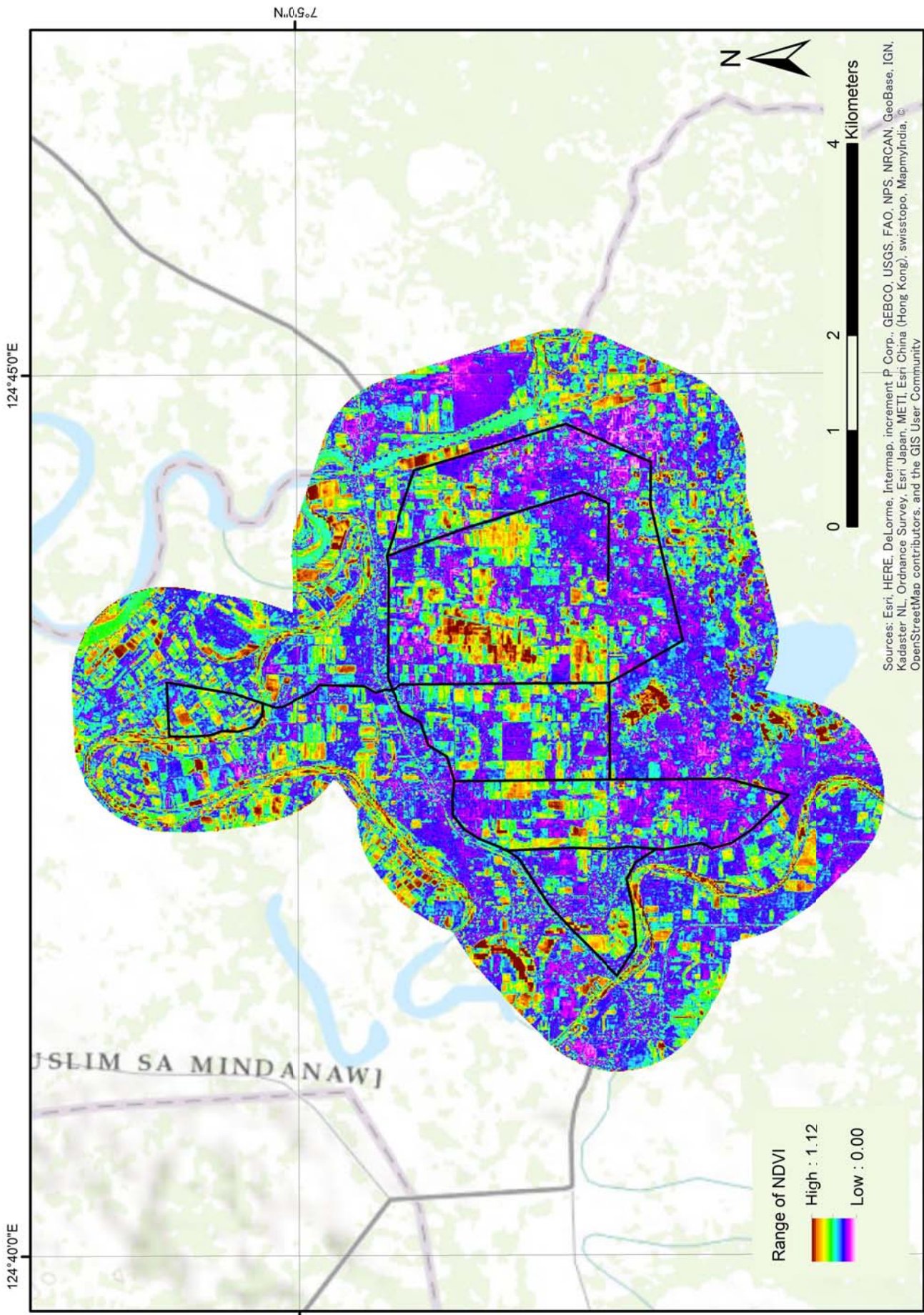


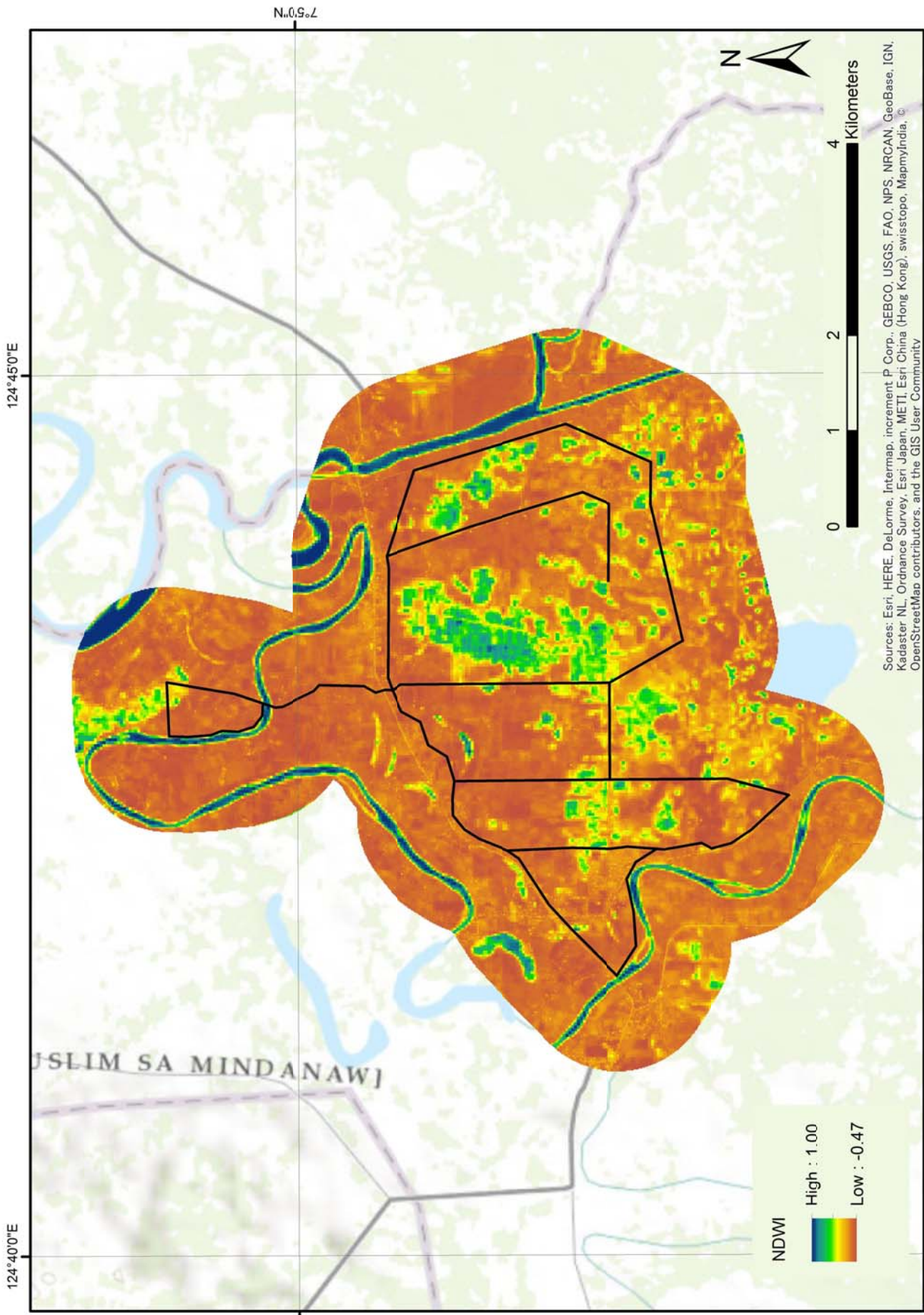


Map XI.2.22 Range of NDVI Change from Oct 2015 to Apr 2016 of Lower Malitubog Service Area

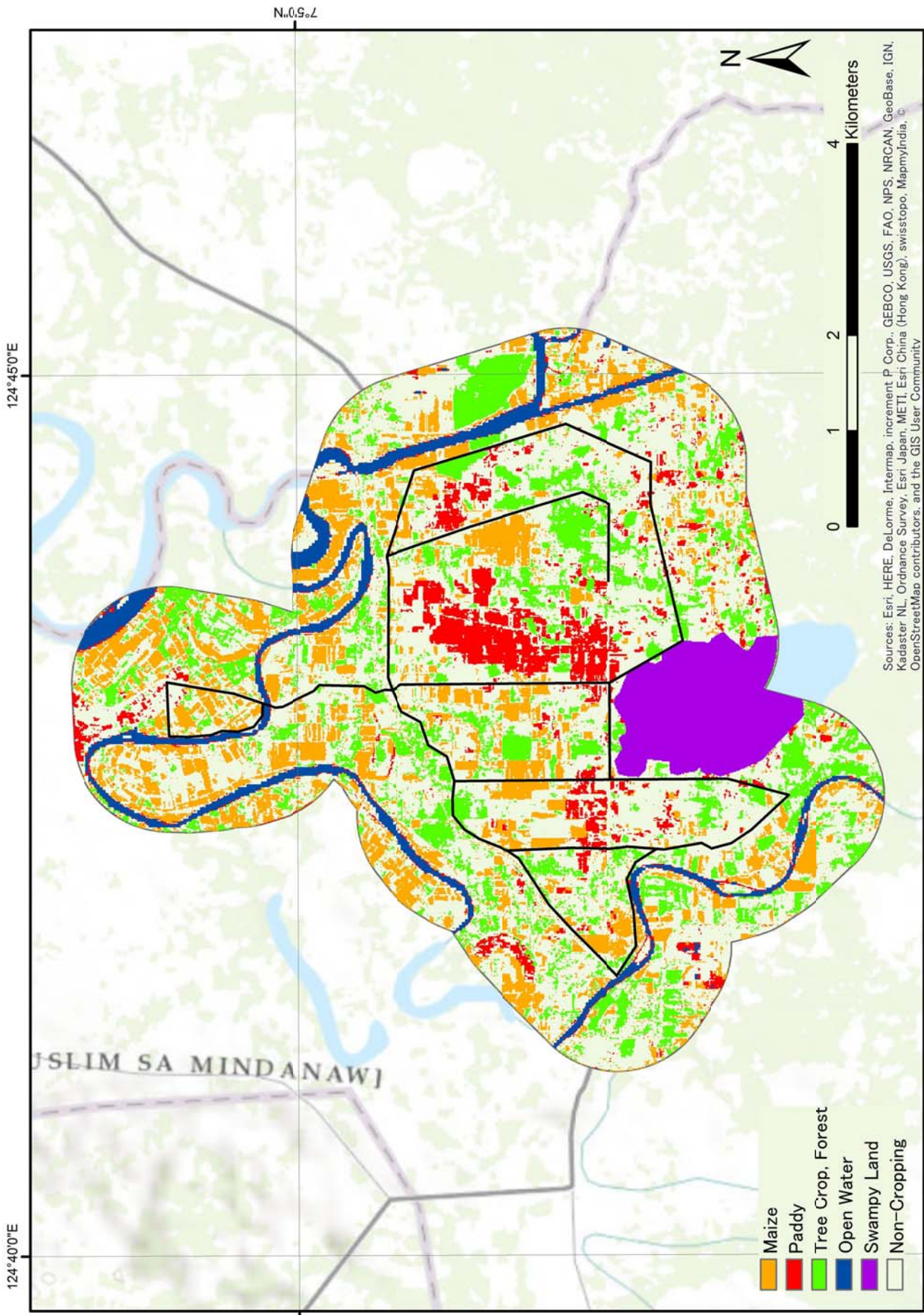




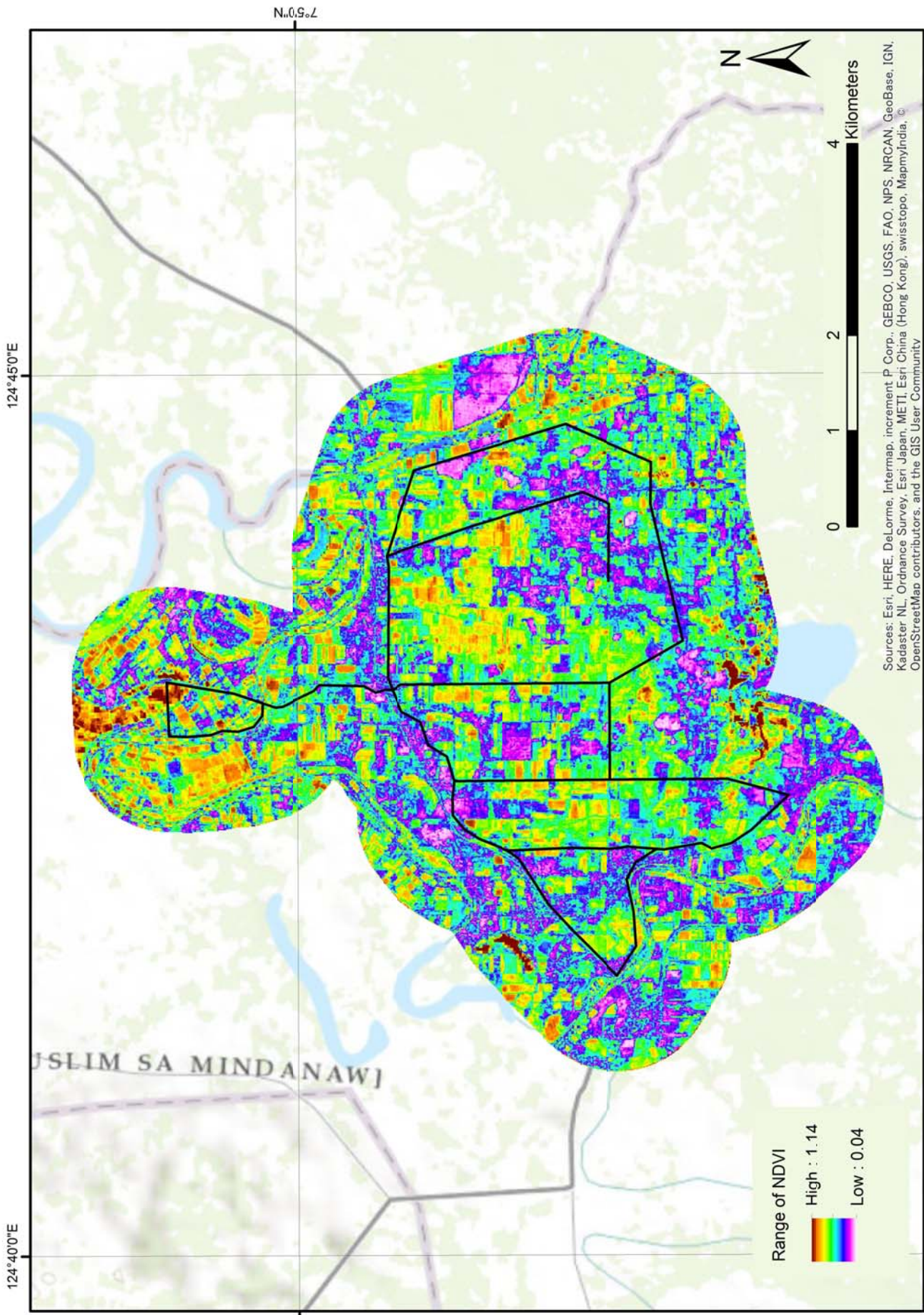




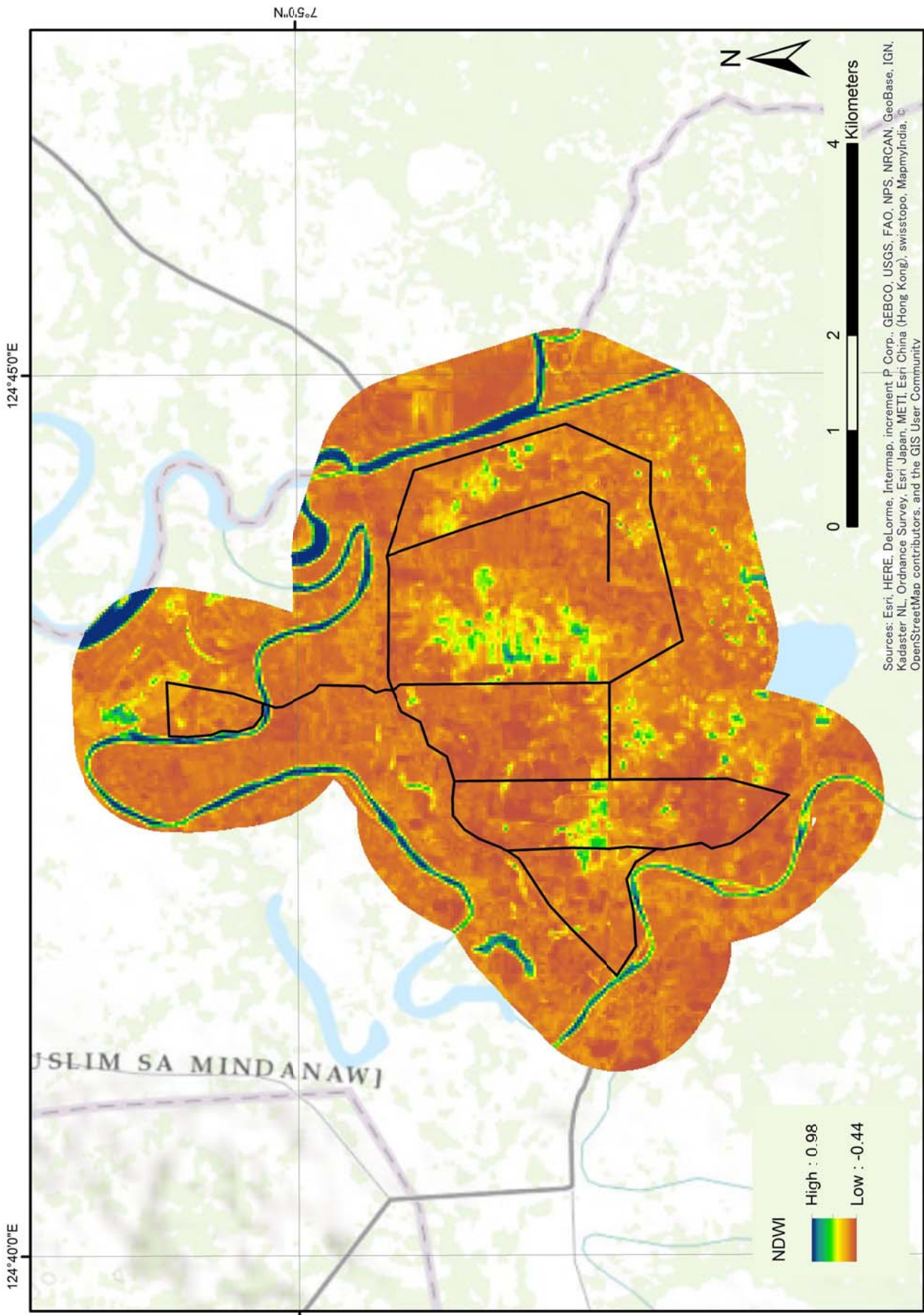
Map XI.2.26 Max. NDWI btw 21 Jul and 2 Aug 2016 of Pagalungan Ext. Service Area



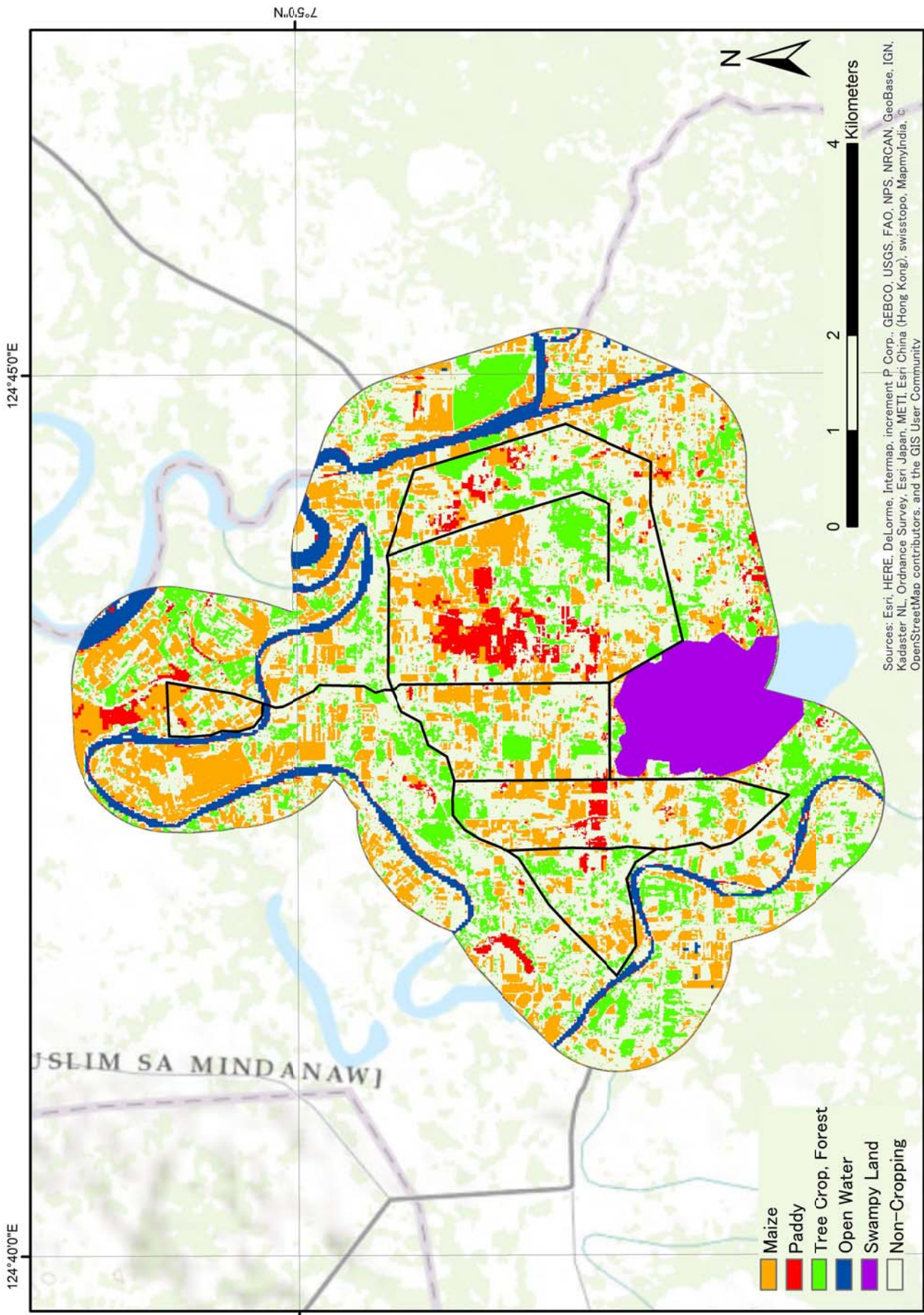
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Map XI.2.29 Max. NDWI btw 13 and 29 Nov 2015 of Pagalungan Ext. Service Area



Map XI.2.30 Agricultural Land Use of Pagalungan Ext. Service Area in Dry Season, 2015-2016

APPENDIX-XII

A CATCH-UP PLAN ON HELP FOR CATUBIG AGRICULTURAL ADVANCEMENT PROJECT (HCCAP)

NATIONAL IRRIGATION ADMINISTRATION (NIA)
NORTHERN SAMAR INTERIM IRRIGATION MANAGEMENT OFFICE

**A CATCH-UP PLAN
ON HELP FOR CATUBIG AGRICULTURAL
ADVANCEMENT PROJECT (HCAAP)**

EXIT REPORT

SEPTEMBER 20, 2017

Prepared by

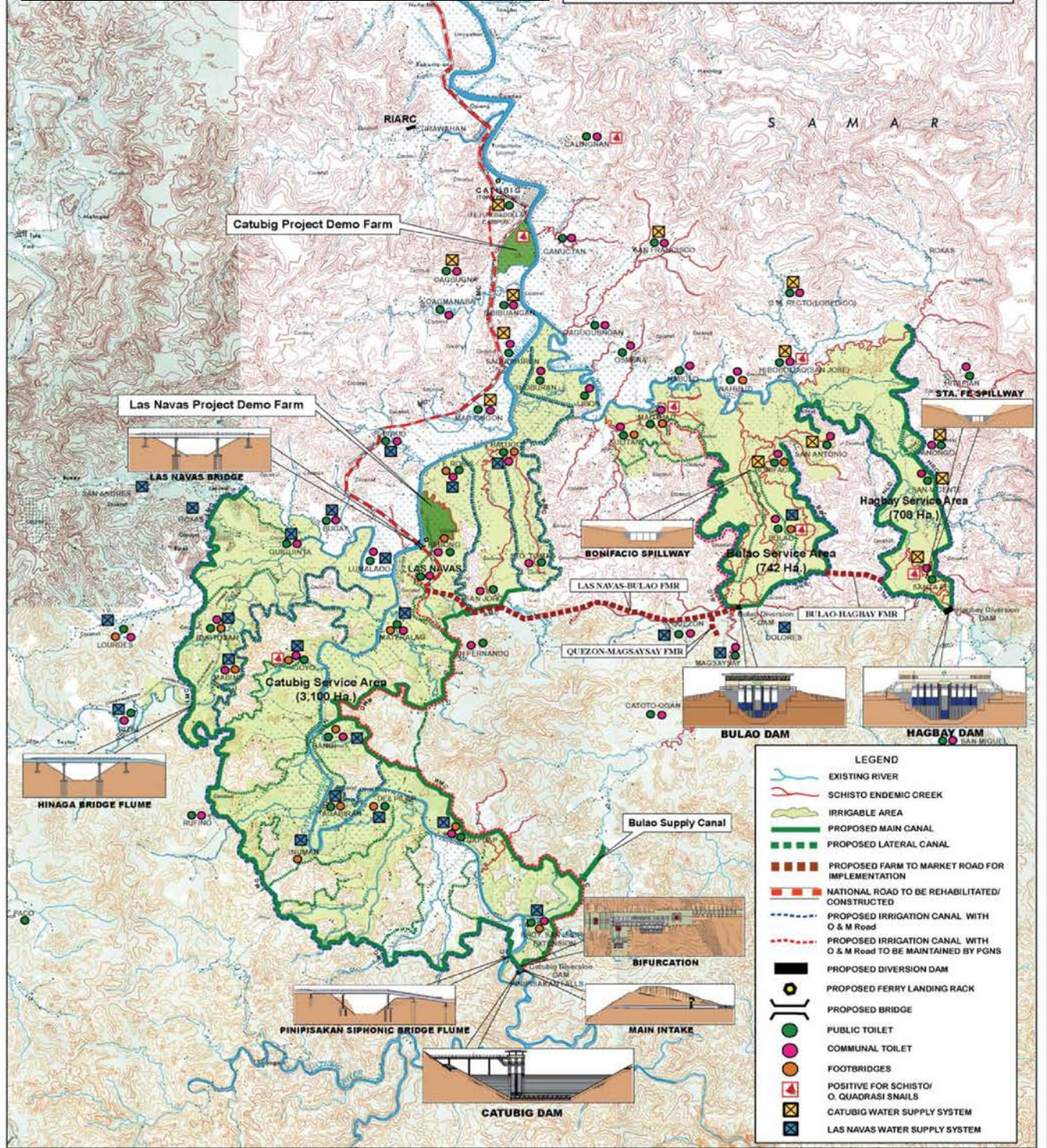
Sanyu Consultants Inc.

JAPAN INTERNATIONAL COOPERATION AGENCY

Irrigation System	Main Canal	Service Area (Ha)	Length, km
Pinipisakan	Right	1,100	21.6
	Left	2,000	22.5
Bulao	Right	308	5.54
	Left	434	6.62
Hagbay	Right	457	8.84
	Left	251	8.60
Total		4,550	73.7 km

PROJECT MAP

HELP FOR CATUBIG AGRICULTURAL
ADVANCEMENT PROJECT
(HCAAP)



- LEGEND**
- EXISTING RIVER
 - SCHISTO ENDEMIC CREEK
 - IRRIGABLE AREA
 - PROPOSED MAIN CANAL
 - PROPOSED LATERAL CANAL
 - PROPOSED FARM TO MARKET ROAD FOR IMPLEMENTATION
 - NATIONAL ROAD TO BE REHABILITATED/ CONSTRUCTED
 - PROPOSED IRRIGATION CANAL WITH O & M Road
 - PROPOSED IRRIGATION CANAL WITH O & M Road TO BE MAINTAINED BY PGNS
 - PROPOSED DIVERSION DAM
 - PROPOSED FERRY LANDING RACK
 - PROPOSED BRIDGE
 - PUBLIC TOILET
 - COMMUNAL TOILET
 - FOOTBRIDGES
 - POSITIVE FOR SCHISTO/ O. QUADRASI SNAILS
 - CATUBIG WATER SUPPLY SYSTEM
 - LAS NAVAS WATER SUPPLY SYSTEM

Revised as of November 2011

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ACRONYMS AND ABBREVIATIONS

BIR	Bureau of Internal Revenue
CO	Central Office
DA	Department of Agriculture
DAR	Department of Agrarian Reform
DBM	Department of Budget and Management
DOF	Department of Finance
DOH	Department of Health
DPWH	Department of Public Works and Highways
DSWD	Department of Social Welfare and Development
FGD	Focus Group Discussions
GAA	General Appropriation Act
GOP	Government of the Republic of the Philippines
HCAAP	Help for Catubig Agricultural Advancement Project
IA	Irrigators' Association
ICC	Investment Coordination Committee
IED	Improvised Explosive Devices
KII	Key Informant Interview
LGU	Local Government Unit
LMC	Left Main Canal
NEDA	National Economic Development Authority
NFCC	Net Financial Contracting Capacity
NIA	National Irrigation Administration
NIS	National Irrigation System
NPA	New People's Army
NTP	Notice to Proceed
NSIIMO	(Northern Samar Interim Irrigation Management Office
OPAPP	Office of the Presidential Adviser on the Peace Process
PAGASA	Philippine Atmospheric, Geophysical & Astronomical Services Administration
PERT	Program Evaluation and Review Technique
PIC	Project in-Charge
PMO	Project Management Office
PSC	Project Steering Committee
RMC	Right Main Canal
RO	Regional Office
ROW	Right-of-Way
DSWD	Department of Social and Welfare Development
SEC	Security and Exchange Commission
TSAG	Turnout Service Area Group
TWG	Technical Working Group
UPLBFI	University of Philippines Los Banos Foundation Inc.
WRFT	Water Resources Facilities Technologist

CURRENCY EQUIVALENTS (AS AT SEPTEMBER 2017)

1 US\$	=	108.976 Japanese Yen (TTB)
1 PHP	=	2.13492 Yen (TTS)
1 US\$	=	51.04454 PHP

PHILIPPINES' FINANCIAL YEAR

January 1 to December 31

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CHAPTER 1 RATIONAL AND GOAL OF THE PROJECT

Submitted herewith is a report prepared based on fact finding surveys on the Help for Catubig Agricultural Advancement Project (HCAAP) including catch-up plans and recommendations to NIA-PMO in order for NIA to accelerate the construction progress of the Project. For the survey, a consultant team was dispatched by JICA from September 3 to 20 to NIA-PMO of HCCAP, and a series of discussions and interviews with PMO officers and farmers, aside from relevant document reviews, were made, based on which this report has been prepared and presented.

1.1 Rationale of the Survey

Help for Catubig Agricultural Advancement Project, so-called HCAAP, is a project aimed at developing the Catubig valley converted to double-paddy cropping area from the current rain-fed farmlands. Irrigation and drainage development being the core component undertaken by NIA, the HCAAP has also other project components such as farm-to-market (FMR) road construction, rural water supply system construction, Schistosomiasis control, agriculture support services and institutional development.

As above-mentioned, the HCCAP is a sort of integrated rural development project covering multi sectors; hence the Project aims at not only increasing the paddy production by irrigation but also mitigate the poverty prevalent in this area since long time ago. As of September 2017, all the components, except for one component, have been completed. The uncompleted component is the irrigation and drainage development undertaken by NIA, which in fact shares the biggest investment among the components.

In fact, though the first Notice to Proceed (NTP) for irrigation and drainage component was issued to a Korean construction company back in March 22, 2007, the component has not been completed yet after almost 10 years implementation. According to the original plan, all the construction works were programmed to complete in 7 years. The Project, thus, falls much behind the scheduled implementation program; hence JICA dispatched a consultant to assess the current status, to identify causes and pitfalls making project so delayed, and to deliver catch-up plans with recommendations.

1.2 Purpose and Output of Survey

The purpose of the survey is to identify causes and pitfalls making the Project so delayed, whereby presenting catch-up plan(s) and recommendations in order for NIA-PMO to accelerate the implementation. For this purpose, a consultant team was deployed by JICA, who is to conduct the following activities, which themselves are the outputs from the survey:

- 1) Data collection on farm-to-market road construction including other access roads construction under HCAAP, and conduct site investigation and key informant interviews,
- 2) Review and pitfall identification on the construction progress, especially on irrigation construction works including packaging of the project,
- 3) Deliver catch-up plans(s) to compete the project soonest by presenting solutions on coping with the delay of construction works on each contract packages, by which assist NIA to modify its construction program, and
- 4) Recommend improvement plan(s) focusing on contract packaging with NIA and DPWH.

1.3 The Project Area

The three subject irrigation projects (IPs), i.e., Pinipisakan IP, Bulao IP, and Hagbay IP are all located within the Municipality of Las Navas and the Municipality of Catubig (see Location Map), Northern

Samar covering 12 irrigator associations (IAs) and a total of 1,303 farmers from various Barangays of the Municipalities of Las Navas and Catubig. As of recent report by NIA, areas of the three (3), out of 12 organized IAs are irrigated.

Table 1.3.1 Project Area and corresponding IAs (as of September 14, 2017)

Site	Total Service Area (ha)	Land Development (ha)	Irrigated Area (ha)
Pinipisakan Service Area	3,100	1,267	449.1
Pinipisakan IA (Brgy. San Isidro, Las Navas)	410	157.4	133
Haremasan ISA (Brgy. San Fernando, Las Navas)	390	123	278
Robasan FIA (Brgy. San Jorge, Las Navas)	380	118.9	38.1
Sajodeta ISA (Brgy. Dapdap, Las Navas)	390	30	
Denugayan IA (Brgy. Del Pilar, Las Navas)	371	25	
Mapapatag IA (Brgy. Guyo, Las Navas)	408	40	
Las Navas ISA (Brgy. Mabini, Las Navas)	432	32	
Saliba FIA (Brgy. Inuboran, Catubig)	320	67	
Bulao Service Area	742	505	
Bubosan FIA (Brgy. Bulao, Las Navas)	308	27	
Bunamas FIA (Brgy. Magtuad, Catubig)	434	36	
Hagbay Service Area	708	633	
ISAHF (Brgy. Anongo, Catubig)	457	45.3	
VANJOFE FIA (Brgy. San Jose, Catubig)	251	27.8	
Total Area (PSA+BSA+HSA)	4,550	2,405	

Source: NIA-PMO

As of recent NIA report, 10% of the total potential area are considered irrigated where three beneficiary Irrigators Associations (IAs) are located; namely, Pinipisakan IA, Haremasan Irrigators Service Association and Robasan Farmers IA. A number of farmers of these IAs were the subject of the focus group discussions (FGDs) for this survey.

With regards to service area coverage, Pinipisakan IP has the widest among the three sub-irrigation projects. Starting at the Catubig Diversion Dam, located at the southern barangay of San Isidro in the Municipality of Las Navas, Pinipisakan IP service areas are towards the northeast side of Las Navas traversing downstream barangays where seven (7) IAs have been institutionalized. Further, continuing north is one barangay service area of Inuboran in the Municipality of Catubig which is home to Saliba Farmers IA.

From the junction of the national road in Las Navas and moving 6 km east traversing the newly converted national road (former farm-to-market road constructed through Provincial Government of Northern Samar under HCAAP), is situated the Bulao IP service area covering two (2) organized IAs, with a total service area of 708 ha. From Bulao IP service area, continuing 3 km to the east situates Hagbay IP service area with 708 ha covered by the two (2) organized IAs of the Municipality of Catubig.

1.4 History of the Project

The three irrigation projects, Pinipisakan IP, Bulao IP and Hagbay IP, are continuing projects of the Help for Catubig Agricultural Advancement Project (HCAAP) after the loan was closed in January 2013. HCAAP, is a project funded by JICA with various components namely: 1) Irrigation and Drainage Development, 2) Rural Infrastructure Improvement, 3) Schistosomiasis Control, 4) Agricultural Support Services, and 5) Establishment of Farmers Organization. The purpose of the project is to alleviate poverty and increase economic activity through agricultural development in the Northern Samar area, which is one of the provinces in the Philippines with high poverty incidence.

The implementation of HCAAP started in April 2002 and ended on June 23, 2013, while some components of the project were completed; however, much of the civil works components mainly the irrigation and drainage development are still yet to be completed. When the official loan closing in January 23, 2013 was decided upon bilaterally by JICA and concurred by the Government of the

Philippines (GOP), the latter decided to provide funds for completion of the irrigation component, through GAA, hence the birth of the three irrigation projects- Pinipisakan IP, Bulao IP, and Hagbay IP.

Pinipisakan IP is the project which covers the Catubig Right and Left Main Canal of the original HCAAP. Funded by the GAA funds, this aims to complete the remaining 22.52 km of CLMC and its appurtenant structures covering a potential irrigable area of 2,000 ha.

Bulao IP is another sub-irrigation project from the HCAAP, which aims at completing the remaining works of HCAAP - irrigation and drainage component of Bulao area. It is envisioned that the project would generate additional total potential irrigable area of 237 ha in the subsequent component completions.

Hagbay IP, unlike the first two sub-irrigation projects, is devoid of lateral canals by design. The reason being is mainly because of its topographical condition and terrain wherein the main canal itself will, at the same time, serve as lateral canals for the service areas. Having generated an irrigable area of 633 ha, 75 ha of potential irrigable area is said to be remaining. The next chapter will discuss details of the status of accomplishments per irrigation projects.

CHAPTER 2 STATUS AND CAUSES FOR DELAYED IMPLEMENTATION

2.1 Status Confirmation

2.1.1 Status Confirmation by NIA-PMO Workshop

The three sub-irrigation projects located in barangays of the Municipalities of Catubig and Las Navas were evaluated by the NIA-PMO participants of the workshop held on September 4 & 5, 2017 in terms of status of civil works accomplishments and the resultant underlying institutional developments. The purpose of the workshop was to establish the actual situation of the construction works, and identify which projects and its components need utmost attention by the management and contractor in order to expedite the implementation. Table 2.1.1 presents the status of the project components in terms of percentage and Table 2.1.2 shows the physical accomplishment:

Table 2.1.1 Confirmation of the Status of the Three Irrigation Projects, %

Irrigation Project	Main Canal	Service Area (Ha)	Main Canal (km)	Progress Status as of Mid August, %					
				Dam	Main Canals	Laterals	Generated Area (On-farm Ditch) 1/	On-farm Dyke (Bund) 2/	Actual Planted/ Benefited Area (ha)
Pinipisakan	Right	1,100	21.69	100%	100%	70%	97%	40%	69.16 (3/)
	Left	2,000	22.585		75%	30%	30.8%	6%	0%
Bulao	Right	308	5.53	98%	72%	25%	69%	9%	0%
	Left	434	6.63		38%	0%	68%	8%	0%
Hagbay	Right	457	6.445	100%	3%	NA	88%	11%	0%
	Left	251	7.716		39%	NA	92%	10%	0%
Total	-	4,550	70.596	99.7%	68%	38% (4/)	53%	16%	2%

Note: 1/ Generated area means that the area had been constructed with on-farm ditches composed of main farm-ditch and supplementation farm ditch, which construction is the NIA-PMO responsibility. 2/ On-farm dyke (bund) means that the area had been constructed with farm bund, with which ponding water for paddy cultivation is now ready, constructed by farmer beneficiaries. 3/ Average 69.16 ha of dry and wet seasons had been planted (benefited) in 2016. 4/ Average of 43% for earth canal and 34% for lined canal.

Source: Workshop participated by NIA-PMO, September 4 and 5, 2017

Table 2.1.2 Confirmation of the Status Constructed for the Three Irrigation Projects

Irrigation Project	Main Canal	Service area (ha)	Lateral Canal (km)	Actual Accomplishments (as of Mid August)				
				Main Canals (Km)	Laterals (Km)	Generated Area (ha)	On-farm Dyke (ha)	Actual Planted/ Benefited Area (ha)
Pinipisakan	Right	1,100	27.719	21.69	17.90	1,134	466.3	69.16
	Left	2,000	14.45	16.938	4.335	238.4	127	-
Bulao	Right	308	1.97	3.98	0.492	171	27	-
	Left	434	5.02	2.51	0	238.6	36	-
Hagbay	Right	457	NA	0.193	NA	284	45.3	-
	Left	251	NA	3.0	NA	163	27.8	-
Total	-	4,550	49.159	48.311	22.727	2,229	729.4	69.16

Source: NIA-PMO, Progress Report

1) Pinipisakan Irrigation Project

The structures evaluated are the dams, main canals, lateral canals and main farm ditches of the respective irrigation projects. Among the three, and relative to accomplishments, Pinipisakan IP is more advanced where most of its structures are beyond 50% done especially the right main canal (RMC) section. However, it revealed that Pinipisakan IP's laterals and main farm ditch of the left main canal (LMC) still needs catching up as the structures are below 50% in terms of accomplishment.

In terms of institutional development, the NIA-PMO reported that the target beneficiaries are already organized as Irrigators Association (IA). These farmer groups are already institutionalized wherein the organizations have crafted their respective by-laws and regulations, registered their organization in the Securities and Exchange Commission (SEC), Bureau of Internal Revenue (BIR) and issued with Certificate of Incorporation. In addition, LGU accreditation was also firmed up in order that these IAs may as well receive locally-initiated or locally-funded programs and activities.

By far, Pinipisakan IP has generated an area of 1,134 ha ready for irrigation within the RMC, while only 238.4 ha was generated within LMC which covers a sum of 44% of the total potential service area of the Pinipisakan irrigation project.

2) Bulao Irrigation Project

Among the three sub-irrigations, Bulao IP still needs to complete the construction of the dam, for which installation of steel gates remains. Conveyance of water starts primarily with the dam; hence, it is crucial to complete the structure. Although it is already substantially complete (98%), however, this needs to be completed at the soonest, as weather systems like torrential rains and thunderstorms, and a number of strong typhoons are expected in the last quarter of the year.

Both main canals of Bulao IP are still incomplete where RMC is still 72% complete while LMC is only 38% complete. The laterals of the Bulao IP are also way behind especially the LMC in which there is still no accomplishment as of this time. In effect, the generated area of Bulao IP is 171 ha and 238.6 ha for RMC and LMC respectively.

Like Pinipisakan IP, the institutionalization of IAs in Bulao IP is also strong, where 2 IAs (100%) have been already organized and have been registered to SEC and BIR. However, in terms of LGU accreditation, Bunamas IA of Brgy. Magtudad was granted with the accreditation from the LGU of Catubig, while Bubosan Farmers IA from Bulao, Las Navas is still yet to receive its official accreditation from the LGU of Las Navas.

3) Hagbay Irrigation Project

Notwithstanding, the distance of the project from the national road, Hagbay IP's construction of the dam was already completed; however, other facilities are yet to be completed. Contrary to the two irrigation projects, wherein their RMCs are more advanced, Hagbay IP has more advanced LMC facilities, where 34% of the LMC is already concreted, as compared to its RMC, which is 3%. On-farm ditches, according to NIA-PMO, are already advanced in terms of accomplishments resulting to 284 ha which is considered by NIA personnel as generated area within the RMC while 163 ha in the LMC.

Institutionalization of the IAs in Hagbay IP is already 100% wherein the IAs (Vanjofe IA and ISAHF IA) have already been registered with SEC and BIR with its by-laws and regulations being already perfected and they are already accredited with the LGUs.

2.1.2 Status Confirmation by Contract Packages as of Mid-August 2017

The physical implementation was commenced on March 22, 2007 with the Notice to Proceed (NTP) to a Korean construction company, Hanjin Industry and Construction Co Ltd., for the construction works of Catubig dam and appurtenant structures including supply and deliver and installation of the steel gates. Though the original contract was to cover the construction from the dam up to the lateral canals for both right and left main canals, finally the contract was reduced to construct only the dam and right main canal. This revised contract was completed on December 21, 2010.

During years of 2008 and 2009, no construction packages had been tendered, and therefore no new construction had been commenced either in those years. In the following year, 2010, one domestic contract was awarded to a contractor who is based in Manila, JD Legaspi Construction, since this package was tendered under domestic bidding procedure. The NTP to the contractor was issued on July 2, 2010, and was supposed to complete on January 22, 2013. However, this package has not been completed to date, leaving approximately 20% slippage as at Mid-August 2017.

In addition to the above domestic bidding, there were 3 more packages also tendered under domestic

bidding procedure, which were awarded in 2011 and 2012. So far, thus, there were one international bidding and total 4 domestic biddings. Note that domestic bid procedure is required for a package with more than 50 million Peso at that time and conducted by the NIA-CO (as of now, packages only with more than 100 million Peso by the NIA Central Office), while packages below 100 million Peso can be tendered by Regional Office).

Construction under local minor contract was started in 2011. As afore-mentioned, packages with less than 50 million Peso (as of now, 100 million Peso) can be tendered and contracted by NIA Regional Office (RO), which are all called local minor contract. In the year 2011, 4 local minor contracts were awarded and NTP issued to the contractors who came from within the province, and in 2012, 5 more minor contract packages were tendered, awarded and NTP issued. The all the packages from year 2013 have been programmed under the local minor contract prepared and awarded by NIA-RO.

Following table summarizes the packages contracted by year, namely; 1) there were 52 contract packages till year 2016 and in this 2017 another 5 packages are under preparation for tendering/awarding as at Mid-August 2017, 2) out of the 52 contracts, only 27 packages have been completed to date leaving almost half the so far committed contracts uncompleted, and therefor 3) NIA-PMO is to handle as many as 30 packages in this CY2017 (25 un-completed packages and new 5 packages of CY 2017).

Table 2.1.3 Contract Status by Current Year with Contract Prices (as of mid August 2017)

Year	ICB	Domestic	Local Minor	Prices, Peso			Completed No.	Cumulative		
				Max.	Min.	Average		No.	Completed	Un-completed
2007-2010 (HCAAP)	1			545,920,503			1			
2011-2012 (HCAAP)		4		231,888,880	66,120,798	143,930,182	0	14	9	5
2011-2012 (HCAAP)			9	22,899,562	5,381,595	13,649,239	8			
2013 (GAA)			12	39,342,818	11,593,036	28,705,080	10	26	19	7
2014 (GAA)			12	39,831,765	10,190,506	22,111,342	6	38	25	13
2015 (GAA)			5	36,883,122	4,862,493	25,716,842	2	43	27	16
2016 (GAA)			7	47,642,583	13,553,774	32,107,401	0	50	27	23
2016 (HCAAP) payment only			2	38,203,918	25,810,976	32,007,447	-	<u>52</u>	<u>27</u>	<u>25</u>
2017 (GAA), under procurement			5	40,495,481	1,875,000	19,852,954	-	<u>57</u>	<u>27</u>	<u>30</u>
Sub-total	1	4	52							
Total/ Average		57		37,899,893	10,466,769	24,878,615	27			

Source: NIA-PMO (HCAAP), Note: GAA stands for General Allotment Act (Philippine government fund),

As indicated in the table, the domestic contracts which were started in 2011-2012 are all very problematic, for which none of them has been completed to date despite the fact that almost 5 years construction period has been spent. In fact, one contract was already terminated and rebid under minor local contract in CY2017, which is the construction of siphonic bridge flume of Pinipisakan IP. Another 2 contracts are also under negotiation for termination, leaving only one domestic contract package still at the original contractor's hand.

With regard to the contract prices, the price awarded under ICB was 546 million Pesos and the ones made under domestic contract ranged from 66 to 232 million Pesos. All the local minor contracts show the prices below 50 million Pesos with the average of 25 million Pesos. Since the ceiling applied for local minor contract, administered by NIA-RO, has been raised to 100 million Pesos as at now and taking into account the many number of simultaneous contract management, NIA-PMO/RO should consider enlarging the size of the minor local contract packages for the years of 2018 and 2019.

2.1.3 Time Elapsed for the Completed Contract Packages

Figure 2.1.1 shows time-elapsed against the original contract period for the packages contracted till the year 2016. If a package has been completed just on the date of the contract expiry date, the

implementation. However, it is worthy to note that the participants reasoned out that cause of the delay of hauling was on the difficulty of the accessibility of the project sites caused by inaccessible or poor road conditions. Hence, it has been the practice of many contractors to deliver their materials transported through motorized medium-sized boats via the Catubig river. While this is the most applicable measure to address the transportation issues, it was emphasized, however, that contractors must take advantage in transporting materials during the dry season when the road networks are easily accessible and stock more materials on site.

Concerning the ‘delayed hauling of materials to jobsite’, there has been road upgrading works by DPWH. Under HCAAP, farm-to-market road (FMR) was constructed between Las Navas and Bulao and further from Bulao to Hagbay. The FMRs were placed under the provincial government responsibility; however, the provincial government has lacked fund to well maintain the roads. Therefore, the provincial government requested DPWH to upgrade the FMR roads to national road by placing concrete pavement.

With the request, only the FMR between Las Navas and Bulao was decided to upgrade to national road, and the construction started from 2014 to date. The upgrading work started with stripping the gravel surface of FMR, and put additional embankment as needed and placed concrete pavement. Due to this upgrading work, the accessibility to Bulao and further to Hagbay was very much hindered for the previous years. However, as of September 2017, the upgrading works have been almost completed, and therefore the accessibility to Bulao will no longer be a concern from year 2018. Noted that the FMR from Bulao to Hagbay is not planned to upgrade, and therefore contractor will be able to access to the site with maintenance works.

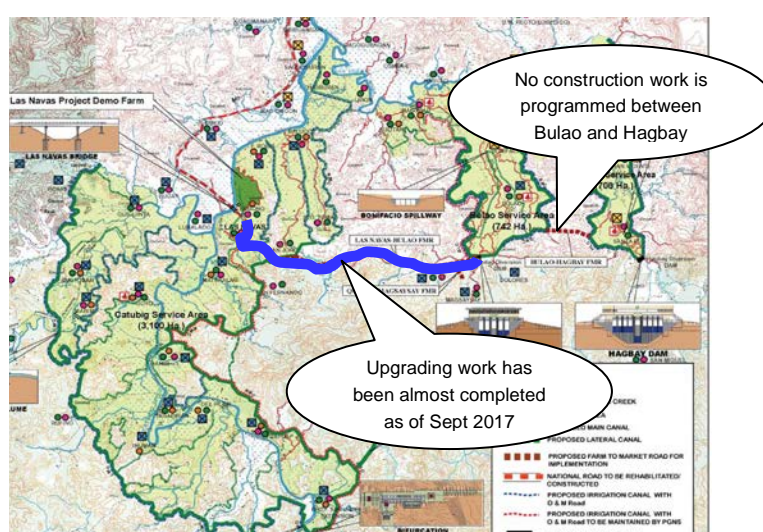


Figure 2.2.1 Road Upgraded to National Road by DPWH

Source: DPWH Regional Office

On the scarcity of aggregate, while it is a known fact that the available aggregates in Northern Samar are not suitable for major structures (requiring 300 psi concrete), hence, the scarcity, contractors source these out from Ormoc City (Visayas), Legazpi City (Luzon) and other neighboring towns and provinces. It was pointed out by the participants that to address the scarcity, contractors must stockpile aggregates during the dry season.

2) NIA-related Issues

There were two (2) issues identified by participants which perceived to be factors in the delay of the problems. These are: 1) multiple contracts awarded to contractors; and 2) warranted indefinite time extension by NIA to the contractors.

It was pointed out that while NIA is aware of the fact that most of the contractors who tender bids have already been awarded with a number of contracts from NIA and other agencies, it seemed that this fact and its implication are not considered during the evaluation of the Bids and Awards Committee (BAC) of NIA RO. It was emphasized by one of the unit heads that NIA-PMO cannot prohibit contractors to take part in the bidding as long as they meet bidding requirements and have satisfactorily passed the post-qualification evaluation. However, NIA can only act on the ineffectiveness or unsatisfactory work

of the contractor once they are already on board and are on the process of implementing the project.

On this note, one responded on the contrary, as she said that based on the purview of the revised RA 9184 implementing rules and regulations (IRR), that procuring agency can have the prerogative to forbid the award of the contract to a contractor, even though it has the lowest calculated bid/highest rated bid, if upon validation and verification, there is enough reason to cancel the contract award.

Moreover, it was pointed out that there seems to be less consideration in the evaluation of the contractors' net financial contracting capacity (NFCC). Without the proper evaluation, multiple contract award may result to a number of issues that will result to contractor-related issues as described in the previous section, especially those which relates to availability of manpower and equipment because the tendency of the contractor would be to work out each and every contract but just utilizing less manpower and equipment resources. Therefore, to minimize this issue, it was suggested that there should be limits to awarding of contracts to contractors who already have multiple contracts.

Another issue that was raised was the allowed time extension by NIA to contractors who requested work suspension due to unworkable days. While time extensions are warranted especially when they are valid, however, during the discussion, it surfaced that time extension, at least in NIA-PMO, can be indefinite and in effect, the contractor seems allowed to delay the commencement or resumption of their works.

Having this scenario, one participant suggested that NIA should formulate plans and schedules of the bidding processes, such that the awarding of contracts up to Notice-to Proceed (NTP) should coincide with the workable months (March-August). This was responded that while it is ideal to award the contract during the workable months, however, with the one-year validity imposed by the government to obligate funds, lest, the funds must be returned to the Department of Finance. Obligation of funds requires proof of award and NTP. Hence, the need to award contract even during the unworkable months.

3) External Factors-related Issues

Problems on unworkable days were also emphasized as one factor that delays project implementation. However, due to the nature of this problem, which neither created nor can be controlled by men, the participants left this issue as it is without giving reasons, since this area is usually visited by torrential rains, low pressures, and typhoons most of the time of the year. Moreover, it is also a known fact that only a few months are considered workable.

Finally, one issue which surfaced that is man-made but undeniably cannot be controlled by NIA nor the contractor is the insurgency issue brought by armed groups within the project site (see box). The participants however, did not elaborate on the reasons of insurgent attacks or arson by this group as they do not have the exact knowledge on the reasons. Nevertheless, they have presented measures to address this problem and that is, on the part of the contractor, he/she must negotiate properly to the armed group.

An Incident by Armed Group (ambush)

On July 25, 2017 at around 6:20 in the morning along the road of Barangay San Jorge, Las Navas, Northern Samar, the victim was on board of Mitsubishi Strada Color Grey going to said place coming from Poblocian, Las Navas to pick-up their finance officer at their barracks of JD Legaspi Construction Company. He was ambushed by unidentified armed group using high power firearms and IED, which is detonated first prior to the close range shooting by the hostile perpetrators. The victim is believed to be fatally wounded by the closed range shooting in-front for the vehicle's windshield and not by the IED explosion.

Table 2.2.1 Problems Identified by the Participants During the Workshop

Problems	Lack of manpower on site	Lack of equipment on site	Delayed hauling of materials to jobsite	Scarcity of aggregates	Multiple contracts of contractor with NIA and other implementing agencies	Contractor is warranted to have indefinite time extension	Unfavorable weather condition	Peace and Order problem (insurgency/ arson)
Reason	Lack of support from the management of the contractor	Lack of support from the management of the contractor	Inaccessibility of road to project site	There is no high-quality quarry (borrow) site in Samar island	Process on evaluation of BAC post-qualification does not consider the implication of the fact that the contractors already possess a number of contracts from other projects agencies.	Scheduling of award /NTP falls under the unworkable or rainy days	The project area belongs to Type II in the classification of the Philippine Climatic Zone	
	Lack of contractor's financial capability to sustain the allocation of salary or wage	Lack of contractor's financial capability to sustain fuel and other logistic needs			Less consideration on the evaluation of contractor's Net Financial Contracting Capacity	Unworkable days are not taken into account in the duration of the contract		
Measure			Provide construction materials during dry season wherein the road is accessible	Stockpiling of aggregates and sand during dry season	Limit contract package especially to problematic contractors	Formulate plans and schedule that would coincide with the dry season in Northern Samar (usually happens May to September)		Proper negotiation with armed groups
Related to	The Contractor				NIA		External	

Source: NIA-PMO Workshop, September 4, 2017

2.2.2 Problem Analysis Establishing Problem Tree by NIA-PMO

The last workshop session was about problem tree analysis in which the participants were allowed to structure the issues and problems that would ultimately point to the core problem which is the “Delayed benefits from the irrigation system”. In relation to the previous workshop sessions, the problems identified were included but a more in-depth analysis was employed in order to determine the depth and breadth of the causes of the problems that would boil down to the core problem.

They were guided further by the identified subsequent problems, which are related to: 1) Delayed completion of construction and; 2) Farmers do not practice irrigated paddy agriculture. From these two sub-causes it revealed a four-tiered problems of which it is apparent that the problems identified with depth and breadth are related to contractor and NIA, which means much of the problems can be resolved and can be controlled.

1) Problem with the Construction

One problem branch according to the respondents that resulted to the delay of completion is the practice of contractors of transferring their equipment and other resources from project to project. This problem is contractor-related issue; however, accordingly when respondents were asked to determine deeper information on its cause, the respondents agreed and identifies that it is caused by awarding multiple contracts to contractors - a problem that can be resolved at the procuring entity’s level. However, subsequently, it might happen that political intervention dictates the warrant of multiple contracts to favored contractors.

Frequent suspension and time extension of contracted works are caused by external factors, one caused by human-intervention (peace and order issue), which NIA and contractors have no direct control, another is related to natural climatic cycle. In fact, Northern Samar falls within Type II climate region, in which rain falls almost throughout year and therefore there is no distinct dry season (see Figure 2.2.1 for the monthly based rainfall detected at Las Navas area covering from 2002 to 2014, Source: Climate Forecast System Reanalysis provided by the National Centers for Environmental Prediction).

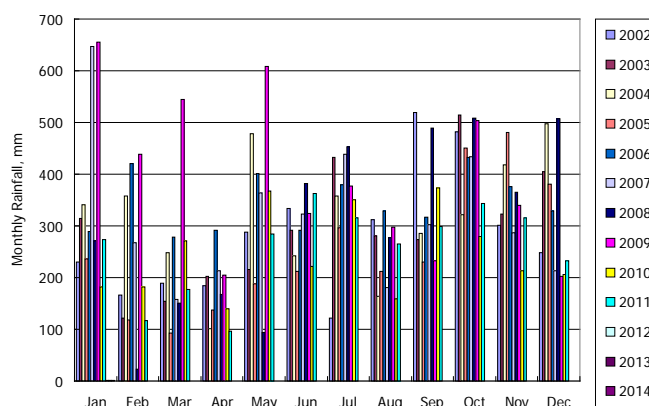


Figure 2.2.2 Monthly Rainfall at Las Navas

Source: Climate Forecast System, US

Another problem branch is caused by the contractors who do not adhere to the construction schedule. According to the respondents, one of the reasons why contractors do not follow the construction schedule was due to lack of equipment at the job sites. Another two reasons for not adhering to schedule is because of unskilled construction team working in the area, and finally, due to the lack of technical personnel. Both problems were perceived by the respondents as the result of the multiple contracts awarded to the contractors, which again, the NIA can have the upper hand of this situation.

With regards to construction schedule, contractors were found not to follow construction schedule because of the need to have multiple handling of construction materials from source then hauled by truck traversing highways or land and then due to difficulty in accessing the site through the existing dilapidated road, transport of these materials are then cruised through the Catubig river using motorized boats.

Lastly, on construction problems, factors affected its completion is the suspension of work allowed by

the NIA-PMO to contractors who request suspension order upon issuance of NTP. The justification of the suspension is the unworkable days due to rainfall. Based on the discussion, procurement process takes too long a time resulting in the need of NIA to award the contract on the last quarter which coincides with the rainy season in the area. It means that upon the NTP issued, the contractor submits suspension request at the same time, due to the heavy rainfall.

2) NIA-PMO’s Perception on the Problems with Farmers

With regards to farmers and development of their farms, NIA-PMO participants responded that the lack of capital to develop lands is one of the causes why farmers do not practice irrigated paddy agriculture. Another reason according to the NIA respondents was that rice cultivation is not a priority by many farmers as other sources of income are available. Having the reason that landowners/farmers are not so much interested in rice farming, consequently their tenants are barred to expand the development. Moreover, according to the respondents, there seems to have no proper maintenance done by farmers to its on-farm facilities.

Another branch problem which was expounded by the respondents was that at least, for farmer tenants, they could not decide to expand the development of the area as they are prohibited by the landowners who have apprehension with regards to the tenancy law, which might implicate them and subject their lands for distribution.

Subsequently, the respondents perceived that the interest of the landowners to investing for the development or expansion of the area for paddy agriculture is still not that strong mainly because many of the landowners reside far from the agricultural areas.

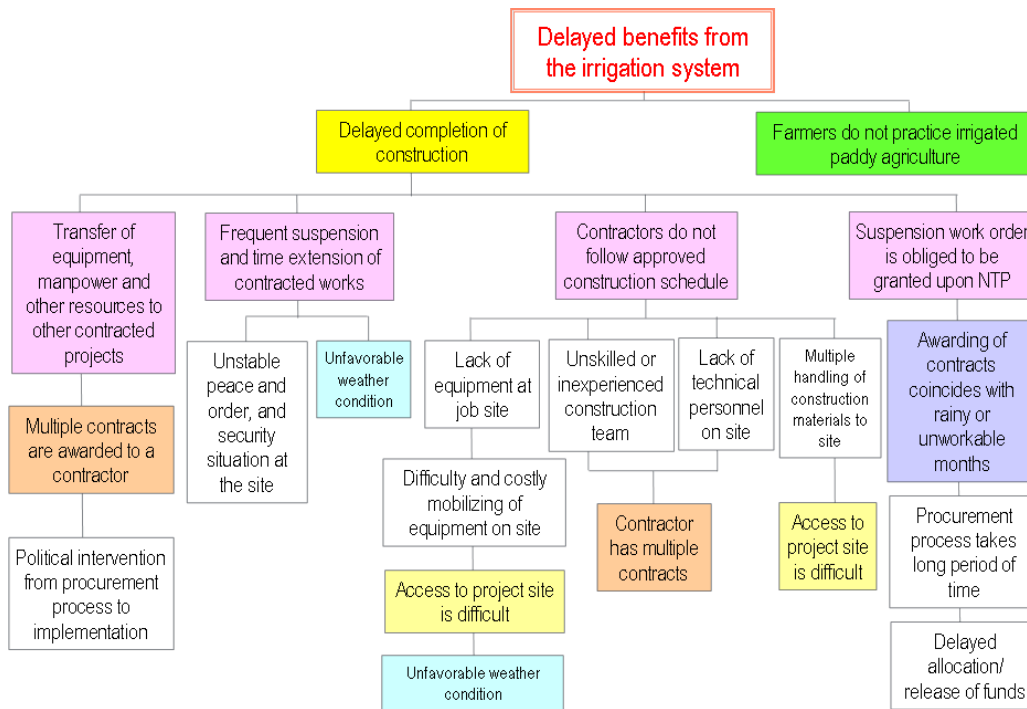


Figure 2.2.3 Problem Tre Analysis (centering on Construction Side)

Source: NIA-PMO Workshop, September 5, 2017

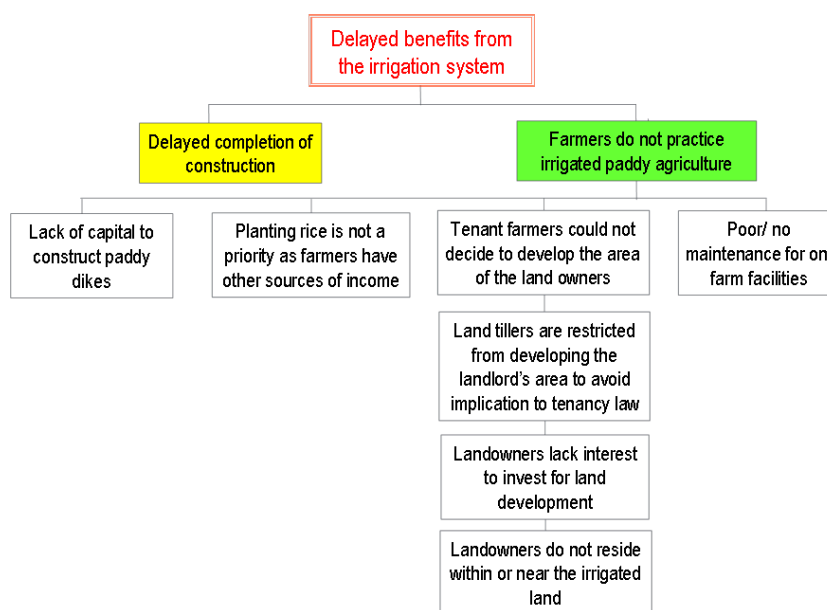


Figure 2.2.4 Problem Tree Analysis (centering on Farmer Side)

Source: NIA-PMO Workshop, September 5, 2017

2.3 Farmers' Perception on the Project

After the workshop and Focus Group Discussions (FGDs) done with NIA personnel, FGDs with farmers were conducted on September 7 and 12, 2017 to know and assess the perception of the farmers with regards to the irrigation projects that is still on-going, and determine the problems or issues that they experienced on the development of their lands for rice paddy cultivation.

There are 12 IAs which have been institutionalized within the service areas of the three sub-irrigation projects. Three (3) out of the 12 IAs are said to have been irrigated by the project through the Catubig right main canal (CRMC); namely, Pinipisakan IA, Robasan IA and Haremasan IA. Some farmer members of these IAs were invited to be interviewed and subjected to the FGDs at the NIA Catubig Field Office on the two occasions (September 7 and 12, 2017).

2.3.1 Workshops Held at the Sites with Beneficiary Farmers

A total of 34 farmers were respondents of FGDs whom perceptions were assessed with regards to the various issues brought by the personnel of the NIA-PMO during the workshops. Table 2.3.1 summarizes the information of the farmer respondents of the FGDs:

Table 2.3.1 Farmer Respondents during the Conduct of FGD

Name of IA	Number of Farmer Respondents	Number of Landowners	Number of Tenants
Pinipisakan IA	9	5	4
Haremasan ISA	15	12	3
Robasan FIA	10	7	3
TOTAL	34	24	10

Source: Workshop held on September 7 and 12, 2017

While the farmers are within a supposedly irrigated area as reported by NIA-PMO, we requested the Institutional Development Officers (IDO) of the Catubig office to invite farmers who may belong to the following categorization: a) Category 1 - Undeveloped and unplanted lands, b) Category 2 - Irrigated and developed areas but not planted, c) Category 3 - unirrigated or very minimal irrigation but developed for rice cultivation usually during wet season and; d) Category 4 - Paddies that are irrigated and are planted.

Table 2.3.2 shows the number of farmers belonging to the various categories per IA. The stratification was done to determine if there could be a number of farmers who are still not developing their lands for rice cultivation despite the claims that at least, in CRMC, it is already an irrigated area. Moreover, the categorization would somehow determine if there are farmers who may have developed their lands (in bunds) in preparation for irrigated paddy cultivation, but, for some reasons did not choose to cultivate their lands. And, on the same standing, reasons of some farmers who on the contrary, to the previous category of farmers, have cultivated their lands were also sought.

During the Problem Tree Analysis workshop done at NIA-PMO, the NIA participants shared a number of issues experienced by the beneficiary farmers with regards to their non-adoption to irrigated paddy farming. The issues raised were: 1) scarcity of capital for land development, 2) non-priority of rice farming due to a number of other income source, 3) tenurial issues; and 4) non-maintenance of constructed appurtenant irrigation facilities. These issues were discussed with the farmers to shed light on what really is the perception of the farmers.

Aside from their reasons to cultivate or not to cultivate, during the discussion, the farmers were asked what were: 1) the measures done in order to develop the land 2) the difficulties or problems they encounter in the development of their lands, 3) how they were able to overcome the difficulties.

Table 2.3.2 Farmer Respondents during the Conduct of FGD by Category

Name of IA	Category 1	Category 2	Category 3	Category 4
Pinipisakan IA	1	2	3	3
Haremasan ISA	5	1	3	6
Robasan FIA	4	2	2	2
TOTAL	10	5	8	11

Source: Workshop held on September 7 and 12, 2017

2.3.2 Common Issues and Farmers Perceptions

1) Tenurial Issues

On the part of landowner respondents, the minimum and maximum landholding is 2ha and 20 ha, respectively. The landowners stressed that they do not have tenants for rice cultivation as they usually develop, at the most, 1.5 - 2 ha which is only very manageable by the family and with the help of some farm laborers. The remaining areas of their lands are planted with other crops such as corn, legumes and other vegetables. One landowner of 20 ha only cultivated 1.5 ha for rice and much of their land is used for silage production for their carabaos (drafting animal).

Tenant respondents were specifically asked whether or not they are restricted to develop the area of their landlords and if they have on-going issues with the landowners. Based on the responses of the farmers, majority did not perceive tenurial issues as the foremost problem with regards to land development. In fact, only 1 out of 10 tenant respondents perceived issues of this kind with his/her landlord.

The findings of this FGD are somehow consistent with UPLBFI's KII with DAR Northern Samar provincial officials (refer to SAPS for HCAAP Revised Inception Report, 2017). According to the report, DAR officials are curious why tenurial issues are being consistently brought out during the many discussions, when in fact, it was already pointed out during the previous NIA assessment that critical issues attributed to land tenure being the reason was only 7%.

On the same UPLBFI report, the DAR at the municipal level, maintains that the problem is not on land tenure, but more on the attitudes of the farmers, hence, if we are to deduce the statements of DAR and the responses of the farmer respondents, tenurial issues at least, in Las Navas or in Catubig, may not be a strong reason why there seems to be non-development of land for rice paddy cultivation in the

area.

The rest of the tenant respondents for this FGD, however, stressed that their landlords are willing to let the expansion of the paddy development in order to gain more from the land. It should be noted that, for this FGD, we only concentrated on three (3) of the IAs which were already irrigated by the project.

2) Capital Issues for Land Development

Majority of the farmer respondents admitted that they do not have readily available financial capital to fund land development for rice paddy. However, they stressed out that the determination to find ways through a number of means (i.e. borrowing money from friends and relatives, loans, Pantawid Pamilyang Pilipino Program (4Ps) of DSWD under Cash-for-Work Program, among others) may allow them to raise funds for the land development and, by and large, rice cultivation.

3) Issue on Availability of Farmers

Participants see that there is no lack of laborers as long as there is available money as wages for the farmers. Hence, for the respondents the availability of farm laborers is dependent on the availability of funds of the hiring party. They perceived that in order to make the workers available, the landowners must make their compensation attractive and must be competitive if not exceed with the construction contractors' offer within the area.

Some respondents agreed that laborers are available during the planting stage where it usually coincides the wet season in the area, at this time construction work is usually suspended, hence, workers are available for farming. However, when harvest time comes and usually coincides dry season, farm laborers opt to be hired as construction workers which wages are usually paid in cash contrary to harvested palay (paddy) which is paid in kind.

Moreover, as workers are paid with palay, they tend to agree to work for the fields with good quality palay as there is surety of better compensation. Good quality palay as payment ensures higher margin when they sell their palay to local buyers. However, when a field has poor quality palay, workers tend to make excuses not to harvest the grains or opt to work as construction worker or other manual labor jobs.

4) Rice Cultivation is NOT a Priority

Respondents at all categories disagreed that it is not a priority crop. They shared that rice farming is a priority for food sustenance; however, with the absence of a good irrigation system, farmers are afraid to invest for rice farming.

Moreover, those respondents who have irrigated farms and have planted, agreed that they observed that the yields are high and so rice farming in the area has a promising future that needs to be tapped and harnessed as these farmers have experienced decent income and profit from the present situation of rice farming. They stressed further that if the situation would change for the better, in a way that irrigation system would be properly operational and efficient, there would be a lot of compounding benefits from rice cultivation.

2.3.3 Farmers Perception by Category in Development

1) Category 1- Undeveloped and Unplanted

The farmers shared that while they tried to develop dikes or bunds in their areas years ago using manual labor, they were not able to complete the dikes, because the dikes were trod upon by carabaos and residents (farm labors in the neighboring farms) in the area, leaving the dikes collapsed and damaged. Demotivated, they chose not to develop the area until the irrigation system is ready to

distribute water for rice production. After all, they are also cultivating coconut at the upland area as means of income.

Similarly, some farmers claimed that they lost their motivation to develop bunds, because of the failure of the irrigation canals to effectively convey water and be distributed to their farm lands. He suspected that it is because of improper construction works of the irrigation canals. For almost four years, no water is flowing through their farms, if there could be, then it is during a very hard rain, and nonetheless, opted not to develop their farms.

There were other farmers who claimed that they were able to develop bunds before and cultivated their lands during rainy seasons. However, because of the very slow progress in the irrigation project, which rendered their areas unirrigated and so they opted not to redevelop the bunds in their land and wait for the irrigation project to be completed. For them, to lessen their burden, they opted to stop farm development, at least for rice, and concentrate on the cultivation of coconut.

One disappointment that was raised by a farmer was that project monitoring by NIA-PMO personnel was not thorough. An example he cited was that monitoring team did not scrutinize the quality of the works done by the contractors. On top of this, the farmers clamored to expedite the completion of irrigation project in order that they could experience the true benefit of the said project.

Category 2- Developed Areas but not Cultivated

Some farmers in this group claimed that while they have diked at least one (1) hectare of their land, they were not able to cultivate rice because of so much water that enters in their paddy areas especially during rainy season. They perceived that there is problem in the system such that water does not easily drain out of their fields.

This perennial problem has been experienced by the farmers within this area long before the NIA irrigation, however, their expectation that this problem will be addressed by the irrigation project, did not materialize. In fact, farmers perceived that it worsened perhaps due to non-provision of drainage. According to NIA personnel, one of the contractors was not able to complete the construction of drainage hence the inundation of the area.

According to farmers within this category, they do not see much difficulty in the development of bunds, as they were able to develop bunds long before. But because of the inefficiency (not completion) of the project, they would refuse to develop their area. One farmer claimed that it is not only the contractors who are liable in this problem, as NIA is mandated to monitor the irrigation projects, however, it seems that NIA does not properly monitor and evaluate the on-going implementation of the canals.

Category 3- Unirrigated/ Minimal Irrigation but Developed Land for Rice Cultivation

While it is a fact that there is no substantial irrigation water conveyed in their areas, farmers in this category were able to develop and cultivate for two basic reasons; 1) one is to feed their family, and 2) another is to harness the potential of their own land.

Farmers explained further that their families consider rice as their staple food, therefore in order to feed their family with enough rice, they need to cultivate rice for the simple reason of sustenance, the surplus harvest are sold to buyers. Hence, for this category of farmers, their motivation is not so much for profit but for food sustenance.

They also explained that having a considerable area of fertile land, it is important for them to harness the potential of their land for rice farming. By developing their lands, it somehow gives them a sense of purpose of possessing their lands, as they are able to produce food from their lots instead of buying

this staple food from the market at a retail price. Moreover, farmers explained that with the limited assistance from the government, having to produce their own food in itself gives them a sense of satisfaction.

Some farmers in this category were able to develop their lands ready for rice cultivation through personal financial capital (i.e., financial- savings and income) or borrow money from their relatives or neighbors without interest. While others were able to develop with the assistance from the DSWD's cash-for-work program, where farm laborers (usually 10 laborers) are employed to develop the land of the farmers with bunds or dikes compensating the laborers a sum of 219 Pesos per day for ten days work.

Farmers in this category admitted that at the beginning of bund development, major difficulties include physical and financial aspect. Challenge on physical aspect is on the difficulty of tending the land to make dikes as the soil is hard given that it is not well irrigated. On the financial side, many farmers admitted that in the beginning they did not have enough financial capital hence, they usually borrow money as mentioned above.

Farmers have been cultivating rice usually during monsoon seasons. While they acknowledge that they are financially hard up to develop their area, but because of the drive and motivation to develop their land, nonetheless they find ways to fund the land development, and rice cultivation.

They resolved to keep and maintain their lands, developed as they perceived that if they cease to farm the area, weeds will flourish and proliferate, and they may need more capital in the farm development as labor costs has been rising year after year. These farmers emphasized that they are encouraging other farmers or landowners, to also develop their lands, which are adjacent to the existing developed areas, in order to minimize rat infestation to the cultivated areas. It was observed that adjacent undeveloped or bushy areas are home to a number of pests such as rats, which cause damage to the planted rice.

While most of them are planting rice during the monsoon seasons, they sometimes plant corn during the dry season and sometimes they leave it uncultivated or subject it for fallow period. They are optimistic that continuous cultivation of their area would allow them to enroll a number of government assistance in the future with regards to rice farming. After all, with the on-going NIA projects, they are certain that one day it would efficiently distribute water for their farms.

Category 4- Paddies that are Irrigated and Planted

Prior to the irrigation of its land, they were first monsoon rain cultivators and when their farms had been irrigated, they continuously develop their farms for rice production (see the Google map showing existing paddy fields). Like the Category 3 farmers, their previous motivation for paddy rice cultivation was only for food sustenance and not much for profit. But when irrigation water was conveyed and distributed in their farms, their motivation changed as they are now targeting to double their rice production to increase profit.

In the beginning of the land development, most farmers in this category also did not have sufficient capitalization. Some farmers saved much from other income source (i.e., coconut



Existing rain-fed paddy fields developed since long time ago before the project (light color dots show s the heap of threshed hay. Google Earth (March 2015)

and abaca production, etc.) to raise funds for land development for rice production. One farmer revealed that they were blessed to have other helpful neighbors who helped them develop their lands through *bayanihan*¹. Like some Category 3 farmers, some were beneficiaries of the cash-for-work program of the DSWD which assisted them in the bund development.

Category 4 farmers, while they are relatively advanced in terms of rice production, still experience challenges in the land development or bund maintenance. One difficulty that they encounter is the increasing prevailing labor price which is presently ranging from 250 to 300 Peso per person per day at par with the prevailing labor wages in the construction industry in the area. This means that farmers need more financial capital to employ the laborers needed lest they have a hard and longer time in developing their areas. Another difficulty they experienced is the availability of the laborers who are also employed by a number of contractors around the area for NIA, DPWH and other projects.

Provision of working tools such as shovels, pike among others was also a challenge because usually during planting season, farmers simultaneously tend their respective lands, and borrowing of these tools seems difficult at times. They perceived that buying a number of shovels and other tools (around 10 pieces each for the laborers) is not practical.

The farmers revealed that they overcame a number of challenges by saving much in preparation for the planting season to increase their capitalization, while others borrow money from friends and neighbors and also from creditors. On the issue of availability of farmers, many landowner farmers provide additional incentives that would attract laborers to work for them regularly or continuously. This includes free meals while at work, snacks and coffee and even free cigarettes.

While most farmers may have developed their areas for rice, they revealed that a portion (0.25 ha or even less) are left for cultivation of other crops such as corn, legumes, squash and other vegetables. Some farmers (those with more than 10 hectares of land) revealed that some of their areas are not cultivated for rice. In fact, some of these areas are left uncultivated, while some are used for silage production to support carabao raising.

¹ Bayanihan is a joint effort of neighbors and relatives to help out one's neighbor or relative in doing task or tasks together, lessening the burden of the work, thus, making the job easier. This is exhibited when a neighbor is transferring a traditional Filipino house, or 'bahay-kubo' from one location to another, rice planting or harvesting, preparation of food for fiestas, wedding feasts, among others. The service rendered by the neighbors need no compensation or reciprocation, it is all about the community spirit of the Filipinos.

CHAPTER 3 IMPROVEMENT AND CATCH-UP PLAN

Chapter 2 presented the current status of the Project in terms of physical accomplishment and also contract fulfillment together with problems identified through workshops, interviews and discussions. This Chapter 3 presents improvement and catch-up plans based on the afore-mentioned discussions. Also, the following include a forecast if what has been made were to continue and the target of when to complete taking into the prevailing conditions.

3.1 Future Forecast and Target Setting

3.1.1 Future Forecast without Measure

NIA-PMO has periodically prepared/updated overall scheduled and completed physical and financial status including so-called S-curve according to Form-1A and Form-2A prescribed by NIA-CMD. Based on the physical status for the 3 irrigation systems of Pinipisakan, Bulao, and Hagbay, following chart indicates those progress status with the overall status since the commencement of the construction till the mid August 2017 (note that monthly basis progress status of HCAAP is not available between the 2013 and August 2017, the progress between the 2 points was linearly interpolated):

As shown in the chart, the lowest progress shows up in the Bulao and Hagbay irrigation system, both of which have achieved only about 26% accomplishment only as at mid August 2017. On the other hand, Pinipisakan has been completed by about 63%, which however still approximately 40% of the works have to be done till the completion. Works undertaken under HCCAP had progressed over 70% already as of end 2014, and to date another about 20% achievement has been made, making total accomplishment at 92%. In overall, the progress has come to 72% as at the mid August 2017.

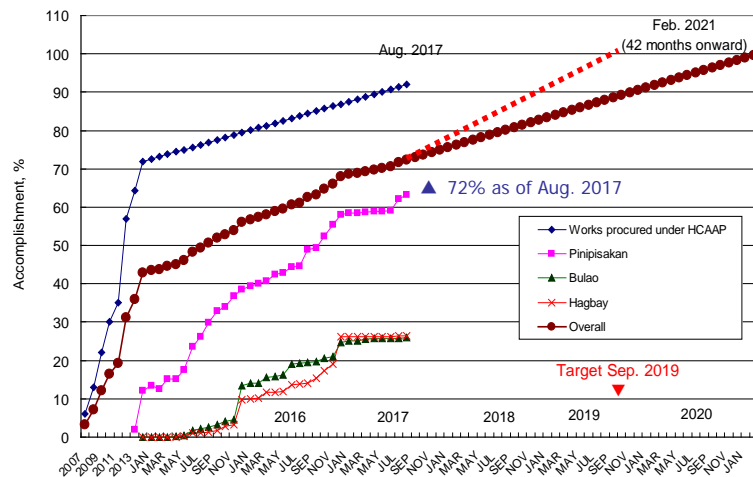


Figure 3.1.1 Progress Status till Aug 2017, and Future Forecast
Source: NIA-PMO, JICA Consultant

An average monthly progress can be estimated by dividing the overall progress to date by the total number of months during the period. The estimated average progress ratio is only at 0.65% per month. Should this progress continue, as if business as usual, there would be as many as 42 months to complete all the reaming works. Therefore the estimated completion date will in February 2021 during which there could be 3 dry seasons.

3.1.2 Economic Loss Incurred under Current Progress

According to an original plan, the construction parts of the Project was supposed to complete within 7 years. However, with above-mentioned estimation, the Project would need as long as 15 years, approximately double period as compared to the original one. Delay in implementation leads to delay of benefit generation, and hence, as is well known, such delay reduces the project viability in a form of lower IRR, lower B/C ratio, and even negative net present value.

Table 3.1.1 summarizes the results of economic analysis¹ conducted for the 2 cases; 1) project is

¹ For simplicity purpose, financial values were all entered; project costs were referred to NIA-PMO actually

3.2 Improvement and Catch-up Measures

To improve the current status of progress and also catch-up toward the target of September 2019, following 11 measures should be undertaken;

- 1) Conduct early tendering,
- 2) Consider only half workable days,
- 3) Modify Net Financial Contracting Capacity (NFCC) formula,
- 4) Validate the post-qualification documents,
- 5) Include NIA-PMO representative to Bid and Award Committee,
- 6) Strengthen the project management, and conduct regular coordination meeting,
- 7) Invite contractors from other areas/provinces too,
- 8) Hauling the materials during dry season,
- 9) Arrange package manageable within the area, and
- 10) Prepare enough fund for trial-operation

Following discussion elaborates all above measures in detail:

1) Conduct Early Tendering

In most cases, NIA-RO/PMO has conducted the current year's packages in the latter part of the same year as exemplified below, in which Notice to Proceeds (NTPs) were given to the awarded contractor in November and December 2014. As afore-mentioned, wet season starts from September and peaks in December. Therefore even if the contractor is given the NTP, he/she cannot mobilize necessary machineries and man-powers.

In fact, according to the record based on the daily rainfall data from 2012 – 2017, approximately 63%, 74% and 68 % are considered as unworkable days for November, December and January respectively. With this unworkable condition, suspension is requested by the contractor and NIA-RO/PMO shall have no way than granting it upon the issuance of NTP.

Table 3.2.1 Example of Data of NTP for 2014 Packages

Contract	Work content	Date of NTP
PINIPISAKAN IP		
PIP#1-2 014	Preparatory Works for CLMC and Construction of Service Road	November 28, 2014
PIP#2-2014	Preparatory Works for CLMC and Construction of Service Road	November 28, 2014
PIP#3-2014	Preparatory Works for CLMC and Construction of Service Road	November 28, 2014
PIP#4-2014	Preparatory Works for CLMC and Construction of Service Road	November 28, 2014
BULAO IP		
BIP#1-2014	Construction of Bulao IP On-farm Facilities at BUNAMAS Service Area - 1	December 2, 2014
BIP#2-2014	Construction of Bulao IP On-farm Facilities at BUNAMAS Service Area - 2	December 2, 2014
BIP#3-2014	Construction of Bulao IP On-farm Facilities at BUBOSAN Service Area	December 1, 2014
BIP#4-2014	Construction of Bulao Supplemental Canal	December 2, 2014
HAGBAY IP		
HIP#1-2014	Construction of Hagbay IP On-farm Facilities at Vanjofe Service Area - 1	November 28, 2014
HIP#2-2014	Construction of Hagbay IP On-farm Facilities at Vanjofe Service Area - 2	December 1, 2014
HIP#3-2014	Construction of Hagbay IP On-farm Facilities at ISAHF Service Area - 1	December 1, 2014
HIP#4-2014	Construction of Hagbay IP On-farm Facilities at ISAHF Service Area - 2	December 1, 2014

Source: NIA-PMO (Cataraman)

Though there is not a distinct dry season in this climate region (Region II), relatively small amount of rainfalls take place from March as calculated by around 30% to 45% of unworkable days for the months of March to August (refer to next session). It means that the construction works should commenced in a full swing from March, and to make this arrangement possible, the NTP should be issued mid February. Further, to issue the NTP by that time, tendering process, i.e. advertisement and invitation to tender (ITT), should be started in October of the previous year, or as latest case by Mid

November. Note that tendering process needs minimum 2 months but usually 3 – 4 months.

Table 3.2.2 Prospected Schedule of CY 2018 Packages Tendering

2017				2018											
S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Advertisement	ITT				NTP			Construction							
	▼				▼										

Source: JICA Consultant

2) Consider Only Half Workable Days

Figure 3.2.1 shows percentage of unworkable days summarized by year from 2013 to 2016 while Figure 3.2.2 summarizes those unworkable days by month. The sum of annual unworkable days reaches almost half of the whole year, say 45%, 55%, 47% and 48% for the years of 2013, 2014, 2015 and 2016. By month, the ratio of unworkable days varies as relatively small from March to August while bigger for the rest of the year, say from September to the following year's February.

During the tender document preparation, such high rate of unworkable days should be taken into account. One requirement specified in the tender document is the necessary kind and number of machineries that the bidders should avail of during the construction. The number of machineries should therefore be doubled or at least be 150% of what are required under normal condition. Also, there could be such additional provision, in that more than two-third number of machineries should be owned-ones and not rental ones.

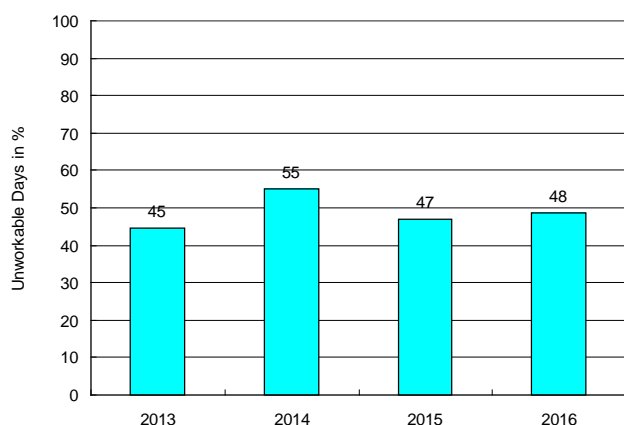


Figure 3.2.1 Unworkable Days from 2013 to 2016

Source: NIA-PMO, JICA Consultant

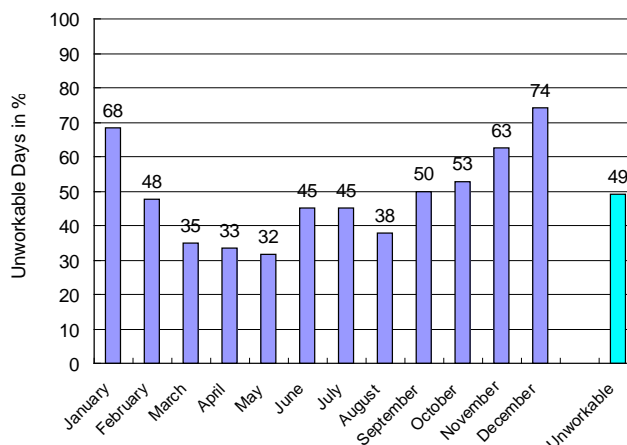


Figure 3.2.2 Unworkable Days by Month (2013 to 2016)

Source: NIA-PMO, JICA Consultant

3) Modify Net Financial Contracting Capacity (NFCC) Formula

There was a concern related to multiple awards of contracts to a contractor raised during the workshop held with NIA-PMO staff. In fact, to limit multiple contract awards over the contractor's capacity, there is a formula, which estimates the bidders' net financial contracting capacity applied in the bids conducted in Philippines. The formula requires the bidders to submit their current asset, current liabilities, value of outstanding works, with which the NFCC is calculated as below:

$$\text{NFCC} = [(\text{Current Assets} - \text{Current Liability}) \times K] - \text{Value of All Outstanding Works}$$

Where, K value is set at 10 in case of projects able to complete within one year.

An example is given below wherein a contractor submitted his bids to the 3 packages simultaneously held. The bid prices are, as example, 55 million Peso, 33 million Peso and 47 million Peso for the package 1, 2, and package 3 respectively. With the contractor's financial status exemplified in the

following table, the contractor was awarded all the packages according to the previous practice since individual bid of the 3 packages is all below his contracting capacity of 99.250 million Peso.

However, the method recommended here is that cumulative bid prices, not individual bid price, should be counted in evaluating his bids as compared to his contracting capacity. According to this recommended practice, the contractor who submitted his bid to 3 packages can be awarded package No.1 and Package No.2 but the package No.3 cannot be awarded to the same contractor. The total bid price of package 1 and package 2 comes to 88 million Peso which is still below his contracting capacity of 99.25 million Peso, while sum of the 3 bids arrives at 135 million Peso which is over the contracting capacity, thus the package No.3 cannot be awarded to the same contractor.

Table 3.2.3 An Example of Calculating NFCC (with Recommended Application for Multiple Award)

No.	Description	Amount, Peso
1	Current Asset	16,000,000
2	Current Liabilities	75,000
3	Value of Outstanding Works	60,000,000
4	K	10

$$[(16,000,000 - 75,000) \times 10] - 60,000,000 = \text{Php } 99,250,000 \text{ (NFCC)}$$

Bid Price of Package 1= 55,000,000		✓	(awarded)
Bid Price of Package 2= 33,000,000	Total 1&2 = 88,000,000	✓	(awarded)
Bid Price of Package 3= 47,000,000	Total 1&2&3 = 135,000,000	X	(NOT awarded)

4) Validate the Post-qualification Documents of the Bidders

Tendering for local minor contracts is conducted under single stage - 2 envelope system. In this system, there is no pre-qualification conducted prior to the bidding, instead post qualification is conducted with the bid prices opened. Required documents for the tender submitted by those contractors who submitted the bid price below the ABC, the ceiling price of the bid, are scrutinized in terms of financial status, similar work experiences, out-standing work volume, man-power and the equipment the bidder is committed, technical/ engineering staff who are to stay at site as responsible at the job site, etc.

There might be a possibility, especially for those contractors who have recorded negative slippage in NIA's similar works, not to show all the facts in the submitted documents. In this case, the Bid and Award Committee (BAC) should request the bidders to show the original documents to check the consistency with the submitted copies of such documents, and the Technical Working Committee (TWC) should go to the contractor's office and directly check them.

5) Include NIA-PMO Representative to the Bid and Award Committee (BAC)

The BAC established at Regional Office is composed of permanent staff/officers of such departments as finance, administration, procurement, operation and engineering, and chaired by a higher ranking officer in the regional office. Then, there is a concern why the representative from the PMO to the BAC is not well reflected. In fact, present establishment of the BAC is supposed to include a responsible person from the PMO who should know the site condition the most and know the performances of the contractors previously contracted the most. The Project Manager of PMO should well be represented in the BAC through the tendering process as a provisional member in the BAC with voting power.

6) Strengthen the Project Management

To lead a project to the completion, monitoring and controlling should be well in place throughout the process of implementation. A project is started with an initiation, and put to the stage of planning, design and tendering as a simplest sequential process, and then implementation is commenced. During

the implementation process, the project owner (NIA-PMO) should monitor the project activities in each and every aspect of the construction/works according to the documents submitted by the contractor such as list of man-power and equipment, PERT chart she/he has committed in the contract. The monitoring results should be forwarded to the successive stage, whereby the project owner can/should control the process of the implementation (see Figure 3.2.3)

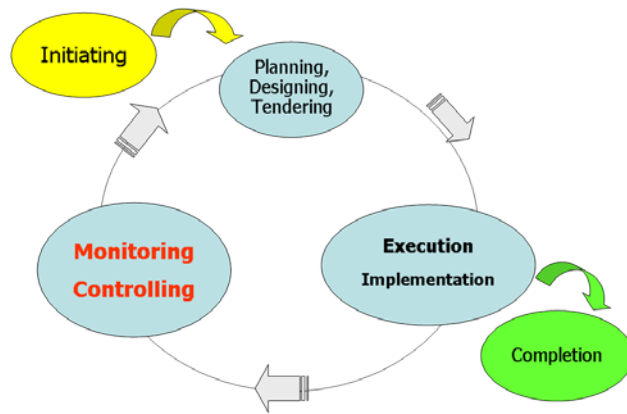


Figure 3.2.3 Project Implementation Cycle towards Completion
Source: JICA Consultant

Likewise, such contract documents as general conditions of contract, specific/particular conditions of contract, drawings, technical specifications, bill of quantities etc. are all important documents as tools of project management. Contract conditions specify penalties, termination, force majeure, retention and release of dues, security bond, performance bond, surety bond, etc. Not only project manager but also the responsible field staff should be well aware of those provisions. With those documents at hand readily available not only in the PMO office but also in the field offices, the NIA-PMO should conduct monitoring of the process, controlling of the process and thus improvement of the process.

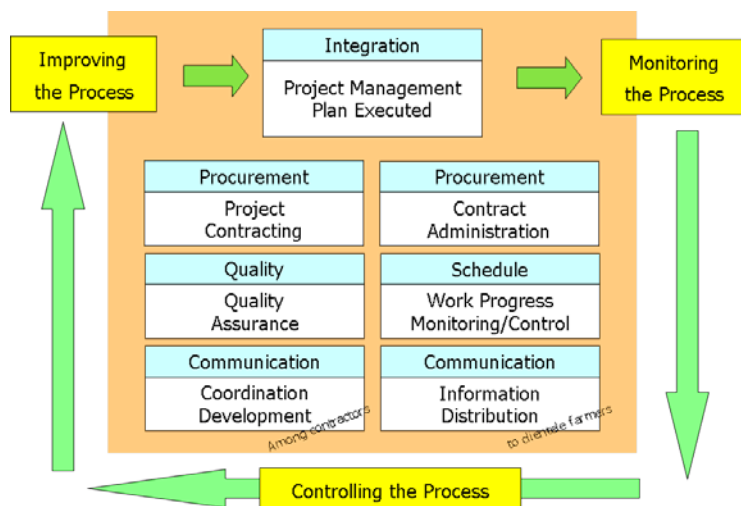


Figure 3.2.4 Monitoring and Controlling Aspect
Source: JICA Consultant

The aspects the PMO and field offices should monitor are indicated in Figure 3.2.4 covering the areas of procurement, quality control, schedule control, communication with contractors as well as with clientele farmers. Those aspects are always monitored by responsible PMO and field officers/staff and recorded accordingly, and the records should always be confirmed with the contractors through periodical coordination meeting.

Project management may sound a bit difficult to put into well functional mode of practice. However, the starting point to strengthen the project management is not difficult at all but requires a bit of commitment of changing bias inclined towards keeping ‘business as usual’. The first step recommended is to conduct regular coordination meeting with the Contract Documents at hand. Note that PMO and the field offices do not have the contract documents at present, and this situation has to be corrected. Frequency of the meeting should be, e.g. once per week from March to August, every fortnight for the months of February, September, October, and once in a month for the months of November, December and January, and further quarterly meeting at the site including Regional Office.

In fact, though coordination meeting has been held till today, it is not enough to well monitor and control the project implementation. Specifically, weekly site meeting calling all the contractors at one place is due necessary during the dry season from March to August in order for the contractors not to fall behind the agreed schedule. Meeting minutes should always be prepared and shared with the participant contractors and PMO management, so that timely assistance from the management should

also be expected. In fact, such regular coordination meetings with systematic documentation will facilitate the following;

- A) Can take remedial actions as soon as possible (ASAP),
- B) Can coordinate among contractors affected each other,
- C) Can initiate peer-competition among contractors,
- D) Can forward issues to PM, RO, and CO at the soonest,
- E) Can minimize the risk of NIA-PMO not having the contractor's responsible person on the site, and
- F) Can protect NIA from auditing.

On above 'B) Can coordinate among contractors affected each other', there are packages located side by side, e.g. canal construction from ST0.00 to ST2.00 by contractor A, and ST2.00 to 6.00 by contractor B, and ST6.00 to 8.65 by contractor C, etc. In such case, the contractor C may pass through the construction sites of contractor A and B, and without coordination among the 3 contractors deployment of machineries, hauling of materials, etc. would be badly affected, causing temporary suspension on one side.

With regard to 'C) Can initiate peer-competition among contractors', if all the contractors are called at one place, they can know each other their performance and advancement or otherwise delay. By sharing those experiences, contractors are expected to give peer-pressure each other whereby they are expected to try to improve their performance. NIA should facilitate contractors to discuss not in the way of providing excuse for delay but in a way of learning best practices conducted by their colleague contractors.

7) Invite Contractors from Other Areas/ Provinces

As at now, the bidders are from the Northern Samar province only. However in fact, the Samar island is divided into 3 provinces of Samar province (the western two-fifths of the island of Samar), Northern Samar province where HCAAP is located, and Eastern Samar province. These three provinces, along with the provinces on the nearby islands of Leyte and Biliran are part of the Eastern Visayas region.

The invitation to the tender, taking into account above 3 provinces in Samar island, may be extended to the other 2 provinces. Multiple-award to a contractor is a concern as one of the reasons behind delayed implementation. This is caused by a limited number of contractors to the tender, and therefore it is recommended to extend the invitation not only to the contractors in Northern Samar province but also to the contractors in Samar province and Eastern province.

Above recommendation may be linked with climate classification. In the Philippines, there are 4 types of climate regions such as Type I, II, III, and IV. Northern Samar province falls in the climate type II wherein no complete dry period is observed throughout the year with a pronounced wet season from November to February. Western side of the Samar island falls in Type IV where rainfall is almost evenly distributed during the whole year. Further western side from the Samar island is Leyte island separated by the San Juanico Strait, which is crossed by the San Juanico Bridge of about 2 km, and this are falls in Type IV climate

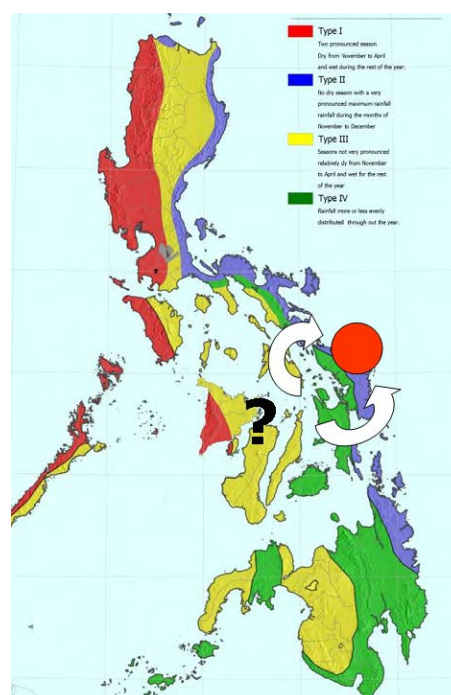


Figure 3.2.5 Climate Classification

Source: Pagasa

classification. The invitation may be extended to Layte as well. Contractors located in different climate region may have a capacity to avail of their man-power and machineries to HCAAP.

8) Hauling the Materials During Dry Season

Weather condition is a big concern behind the delayed implantation. As many times afore-mentioned, the rain in this Type II region falls almost throughout year. However, still there are months whose rainfall are relatively less as compared with other months. The dry months are from March to August, and during the months, the NIA-PMO should instruct the contractors to haul necessary materials, e.g., aggregate and sand, and stock them at the sites. Hauling materials during wet season should be a really tough work, and rather such arrangement should be done during dry season. To do this arrangement constructing schedule should be well programmed beforehand the dry season.

9) Arrange Package Manageable Within the Area

Difficult parts in terms of construction can be the diversion dams and main canals, and to some extent lateral canals. Diversion dams have been almost completed while main canal construction and lateral canal construction are still on-going though cut-embankment of main canals has progressed to some extent. NIA-PMO should arrange packages, within which cut-embankment for earth work can be managed, such that the contractor, once after having brought machineries to the site, could almost continue working within his/her package area, without accessing from/to other package area.

On the contrary, if a contractor has to move out from his job site to haul embankment materials from other areas outside his job site, it could be a big burden especially taking into account the weather condition. Such movement out of his/her area passing through other contractors' working area would give damages to the access road constructed/ being constructed by other contractors. Given claim from the other contractor, he/she should suspend his/her work till weather condition recovers fully, which is hardly expected in this area. Therefor cut-embankment should be arranged to complete within one package as far as possible.

10) Prepare Enough Fund for the First Time Trial-operation

There is a concern on the retention money and/or surety bond. In general, the contractors are required to submit 10% of what the contractors have billed as retention money in order to prepare for repair for defective parts which are showing up during the trial operation. Then, upon the receipt of Certificate of Work Acceptance by the project owner, the contractor submits the final billing for the final payment and requests the release of retention money in replacement by a surety bond. The surety bond is usually one-year effective only.

Since construction has continued long time since 2007, some packages have been already completed and further one-year has already passed for some of the completed packages. For those packages, liability period has been expired. Thus, there is no more retention money and/or surety bond which can effectively be enforced for the purpose of repairing defective parts to take place during the trial operation. Facing this scenario, NIA-PMO should prepare enough fund to repair/ maintain the 3 irrigation systems during the first-time trial operation which is now expected to conduct in CY2019.

CHAPTER 4 RECOMMENDATIONS

Based on the construction progress achieved to date, it may need another 42 months to complete; namely, the completion may not come till February 2021, approximately another 3 and half years from now. This time-elapsd implementation should not be accepted, and therefore NIA-PMO together with RO should put every effort to complete the project at the soonest. The completion target should be set on September 2019, till which 2 dry seasons should be fully utilized. Towards this target to be fulfilled, there are measures already elaborated in Chapter 3, of which following 3 points are specifically recommended to strictly adhere;

- 1) Though NIA-PMO/RO is, as of September 2017, preparing tendering for CY 2017 packages, they should complete the tender documents for the 2018 packages as soon as possible. Upon completion of the tender documents for the CY 2018 packages, the Advertisement/ Invitation to Tender (ITT) should be issued as early as in October. It may take 4 – 5 months, while shortest case could be only 2 months from the advertisement to the Notice to Proceed. This arrangement should be so made that the NTP be issued in February 2018, and thus the contractors awarded can commence the physical works from early March corresponding to the onset of dry season. Should NIA-PMO/RO fall behind this scenario, the 2018 packages would have to be started in 2019, and accordingly be completed in 2020 at the earliest case; namely, 2 years construction period of 2019 and 2020.
- 2) Multiple contract awards to a contractor is one of the major reasons why the construction falls so much behind the original schedule. To limit the number of contracts to a contractor, the formula of Net Financial Contracting Capacity (NFCC) for contractors should be improved in the application to such contractors who have submitted more than one bid at the same time aiming at obtaining multiple contract packages. The improvement is simple in that accumulated bid prices should be referred to in calculating the NFCC. If he/she submits 2 bids for 2 packages, NFCC should not be estimated one bid by one bid but one bid for the first package and sum of the 2 bids for the purpose of assessing his/her capacity to undertake the 2 contracts. By practicing this, there could be a possibility of reducing the risk of awarding multiple contracts to a contractor.
- 3) It seems that NIA-PMO project management may be weak exempld as; 1) no caution letter has been issued to contractors so far though there have been many extension/ suspension of works, 2) copy of the contract documents are not readily available in the PMO and its field offices, and 3) further frequent site meetings have not been held but only when need arises. To improve project management, the first step should be to have and refer to the copy of contract documents at the offices/ hands, and to hold frequent coordination meetings e.g. once in a week during the peak dry season period inviting all the contractors at the field office.

APPENDIX I. STATUS OF CONTRACT FOR HCAAP AS OF AUGUST 14, 2017

NAME OF CONTRACTOR	NAME OF PROJECT	CONTRACT NO.	CONTRACT DESCRIPTION AND SCOPE OF ACTIVITIES	AWARDED CONTRACT AMOUNT, P1p	NTP ISSUANCE DATE	CONTRACT DURATION (CY)		CONTRACT EXPIRY DATE		ACTUAL DATE COMPLETED	PHYSICAL ACCOMP. (%)		SLIPPAGE (%)	TIME ELAPSED (Cal. Days)	PROCURE D AT (RO or IMO)	STATUS REMARKS (Completed, Ongoing, Delayed, Reasons of Delay i.e. Suspended/ Terminated, ROW, others...)	
						ORIGINAL	REVISED	ORIGINAL	REVISED		Target	Actual					
INTERNATIONAL BIDDING																	
HCAAP (2007-2010)																	
HANJUN Industry and Construction Co. Ltd.	Help for Catubig Agricultural Advancement Project	HCAAP-C-1	Construction of Catubig Dam and Appurtenant Structures, Including Supply and Delivery and Installation of Steel Gates	545,920,503.46	March 22, 2007	1095	1381	March 21, 2010	December 31, 2010	December 31, 2010	100.00	100.00	-	126	1,381	CO	COMPLETED
DOMESTIC BIDDING																	
HCAAP (2010-2012)																	
JD Legaspi Construction	Help for Catubig Agricultural Advancement Project	HCAAPD-C-1	Construction of Hagbay Diversion Dam and Appurtenant Structures, Including Supply and Delivery and Installation of Steel Gates	231,888,860.00	July 2, 2010	935	1766	January 22, 2013	May 3, 2015		100.00	81.35	(16.65)	278	2,601	CO	Deductive Variation was Approved and Contract Terminated by Convenience
BROSTAN Construction	Help for Catubig Agricultural Advancement Project	HCAAPD-C-2	Construction of Bulao Diversion Dam and Appurtenant Structures, Including Supply and Delivery and Installation of Steel Gates	172,722,996.43	September 9, 2011	874	1735	January 30, 2014	June 9, 2016		100.00	65.85	(34.15)	248	2,167	CO	Under Suspension due to Insurgency Problem
JD Legaspi Construction	Help for Catubig Agricultural Advancement Project	HCAAPD-C-3	Construction of Pinispikan Siphonic Bridge Flume and Concrete Lining for Critical Portion of Catubig Right Main Canal	66,120,797.74	October 31, 2012	650	938	August 12, 2014	May 27, 2015		24.93	24.93	248	1,749	CO	Contract Terminated	
JD Legaspi Construction	Help for Catubig Agricultural Advancement Project	HCAAPD-C-4	Construction of Catubig Right Main Canal's Lateral 1, 3, 4 & Structures and Creek Improvement	104,988,055.00	October 31, 2012	800	1332	January 9, 2015	June 24, 2016		100.00	70.06	(29.94)	248	1,749	CO	Suspended due to Insurgency. Variation Order was under evaluation and Request for Contract Termination was on process
LOCAL COMPETITIVE BIDDINGS																	
HCAAP(2011-2012)																	
Solid M Construction	HCAAP	HCAAP-LMC-C-1	Labor and Material Hauling for the Construction of On-Farm Facilities, Pinispikan IA Service Area (TOB1, OS, SA, SO, TO1, TOB, TOB204)	9,767,062.10	February 7, 2011	360	478	February 2, 2012	May 30, 2012		100.00	100.00	-	133	478	IMO	COMPLETED
Rhyes Const. & Supply	HCAAP	HCAAP-LMC-C-2	Construction of Catubig Irrigation Subsystem On-Farm Facilities, Haremanan Area (TO11-19)	9,260,910.00	February 7, 2011	360	542	February 2, 2012	August 2, 2012		100.00	100.00	-	151	542	IMO	COMPLETED
SAL Construction	HCAAP	HCAAP-LMC-C-3	Construction of Catubig Irrigation Subsystem On-Farm Facilities, Pinispikan Area	5,381,594.64	February 24, 2011	300	533	December 21, 2011	August 10, 2012		100.00	100.00	-	178	533	IMO	COMPLETED
NORSAM Construction	HCAAP	HCAAP-LMC-C-4	Construction of Catubig Irrigation Subsystem On-Farm Facilities, Haremanan Area (TO1W-21)	9,889,291.86	June 22, 2011	300	415	April 17, 2012	August 10, 2012		100.00	100.00	-	138	415	IMO	COMPLETED
Solid M Construction	HCAAP	HCAAP-LCB-C-1	Construction of Catubig Dam Upstream Left Abutment Slope Protection and Roof Deck	17,746,516.37	July 5, 2012	120	300	November 2, 2012	May 1, 2013		100.00	100.00	-	250	300	IMO	COMPLETED
B. Vianzon Construction	HCAAP	HCAAP-LCB-C-2	Construction of On-Farm Facilities (Pinispikan IA)	15,995,355.56	July 27, 2012	120	703	November 24, 2012	June 30, 2014		100.00	100.00	-	586	703	IMO	COMPLETED
Pablo S. Lababas Construction	HCAAP	HCAAP-LCB-C-3	Construction of On-Farm Facilities (Haremanan IA)	17,654,099.57	August 16, 2012	120	195	December 14, 2012	February 27, 2013		100.00	100.00	-	163	195	IMO	COMPLETED
VCD Construction and Supply	HCAAP	HCAAP-LCB-C-4	Construction of On-Farm Facilities (Robasan IA)	14,249,642.63	July 24, 2012	180	1133	January 20, 2013	August 31, 2015		100.00	100.00	-	629	1,133	IMO	COMPLETED
CS RAYOS Const. and General Services	HCAAP	HCAAP-LCB-C-5	Construction of On-Farm Facilities (Saliba IA)	22,699,561.85	November 19, 2012	180	1669	May 18, 2013	January 1, 2016		100.00	96.15	(-16.85)	961	1,730	IMO	Request for time extension under evaluation - Subjected for Liquidated Damages
PINISPIKAN IP CY 2013 PROJECTS																	
CSJ Construction	Pinispikan IP	PIP 01-2013	Diversion Road to CLMC Access Road	11,933,036.08	November 4, 2013	120	625	March 6, 2014	July 22, 2015	June 30, 2015	100.00	100.00	-	503	603	RO	COMPLETED
Solid M Construction	Pinispikan IP	PIP 02-2013	Preparatory Works for CLMC and Construction of Service Road at Sta. 20+000 to 22+585	29,824,849.97	June 26, 2013	210	737	January 21, 2014	July 3, 2015	July 3, 2015	100.00	100.00	-	351	737	RO	COMPLETED
ESD Construction & Supply	Pinispikan IP	PIP 03-2013	Preparatory Works for CLMC and Construction of Service Road at Sta. 18+000 to 20+000	31,030,285.27	November 4, 2013	180	1317	May 5, 2014	June 13, 2017		100.00	100.00	-	732	1,317	RO	Completed by June 30, 2017 Subject for Liquidated Damages
JAPA Construction	Pinispikan IP	PIP 04-2013	Preparatory Works for CLMC and Construction of Service Road at Sta. 16+000 to 18+000	25,700,464.98	November 4, 2013	180	1328	May 7, 2014	June 24, 2017		100.00	92.82	(7.18)	767	1,380	RO	Only surfacing works was the remaining works
Viguz Construction Corp.	Pinispikan IP	PIP 05-2013	Preparatory Works for CLMC Lateral 4 and Construction of Service Road at Sta. 0+000 to 1+418	39,342,818.48	June 26, 2013	210	1019	January 27, 2014	April 10, 2016	July 4, 2015	100.00	100.00	-	351	738	RO	COMPLETED
Square Cube Const.	Pinispikan IP	PIP06-2013	Preparatory Works for CLMC and Construction of Service Road at Sta. 13+000 to 16+490	38,980,294.72	June 26, 2013	210	1075	January 27, 2014	June 5, 2016	July 5, 2015	100.00	100.00	-	352	739	RO	COMPLETED
Square Cube Const.	Pinispikan IP	PIP07-2013	Preparatory Works for CLMC and Construction of Service Road at Sta. 12+000 to 13+300	28,306,849.21	June 26, 2013	210	1074	January 27, 2014	June 4, 2016	July 6, 2015	100.00	100.00	-	352	740	RO	COMPLETED
Victoria Dev't & Const. Supply, Corp.	Pinispikan IP	PIP08-2013	Preparatory Works for CLMC Lateral 3 and Construction of Service Road at Sta. 0+000 to 1+000	25,734,333.07	November 4, 2013	180	958	May 6, 2014	June 19, 2016	July 7, 2015	100.00	100.00	-	339	610	RO	COMPLETED
Leadtek Const. Inc.	Pinispikan IP	PIP09-2013	Preparatory Works for CLMC and Construction of Service Road at Sta. 18+000 to 19+000	37,032,674.46	June 26, 2013	210	1034	January 24, 2014	April 25, 2016	April 25, 2016	100.00	100.00	-	492	1,034	RO	COMPLETED
Leadtek Const. Inc.	Pinispikan IP	PIP 10-2013	Preparatory Works for CLMC and Construction of Service Road at Sta. 8+000 to 9+000	30,069,455.69	June 26, 2013	210	1025	January 24, 2014	April 16, 2016	April 16, 2016	100.00	100.00	-	488	1,025	RO	COMPLETED
Solid M Construction	Pinispikan IP	PIP11-2013	Hinge Siphonic Box Culvert	11,985,932.81	November 4, 2013	120	1387	March 4, 2014	August 22, 2017		29.00	24.35	(4.65)	1,150	1,380	RO	Still suspended due to inaccessibility
B. Vianzon Construction/Victoria Dev't & Const. Supply, Corp., JV	Pinispikan IP	PIP12-2013	Hinge Bridge Flume	34,880,162.56	November 7, 2013	180	1338	May 6, 2014	July 7, 2017		35.00	34.03	(0.97)	765	1,377	RO	Still suspended due to inaccessibility
CY 2014 PROJECTS																	
PINISPIKAN IP																	
Solid M Construction	Pinispikan IP	PIP1-2014	Preparatory Works for CLMC and Construction of Service Road	26,778,076.79	November 28, 2014	280	502	September 8, 2015	April 13, 2016	April 12, 2016	100.00	100.00	-	179	501	RO	COMPLETED with Variation Order
Solid M Construction	Pinispikan IP	PIP2-2014	Preparatory Works for CLMC and Construction of Service Road	26,523,615.02	November 28, 2014	280	502	September 8, 2015	April 13, 2016	April 12, 2016	100.00	100.00	-	179	501	RO	COMPLETED with Variation Order
RJR Enterprises	Pinispikan IP	PIP3-2014	Preparatory Works for CLMC and Construction of Service Road	26,583,143.83	November 28, 2014	280	502	September 8, 2015	April 13, 2016	April 12, 2016	100.00	100.00	-	179	501	RO	COMPLETED with Variation Order
Solid M Construction	Pinispikan IP	PIP4-2014	Preparatory Works for CLMC and Construction of Service Road	39,806,149.13	November 28, 2014	300	518	September 28, 2015	April 28, 2016	April 28, 2016	100.00	100.00	-	172	517	RO	COMPLETED with Variation Order
BULAO IP																	
Aqualine Construction	Bulao IP	BP1-2014	Construction of Bulao Irrigation Subsystem On-farm Facilities at BUNAMAS Service Area - 1	10,828,433.00	December 2, 2014	180	951	May 31, 2015	July 10, 2017		65.26	67.35	2.09	548	987	RO	Suspended due to Insurgency problem
Aqualine Construction	Bulao IP	BP2-2014	Construction of Bulao Irrigation Subsystem On-farm Facilities at BUNAMAS Service Area - 2	15,828,153.76	December 2, 2014	240	990	July 30, 2015	August 18, 2017		74.04	68.14	(6.90)	411	987	RO	Suspended due to Insurgency problem
G.C Builders	Bulao IP	BP3-2014	Construction of Bulao Irrigation Subsystem On-farm Facilities at RUBOSAN Service Area	10,190,506.15	December 1, 2014	180	951	May 30, 2015	July 9, 2017		69.84	68.71	8.07	549	988	RO	Suspended due to Insurgency problem
Aqualine Construction	Bulao IP	BP4-2014	Construction of Bulao Supplemental Canal	39,831,764.52	December 2, 2014	300	1035	September 28, 2015	October 2, 2017		89.17	85.77	(3.40)	329	987	RO	Suspended due to Insurgency problem
HAGBAY IP																	
SG Galvez Construction & Supply	Hagbay IP	HP1-2014	Construction of Hagbay Irrigation Subsystem On-farm Facilities at HAGBAY Service Area - 1	14,994,954.63	November 28, 2014	240	742	July 26, 2015	December 9, 2016		100.00	100.00	-	309	742	RO	Completed with Variation Order
Solid M Construction	Hagbay IP	HP2-2014	Construction of Hagbay Irrigation Subsystem On-farm Facilities at Yargyo Service Area - 2	18,719,896.05	December 1, 2014	240	775	July 29, 2015	January 14, 2017		89.00	86.32	(2.68)	412	988	RO	Work suspended due to inaccessibility
Solid M Construction	Hagbay IP	HP3-2014	Construction of Hagbay Irrigation Subsystem On-farm Facilities at ISAH Service Area - 1	17,388,759.52	December 1, 2014	240	715	July 29, 2015	November 15, 2016		100.00	100.00	-	298	715	RO	Completed with Variation Order
Solid M Construction	Hagbay IP	HP4-2014	Construction of Hagbay Irrigation Subsystem On-farm Facilities at ISAH Service Area - 2	17,862,856.80	December 1, 2014	240	775	July 29, 2015	January 14, 2017		89.80	87.12	(2.68)	412	988	RO	Work suspended due to inaccessibility
CY 2015 PROJECTS																	
PINISPIKAN IP																	
Solid M Construction	Pinispikan IP	PIP1-2015	Preparatory Works for CLMC OF Pinispikan Irrigation Project	26,778,076.79	June 1, 2015	240	487	January 27, 2016	September 30, 2016		100.00	100.00	-	203	487	RO	Completed with Variation Order
Solid M Construction	Pinispikan IP	PIP2-2015	Preparatory Works for CLMC OF Pinispikan Irrigation Project	26,523,615.02	June 1, 2015	240	550	January 27, 2016	December 2, 2016		100.00	100.00	-	229	550	RO	Completed
BULAO IP																	
Aqualine Construction	Bulao IP	BP1-2015	Construction of Supplemental Canal	4,862,492.73	May 25, 2015	180		November 21, 2015	September 6, 2016		35.71	35.19	(0.52)	462	813	RO	Work Suspended due to Insurgency problem
Aqualine Construction	Bulao IP	BP2-2015	Canalization (Canal Lining Sta. 0+000 - 6+100 BLMC & Sta. 0+000 - 6+548 RMCC)	33,536,905.00	February 23, 2016	300		December 19, 2016			18.90	18.90	-	180	539	RO	Work Suspended due to Insurgency problem
HAGBAY IP																	
Solid M Construction	Hagbay IP	HP1-2015	Canalization (Canal Lining Sta. 0+000 - 7+716 HLMC & Sta. 0+000 - 3+987 RMCC)	36,983,121.62	February 23, 2016	300		December 19, 2016			100.00	32.56	(67.44)	180	539	RO	Request for time extension under evaluation
CY 2016 PROJECTS																	
PINISPIKAN IP																	
Solid M Construction	Pinispikan IP	PIP1-2016	Construction of CLMC & Service Road of Pinispikan Irrigation Project	47,842,582.84	June 21, 2016	300		April 17, 2017	November 10, 2017		44.63	62.54	17.91	140	420	RO	On-going Construction
Solid M Construction	Pinispikan IP	PIP2-2016	Construction of Canal and Structures of Pinispikan Irrigation Project	45,997,393.27	June 21, 2016	300		April 17, 2017	November 10, 2017		29.48	35.26	5.78	140	420	RO	On-going Construction
Solid M Construction	Pinispikan IP	PIP3-2016	Construction of CLMC Lateral 2 and Structures of Pinispikan Irrigation Project	30,622,288.27	June 21, 2016	300		April 17, 2017	November 10, 2017		41.94	43.13	1.19	140	420	RO	On-going Construction
SAL Construction	Pinispikan IP	PIP4-2016	Construction of CLMC Lateral 3 and Structures of Pinispikan Irrigation Project	34,202,272.29	June 17, 2016	300	545	April 13, 2017	December 14, 2017		45.00	54.42	9.42	141	424	RO	On-going Construction
SAL Construction	Pinispikan IP	PIP5-2016	Construction of CLMC Lateral 3 Irrigation On-Farm Facilities of Pinispikan Irrigation Project	13,553,773.74	June 17, 2016	280	472	March 4, 2017	October 2, 2017		67.14	64.64	(2.50)	163	424	RO	On-going Construction
Solid M Construction	Pinispikan IP	PIP6-2016	Construction of CLMC Main Turnout Upstream Irrigation On-Farm Facilities of Pinispikan Irrigation Project	13,569,437.55	June 21, 2016	280		March 28, 2017	November 10, 2017		45.38	43.22	(2.16)	150	420	RO	On-going Construction
Victoria Dev't & Const. Supply	Pinispikan IP	PIP7-2016	Construction of Service road (Road Surfacing Only)	39,164,061.91	April 3, 2017	300		January 28, 2018			0.92	1.50	0.58	45	134	RO	On-going Construction
BULAO IP																	
BROSTAN Construction	HCAAP	HCAAPD-C-2	Construction of Bulao Diversion Dam and Appurtenant Structures, Including Supply and Delivery and Installation of Steel Gates	25,810,976.39													

**ACTION PLAN
PROPOSED COMPLETION OF BULLAO IRRIGATION PROJECT**

ITEM NO	DESCRIPTION	ORIGINAL CONTRACT AMOUNT	% W/T	REVISED CONTRACT AMOUNT		REMARKS / WORKS TO BE PERFORMED	REMARKS / WORKS		ACTION PLAN 2018												ACTION PLAN 2019																		
				AMOUNT	% W/T		AMOUNT	% W/T	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER							
1.) HICAMP-C2 - including CY-2016 allocation																																							
A. BULLAO DIVERSION DAM																																							
	Remaining Works	32,252,355.32		19,291,720.12	59.81	Final definition of Steel Gates and ECC.	12,960,635.20	40.19																															
B. IRRIGATION CANALS																																							
	Remaining Works	140,020,600.00		51,727,657.95	36.92	Complete lining of Left and Right Main Canal and appurtenant structures.	88,742,982.65	63.18																															
	TOTAL AMOUNT FOR HICAMP-C2	172,272,955.32		71,019,378.07	41.24%		101,762,570.72	58.76%																															
MANPOWER REQUIREMENTS																																							
EQUIPMENT REQUIREMENTS																																							
2.) BULLAO On-Farm Facilities																																							
Package 1																																							
	Construction of Bulao Irrigation Subsystem On-Farm Facilities at BUMWMS Service Area - 1	10,836,570.13		7,298,429.98	67.35	Completion of Farm D1 ches	3,538,140.15	32.65																															
Package 2																																							
	Construction of Bulao Irrigation Subsystem On-Farm Facilities at BUMWMS Service Area - 2	15,839,418.98		10,792,980.09	68.14	Completion of Farm D1 ches	5,046,438.89	31.86																															
Package 3																																							
	Construction of Bulao Irrigation Subsystem On-Farm Facilities at BIRISSAN Service Area	10,198,902.46		7,007,665.88	68.71	Completion of Farm D1 ches	3,191,234.58	31.39																															
Package 4																																							
	Construction of Bulao Supplemental Canal	39,881,649.68		34,180,739.93	85.77	Completion of Bulao Supplemental Canal	5,670,889.75	14.23																															
Package 5																																							
	Construction of Bulao Supplemental Canal	3,537,000.00		-	0.00%																																		
3.) BULLAO CANAL LINING WORKS - CY 2015																																							
Package 1																																							
	Canalization (Capal Lining) Sub-0+000 - 6+100 B/C & S/A 0+000 - 5+534 BR/MC	33,536,905.00		6,338,475.05	18.90	Canal Lining of Bulao Main Canal	27,198,429.95	81.10																															
	TOTAL OF CANAL LINING	33,536,905.00		6,338,475.05	18.90%		27,198,429.95	81.10%																															
Package 2																																							
	Bulao Canal Lining	3,537,000.00		-	0.00%	Completion of Canal Lining of Main Canal																																	
	SUB-TOTAL OF CANAL LINING	3,537,000.00		-	0.00%		-	0.00%																															
4.) BULLAO IP CY-2017 Allocation																																							
Package 1																																							
	Bulao IP - Three (3) Packages	137,837,590.44		144,680,977.45	104.95%	Govt. of Sulu, Dan Quizon ADMU, Linao, 1, 2, 3 & BRAC, Linao at Bulao Division Office through Civils and Strategic Planning Office.	11,760,016.91	8.54%																															
	TOTAL FORCE ACCOUNT WORKS	22,056,546.71		144,680,977.45	65.62%		13,920,033.82	63.14%																															
	TOTAL CONTRACTUAL WORKS	286,392,488.29		151,768,974.90	52.99%		149,620,972.71	52.26%																															
	TOTAL PROJECT COST	364,377,000.00		151,768,974.90	41.63%		149,620,972.71	41.33%																															

TO BE COMPLETED ON JUNE 30, 2019

TO BE COMPLETED ON JUNE 30, 2018

TO BE COMPLETED ON JUNE 30, 2018

TO BE COMPLETED ON JUNE 30, 2018

TO BE COMPLETED ON SEPTEMBER 30, 2018

TO BE COMPLETED ON JUNE 30, 2019

BULLAO IP PROJECT COMPLETION : AUGUST 31, 2019

APPENDIX IV. PARTICIPANT LIST FOR NIA WORKSHOP AND FARMERS WORKSHOP

CONSULTATION MEETING WITH JICA, NIA compound , Conference Room,
NORTHERN SAMAR IRRIGAION MANAGEMENT OFFICE, September 4, 2017 9:00 A.M.

NAME	DESIGNATION/AGENCY
1. Marino R. Espina	Project Inspector/NIA-PIP
2. June B. Mira	Project Inspector/NIA BIP
3. Hilbert M. Sirzielo	Project Inspector/NIA HIP
4. Cathar Jake C. Dolfo	Project Inspector/NIA PIP
5. Jude A. Bido	Engr A/NIA PMO
6. Adelfo G. Muchaniel	Sr Engr A/NIA-PIP
7. Estelita S. Sumile	Div Mgr A/Acting PM
8. Jin Hirosama	JICA PP
9. Merba Hannah Martires	SAP A/NIA
10. Buenaventura Poso Jr.	Sr Engr A/NIA
11. Sherilyn Aoyama	Sr. Prog Officer/JICA
12. Exelson Y. Tenedero	Project Inspector/NIA
13. Emerito M. Balanquot	Sr IDO/PIP
14. Kosei Hashiguchi	JICA Consultant
15. Henrietta B. Quinto	Irrigation/Sanyu Consultants, Inc.
16. Ian Evert B. Cayunda	Envi/Sanyu Consultants, Inc

CONSULTATION MEETING WITH JICA, NIA Compound Conference Room
Northern Samar Irrigation Management Office, September 5, 2017

NAME	DESIGNATION/AGENCY
17. Jin Hirosama	JICA PP
18. Sherilyn Aoyama	Sr Prog Officer/JICA
19. Jude A. Bido	Engr A/NIA
20. Hilbert M. Sirzielo	Proj Inspector/NIA
21. Adelfo G. Muchaniel	Sr Engr A/NIA PIP
22. Jake Gahar C. Dolfo	Pro Inspector/NIA PIP
23. Exelson Tenedero	Project Inspector/NIA PIP
24. Buenaventura Poso, Jr.	Sr Engr A/NIA
25. Marino R. Espina	Pro Inspector/NIA PIP
26. June B. Mira	Project Inspector/NIA BIP
27. Kosei Hashiguchi	JICA Consultant
28. Ian Evert B. Cayunda	SCI
29. Henrietta B. Quinto	SCI

MEETING WITH JICA CONSULTANTS, INC WITH FARMER
HCAAP FIELD OFFICE, CATUBIG, NORTHERN SAMAR, September 12, 2017, Meletico N. Adil

NAME	DESIGNATION/AGENCY
1. Roger M. Yruna	Robasan, TSAG Chairman
2. Jose P. Baldoza	Robasan, TSAG Chairman
3. Eufema Dealca	Harimasan – member
4. Caridad Cuanco	Harimasan – member
5. Guadalupe Lucia	Harimasan – member
6. Letecia C. Tandia	Harimasan – member

NAME	DESIGNATION/AGENCY
7. Bernardita O. Odosis	Pinipisakan – member
8. Enrique Tendido	Harimasan – member
9. Jaime Ultra	Harimasan – member
10. Nelson Luoz	Robasan – member
11. Esteban Lutao	Harimasan – member
12. Rogelieta T. Luoz	Robasan – TSAG Chairman
13. Ricardo T. Openiano	Robasan – member
14. Jose Esteban	Pinipikasan – member
15. Carlos Golonorca	Pinipikasan – member
16. Meletico M. Adel	Robasan – member
17. Jaime H. Villaneda	Robasan – FIA
18. Monica Alo	Pinipikasan - member
19. Teresa J. Tapang	Pinipikasan – member
20. Ian Jay A. Ravelas	Harimasan - member
21. Castor Medillena	Harimasan - member
22. Vicente O. Gadgad	Harimasan – IA president
23. Jonathan C. Gana	IDO – NIA
24. Exelson Tenedero	Robasan – acting SWRFT
25. Elemr P. Durin	Pinipisakan – SWRFT NIA
26. June Gudgao	SWRFT – NIA
27. Henson P. Care	UW
28. Raydo Ramon Q. Erco	IDO-A
29. Mar S. Lemonera	IDO-A
30. June A. Bido	Engr A – NIA
31. Cesar Ecuayo	Sr Engr A – NIA
32. Antonio Casio Sr	Harimasan – Member
33. Emerito Balanquit	Sr IDO – NIA

JICA/SANYU CONSULTATIVE MEETING WITH IA
HCAAP FIELD OFFICE, CATUBIG, NORTHERN SAMAR, SEPTEMBER 7, 2017

NAME	DESIGNATION/AGENCY
1. Elvira t. Militar	Robasan – member
2. Samson B. Mejica	Robasan – Vice President
3. Julio Orquita	Robasan – member
4. Julio Ultra	Robasan – member
5. Hernani Duanito	Robasan – member
6. Juan Ylamar	President
7. Lucia E. Ultra	Harimasan – auditor
8. Marie T. De Asis	Pinipikasan – IA Treasurer
9. Carlos A. Oligario	Pinipikasan – President
10. Jose C. Dela Cruz	Pinipikasan – member
11. Mar S. Lamoner	IDO A – NIA
12. Cesar R. echano	Sr Engr A
13. Jude Bido	Engr A – NIA
14. Emrito Balandoy	Sr IDO
15. Johnny G. Martinez	Mechanic
16. Raydo Ramon Erco	IDO A

NAME	DESIGNATION/AGENCY
17. Elmer P. Durin	SWRFT
18. Henson P. Care	SWRFT
19. Michael Benediolo	
20. Leo P. Olegario	IA Vice President
21. Ian Cayunda	Envi/Sanyu Consultants Inc
22. Henrietta B. Quinto	Irrig/ SCI

**VALIDATION OF EXISTING FACILITIES FOR
HARIMASAN IA & ROBASAN IA, September 13, 2017**

NAME	DESIGNATION/AGENCY
1. Emerito Balanquit	Sr IDO
2. Perfecto E. Medalla	NIA
3. Abel S. Castillo	
4. Alwin Sieryo	
5. Aman Castillo	
6. Irinco R.	
7. Manue E. Sawili	
8. Leopoldo Lagrimas	
9. Johnny Martinez	
10. Domingo Luot	
11. Cesar R. Echano	Sr Engr A – NIA
12. Jonathan C. Galut	IDO A
13. Mar S. Lamonera	IDO A
14. Buenaventura Poso	SR ENGR a
15. June A. Bido	ENGRA – NIA INSIMO
16. Junie O. Gudgan	SWRFT
17. Elmer P. Duran	SWRFT
18. Mesiro Galut	INSIMO
19. Raydi Ramn Erco	IDO A
20. Heraon P. Gabe	UW
21. Michael Hunrou	UW
22. Genario Labise	
23. Apolinario Becino	
24. Nulanio Infante	
25. Robert Legria	

**CONSULTANTS EXIT PRESENTATION,
AT NIA-PMO Catarman, September 15, 2017**

NAME	DESIGNATION/AGENCY
1. Jimmy Apostol	Regional Manager, Region VIII
2. Estelita Sumile	Division Manager, Acting PM
3. Buenaventura Poso Jr.	Sr. Engr A/NIA
4. Buenaventura Poso Jr.	Sr. Engr A/NIA
5. Melba Hannah Martires	SAP A/NIA
6. Marino R. Esana	Engr A/NIA
7. Exelson Y Tenedero	Engr B/NIA
8. John Renier L. Cabaroniel	Engineering Assistant B/NIA

NAME	DESIGNATION/AGENCY
9. Jude B. Mira	Engineer A/NIA
10. Dolfo Jake Cathar	Engineer A/NIA
11. Jude A. Bido	Engineer A
12. Adelfo G. Muchamiel	Sr Engr A/NIA=PIP
13. Cesar R. Echano	Sr EGINEER A/NIA
14. Noel B. Dosmanos	Sr. Engr A/NIA
15. Hirbert Zirzielo	Engr B/NIA
16. Kosei Hashiguchi	JICA CONSULTANT
17. Henrietta B. Quinto	Irrigation/SCI
18. Ian Evert Cayunda	Environmental/SCI

APPENDIX-XIII

TOR AND PERSON – MONTH FOR LOAN CONSULTANT

APPENDIX XIII: TOR AND PERSON-MONTH FOR LOAN CONSULTANT

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APPENDIX XIII TOR AND PERSON-MONTH FOR LOAN CONSULTANT

This Appendix explains the plan of implementation arrangement as well as proposed consultancy service with its TOR and Person-Month plan in case of the project implementation by ODA Loan.

XIII.1 Implementation Arrangement under Loan Financing

In implementing MMIP II with ODA loan financing, there should be a specific institutional arrangement, which should of course be established based on the existing on-going organizational set up. To ensure the smooth implementation of the MMIP II with loan financing, setting up of Steering Committee (SC) at the NIA central level, comprising of 5 divisions of NIA and ATI central office, and coordination mechanism with the PMO being the center at the site level, comprising of the relevant organizations, is proposed, as diagrammed below:

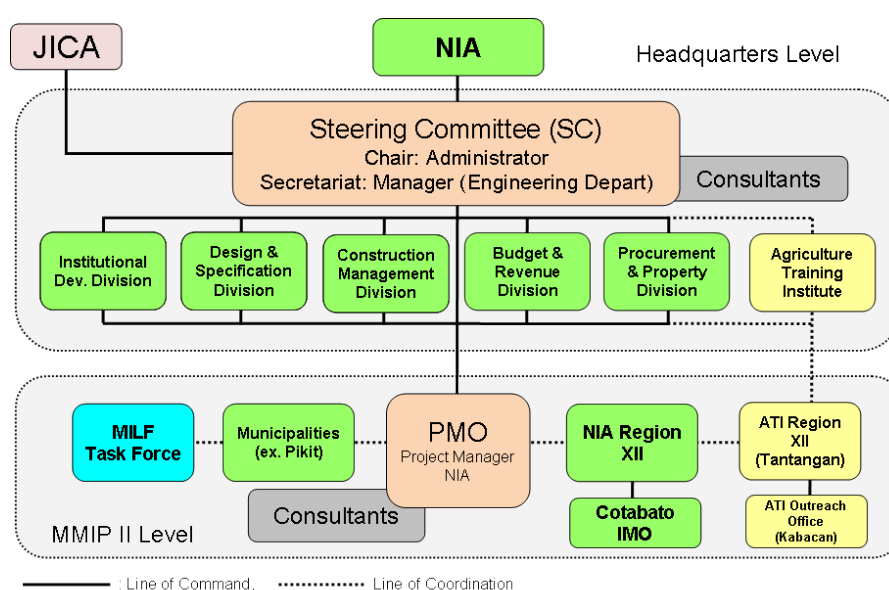


Figure XIII.1.1 Project Implementation Arrangement

Source: JICA Survey Team

This SC/PMO arrangement is proposed, as afore-mentioned, basically with reference to that of the on-going MMIP II. The major difference from the on-gong arrangement is the inclusion of Agriculture Training Institute (ATI) at the central level since ATI is to be engaged in agriculture extension services to be conducted within the MMIP area. The SC should be chaired by the Administrator and the secretariat should be the manager of Engineering Department. Also, JICA Philippines office will participate in the regular meetings held by the steering committee.

With the foregoing, the SC is to facilitate smooth project implementation through proper budget allocation, provision of necessary technical guidance, and control of budget expenditures. The SC has responsibility and authority on all activities such as planning, coordination between divisions, management at the central level, etc. Also, SC has the authority to supervise financial and accounting section as well in order to secure sufficient financial resources and appropriate payment for smooth project implementation. In addition, two working groups will be established at the SC, namely;

- 1) Accounting & Disbursement Management Group: Accounting & Disbursement Management Group takes responsibility of managing the accounting and disbursement status and internal procedure based on the report from the PMO. Accounting & Disbursement Management Group will be comprised of members of Accounting Division and Budget and revenue Division of the

NIA central office.

- 2) Project Monitoring & Evaluation Group: A Project Status Report (PSR) will be compiled once in three months under JICA funded loan project implementation. In order to monitor the project progress and to ensure submission of the PSR without delay, the Project Monitoring & Evaluation Group manages the necessary internal procedures for the preparation of PSR. The Project Monitoring and Evaluation Group will be comprised of members of Construction Management Division.

At the field level, though the current PMO structure can be retained as it is, there should be an explicit coordination mechanism which should include MILF task force, municipalities, e.g. Pikit Municipality, NIA Region XII office with Cotabato Irrigation Management Office and ATI Region XII office with the outreach office of ATI located in Kabacan. MILF task force, with municipalities, will coordinate NIA PMO in the issues of security as well as contacting the beneficiary and project to-be-affected peoples. Cotabato IMP under the Region XII office will take-over the irrigation system upon completion, and the ATI outreach office (Kabacan), controlled by its Region XII office (Tantangan), will provide agriculture extension services to the beneficiary farmers.

XIII.2 Fund Flow

XIII.2.1 Fund Management Mechanism

Fund management mechanism is designed with reference to those projects funded by JICA, e.g. MMIP I and NISRIP (National Irrigation Sector Rehabilitation and Improvement Project). It is also basically the same arrangement applied by the World Bank and ADB, with which NIA is already familiar.

JICA's Transfer Procedure will be applied for disbursement for international procurement, e.g., consultant, international contractors and maintenance machineries, and also for the payment to local civil contractors. JICA's Advance Procedure will be applied for disbursement for local procurement (e.g., PMO's direct force account works, direct shopping for e.g. construction materials and office equipment, ATI's agriculture extension services, etc.), as in the case of MMIP I and NISRIP. Fund flow differs between Advance Procedure and Transfer Procedure, outlined as below, respectively:

XIII.2.2 Advance Procedures

Basic arrangements for disbursement under Advance Procedure are:

- 1) After signing of the Loan Agreement, Designated Account (D/A) denominated in Japanese Yen is opened with Bangko Sentral ng Pilipinas (the Central Bank), Manila, after obtaining the approval of Department of Finance.
- 2) Project Operating Account (POA) denominated in PHP for each of NIA PMO and ATI Tantangan (Region XII office) is opened with the Central Bank after opening of D/A. The purpose of opening of POA is to facilitate payments in PHP to suppliers and laborers efficiently.
- 3) The SC requests PMO and ATI (central office) to prepare financial forecast of expenditures under the Project for the next 2 terms (6 months).
- 4) The SC submits combined Request for Disbursement to JICA on the basis of prepared financial forecast by the PMO and ATI.
- 5) JICA disburses loan proceeds, which are transferred to the D/A with Central Bank through Loan Account (the Borrower's account).
- 6) The SC withdraws JICA loan proceeds from the D/A and transfers to POA in PHP to NIA-PMO and ATI Region XII office applying the prevailing exchange rate on the day of withdrawal.
- 7) NIA-PMO and ATI Region XII office withdraw from the POAs to pay their expenditure for the

Project.

- 8) The statement of expenditure and related evidence documents for payments are prepared by NIA-PMO and ATI Region XII and these documents are reported monthly to the SC.
- 9) The SC prepares monthly reports on the above statement of expenditure, and then submitted to JICA.

JICA's Statement of Expenditure (SOE) Procedure may be applied for the Advance Procedure. Under the SOE procedure, only the statement of expenditure audited by an independent auditor agreed with JICA can be submitted to JICA without submitting each and every evidence documents. As far as such audit report can be submitted before the deadline without any negative observations by the auditor, it would suggest that SOE Procedure could be applied for the MMIP II. It is noted that to make request for new disbursement, the usage ratio of previous disbursement needs to exceed 70%.

XIII.2.3 Transfer Procedure

Procurement and payment under transfer procedure is to be made basically in the following manner:

- 1) Tender for Procurement/ Contractors/ Consultant,
- 2) Contract Signing,
- 3) Payment Request from Suppliers/ Contractors/ Consultants to the SC,
- 4) Payment Request from the SC to JICA,
- 5) Disbursement from JICA to the Loan Account of Central Bank on behalf of the Government of Philippines in Yen with the Bank of Tokyo Mitsubishi UFJ (BTMU), and
- 6) Payment to Suppliers'/ Contractors'/ Consultants' Account in requested currencies from the Loan Account of the Central Bank on behalf of the Government of Philippines.

XIII.2.4 Funds Flow Management

The funds flow arrangements are diagrammed in Figure XIII.2.1. Some explanations to the diagram are given of the following:

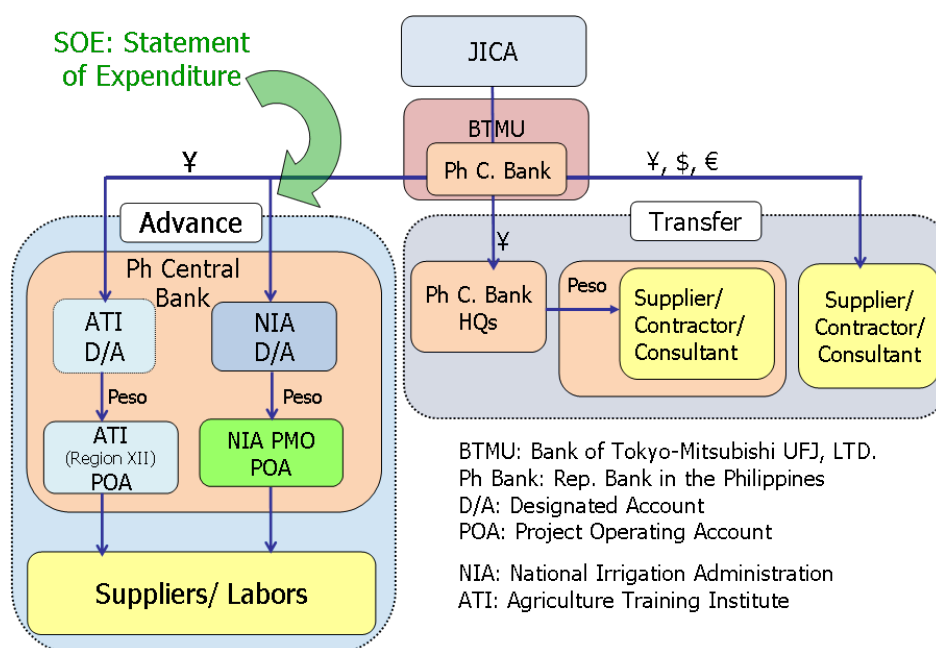


Figure XIII.2.1 Funds Flow Arrangements

Source: JICA Survey Team

- ✓ *Transfer Procedure:* Procurement of machineries, civil contractors and consultants through ICB will apply Transfer Procedures, transferring hard currencies such as Japanese Yen, U.S Dollars, Euro and PHP to the suppliers, contractors and consultants. For canal construction, drainage construction and access road construction, LCB is envisaged. Its disbursement can be done by Transfer Procedure and also by Advance Procedure with or without SOE depending on the number of contracts. Number of contracts may be reduced to a manageable level, and in that case, Transfer Procedure or Advance Procedure without SOE can be applied for those local civil work contracts.
- ✓ *Advance Procedure:* Advance Procedure will be used for other local procurement such as LCB and Direct Force Account (DFR). Under NIA DFA works and also for the agriculture extension activities, there will be many numbers of items of procurement, and therefore advance procedure with SOE procedure should be introduced. As for ATI agriculture extension activities, to meet fund requirements in a timely manner, the ATI would have its own D/A separated from NIA D/A, as shown in the above diagram.

The disbursement procedure is conducted by each D/A. Then, under each of the D/As, there will be each POA; namely, one for NIA-PMO and the other for ATI Region XII office. Note that ATI Kabacan office is an outreach office of the ATI Region XII, so that all the procurement and payment should be done at the Region XII office, but not at the Kabacan office as has been practiced to date.

Submission of necessary expenditure reports and also disbursement request is therefore conducted respectively by its POA and D/A. In the advance procedure, documents including evidence of payment such as receipts are required, and the SOE procedure exempts such documentation provided that the documents are audited annually. This means ATI will be conducting disbursement procedure by itself, while NIA will be conducting the procedure on its own.

In any case, there should a project operation manual including accounting, settlement, auditing and disbursement procedure, which has to be prepared in advance of the commencement of the Project by loan. To finalize the operation manual, the auditor to be nominated may be invited in concluding the manual, with which the first disbursement from JICA could be started. The manual, with reference to the overall schedule, should be prepared within 2018.

XIII.3 Consultancy Services

To lead the project implementation smoothly, technical assistances should be arranged involving international and national consultants/experts. Those consultants/experts shall work closely with and under the supervision of the PMO. The consultants should be employed mainly for the 2 works such as; 1) review of the detail design carried out by NIA-PMO and also tender documents preparation, and 2) progress management including the supervision of construction works.

In most cases, detail design and the tender documents preparation shall be carried out under a Task Concept for the consultants while the management/ supervision is to be under an Assistant Concept to the project owner, NIA. In the MMIP II, most of the detail design has been done by NIA-PMO and therefore the consultants will review the design. However, design of dykes including foundation treatment would need consultants' own design and this part should need the engagement of international consultants. Note that the design of dyke is not yet clear at this moment, so that the consultant employment in this report is not considered.

Consultants will be composed of both international experts and national experts, who are to undertake 1) necessary reviews of the design already completed by PMO, 2) preparation of tender documents as required, which are all undertaken during the detail design stage, and 3) progress management/ supervision of works during the construction period. In case that the construction is done by direct

force account, the consultants have to be in charge of monitoring and endorsing the expenses made by the NIA-PMO, which are then disbursed by the Loan.

Table XIII.3.1 shows consultants to be required with major components which could be covered by the loan and composed of international and national consultants, though, excluding the consultants required for design and supervision of dykes. In fact, there are 6 groups of consultants such as; 1) Overall Management, 2) Irrigation and Drainage Facilities (review), 3) Access Road (review), 4) Procurement of Maintenance Machineries, 5) Construction Supervision, and 6) Agriculture Extension. Of which, the last component, agriculture extension, will not have consultants, but be conducted by the ATI staff only in order to keep the consultancy fee within a certain range.

Therefore, basically there are 2 groups of consultants engaged in the services of; 1) irrigation and drainage development, and 2) access road construction (see table below). It is noted that necessary surveys for detail design and necessary detail designs are proposed to complete by NIA-PMO before the deployment of the consultants, thus the main task for the consultants for design is to review:

Table XIII.3.1 Consultant Person-Month Expected for Major Loan Assisted Components

Program Components	Consultants, MM		Remarks
	International	National	
1. Overall	50	63	
2. Irrigation and Drainage Facilities (review)	3	10	
3. Access Road (review)	0	3	
4. Procurement of Maintenance Machineries	2	2	
5. Construction Supervision	0	198	
6. Agriculture Extension	-	-	
Total MM	55	276	

Note: Consultants required for dyke design and dyke construction supervision are excluded.

Source: JICA Survey Team

The consultancy services are planned to provide 55 person-month and 276 person-month for international and national experts respectively, totaling 331 person-month for the both (for detail consultant deployment, see Table 6.7.2). The cost of the services arrives at 354.49 million JPY (197.8 million PHP) including logistics, office operation & maintenance, local support staff, etc., and this shares 4.8% of the project cost.

XIII.4 TOR for Consultancy Services

Terms of Reference (TOR) for Consulting Services under Malitubog-Maridagao Irrigation Project Stage 2 (MMIP II)

Chapter 1 Background**1.1 Background**

The Malitubog-Maridagao Irrigation Project Stage II (MMIP II) is integral to MMIP as the diversion dam is built to irrigate both Stage I and Stage II. The official date of completion of Stage I was on June 30, 2006 and formally turned-over on October 31, 2011, while, Stage II was approved by NEDA ICC-CC on November 27, 2009. The 5-year implementation period started year 2011 and expected to complete end of 2015. This project aims to irrigate a new area of 9,784 hectares located in the municipalities of Aleosan and Pikit in Cotabato, Region 12 and Pagalungan & Datu Montawal in Maguindanao, ARMM.

The major component is, no doubt, the irrigation and drainage development for the possible ODA loan financing. To delineate the possible PDA loan financing area, the current contractor procurement status for the civil works and the tendering progress should be well taken into account, and then the untouched area which is the remaining area from the NIA's own budget works will be clear. As afore-mentioned, the construction went already into the last irrigation block since year 2015, which is the Lower Malitubog Service Area.

The LMSA is sub-divided into 4 parts in terms of contractor procurement year, meaning commencement year of the civil works. The construction works have continued since 2015, and as of July 2017, the untouched area is the only eastern part of the LMSA. Note that construction in the most western part has not yet started, however tendering for the civil contractor had already been held in May 2017, so that the procurement itself is to be completed in 2017.

Taking into account what was mentioned above and also the current condition of MMIP I and II which had been already completed somewhat ago, the ODA financing area and the components are to be:

- 1) Rehabilitation and, to some extent, improvement of irrigation and drainage facilities in the MMIP I area since the construction of MMIP I started in 1990 whereby there are facilities already aged and in need of rehabilitation,
- 2) Improvement of irrigation and drainage facilities in the MMIP II already completed area, namely, Upper Malitubog Service Area, which could be, for example, partial concrete lining for large lateral canals, bifurcation points, branching points and points where there are hydraulic structure,

- 3) Irrigation and drainage development of the Eastern part of LMSA, 2,133 ha, composed of main canal (MC 2), lateral canals, main drainage canal and lateral drainage canals, associated hydraulic structures, and associated activities such as parcellary mapping, IA establishment, etc.
- 4) Construction of ring dyke and protection dyke along the southern and western boundaries of LMSA, to protect farmland within the LMSA from flood,
- 5) Construction of access roads (intra-roads) which work as farm-to-market road in order to ship produced agricultural commodities out of the farmlands as well as facilitate rural population's mobility especially during rainy season, in which roads become muddy and impassable,
- 6) Procurement of machineries to be used for the maintenance of irrigation facilities of MMIP I and also MMIP II, e.g., excavator, dump truck, etc., and
- 7) Agriculture extension services to facilitate the beneficiary farmers to use irrigation water, whereby 2 times irrigated paddy cultivation is to be established in the MMIP II area. Note that this agriculture extension services activity should cover not only the ODA financing area but also all the MMIP area.

The National Irrigation Administration (NIA) is the organization which has responsibility to implement MMIP II. In order to achieve the aforementioned development and bring about the fruit to the beneficiary farmers, NIA has made arrangements to receive a Japanese ODA Loan and to use a part of it for eligible payments for consulting services, for which this TOR elaborates:

1.2 Components of the Project

The Project consists of the following components and sub-components:

Table 1.1 Components of the Project

No.	Component	
1	Rehabilitation and, to some extent, improvement of irrigation and drainage facilities in the MMIP I area	NIA
2	Improvement of irrigation and drainage facilities in the MMIP II already completed	NIA
3	Irrigation and drainage development of the Eastern part of LMSA (target irrigable area 2,133 ha)	NIA
4	Construction of ring dyke and protection dyke	NIA
5	Construction of access roads which work as farm-to-market road	NIA
6	Procurement of machineries to be used for the maintenance of irrigation and drainage facilities	NIA
7	Agriculture extension services to facilitate the beneficiary farmers for smoothly startup of irrigation farming	ATI

1.3 Procurement Package and Procedure

1.3.1 Procurement Package

The Project will be divided into the following draft packages taking into account the implementation modality such as Direct Force account (DFA), Local Competitive Bidding (LCB), International Competitive Bidding (ICB).

Table 1.2 Expected Procurement Package and Implementation Modality

No.	Component	Modality
1	Rehabilitation and, to some extent, improvement of irrigation and drainage facilities in the MMIP I area	DFA & LCB
2	Improvement of irrigation and drainage facilities in the MMIP II already completed	DFA & LCB
3	Irrigation and drainage development of the Eastern part of LMSA (target irrigable area 2,133 ha)	DFA & LCB
4	Construction of ring dyke and protection dyke	DFA
5	Construction of access roads which work as farm-to-market road	LCB

No.	Component	Modality
6	Procurement of machineries o be used for the maintenance of irrigation and drainage facilities	ICB
7	Agriculture extension services to facilitate the beneficiary farmers for smoothly startup of irrigation faming	DFA

1.3.2 Procurement Procedure

With respect to DFA and LCB components, the Project will procure eligible materials, items, services, equipment, and works under the ODA loan such as fuel and lubricant, cement, reinforcement bars, labors, office equipment, machineries spare parts, experts & lecturers, local contractors, etc. through Local Competitive Bids (LCB) in accordance with the biddings set forth in the Client country and/or the JICA Standard Bidding Documents under Japanese ODA Loans for Procurement of Goods issued in May 2013 and for Procurement of Works issued in October 2012.

While, ICB components will be procured respectively through International Competitive Bidding (ICB) based on Single-Stage One-Envelope Bidding Procedure without, in principle, pre-qualification procedure in accordance with the JICA's Procurement Guideline (Section 2.03, Part II).

1.4 Funding Source

GOP has received a Japanese ODA Loan to finance the Project. GOP intends to use a part of the proceeds of the Japanese ODA Loan for eligible payments for consulting services, for which this TOR is prepared.

1.5 Completion of the Project

The Project is expected to be completed by the 30th day of June 2024.

1.6 Location of the Project

The Project area of MMIP starts at the diversion point established on the Maridagao River with coordinates of 7 degrees 11 minutes 49 seconds N and 124 degrees 43 minutes 08 seconds E, located in Carmen municipality of Cotabato province. The diversion dam, a headworks, provides water to the Maridagao Service Area (MMIP I) extending on the left bank side of the Maridagao river, and then after crossing the river with siphon, further irrigates the Upper Malitubog area (upstream) now extending on the right side of Maridagao river. Both Maridagao Service area and the Upper Malitubog Service area (upstream) were established under MMIP I.

After the Upper Malitubog Service area (upstream), the irrigation water is further delivered to 3 blocks which are all placed under MMIP II construction works; namely, 1) Upper Malitubog Service area (downstream), 2) Pagalungan Extension Service area and 3) Lower Malitubog Service area. The most downstream area of MMIP is therefore located in a most southern part of the irrigable area with coordinates of 6 degrees 57 minutes 8 seconds N and 124 degrees 40 minutes 01 second E. Thus, from north to south direction, the MMIP area extends over an distance of approximately 27 km while it extends over about 30 km length from west to east direction. Concerning elevation, the diversion point indicates 35 m as top bank elevation while the most downstream point shows almost 0 meter altitude.

1.7 Executing Agency

In implementing MMIP II with ODA loan financing, there should be a specific institutional arrangement, which should of course be established based on the existing on-going organizational set up. To ensure the smooth implementation of the MMIP II with loan financing, setting up of Steering Committee (SC) at the NIA central level, comprising of 5 divisions of NIA and ATI central office, and coordination mechanism with the PMO being the center at the site level, comprising of the relevant

organizations, is proposed, as diagramed below:

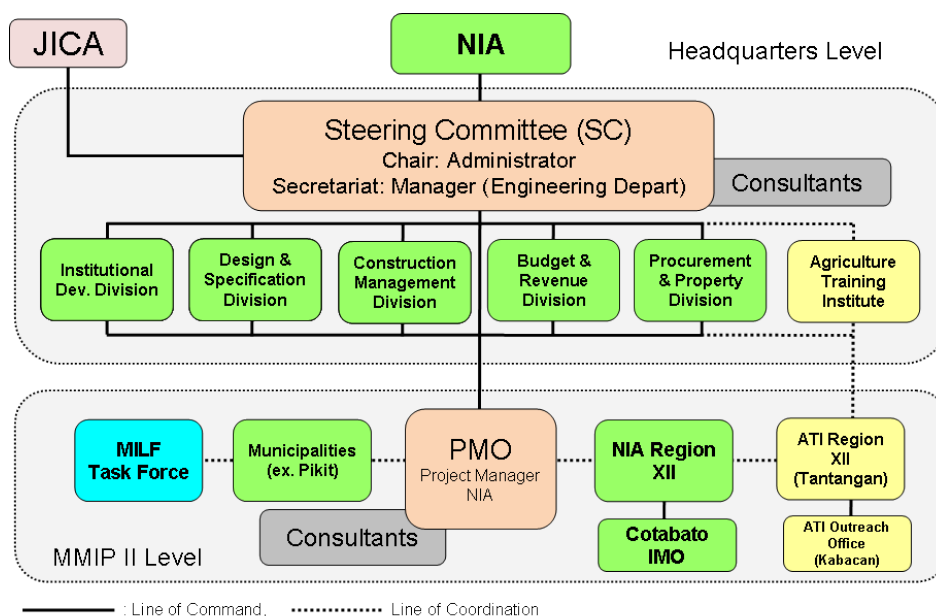


Figure 1.1 Implementation Structure of the Project

This SC/PMO arrangement is proposed, as afore-mentioned, basically with reference to that of the on-going MMIP II. The major difference from the on-gong arrangement is the inclusion of Agriculture Training Institute (ATI) at the central level since ATI is to be engaged in agriculture extension services to be conducted within the MMIP area. The SC should be chaired by the Administrator and the secretariat should be the manager of Engineering Department. Also, JICA Philippines office will participate in the regular meetings held by the steering committee.

With the foregoing, the SC is to facilitate smooth project implementation through proper budget allocation, provision of necessary technical guidance, and control of budget expenditures. The SC has responsibility and authority on all activities such as planning, coordination between divisions, management at the central level, etc. Also, SC has the authority to supervise financial and accounting section as well in order to secure sufficient financial resources and appropriate payment for smooth project implementation. In addition, two working groups will be established at the SC, namely;

- 1) Accounting & Disbursement Management Group: Accounting & Disbursement Management Group takes responsibility of managing the accounting and disbursement status and internal procedure based on the report from the PMO. Accounting & Disbursement Management Group will be comprised of members of Accounting Division and Budget and revenue Division of the NIA central office.
- 2) Project Monitoring & Evaluation Group: A Project Status Report (PSR) will be compiled once in three months under JICA funded loan project implementation. In order to monitor the project progress and to ensure submission of the PSR without delay, the Project Monitoring & Evaluation Group manages the necessary internal procedures for the preparation of PSR. The Project Monitoring and Evaluation Group will be comprised of members of Construction Management Division.

At the field level, though the current PMO structure can be retained as it is, there should be an explicit coordination mechanism which should include MILF task force, municipalities, e.g. Pikit Municipality, NIA Region XII office with Cotabato Irrigation Management Office and ATI Region XII office with the outreach office of ATI located in Kabacan. MILF task force, with municipalities, will coordinate

NIA PMO in the issues of security as well as contacting the beneficiary and project to-be-affected peoples. Cotabato IMP under the Region XII office will take-over the irrigation system upon completion, and the ATI outreach office (Kabacan), controlled by its Region XII office (Tantangan), will provide agriculture extension services to the beneficiary farmers.

1.8 Technical Information

The final report on the “Preparatory Survey on Malitubog-Maridagao Irrigation Project (phase II)” as well as relevant appendixes are available at the headquarters of NIA.

Chapter 2 Objectives of Consulting Services

The consulting services shall be provided by an international consulting firm (hereinafter referred to as "the Consultants") in association with national consultants in compliance with Guidelines for the Employment of Consultants under Japanese ODA Loans (April 2012). The objective of the consulting services is to achieve the efficient and proper preparation and implementation of the Project through the following categorized service works:

Project Overall Management

Review of Detail design and supervise for Irrigation and Drainage Improvement Component

Agriculture extension services will be implemented by the concerned government organizations without consulting services set forth herewith. The consulting services, A and B are composed of the following:

1) Project Management

- (a) Project overall management, and coordination with relevant offices and stakeholders,
- (b) Assistance on overall fund-flow and disbursement management, and
- (c) Assistance on implementation of social and environmental consideration.

2) Review of Detail design and supervise for Irrigation and Drainage Improvement Component

- (a) Review of Detail design,
- (b) Tender Assistance,
- (c) Construction Supervision, and

Chapter 3 Detail of Consulting Service

3.1 Terms of Reference for Consulting Services

The consulting services are composed of the following:

For Project Overall Management

- 1) Project overall management, and coordination with relevant offices and stakeholders,
- 2) Assistance on overall fund-flow and disbursement management, and
- 3) Assistance on implementation of social and environmental consideration.

For Review of Detail design and supervise for Irrigation and Drainage Improvement Component

- 1) Review of Detail design,
- 2) Tender Assistance,
- 3) Construction Supervision, and

3.2 Project Overall Management, and Coordination with Relevant Offices and Stakeholders

The Consultants shall assist the SC and PMU in conducting overall management and coordination with relevant offices and stakeholders through the following:

- 1) monitor and confirm the status (schedule, progress, input, output, payment, disbursement, problem, issue, challenge, modification of the component item from original plan and design, and etc.) of each project component,
- 2) if an issue(s) will be found in each project component, report to the concerning clientele department responsible staff/ officers and raise the issue in SC/PMU meeting,
- 3) assist SC/PMU chairman to proceed the regular PMU meeting and to make records of meetings and delivery to all representatives of clientele departments under SC/PMU,
- 4) prepare recommendations against the issues in view point of technical and JICA loan rules, and assist SC/PMU to judge and direct properly, and
- 5) assist the concerning clientele department responsible staff/ officers to prepare for the project status report which shall be submitted to JICA every three (3) months.

3.3 Assistance on Overall Fund-flow and Disbursement Management

The Consultant shall assist NIAs in processing payment and disbursement to the contractors by carrying out the following works:

- 1) confirm the work schedule and disbursement schedule according to the on-going situation,
- 2) confirm the work area to be carried out according to the design and construction plan not only on drawings but also at the site,
- 3) confirm the monthly progress of the works based on the plan and site situation,
- 4) check necessary documents including contractor's invoices or requests for payment, and if corrections needed, advise the responsible clientele staff/ officers or the contractors to rectify them,
- 5) assist NIA responsible staff/ officers to prepare requests for disbursement from JICA, and
- 6) assist NIA responsible staff/ officers in reporting to JICA on financial status of the Project at such interval as required.
- 7) Assist in preparing material/documents for auditing including internal audit by Executing Agencies and external audit by the Auditor General's Office.

3.4 Assistance on Implementation of Social and Environmental Consideration

The Consultant, under Assistance Concept, shall conduct the following:

- 1) review and update the EMP, if necessary, and prepare a detailed Environmental Monitoring Plan (including mitigation measures and monitoring procedures) that incorporates guidelines indicated in the EMP in accordance with JICA's Guidelines for Environment and Social Consideration and all relevant laws, regulations and directives pertaining to environmental monitoring,

- 2) work with other experts to ensure that all mitigation measures and recommendations given in the EMP are suitably reflected and incorporated in detailed design, bidding documents and contracts for construction works to minimize adverse impacts during construction or thereafter,
- 3) Assist environment responsible staff of the relevant clientele departments in monitoring environmental and social impacts which may be caused by the construction works,
- 4) Examine if negative environmental impacts have been reported to relevant authorities and check if they were well handled and settled, and if not settled, assist the clientele staff/officers to mitigate such impacts,
- 5) Review environmental monitoring reports prepared by the clientele environment responsible staff at such interval as required and submit them to the relevant headquarters offices and Project Steering Committee, and,
- 6) Conduct workshops and field trainings to strengthen the capacity of the environment responsible staff concerned for NIAs and local authorities to carry out the impact identification, evaluation and mitigation measures as needed.

3.5 Review of Detailed Design (Task Responsibility)

The Consultant, under Task Responsibility, shall carry out the following works:

- 1) Review the detailed design of the Component, which is conducted by the NIA PMO, in sufficient detail to ensure clarity contractors and other relevant stakeholders; All the design must be in conformity with the NIA design standards when available or with the appropriate international standards. The detailed design shall, as a minimum, include i) drawings for all facilities, ii) detailed cost estimates, and iii) necessary calculations to determine and justify the engineering details for the Component, associated documentation including detailed specifications, bill of quantities (BOQ), implementation schedule for the Component. Such detailed specifications will contain those in relation to i) quality control of materials and workmanship, ii) safety, and iii) protection of the environment; and
- 2) Review Detailed Specifications, Bill of Quantities (BOQ) and Tender Drawings/Documents, which is prepared by NIA PMO, to be incorporated into Bidding Documents in such cases of biddings being necessary. Such Detailed Specifications shall contain those in relation to; i) quality control of materials and workmanship, ii) safety, and iii) protection of the environment.

3.6 Tender Assistance (Assistance to the Client)

1) Assistance in Pre-Qualification (PQ) of Bidders undertaking Good Supply and Construction Works

For the construction works and the procurement of the machinery for maintenance, the Consultant, under Assistance Concept, shall:

- a) Define PQ criteria in terms of technical and financial requirements, capacity and experience taking into consideration the technical requirements of the component;
- b) Prepare PQ documents in accordance with the latest version of Standard Prequalification Documents under Japanese ODA Loans;
- c) Assist the NIA in PQ announcement, addendum/corrigendum, and clarifications to the applicants' queries;

- d) Evaluate PQ applications in accordance with the criteria set forth in PQ documents; and
- e) Prepare a PQ evaluation report for approval of the PQ evaluation committee.

2) Assistance in the Bidding for Award of Contractor(s) undertaking Good Supply and Construction Works

The Consultant, under Assistance Concept, shall:

- a) Prepare bidding documents in accordance with the latest version of Standard Bidding Documents under Japanese ODA Loans for Procurement of Works together with all relevant specifications, drawings and other documents in respect of individual items to be procured;
- b) Prepare bidding documents which include; i) clauses stating that the Contractor is to comply with the requirement of the Environmental Management Plan (EMP) and JICA Guidelines for environmental and social considerations (April 2010) (JICA Environmental Guidelines), ii) the specification clearly stipulating the safety requirements in accordance with the laws and regulations in the country of the Borrower, relevant international standards (including guidelines of international organization), if any, and also in consideration of “the Guidance for the Management of Safety for Construction Works in Japanese ODA Projects of JICA,” iii) the requirement to furnish a safety plan to meet the safety requirements, iv) the requirement for the personnel for key positions to include an accident prevention officer, and v) the requirement to submit method statements of safety to NIA and the consultant at the construction stage.
- c) Assist the NIA in issuing bid invitation, conducting pre-bid conferences, issuing addendum/corrigendum, and clarifications to bidders’ queries;
- d) Evaluate bids in accordance with the criteria set forth in the bidding documents. In such evaluation, the Consultants shall carefully confirm that bidders’ submissions in their technical proposal including, but not limited to, site organization, mobilization schedule, method statement, supply and construction schedule, safety plan, have been prepared in harmony each other and will meet such requirements set forth in applicable laws and regulations, specifications and other parts of the bidding documents;
- e) Prepare a bid evaluation report for approval of the NIA;
- f) Assist the NIA in contract negotiation by preparing agenda and facilitating negotiations including preparation of minutes of negotiation meeting; and
- g) Prepare a draft and final contract agreement.

4.1.3 Construction Supervision

The Consultant shall perform his duties during the contract implementation period of the contracts to be executed by the Contractor. FIDIC MDB Harmonized Edition (2010) complemented with the Specific Provisions as included in the Standard Bidding Documents under Japanese ODA Loans for Procurement of Works will be applied to the civil works of the Project. In this context, the Consultant shall:

- 1) Act as the Engineer to execute construction supervision and contract administration services in accordance with the power and authority delegated by the head office of NIA;
- 2) Provide assistances to the Employer concerning variations and claims which are to be ordered /issued at the initiative of the head office of the NIA, and/or advise the Employer on resolution of any dispute with the Contractor;

- 3) Issue instructions, approvals and notices as appropriate;
- 4) Provide recommendations to the NIA for acceptance of the Contractor's performance security, advance payment security and required insurances;
- 5) Provide the commencement order to the Contractors;
- 6) Assess adequacy of all inputs such as materials, labor and equipment provided by the Contractor
- 7) Check and approve the Contractor's method of work, including site organization, program of performance, quality assurance system, safety plan, method statements of safety, and environmental monitoring plan so that the requirements set forth in the applicable laws and regulations, the specifications or other parts of the contract are to be duly respected;
- 8) Regularly monitor physical and financial progress, and take appropriate action to expedite progress if necessary, so that the time for completion set forth in the contract will be duly respected by the Contractor;
- 9) Explain and adjust ambiguities and discrepancies in the Contract Documents and issue any necessary clarifications or instructions. Issue further drawings and give instructions to the Contractor for any works which may not be sufficiently detailed in the contract documents, if any;
- 10) Review, verify and further detail the design of the works, approve the contractors' working drawings, shop drawings and drawings for temporary works. Also, review and approve, if any design prepared by the Contractor for any part of the permanent works;
- 11) Liaise with the appropriate authorities to ensure that all the affected utility services are promptly relocated;
- 12) Carry out field inspections on the Contractor's setting out of the works in relation to original points, lines and levels of reference specified in the contract;
- 13) Organize, as necessary, management meetings with the Contractor to review the arrangements for future work, and prepare and deliver minutes of such meetings to the Employer and the Contractor;
- 14) Supervise the works so that all the contractual requirements are met by the Contractor, including those in relation to i) quality of the works, ii) safety and iii) protection of the environment. Confirm that an accident prevention officer proposed by the Contractor is duly assigned at the project site. Require the Contractor to take appropriate remedies if any questions are recognized regarding the safety measures;
- 15) Supervise field tests, sampling and laboratory test to be carried out by the contractors;
- 16) Inspect the construction method, equipment to be used, workmanship at the site, and, when required, attend shop inspection and manufacturing tests in accordance with the specifications;
- 17) Survey and measure the work output performed by the Contractor, verify statements submitted by the Contractor and issue payment certificates such as interim payment and final payment as specified in the contract;
- 18) Coordinate the works among different organizations working for the Component;

- 19) Modify the designs, technical specifications and drawings, relevant calculations and cost estimates as may be necessary in accordance with the actual site conditions, and issue variation orders (including necessary actions in relation to the works performed by other contractors working for other projects, if any);
- 20) Carry out timely reporting to the NIA for any inconsistency in executing the works and suggesting appropriate corrective measures to be applied;
- 21) Inspect, verify and fairly determine claims issued by the parties to the contract (i.e. the Employer and Contractor) in accordance with the civil works contract;
- 22) Perform the inspection of the works, including Test on Completion, and to issue certificates such as the Taking-Over Certificate, Performance Certificate as specified in the contract;
- 23) Supervise commissioning and carry out tests during the commissioning, if applicable;
- 24) Provide periodic and/or continuous inspection services during defects notification period and if any defects are noted, instruct the contractors to rectify;
- 25) Prepare as-built drawings for the parts of the works constructed in accordance with the design provided by the NIA, and check and certify as-built drawings for the parts of the works designed by the contractors, if any; and
- 26) Prepare an operation and maintenance manual for the parts of the works constructed in accordance with the design provided by the NIA, and check and certify an operation and maintenance manual for the parts of the works designed by the contractors, if any.

3.5 Expected Time Schedule

The total duration of consulting service-A will be 66 months. The implementation schedule expected is presented in following table:

Table 3.1 Implementation Schedule Expected

Key Activities	Date	Duration in Months
Commencement of Consulting Services	1 January 2019	66
Period of Consulting services	1 January 2019 to 30 June 2024	
Final Contract Administration	1 July 2024 to 30 October 2024	4
Completion of Consulting Services	30 October 2024	-

3.6 Staffing (Expertise Required)

Total 4 Professional (A) consultants (Foreign Persons) and 16 Professional (B) consultants (Local Persons) will be engaged, over the duration of consulting service-A, for a total of 55 person-months for Professional consultants (A) and 276 person-months for Professional consultants (B). Total consulting input is thus estimated at 276 person-months.

3.6.1 Consulting Input for the Respective Modules

The Consultant services will be performed by following consultant personnel together with supporting staff. The allocation of person-month, excluding national supporting staff, is shown in Table 3.2:

Table 3.2 Allocation of Person-Month on Project Overall Management

Nr.	Designation	No.	Total
	Professional (A): International Specialist		Total 55
1	Project Team Leader	1	42
2	Procurement/ Bid Document (Civil Woks)	1	2
3	Soil and Foundation	1	1
4	EIA Monitoring	1	5
5	Irrigation and Drayage Design Engineer	1	3
6	Procurement Expert on Maintenance Machinery	1	2
	Professional (B): National Specialist		Total 276
5	Deputy Project Team Leader	1	50
6	Procurement/ Bid Document (Civil Woks)	1	4
7	EIA Monitoring	1	9
8	Irrigation and Drayage Design Engineer 1	1	3
9	Irrigation and Drayage Design Engineer 2	1	3
10	Quantity and Cost Estimation 1	1	2
11	Quantity and Cost Estimation 2	1	2
12	Road Design Engineer	1	2
13	Quantity and Cost Estimation for Road Portion	1	1
14	Procurement Expert on Maintenance Machinery	1	2
15	Construction Supervision 1	1	36
16	Construction Supervision 2	1	36
17	Construction Supervision 3	1	36
18	Construction Supervision 4	1	36
19	Construction Supervision 5	1	18

3.6.2 Qualification of Key Experts

The qualifications of Key Experts of Professional (A) and Professional (B) are shown below:

Table 3.3 Qualification of Key Experts

Designation	Qualification
Professional (A) International Specialist	
Project Team Leader	<ul style="list-style-type: none"> ✓ Should have at least Master degree in civil engineering field or other related fields. ✓ Should have at least 25 years' experience in rural development project and its related projects, e.g. irrigation and drainage and canal roads improvement/ construction, ✓ Should have handled at least five comprehensive rural development projects involving planning, design, and tender assistance and construction supervision, of which at least three projects should have been attended as team/section leader, ✓ Should have an experience(s) engaged in rural development related projects carried out in Southeast Asia or South Asia, and ✓ Preferable to have knowledge on direct force account development projects.
Irrigation and Drainage Design Engineer	<ul style="list-style-type: none"> ✓ Preferable to have Master degree in civil engineering field or other related fields ✓ Should have at least 15 years' experience in irrigation development project and its related projects, ✓ Should have design experiences on irrigation project involving layout planning of irrigation facilities, irrigation distribution planning, drainage layout, construction planning, and other related planning works, and ✓ Should have an experience(s) engaged in irrigation related projects carried out in Southeast Asia or South Asia.
Professional (B) National Specialist	
Deputy Project Team Leader	<ul style="list-style-type: none"> ✓ Should have at least Bachelor degree in civil engineering or other related fields ✓ Should have at least 20 years' experience in consultant services for rural development project and its related project, e.g. irrigation and drainage and canal roads improvement/ construction, ✓ Should have handled at least one comprehensive rural development projects involving

Designation	Qualification
	<ul style="list-style-type: none"> planning, design, and tender assistance and construction supervision, ✓ Preferable to have an experience(s) of team leader or deputy team leader. ✓ Preferable to have an experience(s) in managing direct force account development projects.

Consultant may propose other experts and supporting staff required to accomplish the tasks outlined in this TOR. It is the Consultant's responsibility to select the optimum team and to propose the professionals, which he/she believes best meets to the needs for the project management.

3.6.4 Scope of Works for the Respective Personnel

Detailed information on the major tasks and duties to be performed by the members of the detailed engineering design team and the construction supervision team is shown in Table 3.4:

Table 3.4 Major Tasks and Duties of Team Members

Designation	Major Tasks and Duties
Professional (A) (International Specialist)	
Project Team Leader	<ul style="list-style-type: none"> ✓ Project overall management, and coordination with relevant offices and stakeholders, ✓ Assistance on overall fund-flow and disbursement management, ✓ Assistance on implementation of social and environmental consideration, ✓ General coordination and supervision of the whole team during the project, ✓ Assumes direct responsibility for day-to-day consulting services during the project, ✓ Represents the whole team in all matters relating to the performance of services during the project, and ✓ Direct the section leaders and other project staff on the overall implementation of the project. ✓ Guide the preparation of procurement plan and update.
Procurement/ Bid Document	<ul style="list-style-type: none"> ✓ Assist NIA for preparation of the bid document for the procurement of contractor/supplier for implementation of the project component in cooperation with section leader and staff of each section, and ✓ Assist NIA responsible staff/ officers for conducting prequalification and tender including evaluation and technical support for contract negotiation. ✓ Assist Project Team Leader according to requests from Project Team Leader.
Soil and Foundation	<ul style="list-style-type: none"> ✓ Assist clientele department for detail design on the foundation treatment for ring dike and protection dike by technical view point of geotechnical and soil conditions
EIA Monitoring	<ul style="list-style-type: none"> ✓ Review and update the EMP, when necessary, ✓ Assist NIA to prepare a detailed Environmental Monitoring Plan (including mitigation measures and monitoring procedures) that incorporates guidelines indicated in the EMP, ✓ Work with other experts to ensure that all mitigation measures and recommendations given in the EMP, ✓ Assist environmental responsible staff of the relevant clientele department in monitoring environmental and social impacts, ✓ Examine if negative environmental impacts have been reported to relevant authorities and check if they were well handled and settled, and if not settled, assist the clientele staff/ officers to mitigate such impacts, ✓ Review environmental monitoring reports prepared by the environment responsible staff at such interval as required, and ✓ Conduct workshops and field trainings to strengthen the capacity of the environment responsible staff concerned for NIAs and local authorities to carry out the impact identification, evaluation and mitigation measures if needed. ✓ Assist Project Team Leader according to requests from Project Team Leader.
Irrigation and Drainage Design Engineer	<ul style="list-style-type: none"> ✓ Review existing structural designs on irrigation & drainage systems, ✓ Review Technical Specifications, and ✓ Assist NIA to prepare Bills of Quantities for the construction works. ✓ Assist Project Team Leader according to requests from Project Team Leader

Designation	Major Tasks and Duties
Procurement Expert on Maintenance Machinery	<ul style="list-style-type: none"> ✓ Review the equipment/ machineries to be procured, ✓ Prepare PQ documents and bidding documents for the equipment and machineries to be procured, ✓ Assist NIA in the process of issuing PQ and Bid documents, and tender procedure, and ✓ Prepare an evaluation report for the tendering and recommend NIA for the success bidding.. ✓ Assist Project Team Leader according to requests from Project Team Leader
Professional (B) (National Specialist)	
Deputy Project Team Leader	<ul style="list-style-type: none"> ✓ Assist the Project Team Leader in carrying out all tasks and duties of the Project Team Leader, ✓ Represent the Consultants team during absence of the Project Team Leader, and ✓ Perform specific issues/aspects delegated by the Project Team Leader. ✓ Assist NIA responsible staff/ officers to prepare requests for disbursement from JICA, and ✓ Assist NIA responsible staff/ officers in reporting to JICA on financial status of the Project at such interval as required. ✓ Assist in preparing material/documents for auditing including internal audit by Executing Agencies and external audit by the Auditor General's Office ✓ Assist Project Team Leader according to requests from Project Team Leader.
Procurement Expert/ Bid Document	<ul style="list-style-type: none"> ✓ Assist a Procurement/ Bid Document (international) and Project Team Leader and Deputy Project Team Leader in the works concerning preparation of the bid document, tender assistance and contract management.
EIA Monitoring	<ul style="list-style-type: none"> ✓ Assist the EIA Monitoring and (international) and Project Team Leader and Deputy Project Team Leader in the works concerning assistance on implementation of social and environmental consideration.
Irrigation and Drainage Design Engineer 1, 2	<ul style="list-style-type: none"> ✓ Assist the Irrigation and Drainage Design Engineer (international) in reviewing the existing structural designs for MMIP2, ✓ Assist NIA in preparing the detailed designs of irrigation networks, ✓ Assist NIA in preparing Bills of Quantities.
Quantity & Cost Estimation	<ul style="list-style-type: none"> ✓ Assist NIA to prepare bills of quantities on Irrigation and Drainage component, ✓ Assist the Experts of NIA in preparing bills of quantities on Irrigation and Drainage component ✓ Assist NIA to prepare cost estimation of the Project, and
Road Design Engineer	<ul style="list-style-type: none"> ✓ Review the detail design on access road, ✓ Assist NIA to prepare tender documents, and
Quantity & Cost Estimation	<ul style="list-style-type: none"> ✓ Assist NIA to prepare bills of quantities on access road ✓ Assist the Experts of NIA in preparing bills of quantities on access road ✓ Assist NIA to prepare cost estimation of the Project, and
Procurement/ Bid Document	<ul style="list-style-type: none"> ✓ Assist NIA for preparation of the bid document for the procurement of contractor/supplier for implementation of the project component in cooperation with section leader and staff of each section, and ✓ Assist NIA responsible staff/ officers for conducting prequalification and tender including evaluation and technical support for contract negotiation. ✓ Assist Project Team Leader according to requests from Project Team Leader.
Construction Supervision 1, 2, 3, 4, 5	<ul style="list-style-type: none"> ✓ Assist NIA in coordination and supervision on works of a contractor(s) for Irrigation and Drainage component and access road, ✓ Assist the experts of NIA in reviewing and approving Shop Drawings/ Construction Drawings for these works prepared by a contractor(s), ✓ Assist the experts of NIA in reviewing and approving test reports for materials prepared by a contractor(s), and ✓ Assist the Experts of NIA in inspection on the construction works implemented by a contractor(s).

3.7 Reporting

Within the scope of consulting services, the Consultant shall prepare and submit reports and documents to NIA as shown in Table 3.5. The Consultant shall provide electronic copies of each of

these reports as well:

Table 3.5 Summary of Reports to Be Submitted

Category	Type of Report	Timing	No. of Copies
Project management	Inception Report	Within 1 month after commencement the services	5
	Design review Report	After completion of the review	5
Tender Assistance	Pre-qualification Document	At appropriate timing	5
	Bidding Document	At appropriate timing	5
	Pre-qualification Evaluation Report	At appropriate timing	5
	Bid Evaluation Report	At appropriate timing	
Construction Supervision	Monthly Progress Report	Every month	5
	Quarterly Progress Report	Every quarter	5
	Project Completion Report	At the end of the services	10
	Technical Reports	As required or upon request	As required

3.7.1 For Project management

- 1) Inception Report: presents the methodologies, schedule, organization, etc.
- 2) Design review Report: presents the result of design review on irrigation and drainage component

3.7.2 For Tender Assistance

- 1) Pre-qualification Document: presents the pre-qualification documents and its evaluation criteria.
- 2) Bidding Document: presents the bidding documents and bid evaluation criteria.
- 3) Pre-qualification Evaluation Report: presents the results of the evaluation with recommendations on the selection of the qualified applicants.
- 4) Tender Evaluation Report: presents the results of technical and price evaluation with recommendations on technically and financially responsive bidders.

3.7.3 For Construction Supervision

- 1) Monthly Progress Report: describes briefly and concisely all activities and progress for the previous month by the 10th day of each month. Problems encountered or anticipated will be clearly stated, together with actions to be taken or recommendations on remedial measures for correction. Also indicates the work to be performed during the coming month.
- 2) Quarterly Progress Report: presents the progress status of the Project.
- 3) Project Completion Report: comprises outline of all facilities completed and construction records from the commencement through completion, together with key data and records.

3.8 Obligations of the Executing Agency (NIA)

A certain range of arrangements and services will be provided by the NIA to the Consultant for smooth implementation of the Consulting Services. In this context, the NIA will:

1) Reports and data

Make available to the Consultant existing reports and data related to the Project as required.

2) Office space

Provide a suitable office space in the NIA HQs and also at the project site (NIA PMO office) with necessary equipment, furniture and utility. However, the Consultant's requirement for office space,

including necessary equipment, furniture and utilities, shall be clearly stated in the proposal with its rental cost for the case where the NIA would not be able to provide such facilities.

3) Cooperation and counterpart staff

Appoint counterpart officials, agent(s) and representative(s) as may be necessary for effective implementation of the Consulting Services.

4) Assistance and exemption

Use its best efforts to ensure that the assistance and exemption, as described in the Standard Request for Proposal issued by JICA, will be provided to the Consultant, in relation to:

- ✓ travel permits, stay permit, security application, and such other documents;
- ✓ VISAs and such other necessary documents,
- ✓ clearance through customs,
- ✓ instructions and information to officials, agent and representatives of the GOP,
- ✓ exemption from any requirement for registration to practice their profession, and
- ✓ privilege pursuant to the applicable law in Myanmar.