



**Ministry of Transport and Roads  
Of Kyrgyz Republic**

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# Database System Manual for Road Disaster Prevention





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# 1 General Information

## 1.1 Database Operation Flow

This database system is the database for road disaster prevention management in Kyrgyz Republic. The database is operated on FileMaker software\*. The data for the inspection of road disaster areas should be stored in the database and managed by Asset Management Section (hereinafter as refer to AMS) in Road Maintenance Department (hereinafter as refer to RMD).

Database operation flow is shown in Figure 1-1.

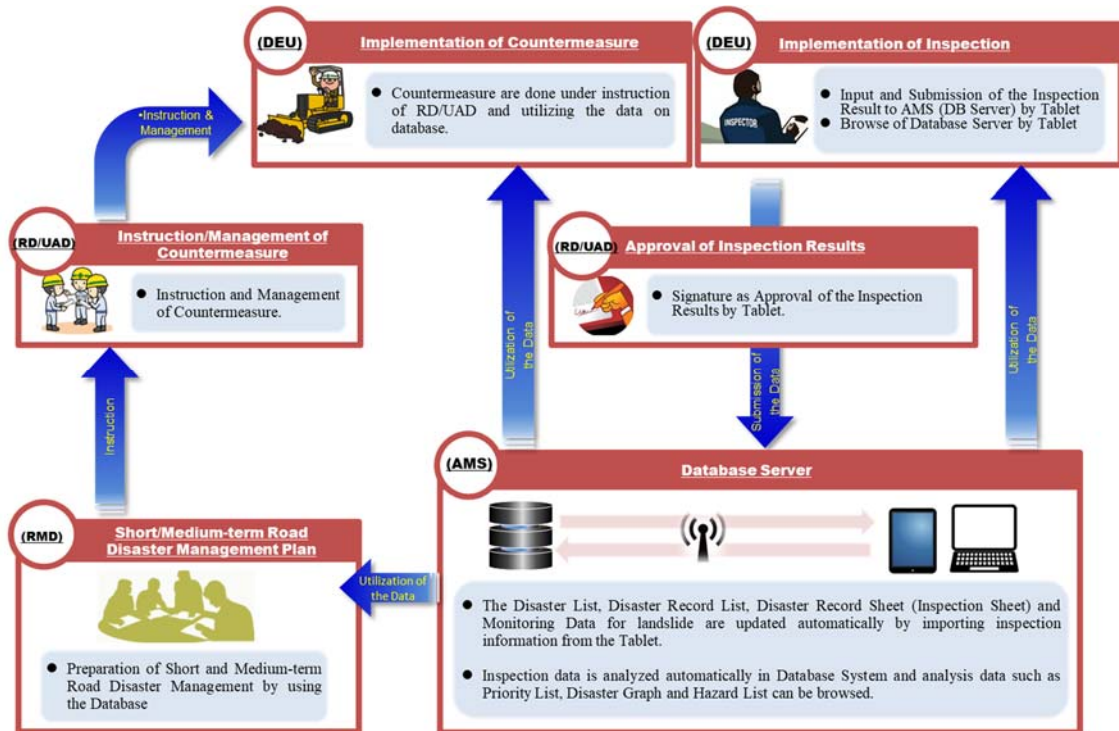


Figure 1-1 Database Operation Flow

## 1.2 Database Structure

### 1.2.1 Database Equipment

The database system consists of database server (MacBook Pro) and portable hard disk for data backup. Database equipment is shown in Photo 1-1.



Photo 1-1 Database System Equipment

### **(1) Database Server**

The database server is MacBook Pro which is placed on the left in Photo 1-1. The software for database “FileMaker Server” is installed in this computer. This software can run only on two operating systems, Windows Server and Mac OS X. Windows Server is not popular in operating systems. Therefore, OS X is selected as an operating system for this database system.

The original database file should be stored in the database server. The location where original file should be stored is the folder which name is “Databases alias” on desktop.

### **(2) Operating Computer**

The database server is a device just to store the original data file and the data files in it cannot be operated by MacBook Pro (database server computer). To manipulate the data files on the database server, an operating computer is needed.

The operating computer is Windows PC of Dell. A database software, FileMaker Pro, should be installed to the operating computer because the software is necessary to access the database server and operate the database files.

### **(3) Storage for Data Backup**

The database system has two external HDDs for data backup and automatically backs up the all data stored in the database server daily. The frequency of data backup can be changed, for example every 2days, weekly, or monthly. Initial setting is daily.

## **1.2.2 Access Equipment from Outside**

The database system can accept 5 connections from iOS device, iPhone and/or iPad, in outside of the database system.

To access to the database system by iOS device, application software FileMaker Go should be installed into the devices. FileMaker Go can be downloaded for free from App Store which is preinstalled application in iOS device.

## **1.2.3 Installation Software**

The software used in the database system is of FileMaker series, and three software shown below is necessary to use the database system.

### **(1) FileMaker server**

This is software for database server. Detail information refers to URL below.

<http://www.filemaker.com/products/filemaker-server/>

### **(2) FileMaker Pro**

This is software for database operation. Detail information refers to URL below.

<http://www.filemaker.com/products/filemaker-pro/>

Trial version of FileMaker Pro is prepared on the web site. it is possible to download from URL below.

[http://info2.filemaker.com/FileMaker\\_Platform\\_Trial\\_Request.html](http://info2.filemaker.com/FileMaker_Platform_Trial_Request.html)

### **(3) FileMaker Go**

This is an application for database operation from iOS device. Detail information refers to URL below.

<http://www.filemaker.com/products/filemaker-go/>



### 1.3 Database System

Database system for road disaster prevention management divided into two main functions which are Inspection and Analysis as shown in Figure 1-2. Function of inspection consists of Disaster Hazard List, Disaster Record List, Disaster Record Sheet and Monitoring for Landslide. Function of Analysis consists of Priority List, Priority Graph, Disaster Graph and Map Information. Responsibility for preparation of each information are shown in Table 1-1.

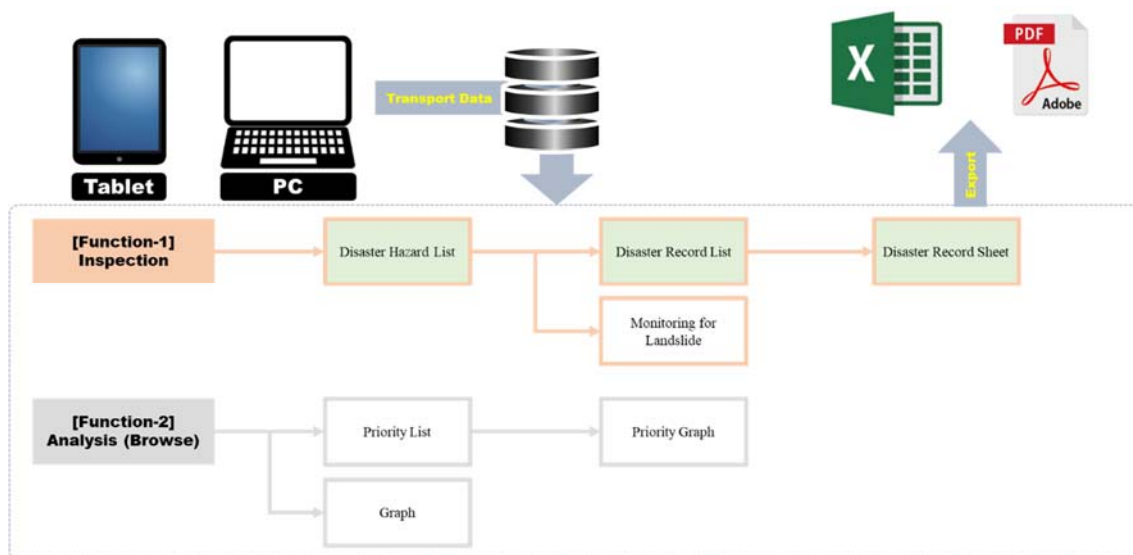


Figure 1-2 Framework of the Database

Table 1-1 Responsibility for Preparation of Each Information

| Institutions | Role  |
|--------------|---|
| RMD          | <ul style="list-style-type: none"> <li>To prepare the Short and Medium-term Road Management Plan by utilizing the Database.</li> </ul>  |
| AMS          | <ul style="list-style-type: none"> <li>To manage the Database System</li> <li>To update the Database System as necessary</li> <li>To provide the information on Database</li> </ul> |
| RD/UAD       | <ul style="list-style-type: none"> <li>To approve the inspection results by signature</li> <li>To manage data collection activities by DEU</li> </ul>                               |
| DEU          | <ul style="list-style-type: none"> <li>To carry out the inspection and input the disaster data</li> </ul>   |

## 1.4 Main Menu

Main Menu is shown in Figure 1-3. On the main menu of the database system, it can be approach or inputted to the following function and items as shown in Table 1-2.

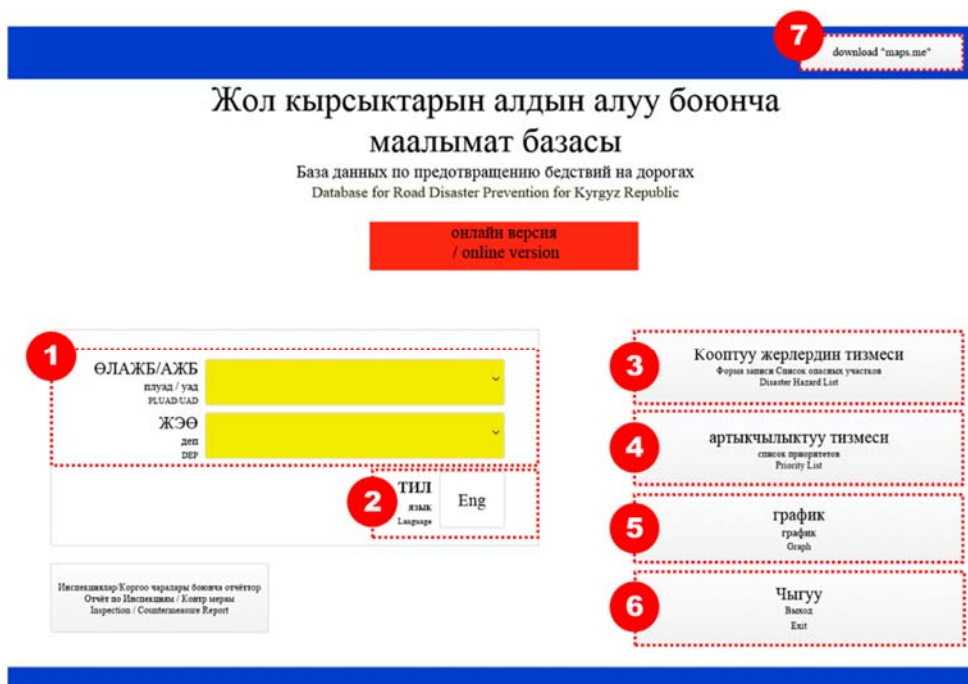


Figure 1-3 Main Menu

Table 1-2 Function of Main Menu

| No.* | Function   | Remarks                           |
|------|--|-----------------------------------|
| 1    | Regional Department, UADs and DEU that the user wants to input or browse the data can be selected. |                                   |
| 2    | Language of the system can be selected.  |                                   |
| 3    | Disaster Hazard List can be opened. (Inspection function can be accessed from this button)         | Details are described in Chapter2 |
| 4    | Priority List can be opened. (Analysis function can be accessed from this button)                  | Details are described in Chapter3 |
| 5    | Graph function can be accessed.  | Details are described in Chapter3 |
| 6    | Database can be terminated.  |                                   |
| 7    | It can be moved to Download site of "Maps.me" by this button.                                      |                                   |

\* No. corresponds to the number described in Figure 1-3

## 2 Input Method for Inspection (Inspection Function)

### 2.1 General

In this chapter, general information and input method for the inspection function are stated in detail. Inspection function is used for recording the road disaster scale, location and history to the database server in order to utilize for road disaster prevention and preparation of Short/Medium-term Road Disaster Management Plan. Also, the inspection by the tablet should be implemented in the site by DEU staff after any road disaster occur and detailed information on the road disaster is inputted to database system by tablet directly.

#### 2.1.1 Disaster Hazard List

Disaster Hazard List is basic information for road disaster prevention management. On this list, disaster hazard sites are listed with road name, coordination, kilo-post and priority. In addition, it has the following functions;

- Detailed location of each site can be browsed by the “google map” and “maps.me” buttons. (It should be noted that "google map" button is working on on-line field only and "maps.me" button is working on on-line and off-line field.)
- Disaster Record List of each site can be browsed by the “Record List” button.
- New disaster hazard site can be added to Disaster Hazard List.

The format of Disaster Hazard List is shown in Figure 2-1.

| карта      |            | Ст. No           |                | Кендик N Узундук E |           | Приоритеттүүлүгү |             |            |
|------------|------------|------------------|----------------|--------------------|-----------|------------------|-------------|------------|
| Не в сети  | Онлайн     | Чакарма (km) (m) | Километр km. m | широта N           | долгота E | Приоритетность   | Record List | Monitoring |
| Google Map | Google Map | 110              | 450            | 42.43              | 73.81     | Priority A       | Record List | Monitoring |
| Google Map | Google Map | 112              |                | 42.42              | 73.80     | Priority B       | Record List | Monitoring |
| Google Map | Google Map | 116              | 500            | 42.39              | 73.80     | Priority B       | Record List | Monitoring |
| Google Map | Google Map | 116              |                | 42.39              | 73.80     | Priority A       | Record List | Monitoring |
| Google Map | Google Map | 119              |                | 42.39              | 73.82     | Priority B       | Record List | Monitoring |
| Google Map | Google Map | 119              |                | 42.39              | 73.82     | Priority B       | Record List | Monitoring |
| Google Map | Google Map | 119              |                | 42.39              | 73.82     | Priority B       | Record List | Monitoring |
| Google Map | Google Map | 119              |                | 42.39              | 73.82     | Priority B       | Record List | Monitoring |

Figure 2-1 Disaster Hazard List

#### 2.1.2 Disaster Record List

On the Disaster Record List, disaster hazard history (inspection history) are listed with disaster date, record date, disaster type and photos. In addition, it has the following functions;

- Disaster Record Sheet of each site can be browsed or inputted by the “Record Sheet” button.
- New disaster record can be added to Disaster Record List by “Add New Disaster Record” button.
- Disaster Record List can be sorted by road disaster types.

The format of Disaster Record List is shown in Figure 2-2.

| Кыргызстан датасы<br>Date of Disaster | Жазуунун датасы<br>Date of Record | Табигый кырсык<br>Natural Disaster Type | Record Sheet |
|---------------------------------------|-----------------------------------|---|--------------|
|                                       | 2018/02/12                        | Slope Collapse                          | Record Sheet |
|                                       | 2018/02/20                        | Snow Drifting                           | Record Sheet |
|                                       | 2018/02/26                        | Landslide                               | Record Sheet |

Figure 2-2 Disaster Record List

### 2.1.3 Disaster Record Sheet

On the Disaster Record Sheet, detailed information shown below can be inputted and transferred to the server by “Submit” button under the internet environmental. The format is shown in Figure 2-3 and the input items of Disaster Record Sheet are followings;

- 1) Road Name, Kilopost\*
- 2) Date of Disaster and Recording
- 3) Coordinate of the Site\*
- 4) RD/UADs/DEU\*
- 5) Type of Disaster
- 6) Damage Range/ Traffic Regulation & Cleaning Time
- 7) Human/Vehicle Damage
- 8) Weather Conditions
- 9) Details of Rock Falling (Maximum and Average Diameter of Rocks)
- 10) Details of Slope Collapse/Landslide (Damage Range)
- 11) Details of Avalanche (Damage Length, Max Depth)
- 12) Details of Snow Drifting (Visibility, Depth)
- 13) Details of Disaster Recovery (Method, Unit, Quantity, Cost, Date)
- 14) Photo and Comments
- 15) Name of the responsible person

|  |  |                 |                        |                          |           |            |
|--|--|-----------------|------------------------|--------------------------|-----------|------------|
| Жолдун аты   | Бишкек - Ош 9-209км                              |                 | Чакарым (км)           | 112                      | -         |            |
| Таб.кырсык б-н күн                                   |  |                 | Кендик N               | 42.421531                | Узундук E | 73.7970003 |
| Каттоо күнү  | 11.04.2018                                       |                 |                        |                          |           |            |
| ӨЛАЖБ/АЖБ  | GDAD_BO  | ЖЭӨ             | 9                      | Табигый кырсык           |           |            |
| Жолго келтирилген зыянын деңгээли                    | Жол кыймылын жолго салуу ж/а тазалоо үчүн убакыт |                 |                        | Бүткүл жол               |           |            |
|  |  |                 |                        | Жолдун бир жагы          |           |            |
|  |  |                 |                        | Тазалоо                  |           |            |
| Адамга/автоунаага келтирилген зыян (Nos)             |  |                 |                        |                          |           |            |
| Өлүм   | Катуу жабыркоо                                   | Кичине жабыркоо | Автоунаанын жабыркоосу | Эңгексиз жок             |           |            |
|  |  |                 |                        | <input type="checkbox"/> |           |            |
| Кырсык учурундагы аб-ырайы                           |  |                 |                        |                          |           |            |
| Таш түшүү боюнча                                     |  |                 |                        |                          |           |            |
| Таштын макс. диаметри (см)                           |  |                 |                        |                          |           |            |
| Таштын орточо диаметри (см)                          |  |                 |                        |                          |           |            |
| Макс. тереңдиги (м)                                  |  |                 |                        |                          |           |            |
| Тоо тегинин кыйрашы/Жер көчкү/Селдер боюнча          |  |                 |                        |                          |           |            |
| Зыянын көлөмү (м)*1                                  |  |                 |                        |                          |           |            |
| *1: Жолдун узун багыты боюнча                        |  |                 |                        |                          |           |            |
| Кар көчкүлөр үчүн                                    |  |                 |                        |                          |           |            |
| Жолго чыккан урандылар же кар                        | Узуну (м)  |                 |                        |                          |           |            |
|  | Макс. тереңдиги (м)                              |                 |                        |                          |           |            |
| Кар күрткүсү боюнча                                  |  |                 |                        |                          |           |            |
| Кар күрткү убагындагы көрүнүү (м)*2                  |  |                 |                        |                          |           |            |
| Кар күрткүсүнүн тереңдиги (см)*2                     |  |                 |                        |                          |           |            |
| *2: if necessary (Если необходимо)                   |  |                 |                        |                          |           |            |
| Жаңа башка зыян                                      |  |                 |                        |                          |           |            |
| Чыныгы аткарылган кырсыктан калыбына келтирүү иштери |  |                 |                        |                          |           |            |
| Ыкмасы   | Өлчөө чоңдугу                                    | Саны            | Бүткүл баасы           | Жазалган күн             |           |            |
| Сүрөт  | Сүрөт-1  |                 | Сүрөт-2                |                          | Сүрөт-3   |            |
|  |  |                 |                        |                          |           |            |
| Сүрөт Комент киргизүү                                |  |                 |                        |                          |           |            |
| Коммент киргизүү                                     |  |                 |                        |                          |           |            |
| Аты-жөнү   |  |                 | Артка                  | Өчүрүү                   | Жиберүү   |            |

Figure 2-3 Disaster Record Sheet.

### 2.1.4 Monitoring for Landslide

Monitoring function is to record the displacement of landslide and photo by “Monitoring” button on the Disaster Record List as shown in Figure 2-4. The displacement is measured by the simple extensometer which is introduced by the Project and can be inputted up to 3 units to Monitoring List as shown in Figure 2-5.

The screenshot shows a web interface for disaster records. At the top left, there is a 'Назад / Back' button. Below it, a section titled 'Артка' (Filter) contains a list of disaster types with checkboxes: 'Аваланше' (Avalanche), 'Ландслайд' (Landslide), 'Обвал скальных пород' (Bedrock Collapse), 'Эрозия берега реки' (River Bank Erosion), 'Падение обломков' (Debris Flow), 'Обвал склона' (Slope Collapse), and 'Падение камней' (Falling Rocks), 'Снежный занос' (Snow Drifting). To the right, there is an 'экспорт' (Export) button and a 'жаны кырсык жазууну кошуу' (Add New Disaster Record) button. Below the filter section, there are columns for 'Кырсыктан датасы' (Date of Disaster), 'жазуунун датасы' (Date of Record), and 'Табигый кырсык' (Natural Disaster). The main table lists two records: Record 1 (05.04.2018, 06.03.2018, Landslide) and Record 2 (02.04.2018, 10.04.2018, Avalanche). Each record has a 'Record Sheet' button and a 'Monitoring' button, which is highlighted with a red border.

Figure 2-4 Monitoring Button on Disaster Record List

|  | дата<br>Date / Date | жылышуусу 1<br>сменка / Displacement 1 | жылышуусу 2<br>сменка / Displacement 2 | жылышуусу 3<br>сменка / Displacement 3 | Сүрөт<br>Фото / Photo |
|--|---------------------|--|--|--|-----------------------|
|  | 1 04.04.2018        | 10                                     | 20                                     | 10                                     | <input type="text"/>  |
|  | 2 05.04.2018        | 10                                     | 5                                      | 15                                     | <input type="text"/>  |
|  | 3 05.04.2018        | 5                                      | 10                                     | 10                                     | <input type="text"/>  |

Figure 2-5 Monitoring List

## 2.2 Input Method for Inspection

### 2.2.1 Disaster Hazard List

Disaster Hazard List is displayed by selecting the road name by No.1 button which is indicated in Figure 2-6. The road name is selected by pulldown system. If you want to browse the Disaster Record List of the site, it can be displayed by the “Record List” button which is indicated as No.5 button in Figure 2-6. Also, existing site data can be deleted by the “Delete” button which is indicated as No.6 button in Figure 2-6.



Figure 2-6 Disaster List Display

#### 2.2.1.1 Adding New Site information

In case of adding new disaster site to Disaster Hazard List, “Adding New Site” button which is indicated as No.5 in Figure 2-6 is selected. And then input sheet for adding new disaster site is open as shown in Figure 2-6. In this sheet, the information such as Road Name, Kilo Post and Disaster Type etc. can be inputted and be registered by the “Submit” button.



Figure 2-7 Adding of New Site Information

**(1) Road Name**

Tap the input space of “Road Name”, and Road Name can be inputted directly by using keyboard on the tablet.

**(2) Kilo Post**

Tap the input space of “Kilo Post”, and Kilo Post can be inputted directly by using keyboard on the tablet.

**(3) Disaster Type**

Tap the input space of “Disaster Type”, and Disaster Type can be selected from the list shown in below.

|  |
|--|
| Falling Rocks/<br>Bedrock Collapse<br>Slope Collapse<br>Landslide<br>Debris Flow<br>Avalanche<br>Snow Drifting<br>River Bank Erosion |
|--|

**(4) Latitude/Longitude**

In the place where the internet communication is available, value of latitude/longitude can be input automatically by tap “Get Location” button as shown in Figure 2-7. In the place where the internet communication is not available, tap the blank space of “Latitude/Longitude” and value of Latitude/Longitude can be inputted directly by using keyboard on the tablet.

**(5) RD/UAD**

Tap the input space of “RO/UAD”, and RO/UAD can be selected from the list shown in below.

|  |
|--|
| RO_No.1<br>RO_No.2<br>RO_No.4<br>RO_No.3<br>UAD_JAB<br>UAD_Bishkek_Osh<br>UAD_Osh_Batken_Isfana<br>UAD_Biskek_Nayn_Torugart<br>UAD_Osh_Sary_Tash_Irkeshtam |
|--|



**(6) DEU**

Tap the input space of “DEU”, and DEU can be selected from the list shown in below.

| RO /UAD | RO No.1 | RO No.2 | RO No.4 | RO No.3 | UAD JAB | UAD BO  | UAD OBI | UAD BNT | UAD OSI |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| DEU     | DEU 1   | DEU 8   | DEU 3   | DEU 6   | DEU 12  | DEU 5   | DEU 2   | DEU 32  | DEU 16  |
|         | DEU 25  | DEU 14  | DEU 4   | DEU 19  | DEU 17  | DEU 9   | DEU 13  | DEU 34  | DEU 21  |
|         | DEU 28  | DEU 15  | DEU 7   | DEU 36  | DEU 27  | DEU 22  | DEU 46  | DEU 39  | DEU 37  |
|         | DEU 40  | DEU 18  | DEU 10  | DEU 47  | DEU 31  | DEU 23  |         | DEU 41  | DEU 44  |
|         | DEU 42  | DEU 20  | DEU 11  | DEU 48  | DEU 50  | DEU 26  |         | DEU 955 | DEU 45  |
|         | DEU 43  | DEU 24  | DEU 33  |         | DEU 51  | DEU 30  |         | DEU 957 | DEU 959 |
|         | DEU 954 |         | DEU 35  |         | DEU 52  | DEU 38  |         |         | DEU 960 |
|         | DEU 958 |         |         |         |         | DEU 956 |         |         |         |

**2.2.1.2 Browse of Map Information**

Details location data of the site can be browsed by Map Information which are Google Map and Maps.me application based on the coordinate data saved in the site information. It should be noted that "google map" button is working on on-line field only and "maps.me" button is working on on-line and off-line field. Users can select the map application by “Google Map” or “Maps.me” button which is indicated as No.3 and No.4 in Figure 2-6.

Кооптуу жерлердин тізмеси  
 Формалардын кооптуу жерлердин участкасы  
 Disaster Hazard List

ГДДАД\_БО 9 Eng

Артка  
 Назар  
 Back

Жолдун аты /название дороги/ Road Name  
 Bishkek-Osh 9-209 km

Жаңы участкагу кошуу  
 Добавить нового участка/ Добавить новый участок  
 Add New Disaster Hazard Site

| карта<br>не в сети<br>онлайн | Ст. No.<br>Чакырым (km) (m)<br>Километр km м | Кендик N Узундук E<br>широта N долгота E<br>Latitude N Longitude E | Приоритеттүүлүгү<br>Приоритетность<br>Priority |
|------------------------------|--|--|--|
| Google Map                   | 110 450                                      | 42.43 73.81  | Priority A                                     |
| Google Map                   | 112  | 42.42 73.80  | Priority B                                     |
| Google Map                   | 116 500                                      | 42.39 73.80  | Priority B                                     |
| Google Map                   | 116  | 42.39 73.80  | Priority A                                     |
| Google Map                   | 119 300                                      |  |  |
| Google Map                   | 119  | 42.39 73.82  | Priority B                                     |
| Google Map                   | 119  | 42.39 73.82  | Priority B                                     |
| Google Map                   | 119  | 42.39 73.82  | Priority B                                     |

**Figure 2-8 Map Information**

## 2.2.2 Disaster Record List

Disaster Record List is displayed by selecting the disaster types by No.1 button which is indicated in Figure 2-9. If you want to browse the Disaster Record Sheet, it can be displayed by the “Record Sheet” button which is indicated as No.3 button in Figure 2-9. Also, existing disaster record data can be deleted by the “Delete” button which is indicated as No.5 button in Figure 2-9.

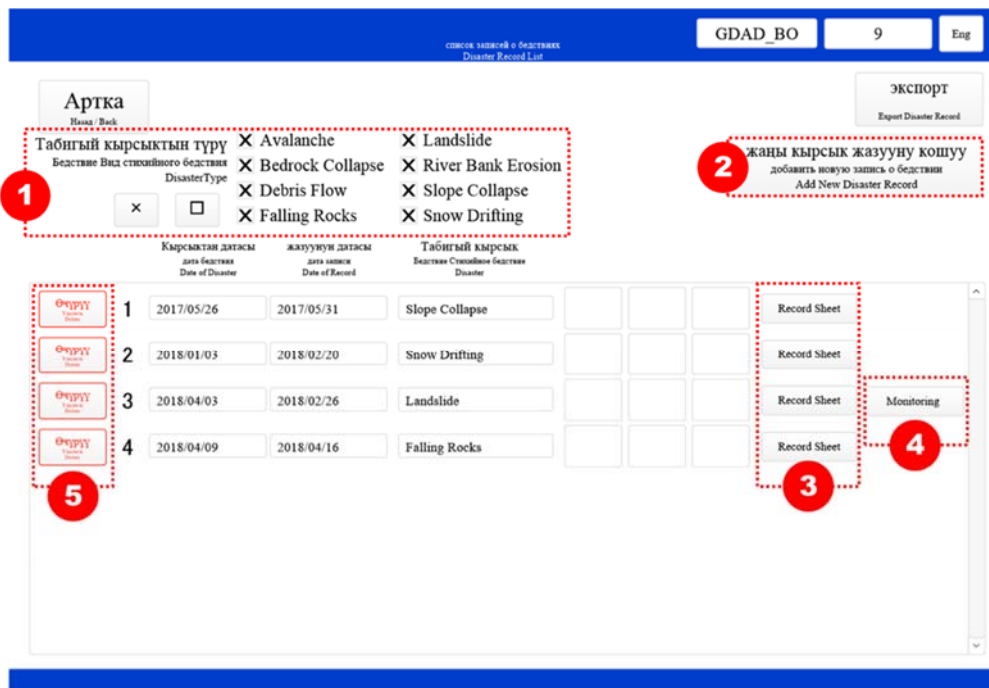


Figure 2-9 Disaster record List

### 2.2.2.1 Adding New Disaster Record

In case of adding new disaster record to Disaster Record List, “Add New Disaster Sheet” button which is indicated as No.2 in Figure 2-9 is selected. And then Disaster Record Sheet is opened. Details of the input method of Disaster Record Sheet is described in Chapter 2.2.3.

### 2.2.2.2 Monitoring Function for Landslide

In case of monitoring of the displacement for landslide, “Monitoring” button which is indicated as No.4 in Figure 2-9 is selected. And then Monitoring Sheet shown in Figure 2-10 is opened. If you want to add the new monitoring data to the list, “Add Monitoring Data” button which is indicated as No.1 in Figure 2-10 is selected. And then, new data is added to the list automatically and users can input the items directly. By the “Data Monitoring Data Graph” button, time series graph shown in Figure 2-11 can be confirmed. Also, existing monitoring data can be deleted by the “Delete” button which is indicated as No.3 button in Figure 2-10.

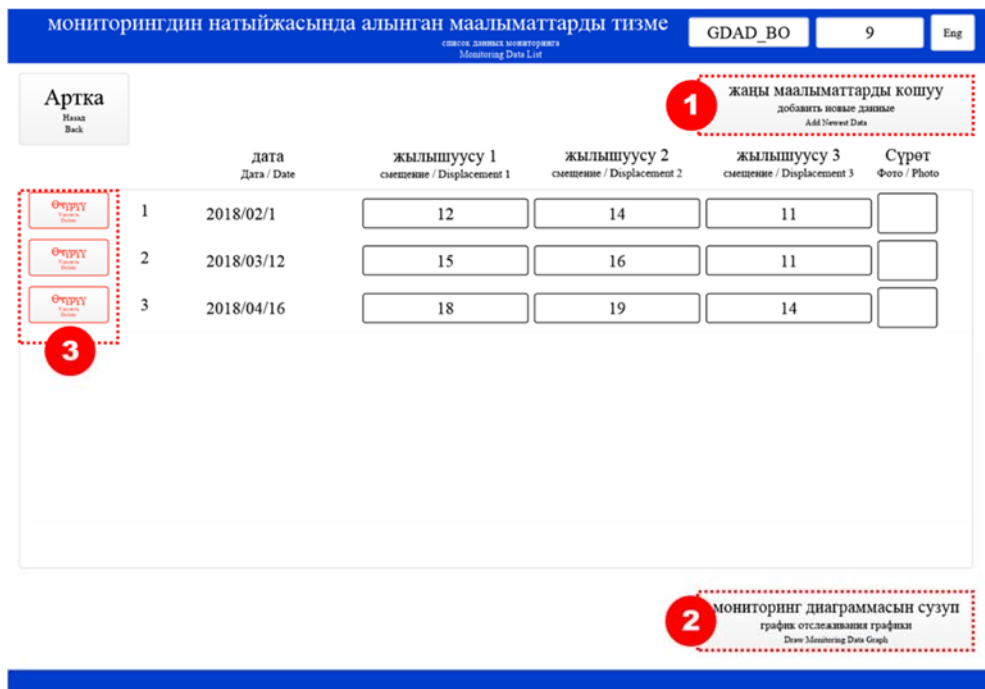


Figure 2-10 Monitoring Sheet



Figure 2-11 Monitoring Graph

(1) Date

The date is inputted automatically when you add the new monitoring data. If you want to change the date, you can change directly by click of date space.

**(2) Displacement**

Displacement can be inputted directly.

**(3) Photo**

When you click the photo space, camera function is executed automatically. After taking a photo, it is saved to the Monitoring automatically.

**2.2.3 Disaster Record Sheet**

The Disaster Record Sheet format is shown in Figure 2-3. The input method of that is below.

**(1) Road Name, Kilo Post, Longitude, Latitude, RD/UADs, DEU**

Information on Road Name, Kilo Post, Longitude, Latitude, RD/UADs, DEU is inputted automatically based on the site information.

**(2) Date of Disaster and Record**

Date of disaster and record are inputted manually by calendar system.

**(3) Disaster Type**

Disaster types are selected from among “Falling Rock”, “Slope Collapse”, “Bedrock Collapse”, “Landslide”, “Snow Drifting”, “Avalanche” and “Debris Flow” by pulldown system.

**(4) Damage Range to Road**

The damage range to road is selected from among “Full Lane”, “One Side Lane” and “Without Traffic Regulation” by pulldown system.

**(5) Traffic Regulation and Cleaning Time**

The information on traffic regulation and cleaning time are inputted manually. If one side lane of whole lane of the road is closed by the disaster, closing time is inputted to “one side lane” or “whole lane” space. Cleaning time to recover the damage of the disaster is inputted to “Cleaning” space.

**(6) Human/Vehicle Damage**

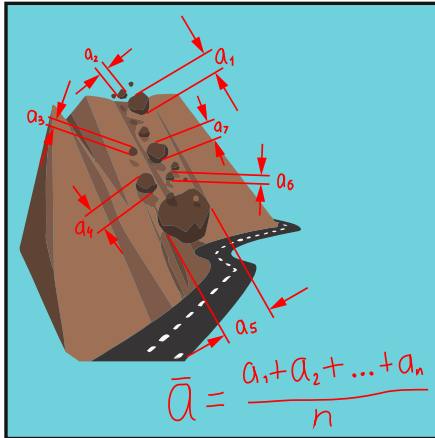
The number of decease, serious injury, slight injury and vehicle damage are inputted manually. If there is no damage against humans and vehicles, “Nothing” space is checked.

**(7) Weather Condition at Occurrence**

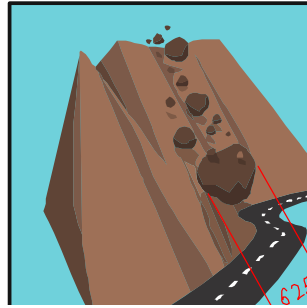
Weather condition at occurrence is selected from among “After Rain”, “Snow Melt”, “Snow Cover”, “Dry Snow”, “Snow Drifting” and “Other” by pulldown system.

**(8) Rock Falling**

Detailed information of rock falling which are “Maximum Rock Diameter” and “Average Rock Diameter” is inputted with reference to Figure 2-12.



<Average Rock Diameter>

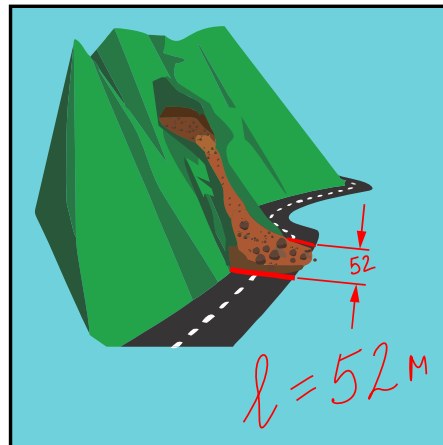


<Maximum Rock Diameter>

**Figure 2-12 Average and Maximum Rock Diameter**

**(9) Slope Collapse/Landslide/Debris Flow**

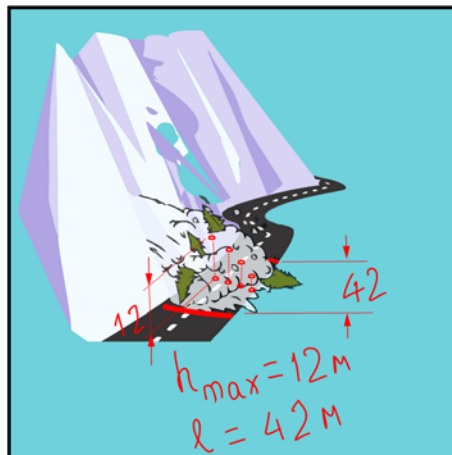
Damage range of slope collapse, landslide and debris flow is inputted with reference to Figure 2-13.



**Figure 2-13 Damage Range**

**(10) Avalanche**

Detailed information of avalanche which are “Length” and “Max Depth” is inputted with reference to Figure 2-14.



**Figure 2-14 Length and Max Depth**

### (11) Snow Drifting

Detailed information of snow drifting which are “Visibility during Snow Drifting” and “Depth of Snow Drifting” is inputted with reference to Figure 2-15.

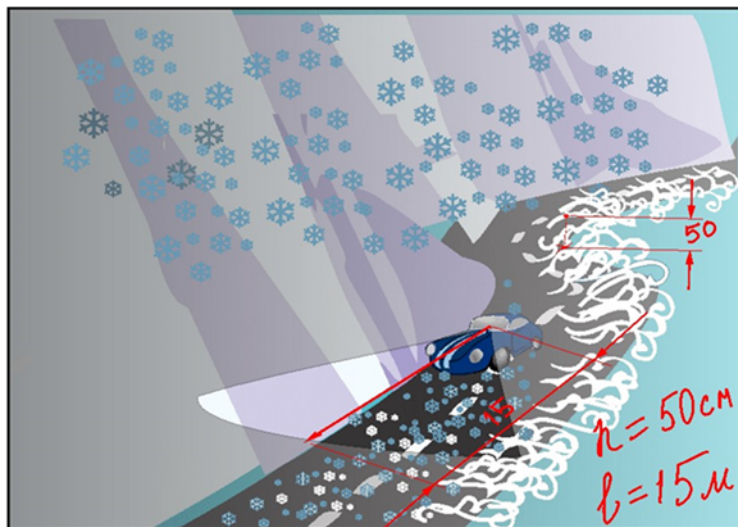


Figure 2-15 Visibility during Snow Drifting and Depth of Snow Drifting

### (12) Other Damage

If other damage such as collapse of guardrail or road sign is found, the information can be inputted manually.

### (13) Actual Executed Disaster Recovery

The information on actual executed disaster recovery works which are “Method”, “Unit”, “Quantity”, Total Cost” and “Executed Date” is inputted manually.

### (14) Photo and Comment

When you click the photo space, camera function is executed automatically. After taking photos, these are saved automatically. Also, comments of photos are inputted manually

### (15) Comment

Comment regarding to the disaster is inputted manually.

### (16) Person Name

Inspector name is inputted manually.

### 3 Analysis Method

#### 3.1 Priority List

Priority levels of the site shown in Figure 3-1 are displayed on Priority List. The priority levels are divided into 3 types (Priority A, Priority B and Priority C). They are decided in consideration of risk of the disaster by RMD.

| карта<br>карта X-карта / Map | Ст. No.<br>Чакырым (км) (№)<br>Кйорет km / m | Кендик N Узундук E<br>широта N долгота E<br>Latitude N Longitude E | Приоритеттүүлүгү<br>Приоритетность<br>Priority |
|------------------------------|--|--|--|
| Онлайн<br>Google Map         | 85 500                                       | 42.61 73.89  | Priority A                                     |
| Онлайн<br>Google Map         | 92   | 42.58 73.87  | Priority A                                     |
| Онлайн<br>Google Map         | 96   | 42.54 73.86  | Priority A                                     |
| Онлайн<br>Google Map         | 97 500                                       | 42.52 73.86  | Priority A                                     |
| Онлайн<br>Google Map         | 110 450                                      | 42.43 73.81  | Priority A                                     |
| Онлайн<br>Google Map         | 116  | 42.39 73.80  | Priority A                                     |
| Онлайн<br>Google Map         | 132  |  | Priority A                                     |
| Онлайн<br>Google Map         | 119  | 42.39 73.82  | Priority B                                     |

Figure 3-1 Priority List

#### 3.2 Graph Function

Several types of graphs regarding to the road disaster data, which are “Priority Graph”, “Disaster Graph”, “Priority List by DEUs” and “Number of Falling Rock and Avalanche per DEUs”, can be browsed by graph function as shown in Figure 3-2.

статистика  
Statistics

5 кырык коркунучу статистикасы  
статистика опасности бедствий  
Disaster Hazard Statistics

график  
Graph

1 Приоритет диаграммасы  
График приоритета  
Priority Graph

2 кырык диаграммасы  
График статистики бедствий  
Disaster Graph

3 укук коргоо органдары тарабынан артыкчылык  
Приоритет по юрисдикции  
Priority by Jurisdiction

4 Карамагына күнүнө МКБ тоо жана жер көчкү саны  
Количество выпадающих горных пород и лавин по юрисдикции  
Number of Falling Rocks and Avalanche per jurisdiction

Figure 3-2 Graph Options

### 3.2.1 Priority Graph

Priority Graph can be browsed by “Priority Graph” button which is indicated as No.1 in Figure 3-2. The ratio and number by priority can be confirmed by this graph shown in Figure 3-3.

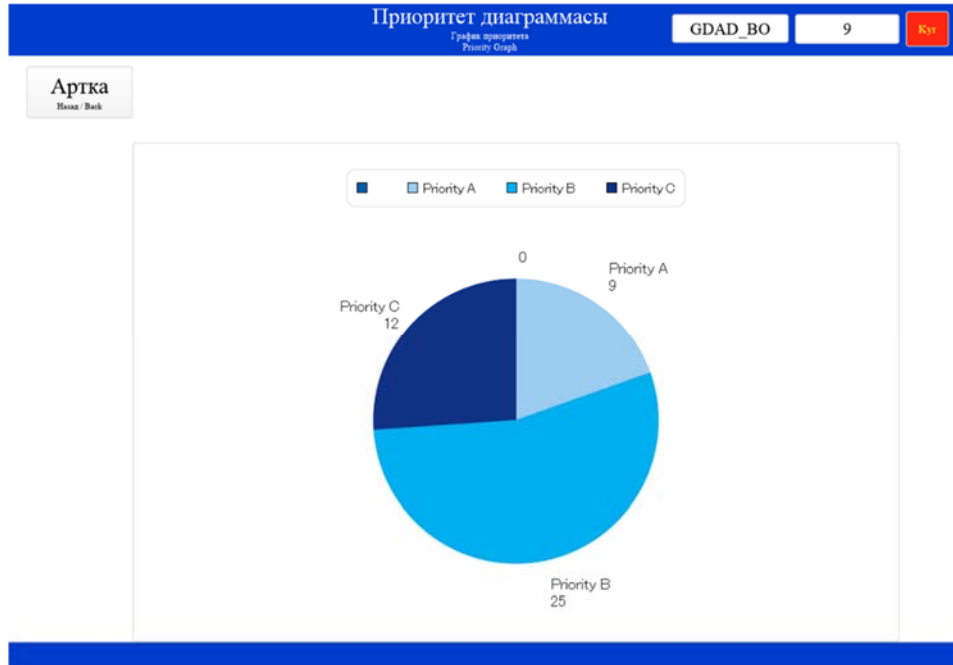


Figure 3-3 Priority Graph

### 3.2.2 Disaster Graph

Disaster Graph can be browsed by “Disaster Graph” button which is indicated as No.2 in Figure 3-2. The number of disaster types can be confirmed by this graph shown in Figure 3-4.

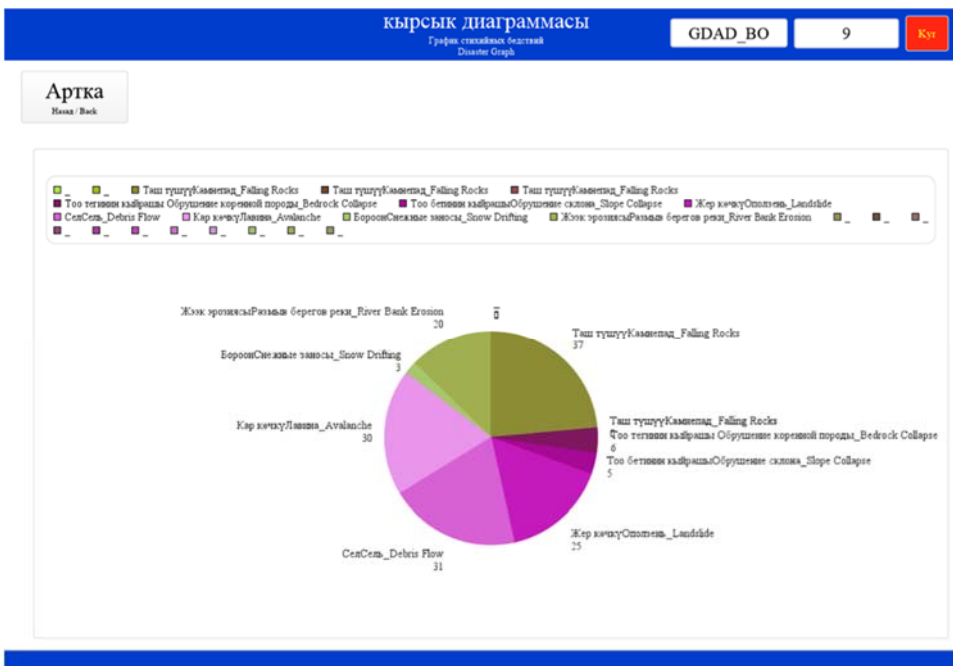


Figure 3-4 Disaster Graph



### 3.2.3 Priority Histogram by Units

Priority Histogram by units can be browsed by “Priority Histogram” button which is indicated as No.3 in Figure 3-2. The number of priorities by RD/UADs can be confirmed by this histogram shown in Figure 3-5.

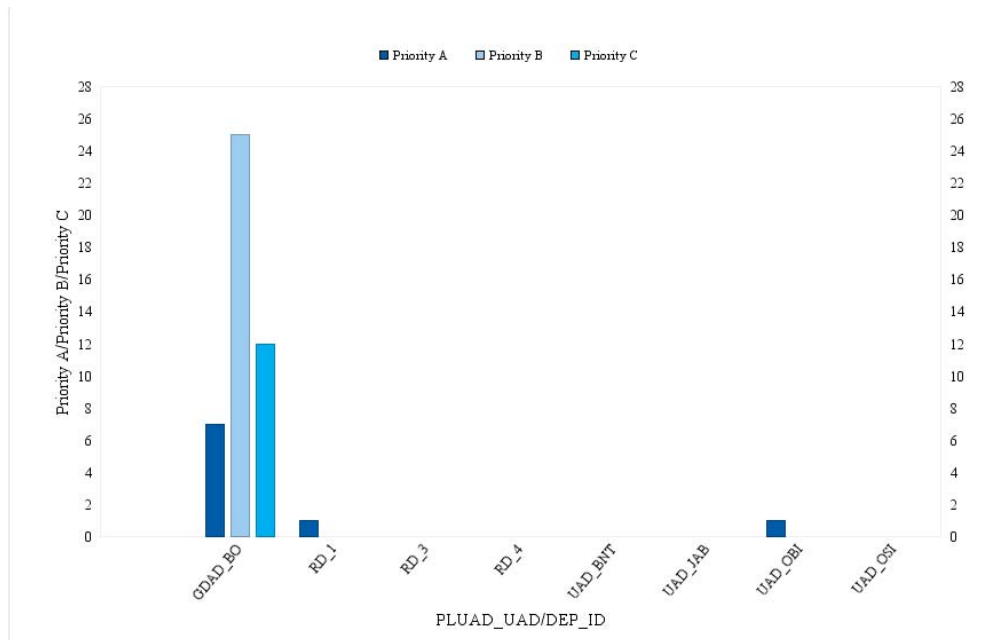


Figure 3-5 Priority Histogram by Units

### 3.2.4 Number of Road Disaster by RDs/UADs

Histogram Number of Road Disaster by RDs/UADs can be browsed by “Number of Filling Rocks and Avalanche per jurisdiction” button which is indicated as No.4 in Figure 3-2. The number of road disasters by RD/UADs can be confirmed by this histogram shown in Figure 3-6.

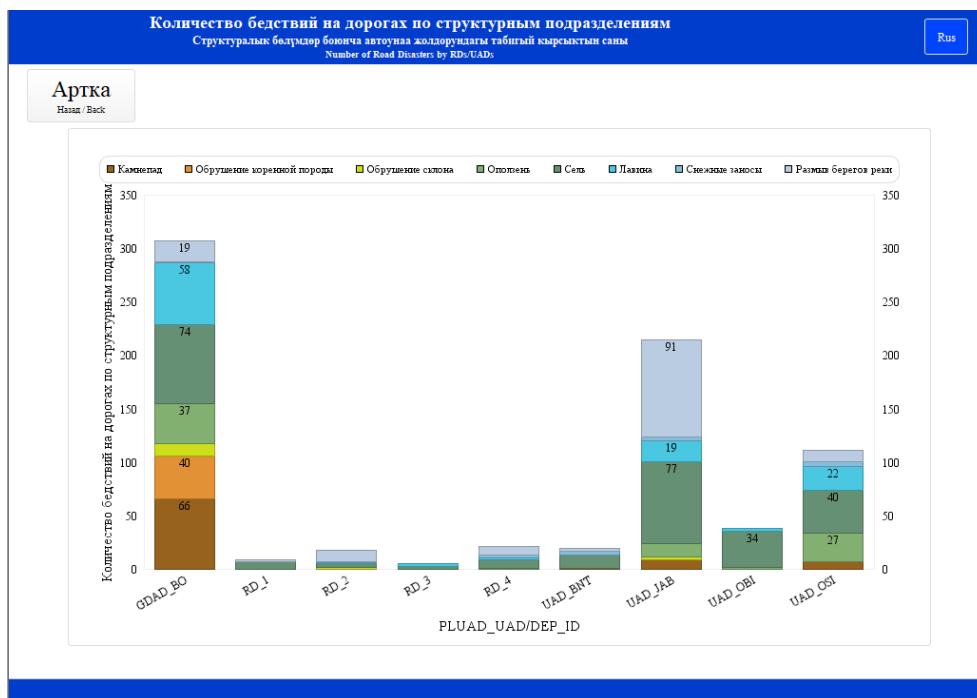


Figure 3-6 Histogram Number of Road Disaster by RDs/UADs

### 3.2.5 Disaster Hazard Statistics

Data of disaster hazard statistics can be browsed by “Disaster Hazard Statistics” button which is indicated as No.5 in Figure 3-2. Disaster Hazard Statistics can be confirmed by table shown in Figure 3-7 Disaster Hazard Statistics.

| Артка<br>Name / Back | RD_UADs | DEUs | Falling Rocks | Bedrock<br>Collapse | Slope<br>Collapse | Landslide | Debris Flow | Avalanche | Snow<br>Drifting | River Bank<br>Erosion | Excel |
|----------------------|---------|------|---------------|---------------------|-------------------|-----------|-------------|-----------|------------------|-----------------------|-------|
| RD_2                 | 18      | 0    | 0             | 0                   | 0                 | 0         | 0           | 1         | 1                | 2                     |       |
| RD_2                 | 20      |      |               |                     |                   |           |             |           |                  |                       |       |
| RD_2                 | 24      | 0    | 0             | 0                   | 0                 | 0         | 0           | 0         | 0                | 3                     |       |
| RD_4                 | 3       | 0    | 0             | 0                   | 0                 | 0         | 6           | 2         | 2                | 0                     |       |
| RD_4                 | 4       |      |               |                     |                   |           |             |           |                  |                       |       |
| RD_4                 | 7       |      |               |                     |                   |           |             |           |                  |                       |       |
| RD_4                 | 10      | 0    | 0             | 0                   | 0                 | 0         | 2           | 0         | 0                | 1                     |       |
| RD_4                 | 11      | 0    | 0             | 0                   | 0                 | 0         | 0           | 0         | 0                | 1                     |       |
| RD_4                 | 33      | 0    | 0             | 0                   | 0                 | 0         | 0           | 0         | 0                | 2                     |       |
| RD_4                 | 35      | 0    | 0             | 0                   | 1                 | 0         | 0           | 0         | 0                | 4                     |       |
| RD_3                 | 6       |      |               |                     |                   |           |             |           |                  |                       |       |
| RD_3                 | 19      | 0    | 0             | 0                   | 0                 | 0         | 2           | 0         | 0                | 0                     |       |
| RD_3                 | 36      | 0    | 0             | 0                   | 0                 | 0         | 0           | 2         | 2                | 0                     |       |
| RD_3                 | 48      |      |               |                     |                   |           |             |           |                  |                       |       |
| RD_3                 | 47      | 0    | 0             | 0                   | 0                 | 0         | 1           | 0         | 0                | 0                     |       |
| UAD_JAB              | 12      | 0    | 0             | 0                   | 0                 | 0         | 38          | 0         | 0                | 23                    |       |
| UAD_JAB              | 17      | 0    | 0             | 0                   | 1                 | 15        | 0           | 0         | 0                | 22                    |       |
| UAD_JAB              | 27      | 0    | 0             | 0                   | 0                 | 3         | 18          | 18        | 8                |                       |       |
| UAD_JAB              | 31      | 0    | 0             | 0                   | 4                 | 1         | 0           | 0         | 0                | 7                     |       |
| UAD_JAB              | 50      | 9    | 0             | 3                   | 4                 | 11        | 1           | 1         | 14               |                       |       |
| UAD_JAB              | 51      | 0    | 0             | 0                   | 0                 | 6         | 0           | 0         | 0                | 2                     |       |
| UAD_JAB              | 52      | 0    | 0             | 0                   | 3                 | 3         | 0           | 0         | 0                | 15                    |       |
| UAD_BNT              | 32      | 1    | 0             | 0                   | 0                 | 5         | 0           | 0         | 0                | 2                     |       |

Figure 3-7 Disaster Hazard Statistics