

2019



Ministry of Transport and Roads of the Kyrgyz Republic

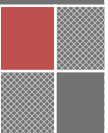
Project for Capacity Development
for Road Disaster Prevention
Management in the Kyrgyz Republic

PRESENTATION MATERIALS OF THE PROJECT

PART II: ENGLISH/JAPANESE VERSION



Japan International Cooperation Agency



PREFASE

Presentation materials on road disaster prevention compiled in this document are prepared for JCCs, seminars, workshops and other meetings organized within the Project. They serve as a reference material to complement the Completion Report of the Project.

While the main language for submission of the reference materials to MOTR remains to be Russian, the given set of presentation materials on road disaster prevention, in addition to the Russian version, is compiled including the original version either in English or Japanese.

PART I: RUSSIAN VERSION

PART II: ENGLISH/JAPANESE VERSION

LIST OF PRESENTATION MATERIAL OF THE PROJECT

1. JCC and Other Meeting

No.	Titles	Date
JO-1	1 st JCC Meeting	2016.04.27
JO-2	Kick-off Meeting	2016.06.01
JO-3	2 nd JCC Meeting	2016.10.13
JO-4	3 rd JCC Meeting	2017.04.06
JO-5	4 th JCC Meeting	2017.10.17
JO-6	5 th JCC Meeting	2018.04.25
JO-7	6 th JCC Meeting	2018.10.18
JO-8	Final Seminar	2019.03.12 ~ 03.13
JO-9	Meeting on Completion Report for Project Sustainability	2019.03.27

2. Road Asset Management Seminar

No.	Titles	Date
RA-1	Management of Bridges on Expressway in Japan	2018.09.03
RA-2	Characteristics of landslide disasters in Kyrgyz and a proposal for counter measures	2018.09.03
RA-3	Road Spatial Information Management by MMS	2018.09.03
RA-4	Introduction of Road Disaster Prevention Technology with Less Maintenance	2018.09.03
RA-5	All-weather Type Temperature Pavement Repair Material "EXCEL Patch"	2018.09.03
RA-6	Monitoring of Wide Area Ground Deformation from Artificial Satellite	2018.09.03
RA-7	The Japanese technology for the slope movement in Kyrgyz -Remote Sensing, Drone and Other Slope Risk Assessment Technology-	2018.09.03
RA-8	Application of Drone Survey for Slope Monitoring and Assessment/ Automatic Landslide Monitoring System by Various Equipment	2018.09.03
RA-9	Advanced Cases on Bridge Maintenance (Asset Management)	2019.03.13
RA-10	Development and Field Practice of Several Inspection Systems with Tablet Computer for Local Government and Developing Country	2019.03.13
RA-11	Development of Road Condition Evaluation System using a Smartphone	2019.03.13

3. Inspection and Countermeasures for Road Disaster Prevention

No.	Titles	Date
IC-1	Workshop on Slope Disaster Prevention in Osh	2016.06.22
IC-2	Seminar on Site Inspection Results	2016.07.11
IC-3	Seminar on Current Situation of Landslide at 85km	2017.05.08
IC-4	Workshop on Non-Structural Countermeasures	2017.10.04
IC-5	Workshop on Slope Disaster Countermeasures	2017.10.06
IC-6	Seminar on Countermeasure Plan for Landslide at 85km	2017.10.16
IC-7	Training Material for Slope Disaster Prevention	2018.04.28
IC-8	Training Material for Snow Disaster Prevention	2018.05.24
IC-9	Seminar on Snow Disaster Inspection	2018.08.11
IC-10	Training Material for Debris Flow & Riverbank Erosion	2018.08.24

4. Database Development

No.	Titles	Date
DD-1	Workshop on Database Structure	2016.05.23
DD-2	Seminar on Data Input	2016.09.12
DD-3	Seminar on Relational Database System	2017.08.16
DD-4	Seminar on Data Collection and Input	2017.08.17
DD-5	Training Material for Bridge Tunnel Database	2018.04.18
DD-6	Training Material for Road Disaster Database	2018.04.20

THE PROJECT FOR CAPACITY DEVELOPMENT FOR ROAD DISASTER PREVENTION MANAGEMENT IN THE KYRGYZ REPUBLIC

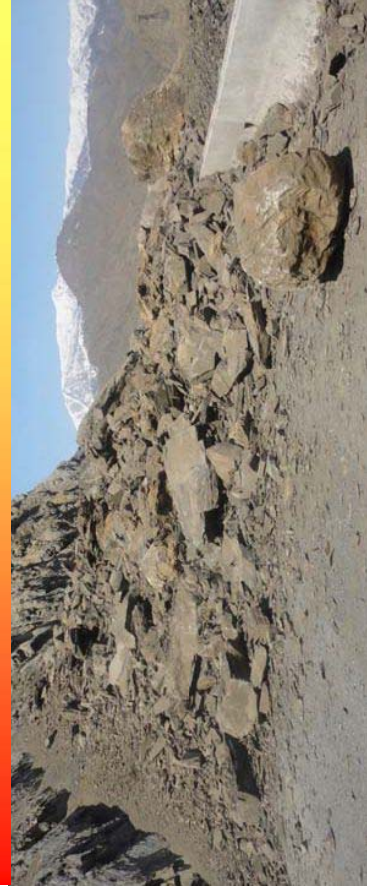
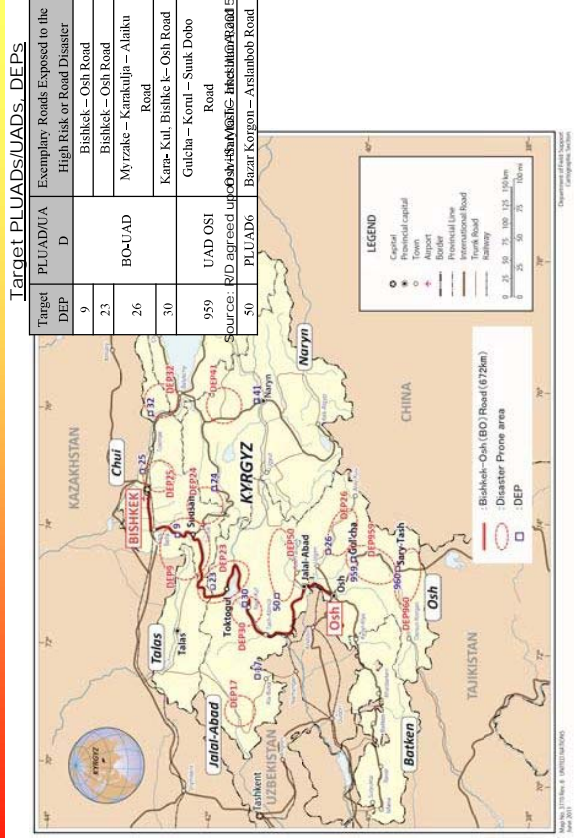


Table of Contents

Location Map

1. Disaster Condition in Target DEPs
2. Outline of the Project
3. Implementation Schedule
4. JCC Member
5. JICA Expert Team Member
6. C/P Member
7. Project Technical Approach
8. Meteorological Observation

Location Map



1. Disaster Condition in Target DEPs

Road	DEP	Summary of Road Disaster
BO Roads (International)	DEP 9	<ul style="list-style-type: none"> ● Traffic is shut off every year due to snow drifting. (Kilo Post 125km ~129km) ● Dangerous spots of massive disaster such as landslide, falling rocks, debris flow are scattered.
BO Roads (International)	DEP 23	<ul style="list-style-type: none"> ● DEP23 manages about 70 dangerous spots of avalanche. (Kilo Post 200km ~ 260km) ● Traffic is shut off every year due to snow drifting. (Kilo Post 216km ~ 222km) ● Dangerous spots of massive disaster such as landslide, falling rocks, debris flow are scattered.
International and National Roads	DEP 26	<ul style="list-style-type: none"> ● DEP26 manages road disaster prone areas. (6 ~ 7 spots of international roads and about 4 spots of national roads are dangerous areas of road disasters due to avalanche, snow drifting, sediment disaster.)
BO Roads (International)	DEP 30	<ul style="list-style-type: none"> ● Dangerous spots of massive disaster such as landslide, falling rocks, debris flow are scattered.
National Roads	DEP 50	<ul style="list-style-type: none"> ● Once the road for many tourists from Fergana Basin (Uzbekistan) is often closed due to road disasters such as river bank erosion and debris flow, economic impact is large.
OSI Roads (International)	DEP 959	<ul style="list-style-type: none"> ● Road disaster such as snow drifting, landslide, debris flow has occurred repeatedly. (Especially, these disasters are often has occurred in important international road from Osh to south area.)

1. Disaster Condition in Target DEPs

<p>[Picture1] Falling Rocks (DEP30)</p> 	<p>[Picture2] River Bank Erosion (DEP50)</p> 	<p>[Picture3] River Bank Erosion (DEP50)</p> 
<p>[Picture4] Debris Flow (DEP59)</p> 	<p>[Picture5] Avalanche (DEP23)</p> 	<p>[Picture6] Drifting Snow (DEP9)</p> 

4

5

2. Outline of the Project

2.1 Overall Goal

Safety of the road traffic at the selected disaster prone areas is improved.

2.2 Project Purpose

The capacity of MOTC's relevant units in the Project (HQ, RMD, target PLUADs/UADs, and DEPs) is enhanced for management of road disaster prevention (including road disaster inspection, preparing of road disaster prevention management plan and planning of budget for road disaster prevention).

2. Outline of the Project

2.3 Objectively Verifiable Indicators

【Output-1】

Responsibilities of MOTC on road disaster prevention, including specific duties to be performed by relevant units (HQ, RMD, target PLUADs/UADs, and DEPs) with necessary staffing in each, become clear.

- 1-1. Roles of MOTC HQ, RMD, target PLUADs/UADs and DEPs for road disaster prevention management are specified by MOTC.

5

2. Outline of the Project

2.3 Objectively Verifiable Indicators

【Output-2】

Capacity of target PLUADs/UADs and DEPs for inspection and analysis of road disaster is enhanced.

- 2-1. Road disaster hazard sections are determined with their feature and classification by target PLUADs/UADs and DEPs by **[May 2017]**.
- 2-2. Inspection and Evaluation Manual for Road Disaster Prevention is drafted by RMD by **[May 2017]**, reviewed by **RMD by [May 2018]** and finalized by **RMD by [March 2019]**.
- 2-3. Countermeasures Manual for Road Disaster Prevention is drafted by RMD by **[May 2017]**, reviewed by **RMD by [May 2018]** and finalized by **RMD by [March 2019]**.
- 2-4. All the staff in target PLUADs/UADs and DEPs trained for inspection/evaluation and standard disaster prevention countermeasures based on the manuals pass the final exam prepared by the Project.

2. Outline of the Project

2.3 Objectively Verifiable Indicators

【Output-3】

Capacity of RMD to operationalize Database Management System for road disaster prevention is developed.

- 3-1. A database format for information on road disaster prevention management planning (incl. costing for countermeasures) is prepared by RMD by [August 2016].
- 3-2. Practically usable Manual for Data Collection and Input is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].
- 3-3. Data collected and input by target PLUADs/UADs and DEPs are integrated to the database for prioritizing countermeasures and certified by RMD by [May 2017].
- 3-4. Staff of target PLUAD/UAD and DEPs trained for data collection and input based on the Manual pass the exam that evaluates their mastery in filling required information in database format.
- 3-5. Database Management System that contains information necessary for road disaster prevention management in the project area is developed for preparing budget by RMD by [May 2017].
- 3-6. Practically usable Manual for Database Operation is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].

2. Outline of the Project

2.3 Objectively Verifiable Indicators

【Output-4】

Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced.

- 4-1. Nation-wide management criteria for road disaster prevention is developed by RMD by [May 2017].
- 4-2. Short-Term Road Disaster Prevention Management Plan (urgent response plan) with cost estimation for road disaster prevention management of the target area is prepared by RMD by [September 2017 and September 2018].
- 4-3. Preparation Manual for Short-Term and Medium-Term Road Disaster Prevention Management Plans is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].

2. Outline of the Project

2.4 Activities

【Output-1】

Responsibilities of MOTC on road disaster prevention, including specific duties to be performed by relevant units (HQ, RMD, target PLUADs/UADs, and DEPs) with necessary staffing in each, become clear.

- 1-1. To review the present work sharing among relevant organizations.
- 1-2. To identify the most suitable MOTC section to each take charge of collection, input and analysis of data in the road disaster prevention Database Management System.
- 1-3. To identify the most suitable MOTC section to each take charge of inspection, evaluation, plan preparation, and implementation of road disaster prevention.
- 1-4. To draft the Decree on assigning responsibilities to relevant organization.

2. Outline of the Project

2.4 Activities

【Output-2】

Capacity of target PLUADs/UADs and DEPs for inspection and analysis of road disaster is enhanced.

- 2-1. To analyze existing condition (including completion of data inventory) on the slope and snow hazards causing road disaster by RMD and PLUADs/UADs, DEPs.
- 2-2. To draft, review and finalize an Inspection, Manual indicating check points for road disaster prevention by RMD.
- 2-3. To practice routine, periodic and emergency inspection and to conduct condition rating based on inspection manual by RMD and PLUADs/UADs, DEPs.
- 2-4. To discuss countermeasures for road disaster prevention by RMD, PLUADs/UADs and DEPs.
- 2-5. To draft, review and finalize a Countermeasures Manual for road disaster prevention including cost estimation to prepare budget plan by RMD, PLUADs/UADs and DEPs.
- 2-6. To practice selecting countermeasures of road disaster prevention including cost estimation based on Countermeasures Manual by RMD and PLUADs/UADs, DEPs.

2. Outline of the Project

2.4 Activities

【Output-3】

Capacity of RMD to operationalize Database Management System for road disaster prevention is developed.

- 3-1. To create a Database Management System of the slope and snow hazards along the international and national roads by RMD.
- 3-2. To establish the procedure for data input and reporting by RMD.
- 3-3. To draft, review and finalize a manual for data input and database operation by RMD.
- 3-4. To implement trainings for staff members of RMD and PLUADs/UADs, DEPs for data collection and input, and database operation.

2

2. Outline of the Project

2.4 Activities

【Output-4】

Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced.

- 4-1. To establish priority criteria for road disaster prevention by RMD.
- 4-2. To implement training for staff of RMD for preparing a Short-Term plan for road disaster prevention as a basic document for annual budget request.
- 4-3. To prepare Short-Term Road Disaster Prevention Management Plan.
- 4-4. To implement training for staff RMD for preparing Medium-Term Road Disaster Prevention Management Plan.
- 4-5. To prepare Preparation Manual for Short-Term and Medium-Term Road Disaster Prevention Management Plans by staff members of RMD.
- 4-6. By referring to the Preparation Manual, to conduct trial preparation of Short-Term & Medium-Term Road Disaster Prevention Management Plan.

3

3. Implementation Schedule

Phase	2016			2017			2018			2019			
	4	5	6	7	8	9	10	11	12	1	2	3	4
Phase-1	Development of basic Skills and Knowledge												
Phase-2	Trial Implementation												
Phase-3	Sustainable Implementation												
Output-1	Responsibilities of MOTC (HQ, RMD, PLUADs/UADs, DEPs) on road disaster prevention become clear												
Output-2	Capacity of target PLUADs/UADs and DEPs for inspection and analysis of road disaster is enhanced												
Output-3	Capacity of RMD to operationalize Database Management System for road disaster prevention is developed.												
Output-4	Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced.												
Other Activities	JCC												
Meeting / Seminar	JCC												
Report	JCC												

14

4. JCC Member

Kyrgyz Side	MOTC	Project Director; Director of Investment Project Implementation Group Project Manager	Mamaev K.A.
		Project Manager, Chief Engineer of RMD	Sodombaev D.A.
		Head of Preparation Division	Kudalbergenov K.
		Head of RAMS section RMD	Seitbekov I.
		Head of BO-UAD	Toktomambetov I.D.
		Head of UAD-OSI	Kurmanbekov U.K.
		Head of PLUAD6	Abdykalykov K.K.
		Representative of Planning and Economic division of RMD	Djumagziev N.
Japan Side		JICA Kyrgyz Office	
		JICA Expert Team	

5

5. JICA Expert Team Member

	Title	Name
(1)	Team Leader/Road Maintenance Expert	Mr. MIZOTA Yuzo
(2)	Deputy Team Leader/Debris Flow Disaster Prevention/River Engineering Expert	Mr. TANAKA Hirofumi
(3)	Snow Disaster Prevention Expert 1	Mr. OTSUKI Masaya
(4)	Snow Disaster Prevention Expert 2	Mr. HONMA Shinichi
(5)	Slope Disaster Prevention Expert	Mr. KAWAKAMI Kyoichi
(6)	Database Expert	Mr. SAWADA Kentaro
(7)	Disaster Prevention Countermeasures Expert	Mr. SASAKI Takao
(8)	Geotechnical Expert	Mr. OHASHI Kengo
(9)	Disaster Prevention Facilities Expert/Cost Estimator/Construction Planner	Mr. INAGAKI Motohiro
(10)	Coordinator/Road Disaster Inspection Assistant	Mr. Ruslan Davlatiev

16

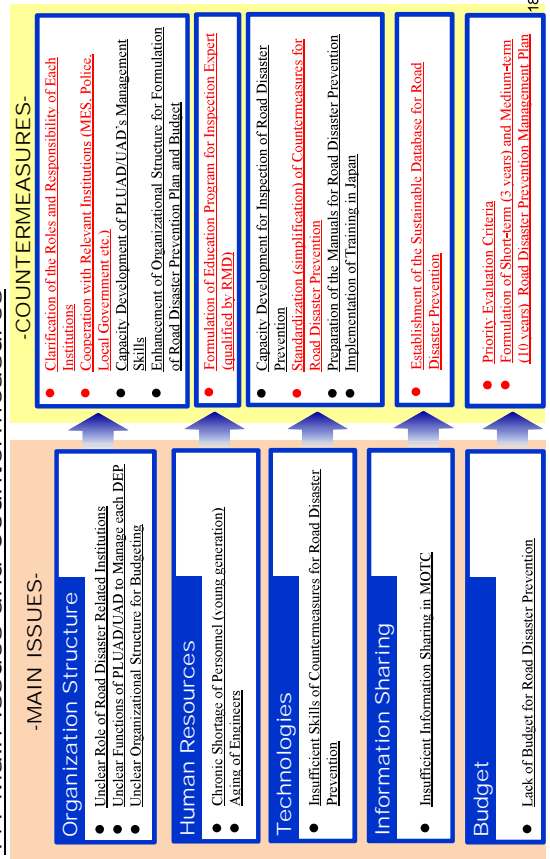
6. C/P Member

Organization	Required Number of Trainees
RMD	9 (RAMS:4 + Others:5)
BO-UAD	5
UAD-OSI	5
PLUAD6	5
DEP9	2
DEP23	2
DEP26	2
DEP30	2
DEP50	2
DEP959	2
Total	36

17

7. Project Technical Approach

7.1 Main Issues and Countermeasures



18

7. Project Technical Approach

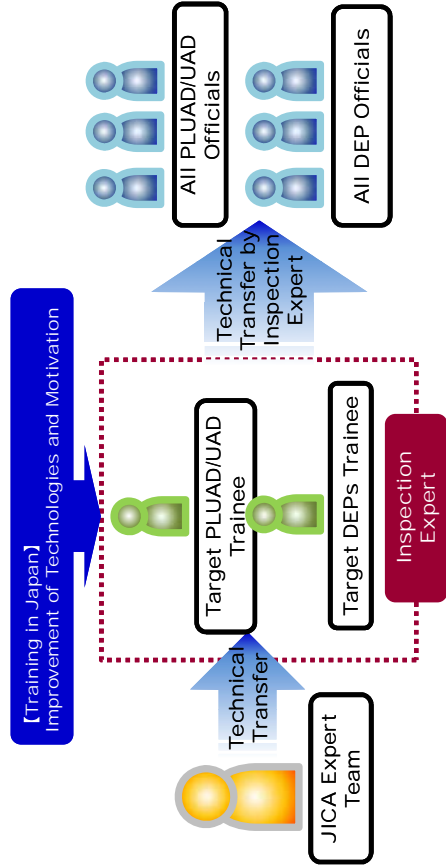
7.2 Work Contents of the Relevant Institutions

Institution	Role	Work Contents on Disasters
MES	Information collection, public relations	<ul style="list-style-type: none"> Site check, traffic control Rescue activities Request of temporary work to DEP, preparation of work conditions Survey of weather information, public relations to related organizations and national people Survey of river water level and general weather information, calculation of river stream flow, flood forecast public relations to related organizations (especially Ministry of Agriculture), electric firms (hydroelectric power plant), and national people
MOTC (DEP)	Site work	<ul style="list-style-type: none"> Management of Traffic Flow Report to MES when disasters occur Site work
Police	Traffic Management	<ul style="list-style-type: none"> Traffic management and trouble shooting Entrance management of cars to closed areas
Army	Disaster prevention support	<ul style="list-style-type: none"> Support for avalanche prevention
Local Government	Public Announcement	<ul style="list-style-type: none"> Disaster prevention activities

19

7. Project Technical Approach

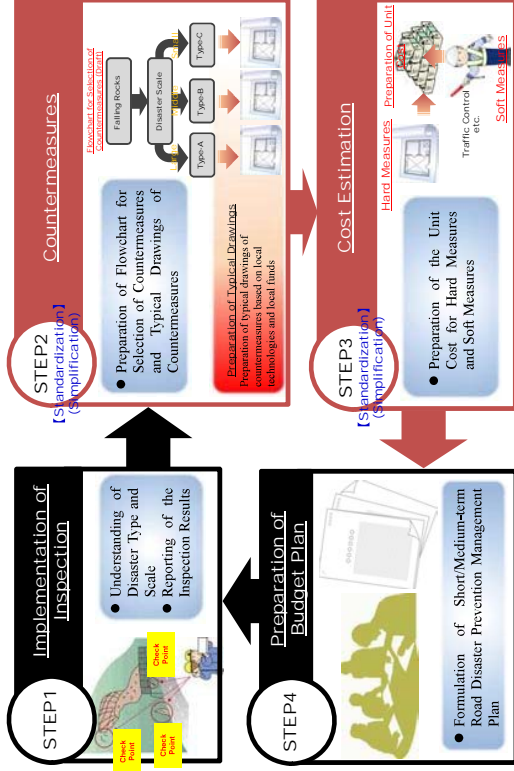
7.3 Education Program for Inspection Expert



20

7. Project Technical Approach

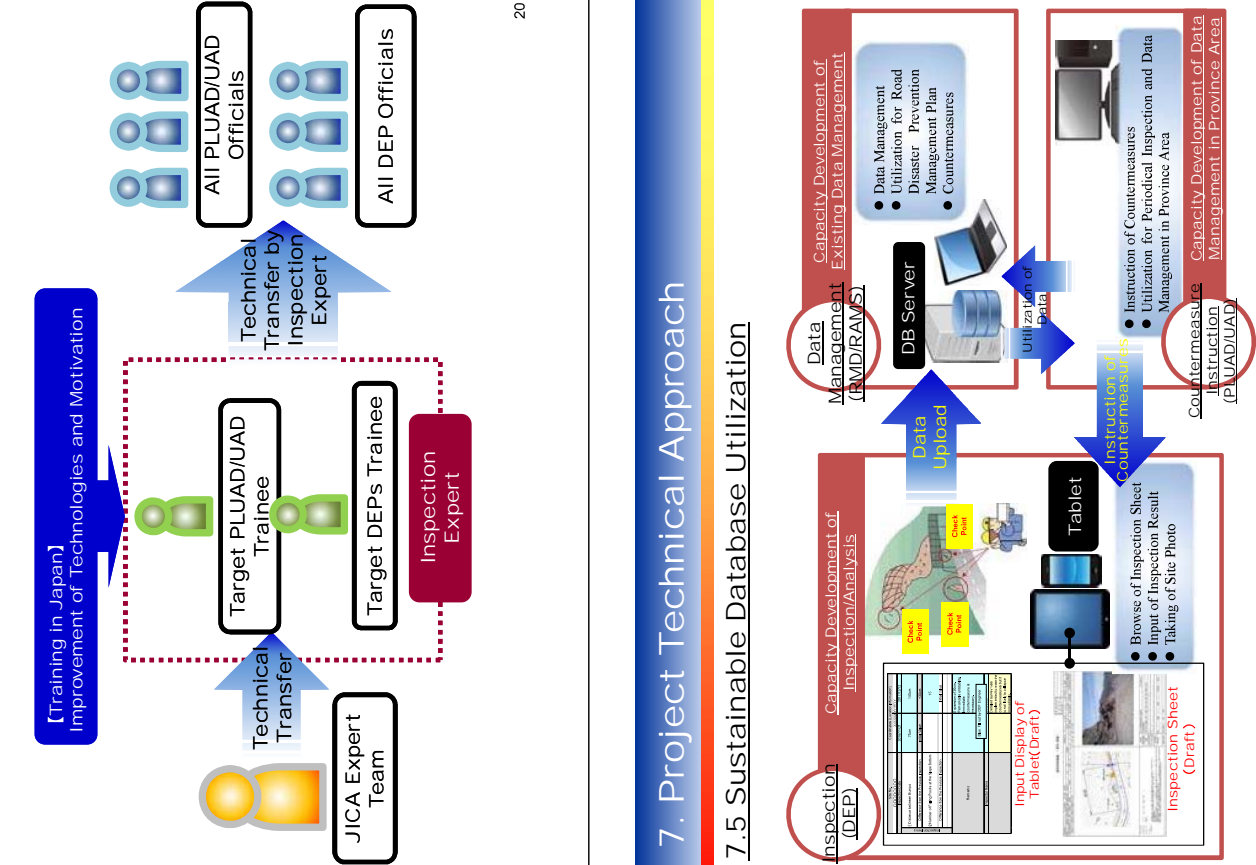
7.4 Standardization of Countermeasure Examination



21

7. Project Technical Approach

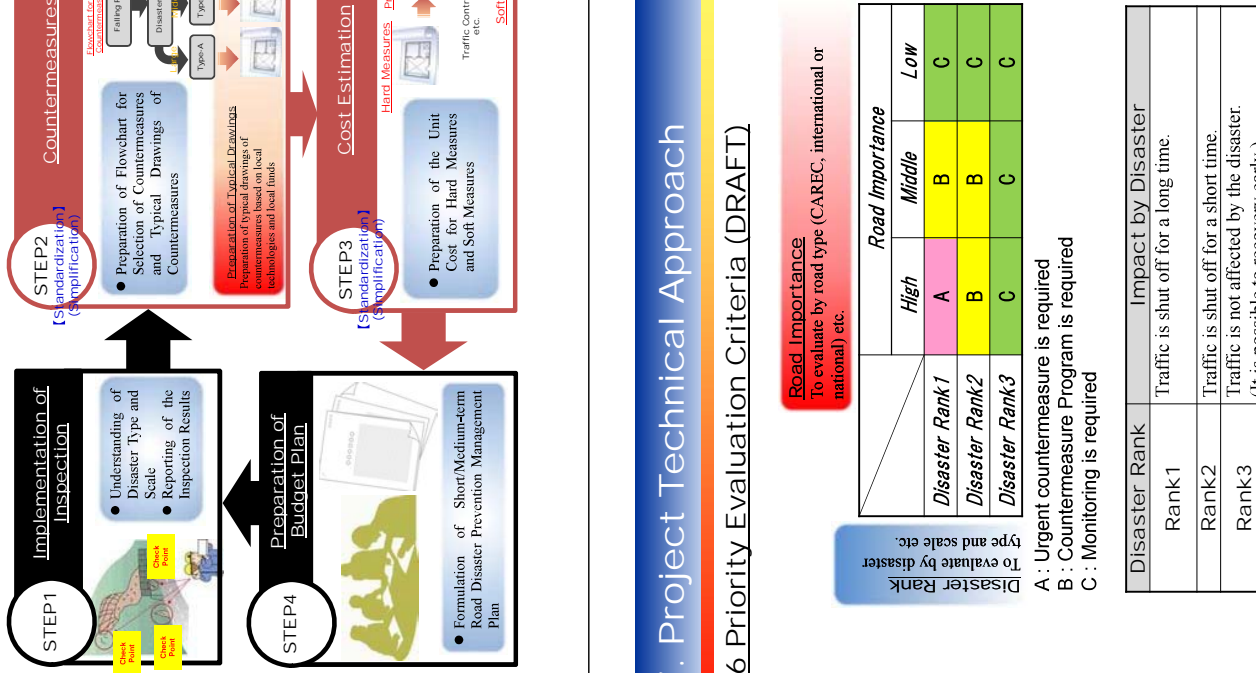
7.5 Sustainable Database Utilization



22

7. Project Technical Approach

7.6 Priority Evaluation Criteria (DRAFT)



23

8. Meteorological Observation

Meteorological Data Observation on the Snow Drifting

1. To confirm the meteorological observation method (location, specifications and schedule) with MOTC and the allocation of necessary budget of MOTC for the procurement and installation of six (6) poles (planned): **April to May, 2016**
2. To get approval of the meteorological observation method by JICA and the necessary budget of JICA for the procurement and installation of meteorological observation equipment: **June, 2016**
3. To install six (6) poles (planned): **July to September, 2016**
4. To install meteorological observation equipment: **September to October, 2016**
5. To start the meteorological observation: **November, 2016**

**THE PROJECT FOR
CAPACITY DEVELOPMENT FOR
ROAD DISASTER PREVENTION MANAGEMENT
IN THE KYRGYZ REPUBLIC**

Kick-Off Seminar



Table of Contents

1. Outline of the Project
2. Annual Budget for Road Disaster (Rehabilitation Cost)
3. Location of Site Inspection for Slope Disaster
4. Result of Site Inspection for Slope Disaster
5. Countermeasures against Slope Disaster
6. Location of Site Inspection for Snow Disaster
7. Result of Site Inspection for Snow Disaster
8. Countermeasures against Snow Disaster
9. Role of Related Agencies for Road Disaster
10. Non-Structural Countermeasures against Road Disaster
11. Database Operation for Road Disaster Prevention Management

1

1. Outline of the Project

Overall Goal

Safety of the road traffic at the selected disaster prone areas is improved.

Project Purpose

The capacity of MOTC's relevant units in the Project (HQ, RMD, target PLUADs/UADs, and DEPs) is enhanced for management of road disaster prevention (including road disaster inspection, preparing of road disaster prevention management plan and planning of budget for road disaster prevention).

2

1. Outline of the Project

【Output-1】

Responsibilities of MOTC on road disaster prevention, including specific duties to be performed by relevant units (HQ, RMD, target PLUADs/UADs, and DEPs) with necessary staffing in each, become clear.

【Output-2】

Capacity of target PLUADs/UADs and DEPs for inspection and analysis of road disaster is enhanced.

【Output-3】

Capacity of RMD to operationalize Database Management System for road disaster prevention is developed.

【Output-4】

Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced.

3

2. Annual Budget for Road Disaster (Rehabilitation Cost)

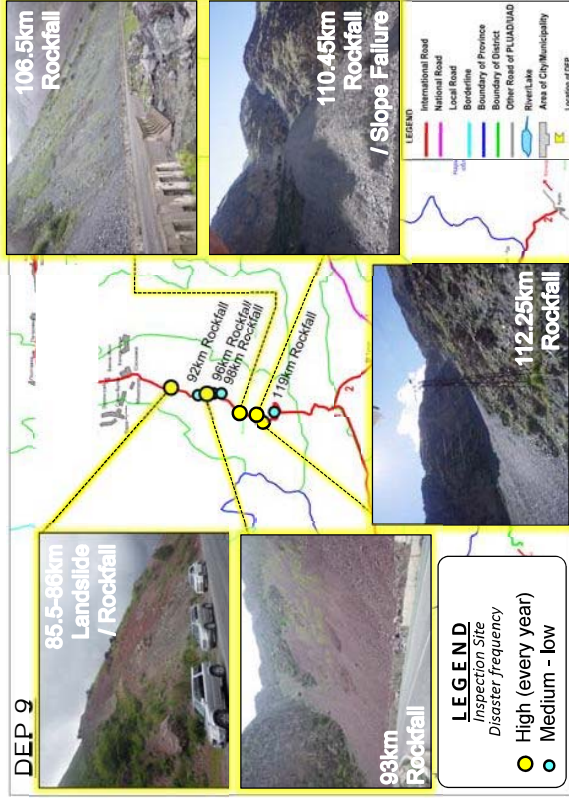
Type of Disaster	Number of Rehabilitation			Actual Rehabilitation Cost (Thousand Soms)			Main Activities for Rehabilitation
	2013	2014	2015	2013	2014	2015	
Talus and Rockfall	4	1	4	422	289	3,500	Cleaning, Restoration
Landslide	6	8	9	1,889	2,921	2,395	Cleaning, Restoration
Mudflow	75	32	44	34,859	5,522	10,417	Cleaning, Restoration
Flood	39	17	39	8,658	10,705	18,347	Restoration of roadbed, bridge and other structure
Avalanche	9	22	8	3,966	4,402	3,251	Cleaning
Snowdrift	6	1	4	164	100	1,318	Cleaning
Others (Unenrolled and Unspecific)	2	2	12	72	54	2,458	-
Total	141	83	120	50,032	23,993	41,686	-

Data Source: MOTC

It is aimed that Countermeasures against road disaster is included in the budget of 2017

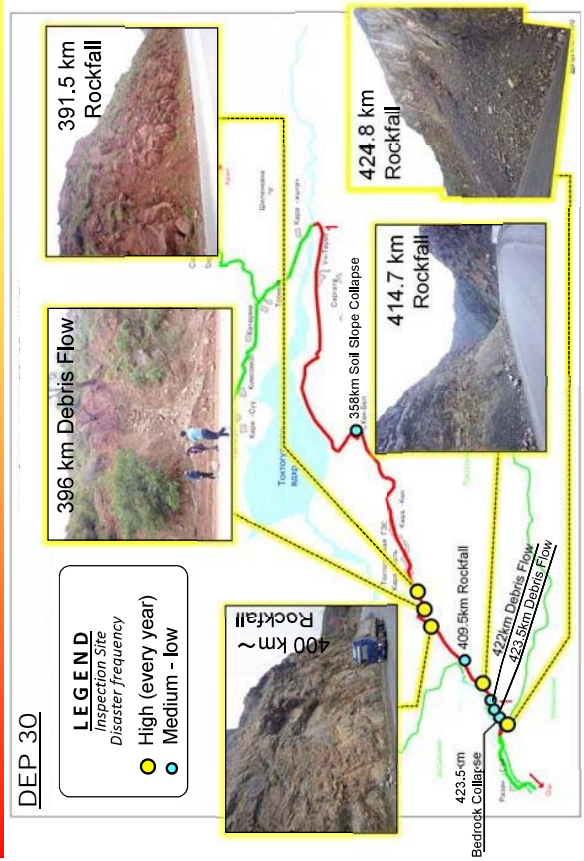
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3. Location of Site Inspection for Slope Disaster



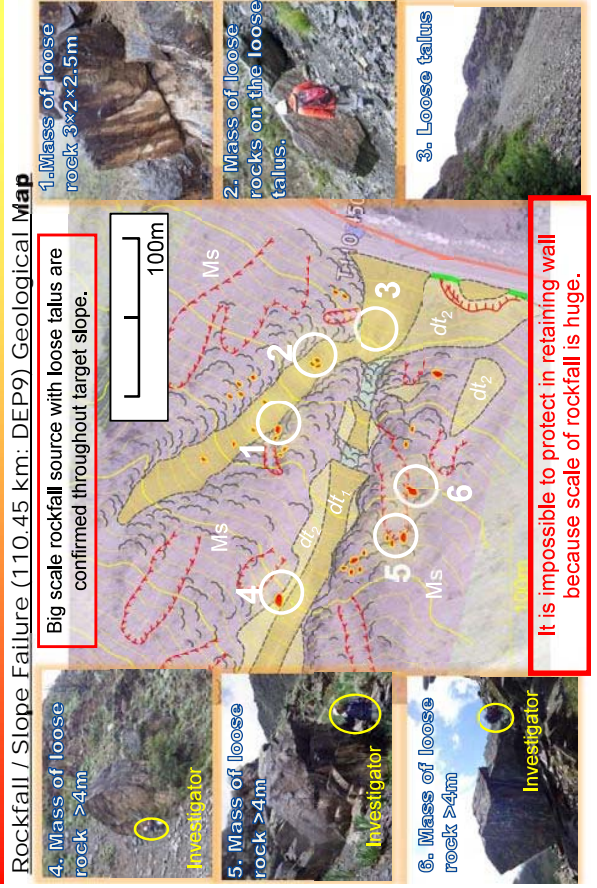
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3. Location of Site Inspection for Slope Disaster



6

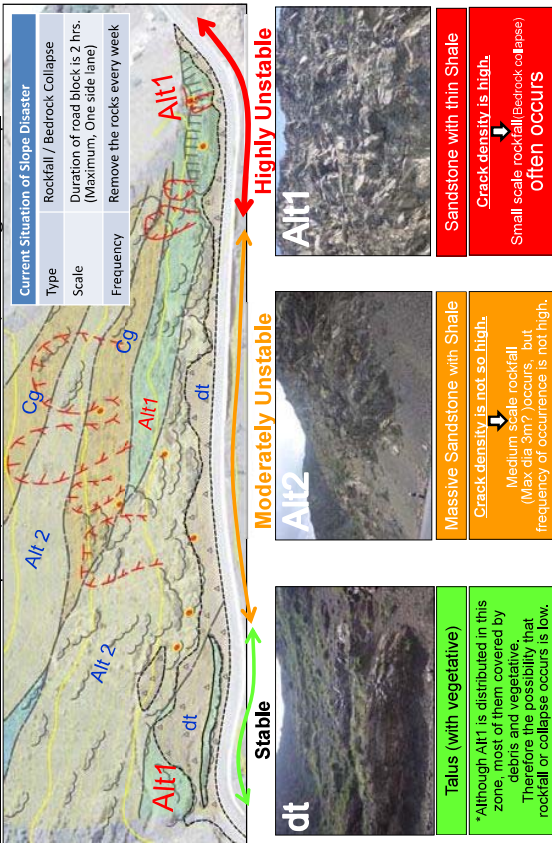
4. Result of Site Inspection for Slope Disaster



It is impossible to protect in retaining wall because scale of rockfall is huge.

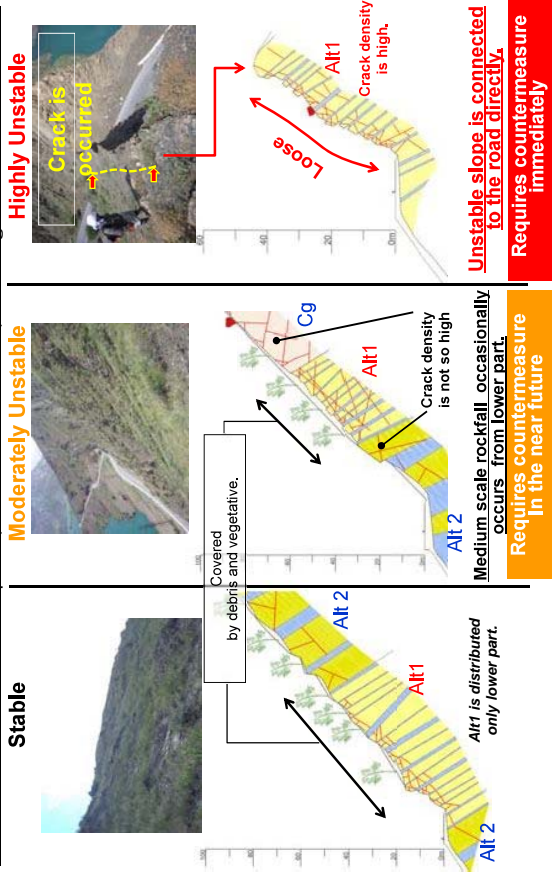
4. Result of Site Inspection for Slope Disaster

Rockfall/Bedrock Collapse (414.7 km : DEP30) Geological Map



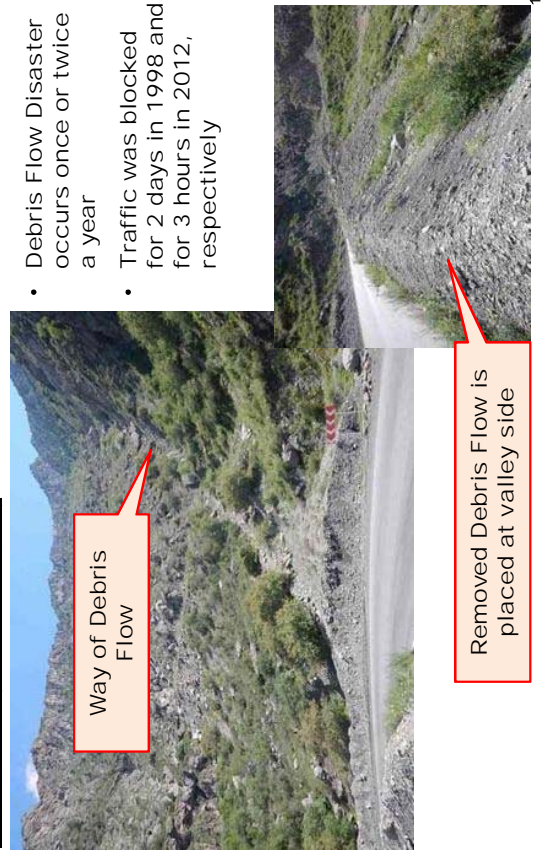
4. Result of Site Inspection for Slope Disaster

Rockfall/Bedrock Collapse (414.7 km : DEP30) Geological Cross-Section



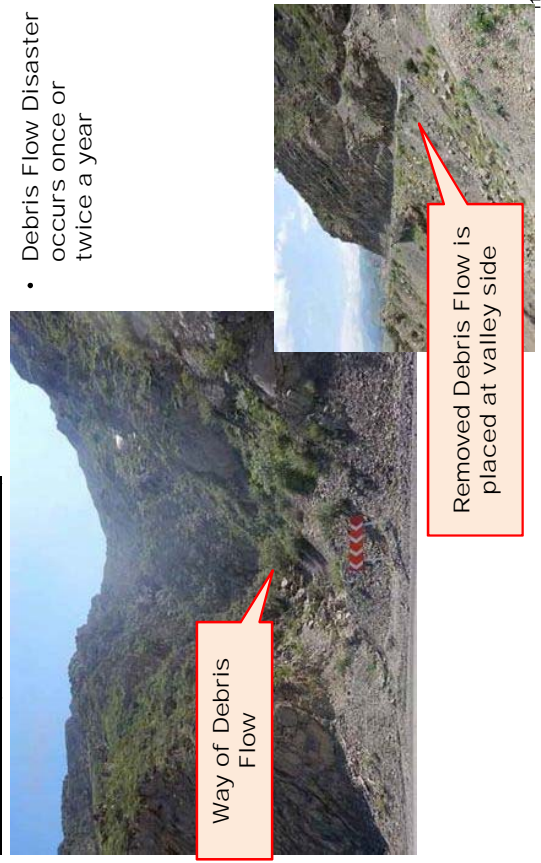
4. Result of Site Inspection for Slope Disaster

Debris Flow (422 km : DEP30)



4. Result of Site Inspection for Slope Disaster

Debris Flow (423.5 km : DEP30)



4. Result of Site Inspection for Slope Disaster

Soil Slope Collapse and Erosion (358 km: DEP30)



Damaged Road Shoulder

- Soil slope was collapsed at former slope drainage ditch on April 2015
- The soil volume of washing out was approx. 3,200 m³ (15m in width, 5m in depth)

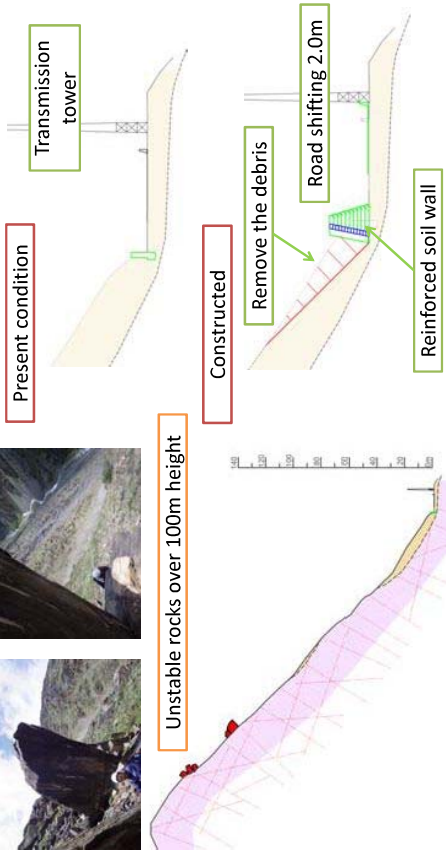


- Soil slope is currently eroded by rainfall and road drainage

12

5. Countermeasures against Slope Disaster

Countermeasures against Rockfall/ Slope failure (110.45 km: DEP9)

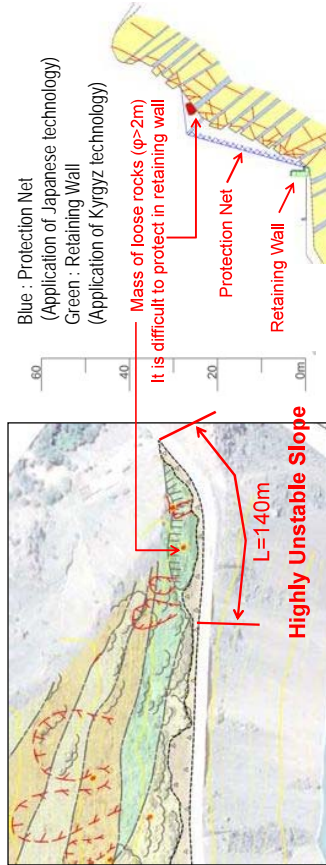


Type of Countermeasure	Qty	unit	Cost / unit	Total Cost (som)
Reinforced soil wall H=5m	50	m	600,000	30,000,000

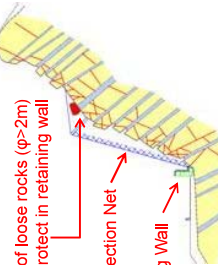
13

5. Countermeasures against Slope Disaster

Countermeasures against Rockfall/Bedrock Collapse (414.7km: DEP30)



Blue : Protection Net
(Application of Japanese technology)
Green : Retaining Wall
(Application of Kyrgyz technology)



Plan View

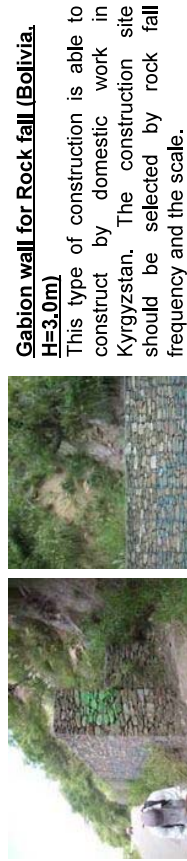
Cross Section

Type of Countermeasure	Execution quantity	unit	Cost / unit	Total Cost (som)
Retaining Wall H=3m	140	m	84,000	11,760,000
Protection Net H=30m	140 × 30	m ²	12,000	50,400,000

14

5. Countermeasures against Slope Disaster

Typical Countermeasures against Rockfall/Bedrock Collapse(1/2)



Gabion wall for Rock fall (Bolivia, H=3.0m)

This type of construction is able to construct by domestic work in Kyrgyzstan. The construction site should be selected by rock fall frequency and the scale.

“Protection Fence” is the one of the countermeasure work for rock fall in Japan. This type of work is developed for high impact load of falling rock. The material of the fence can catch over 2.0m diameter rock from 50m height from the upper slope. For keeping the secure safety of the road, this type of work is necessary in Kyrgyzstan. It will need big budget.

15

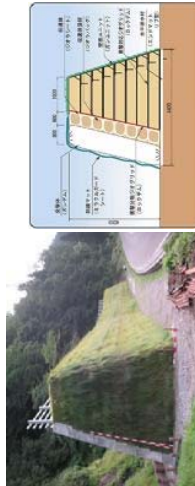
5. Countermeasures against Slope Disaster

Typical Countermeasures against Rockfall/Bedrock Collapse(2/2)

“**Rock Net**” is the one of the countermeasure work for rock fall in Japan. There are two types of this work. One is cover type and the other is pocket type. These types are used for properly by height and shape of the slope. Both type is applied for higher rock impact. But the cost of the high impact type will need big budget.



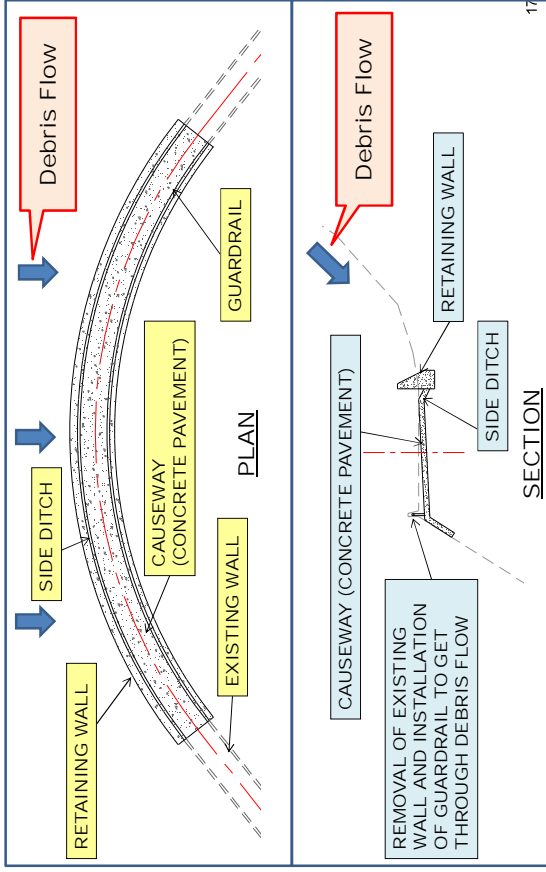
Reinforced soil wall is developed for huge rock fall impact in Japan. This type wall can catch over 2.0m diameter rock from 50m height. For keeping the secure safety of the road, this type of work is necessary in Kyrgyzstan. For constructing this countermeasure work, it will need big budget and enough space along the road.



16

5. Countermeasures against Slope Disaster

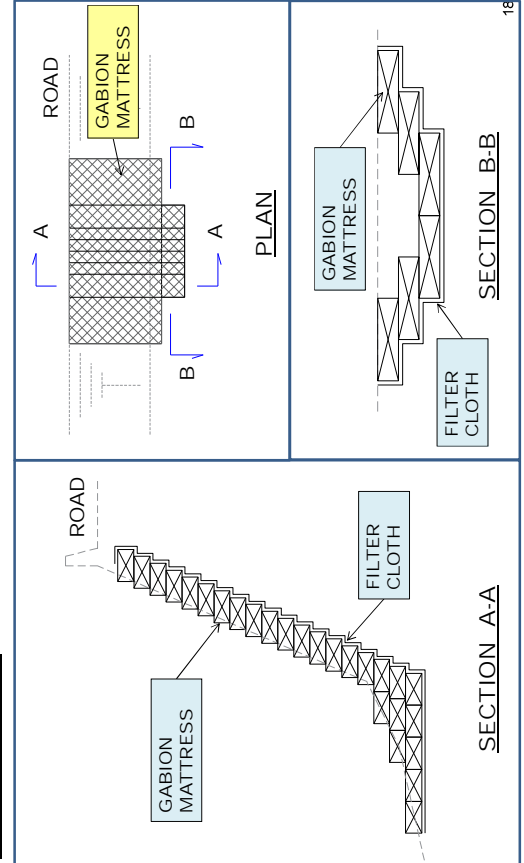
Countermeasures against Debris Flow (422km & 423.5 km)



17

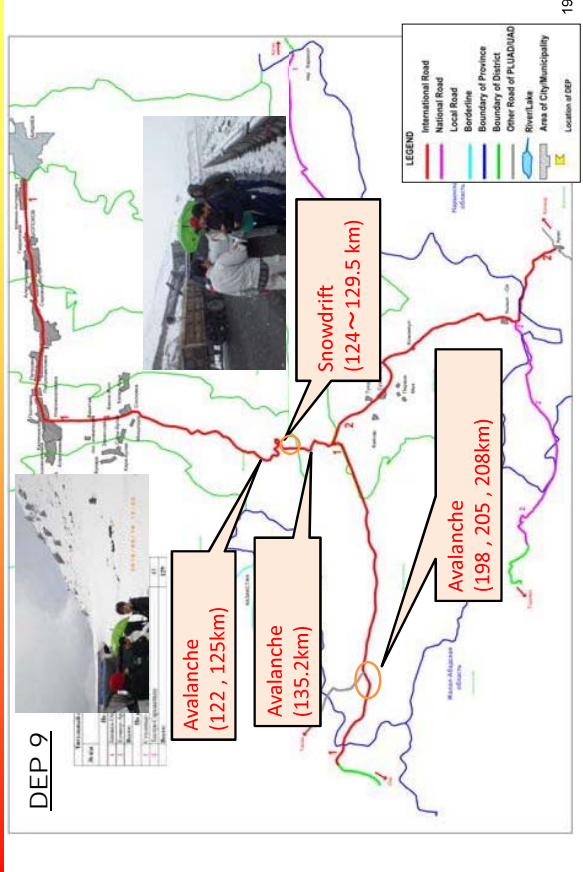
5. Countermeasures against Slope Disaster

Rehabilitation of Slope Collapse and Countermeasures against Slope Erosion (358 km)



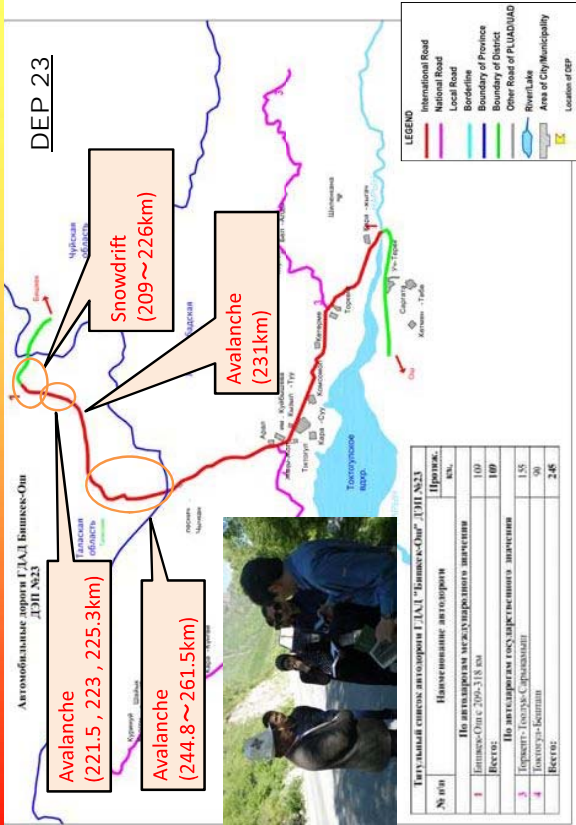
18

6. Location of Site Inspection for Snow Disaster



19

6. Location of Site Inspection for Snow Disaster



20

7. Result of Site Inspection for Snow Disaster

Avalanche (255.5 km and 223 km : DEP23)



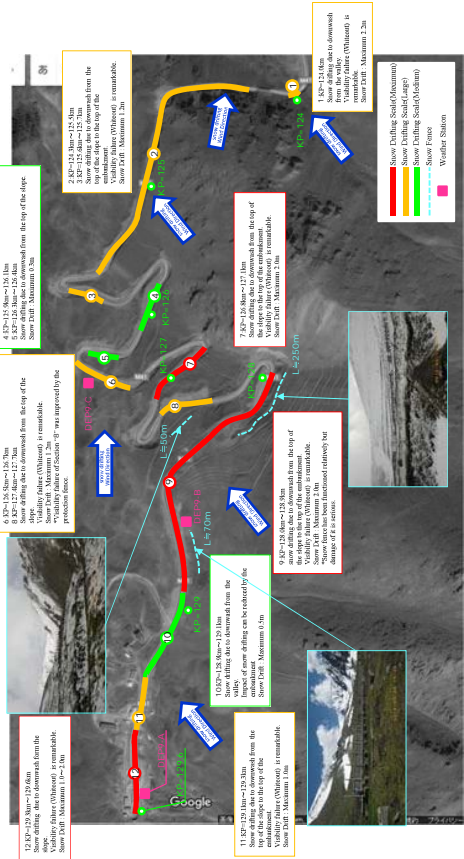
➢ There are many large slopes which are more than 2km of slope scale.

- (Especially, KP=244km ~ 262km)
- It is difficult to countermeasure the sources of avalanche because avalanche slope scale is large.
- The countermeasures in the site should be massive structure if they are designed based on Japanese countermeasure standards. (refer to next page)
- DEP engineers of each disaster area are familiar about the knowledge of the avalanche in the past, but disaster history is not recorded as paper or data.
- Avalanche history in the past should be recorded so that effective countermeasure can be planned.

21

7. Result of Site Inspection for Snow Disaster

Snowdrift (DEP9)

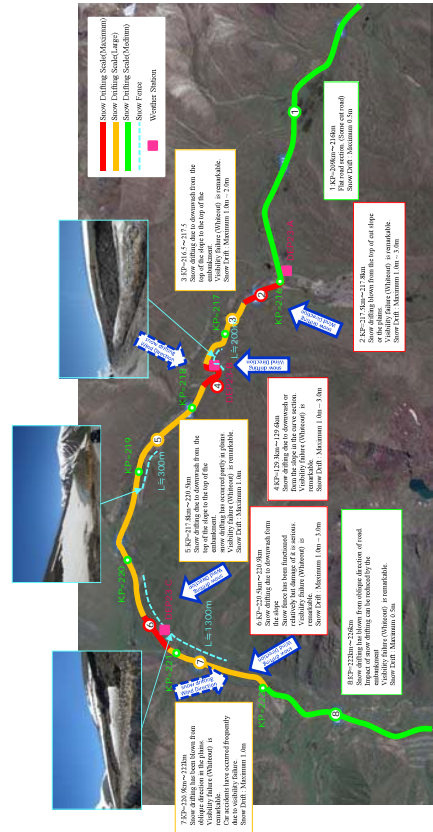


- Heavy snow drifting has occurred by strong downwash wind from southwest or south.
- Especially, visibility failure of section "9" and "12" are serious.

22

7. Result of Site Inspection for Snow Disaster

Snowdrift (DEP23)



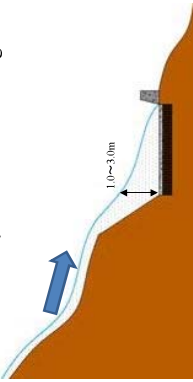
- Heavy snow drifting has occurred by strong wind along valley or downwash wind from south.
- Especially, visibility failure of section "2", "4", and "6" are serious.
- Car accidents have occurred frequently due to the whiteout though the snow drift of section "7" is not serious.

23

7. Result of Site Inspection for Snow Disaster

Snow Drifting (Snow drifting prone road structure: Cutting Road)

Windward side is road of cut structure mostly in mountainous road, since the snow drifting has occurred by downwash from the ridge line.



- Snow supplied from the top of slope is deposited from the top of embankment to on the road, and snow drift has occurred.



24

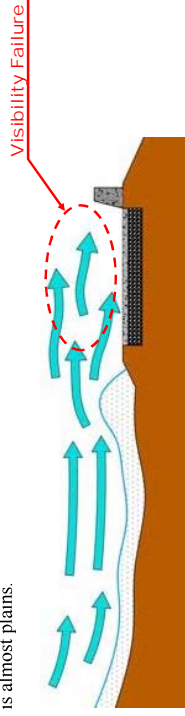
7. Result of Site Inspection for Snow Disaster

Snow Drifting (Snow drifting prone road structure: Plains)

There is plains partly in low mountainous area.



- Windward side is mild terrain and is almost plains.
- Visibility Failure (Location Unknown)



- Concentration of snow drifting is large as closer as the snow surface.
- In the case of plains, a large amount of snow drifting come into driver's view and whiteout will be occurred.

25

7. Result of Site Inspection for Snow Disaster

Snowdrift (Existing Snow Fence)

- Interspace of snow protection plate is large.



Drifts of windward side and downwind side are large according to dimension of interspace of the snow protection plate.
(Interspace of existing snow protection plate is large, and snow protection effect is small.)

- Fence height is low.

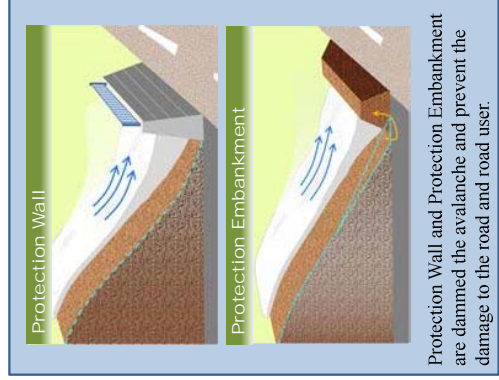


Drifts of windward side is larger than drifts of downwind side according to snow fence height.
Snow fence would be buried in the snow soon.

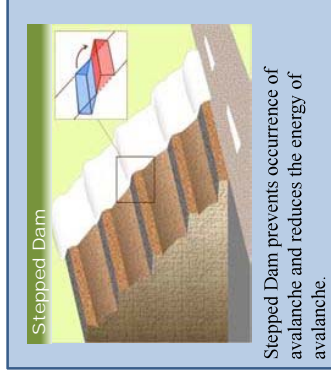
26

8. Countermeasures against Snow Disaster

Typical Countermeasures against Avalanche



Protection Wall and Protection Embankment are dammed the avalanche and prevent the damage to the road and road user.



Stepped Dam prevents occurrence of avalanche and reduces the energy of avalanche.

Applicability

- 1) Protection Wall/Protection Embankment Location that the space between road and slope can be secured.
- 2) Stepped Dam Location that the space between road and slope can not be secured.

*Need combination depending on the situation.

27

8. Countermeasures against Snow Disaster

Typical Countermeasures against Snowdrift

- The snow fence with prescribed height and interspace of snow protection plate can be functioned to prevent the snow drifting. (Materials of the snow fence is not matter)
- The snow fence made by trees shown in below picture is the cheapest than that of other materials such as steel, but durability is lower than steel. (Possibility that material of the snow fence is stolen is low.)
- Snow fence made by trees is required frequent maintenance against corrosion and deterioration than the snow fence made by steel.



Example Pictures of Snow Fence made by Trees

28

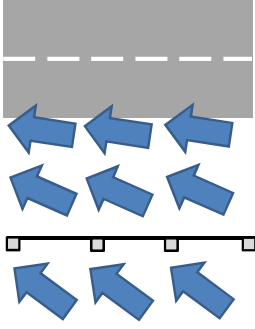
8. Countermeasures against Snow Disaster

Typical Countermeasures against Snowdrift (Installation of Snow Fence)

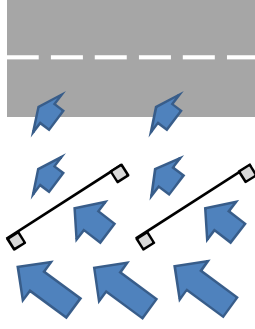
- If the snow drifting direction is oblique to the road, effect of the snow fence which is installed parallel to the road is low. (refer to below figure.)
- It is desirable that the snow fence is installed at right angles to snow drifting direction. (refer to below figure and right photo)



[ex. 11]: Effect of the snow fence is low.



[ex. 21]: Effect of the snow fence is high.



29

8. Countermeasures against Snow Disaster

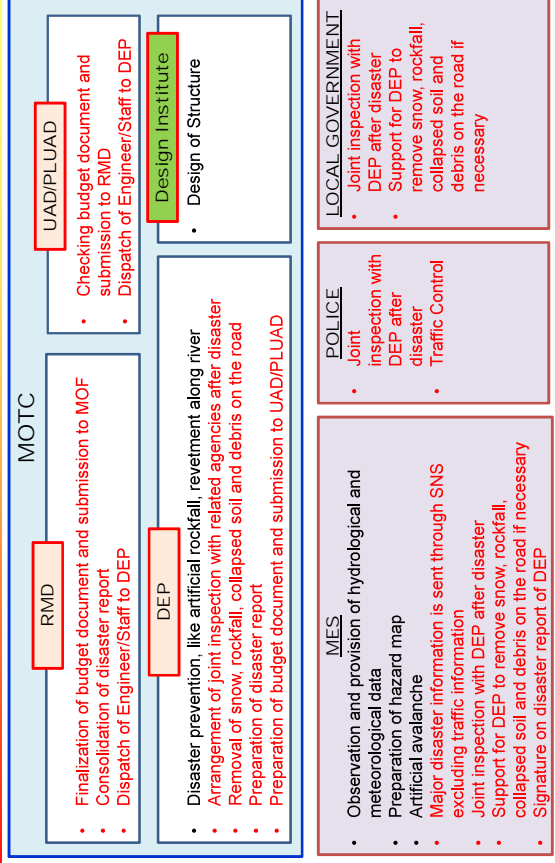
Typical Countermeasures against Snowdrift (視程確保時の視線誘導対策)

- If snow fence is installed, snow drifting can not be prevented completely.
- It is effectively that the snow pole is installed at outside of the road to improve driver's view. (refer to below photos)



30

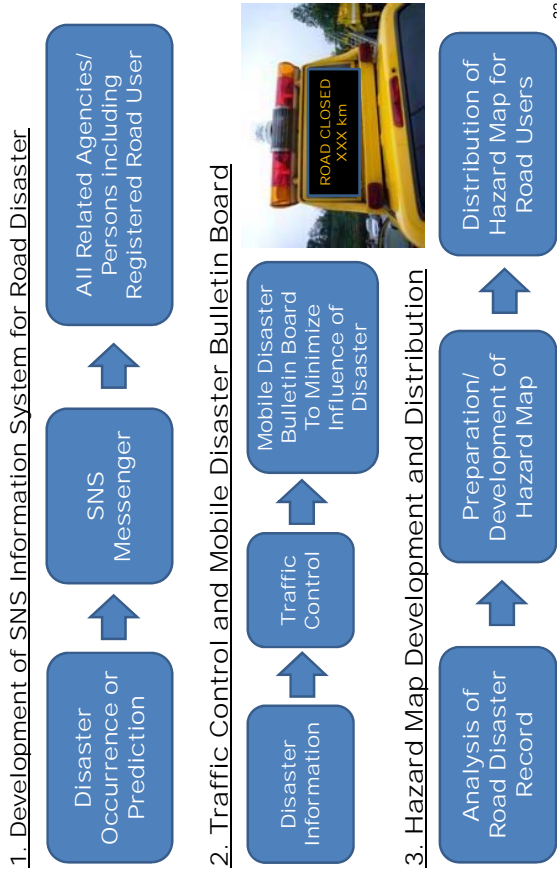
9. Role of Related Agencies for Road Disaster



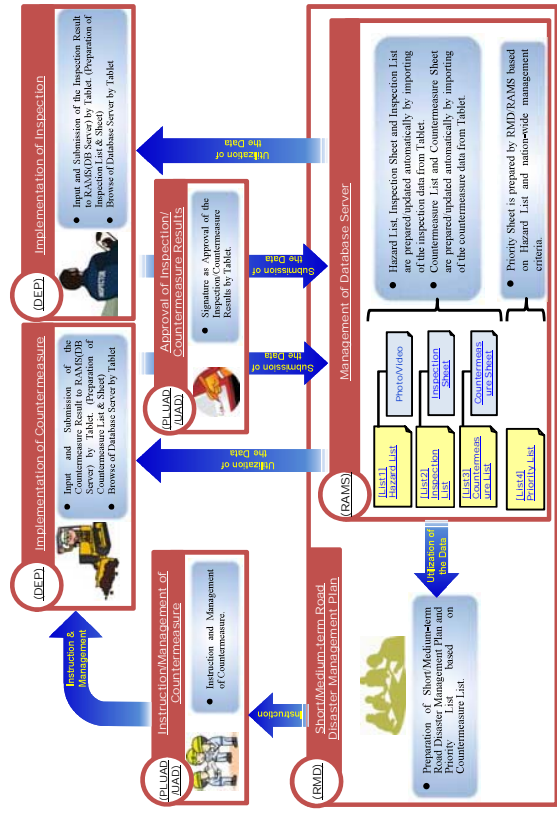
31

* Activities after disasters are indicated in red letters

10. Non-Structural Countermeasures against Road Disaster



11. Database Operation for Road Disaster Prevention Management



11. Database Operation for Road Disaster Prevention Management

Hazard List - Falling Rocks/ Slope Collapse

No.	Disaster	PLUAD/UAAD	DEP	Road Name	Kilo Post	Inspection or Countermeasure
1	Falling Rocks/ Slope Collapse	PLUAD xx UAD xx	DEP xx	xx Road	xx - xx km	Inspection Sheet
2	Falling Rocks/ Slope Collapse	PLUAD xx UAD xx	DEP xx	xx Road	xx - xx km	Countermeasure Sheet
3	Falling Rocks/ Slope Collapse	PLUAD xx UAD xx	DEP xx	xx Road	xx - xx km	Inspection Sheet
4	Falling Rocks/ Slope Collapse	PLUAD xx UAD xx	DEP xx	xx Road	xx - xx km	Countermeasure Sheet
5	Falling Rocks/ Slope Collapse	PLUAD xx UAD xx	DEP xx	xx Road	xx - xx km	Inspection Sheet
6	Falling Rocks/ Slope Collapse	PLUAD xx UAD xx	DEP xx	xx Road	xx - xx km	Countermeasure Sheet

The Disaster List of Falling Rocks/Slope Collapse is shown in the screen. The Inspection Sheet and Countermeasure Sheet of each disaster area can be selected in the Disaster List.

11. Database Operation for Road Disaster Prevention Management

Inspection List - Falling Rocks/ Slope Collapse

No.	Disaster	DEP	Road Name	Kilo Post	Inspection Data	Inspection Sheet
1	Falling Rocks/ Slope Collapse	DEP xx	xx Road	xx - xx km	2016/06/25	Inspection Sheet
2	Falling Rocks/ Slope Collapse	DEP xx	xx Road	xx - xx km	2016/06/25	Inspection Sheet
3	Debris Flow	DEP xx	xx Road	xx - xx km	2016/06/25	Inspection Sheet
4	Falling Rocks/ Slope Collapse	DEP xx	xx Road	xx - xx km	2016/06/25	Inspection Sheet
5	Debris Flow	DEP xx	xx Road	xx - xx km	2016/06/25	Inspection Sheet

The inspection sheet of each disaster areas can be browsed from the Inspection List.

11. Database Operation for Road Disaster Prevention Management

Inspection Sheet

Road Name	Biahkek-Osh Road	Kilo Post	xxx	+	xxx
Date	05/06/2016	Latitude: N	xxx	Longitude: E	xxx
PLUAD/UAD	BO-UAD	DEP	DEP30		
Slope Condition (斜面状況)	Unstable	Spring (湧水状況)	Spring is confirmed		
Vegetation (植生状況)	No Vegetations				
Slope Gradient (斜面勾配)	70 > i	Slope Height (斜面高さ)	Rock Slope 50m > H ≥ 30m		
Photo	Photo-1	Photo-2	Photo-3		
	 <p>Protection walls are installed along the road. The pocket behind the walls is filled with rocks.</p>				
Comment					
Person Name					

※above inspection sheet is draft version.

36

11. Database Operation for Road Disaster Prevention Management

Countermeasure List - Falling Rocks/ Slope Collapse

No.	Disaster	DEP	Road Name	Kilo Post	Countermeasure Data	Photo/ Video	
1	Falling Rocks/ Slope Collapse	DEP xx	xx Road	xx ~ xx km	2017/06/23	Countermeasure Sheet	
2	Falling Rocks/ Slope Collapse	DEP xx	xx Road	xx ~ xx km	2017/06/23	Inspection Sheet	
3	Debris Flow	DEP xx	xx Road	xx ~ xx km	2017/06/23	Inspection Sheet	
4	Falling Rocks/ Slope Collapse	DEP xx	xx Road	xx ~ xx km	2017/06/23	Inspection Sheet	
5	Debris Flow	DEP xx	xx Road	xx ~ xx km	2017/06/23	Inspection Sheet	
6	The countermeasure sheet of each disaster areas can be browsed from the Countermeasure List.					2017/06/23	Inspection Sheet

Save as Excel

Save as PDF

37

11. Database Operation for Road Disaster Prevention Management

Countermeasure Sheet - Falling Rocks/ Slope Collapse

Road Name	Direct Input	Kilo Post	Direct Input	+	Direct Input
Date	Direct Input	Latitude: N	Automatic Input	Longitude: E	Automatic Input
PLUAD/UAD	Direct Input	DEP	Direct Input		
Photo (Before Countermeasure)	Photo-1	Photo-2	Photo-3		
	Photo-1	Photo-2	Photo-3		
Photo (after Countermeasure)					
Disaster Type	Countermeasure				
Comment					
Person Name					

38

11. Database Operation for Road Disaster Prevention Management

Priority List - Falling Rocks/ Slope Collapse

No.	Disaster	DEP	Road Name	Kilo Post	Priority
1	Falling Rocks/ Slope Collapse	DEP xx	xx Road	xx ~ xx km	Priority A
2	Falling Rocks/ Slope Collapse	DEP xx	xx Road	xx ~ xx km	Priority B
3	Debris Flow	DEP xx	xx Road	xx ~ xx km	Priority A
4	Falling Rocks/ Slope Collapse	DEP xx	xx Road	xx ~ xx km	Priority A
5	Debris Flow	DEP xx	xx Road	xx ~ xx km	Priority C
6	Debris Flow	DEP xx	xx Road	xx ~ xx km	Priority C

Save as Excel

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39

2. Review of PDM

2.2 Inputs

【The Japanese Side】

1. Experts

- 1) Team Leader/Road Maintenance Expert
- 2) Deputy Team Leader/Debris Flow Disaster Prevention/River Engineering Expert
- 3) Snow Disaster Prevention Expert (1)
- 4) Snow Disaster Prevention Expert (2)
- 5) Snow Disaster Prevention Expert (3)
- 6) Slope Disaster Prevention Expert
- 7) Database Expert
- 8) Disaster Prevention Countermeasures Expert
- 9) Geological Expert
- 10) Disaster Prevention Facilities Expert/Cost Estimator/Construction Planner
- 11) Coordinator/Road Disaster Inspection Assistant

RED: Review points

4

3. Achievement of the Project

3.1 Achievement of Output-1

Output-1: Responsibilities of MOTC on road disaster prevention, including specific duties to be performed by relevant units (HO, RMD, target PLUADs/UADs, and DEPs) with necessary staffing in each, become clear.

Indicators	Achievement(%)		Achievement in October 2016
	Plan	Actual	
1-1. Roles of MOTC HQ, RMD, target PLUADs/UADs and DEPs for road disaster prevention management are specified by MOTC.	20	20	<ul style="list-style-type: none"> Roles of related organizations for road disaster prevention management have been prepared.
			<p style="text-align: center;">Target in April 2017</p> <ul style="list-style-type: none"> Roles of related organizations for road disaster prevention management will be reviewed.

5

3. Achievement of the Project

3.2 Achievement of Output-2

Output-2: Capacity of target PLUADs/UADs and DEPs for inspection and analysis of road disaster is enhanced

Indicators	Achievement(%)		Achievement in October 2016
	Plan	Actual	
2-1. Road disaster hazard sections are determined with their feature and classification by target PLUADs/UADs and DEPs by [May 2017].	50	50	<ul style="list-style-type: none"> Long and short lists of road disaster hazard including countermeasures was prepared. Meteorological observation equipment has been installed at six (6) polls constructed by BO-UAD to start the observation from the beginning of November, 2016. (BO Road 125km~129km, 216km-222km) <p style="text-align: center;">Target in April 2017</p> <ul style="list-style-type: none"> Long and short lists of road disaster hazard will be updated for preparing the short-term and medium term road disaster prevention management plans. Analysis of the meteorological data observation during 1st winter season will be conducted by the end of April 2017.

6

3. Achievement of the Project

3.2 Achievement of Output-2

Output-2: Capacity of target PLUADs/UADs and DEPs for inspection and analysis of road disaster is enhanced

Indicators	Achievement(%)		Achievement in October 2016
	Plan	Actual	
2-2. Inspection and Evaluation Manual for Road Disaster Prevention is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	30	30	<ul style="list-style-type: none"> Required inspection and evaluation sheets on road disaster prevention were drafted Inspection and evaluation manual for road disaster prevention have been prepared based on the materials for preparing long and short lists of road disaster hazard. Materials for landslide monitoring along the BO Road (85.5 – 86km) were installed to study the movement of landslide and countermeasures for road management including road disaster prevention. <p style="text-align: center;">Target in April 2017</p> <ul style="list-style-type: none"> Inspection and evaluation manual for road disaster prevention will be revised for more practical utilization.

7

3. Achievement of the Project

3.2 Achievement of Output-2

Output-2: Capacity of target PLUADs/UADs and DEPs for inspection and analysis of road disaster is enhanced			
Indicators	Achievement(%)		Achievement in October 2016
	Plan	Actual	
2-3. Countermeasures Manual for Road Disaster Prevention is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	30	30	<ul style="list-style-type: none"> Countermeasures manual for road disaster prevention have been prepared based on the materials for preparing long and short lists of road disaster hazard. <p style="text-align: center;">Target in April 2017</p> <ul style="list-style-type: none"> Countermeasures manual for road disaster prevention will be revised for more practical utilization.

8

3. Achievement of the Project

3.2 Achievement of Output-2

Output-2: Capacity of target PLUADs/UADs and DEPs for inspection and analysis of road disaster is enhanced			
Indicators	Achievement(%)		Achievement in October 2016
	Plan	Actual	
2-4. All the staff in target PLUADs/UADs and DEPs trained for inspection/evaluation and standard disaster prevention countermeasures based on the manuals pass the final exam prepared by the Project.	30	30	<ul style="list-style-type: none"> 31 staff of PLUADs/UADs and DEPs were trained through the preparation of long and short lists of road disaster hazard. <p style="text-align: center;">Target in April 2017</p> <ul style="list-style-type: none"> Trained staff, master trainer, of PLUADs/UADs and DEPs will transfer their knowledge to other staff of PLUADs/UADs and DEPs through the revising works of long and short lists of road disaster hazard.

9

3. Achievement of the Project

3.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed			
Indicators	Achievement(%)		Achievement in October 2016
	Plan	Actual	
3-1. A database format for information on road disaster prevention management planning (incl. costing for countermeasures) is prepared by RMD by [August 2016].	100	100	<ul style="list-style-type: none"> Database draft formats for information on road disaster prevention management planning, which are Disaster List, Inspection List, Countermeasure List and Priority List, were completed by RMD. <p style="text-align: center;">Target in April 2017</p> <ul style="list-style-type: none"> Database draft formats for information on road disaster prevention management planning will be revised by RMD.

10

3. Achievement of the Project

3.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed			
Indicators	Achievement(%)		Achievement in October 2016
	Plan	Actual	
3-2. Practically usable Manual for Data Collection and Input is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	70	70	<ul style="list-style-type: none"> Draft manual for data collection and input is prepared by RMD. <p style="text-align: center;">Target in April 2017</p> <ul style="list-style-type: none"> Draft manual for data collection and input will be revised by RMD.

11

3. Achievement of the Project

3.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in October 2016
	Plan	Actual	
3-3. Data collected and input by target PLUADs/UADs and DEPs are integrated to the database for prioritizing countermeasures and certified by RMD by [May 2017].	30	30	<p>● Data collection and input of disaster prone area by using the tablet are started by target PLUADs/UADs and DEPs.</p> <p>Target in April 2017</p> <p>● Data collection and input of disaster prone area by using the tablet will be completed by target PLUADs/UADs and DEPs.</p>

12

3. Achievement of the Project

3.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in October 2016
	Plan	Actual	
3-4. Staff of target PLUAD/UAD and DEPs trained for data collection and input in the site training by JICA expert, and they passed the exam for data collection and input based on the Manual pass the exam that evaluates their mastery in filling required information in database format.	50	50	<p>● 20 staff of each target PLUAD/UAD and DEPs were trained for data collection and input in the site training by JICA expert, and they passed the exam for data collection and input.</p> <p>Target in April 2017</p> <p>● Staff of target PLUAD/UAD and DEPs trained by JICA expert will train for data collection and input to other staff (more than 10 staff) of target PLUAD/UAD and DEPs.</p>

13

3. Achievement of the Project

3.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in October 2016
	Plan	Actual	
3-5. Database Management System that contains information necessary for road disaster prevention management in the project area is developed for preparing budget by RMD by [May 2017].	30	30	<p>● Database management system of draft version is developed by RMD.</p> <p>Target in April 2017</p> <p>● Database management system of draft version will be improved/updated by RMD.</p>

14

3. Achievement of the Project

3.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in October 2016
	Plan	Actual	
3-6. Practically usable Manual for Database Operation is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	30	30	<p>● Draft manual for database operation is prepared by RMD.</p> <p>Target in April 2017</p> <p>● Draft manual for database operation will be revised by RMD.</p>

15

3. Achievement of the Project

3.4 Achievement of Output-4

Output-4: Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced

Indicators	Achievement(%)		Achievement in October 2016
	Plan	Actual	
4-1. Nation-wide management criteria for road disaster prevention is developed by RMD by [May 2017].	30	30	<ul style="list-style-type: none"> Nation-wide management criteria for road disaster prevention has been prepared. <p>Target in April 2017</p> <ul style="list-style-type: none"> Nation-wide management criteria for road disaster prevention will be revised.

16

3. Achievement of the Project

3.4 Achievement of Output-4

Output-4: Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced

Indicators	Achievement(%)		Achievement in October 2016
	Plan	Actual	
4-2. Short-Term Road Disaster Prevention Management Plan (urgent response plan) with cost estimation for road disaster prevention management of the target area is prepared by RMD by [September 2017 and September 2018].	10	10	<ul style="list-style-type: none"> Short-term road disaster prevention management plan has been prepared. <p>Target in April 2017</p> <ul style="list-style-type: none"> Short-term road disaster prevention management plan will be revised.

17

3. Achievement of the Project

3.4 Achievement of Output-4

Output-4: Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced

Indicators	Achievement(%)		Achievement in October 2016
	Plan	Actual	
4-3. Preparation Manual for Short-Term and Medium-Term Road Disaster Prevention Management Plans is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	10	10	<ul style="list-style-type: none"> Manual for short-term and medium-term road disaster prevention management plans have been prepared. <p>Target in April 2017</p> <ul style="list-style-type: none"> Manual for short-term and medium-term road disaster prevention management plans will be revised.

18

4. Longlist/Shortlist of Road Disaster Prevention

4.1 Longlist

Summary of Road Disaster Prevention in Longlist*1

Type of Disaster	Number of Locations*2	Required Cost of Countermeasures (Million KGS)*3	Major Countermeasures
Landslide	6	3,733	Piles, Anchoring, Drainage, Lateral Boring
Rockfall	28	7,070	High Energy-protection Fence/Net, Retaining Wall, Reinforced Soil Wall, Non-frame Protection Net,
Slope Collapse	2	301	Reinforced Earth Wall, High Energy-protection Net, Non-frame Protection Net
Debris Flow	15	4,623	Causeway, Sabo Dam with Access Road, Concrete Channel, Gabion Mattress, Concrete Retaining wall, Groundsill
Riverbank Erosion	9	258	Embankment, Concrete Retaining Wall, Concrete Block/ Gabion Mattress/ Boulder Riprap Revetment, Concrete Block/Gabion Mattress/ Boulder Riprap Foot Protection
Avalanche	16	6,822	Protection Wall, Snow Shed*4
Snowdrift	20	5,105	Collector Snow Fence, Snow shelter*4
Total	96	27,912	

*1: The target DEPs are DEP 9, 23, 26, 30, 50, 959.

*2: The locations are selected on the basis of information from the each target UAD, PLUAD, and DEP.

*3: The estimated costs are rough direct cost **excluding** indirect cost, temporary works, cofferdam/dewatering cost, etc.

*4: The type/cost of countermeasures against snow disaster will be modified after inspection during winter season.

19

4. Longlist/Shortlist of Road Disaster Prevention

4.1 Longlist

Sample of Longlist for Slope Disaster

No.	DEP #	Road	Sta. No. (Kilo Post)	Disaster	Countermeasure	Countermeasure area	Length/ Relative height from Road to Surface (Scale)	Cost (Millions KGS)	Occurrence rate of slope disaster	Scale of Disaster
4	50	Bazar-Korgon - Aytanbap	26.4km	Debris flow	Sabo Dam with Access Road Concrete Channel at River Side Gabion Mattress	Sabo Dam at mountain side. 8 location Access Road: Several kilometer from the existing road to dam site Concrete Channel: L=100m Groundsill: 5 location	-	1,154	High	Large
25	30	Bishkek -Osh	414.7km	Rockfall	High energy-protection net Retaining wall Road shifting	H=50m, L=140m L=140m	L=140m H=50m	703	High	Large
2	50	Bazar-Korgon - Aytanbap	15.6km	Riverbank Erosion	Embankment Gabion Mattress Revetment (Stacking Type) Gabion Mattress Foot Protection	Embankment (5m widening road shoulder): L:250m ³ Gabion Mattress Revetment : H=5m, L=50m Gabion Mattress Foot Protection: B=2m, L=50m	L=50m along the road	7 (Excluding Cofferdam Cost)	Low	Small
6	9	Bishkek -Osh	97.5km	Rockfall	Retaining wall	H=3m, L=100m	L=100m H=130m	10	Low	Small

20

*1: The target DEPs are DEP 9, 23, 26, 30, 50, 959.

*2: The selected locations need further discussion to formulate short/middle term plan.

*3: The estimated costs are rough direct cost **excluding** indirect cost, temporary works, cofferdam/dewatering cost, etc.

*4: The type/cost of countermeasures against snow disaster will be modified after inspection during winter season.

22

4. Longlist/Shortlist of Road Disaster Prevention

4.1 Longlist

Sample of Longlist for Snow Disaster

No.	DEP #	Road	Sta. No. (Kilo Post)	Disaster	Countermeasure	Countermeasure area	Length/ Relative height from Road to Surface (Scale)	Cost (Millions KGS)	Occurrence rate of slope disaster	Scale of Disaster
27	23	Bishkek -Osh	223.0-224.5km	Avalanche	Protection Wall	L=1500m	L=1500m	2,545	High	Large
12	9	Bishkek -Osh	128.0-128.9km	Snowdrift	Snow Shelter	L=900m	L=900m	1,833	High	Large
2	9	Bishkek -Osh	123.0km	Avalanche	Protection Wall	L=50m	L=50m	85	Low	Large
3	9	Bishkek -Osh	124.0km	Snowdrift	Collector Snow Fence	L=30m	L=30m	3	High	Medium

* The type/cost of countermeasures against snow disaster will be modified after inspection during winter season.

21

4. Longlist/Shortlist of Road Disaster Prevention

4.2 Shortlist

Summary of Road Disaster Prevention in Shortlist*1

Type of Disaster	Number of Locations ^{*2}	Required Cost of Countermeasures [Cost under longlist] (Million KGS) ^{*3}	Major Countermeasures
Landslide	6	0.8 [3,733]	Monitoring of Landslide, not adopting high cost structural countermeasures
Rockfall	3	69.2 [7,070]	Retaining Wall, Protection Net, Rock Fence due to the utilization of private company technique
Debris Flow	3	67.9 [4,623]	Causeway, Concrete Retaining wall, Groundsill, not adopting high cost structural countermeasures such as sabo dam
Riverbank Erosion	3	20.4 [258]	Embankment, Gabion Mattress Revetment, Gabion Mattress Foot Protection, by adopting economical cost materials
Avalanche	2	186.7 [6,822]	Protection Wall, by adopting economical cost materials
Snowdrift	3	66.5 [5,105]	Collector Snow Fence, by adopting economical cost materials
Total	20	411.5 [27,611]	Approx. 1.5 % of total cost of longlist

*1: The target DEPs are DEP 9, 23, 26, 30, 50, 959.

*2: The selected locations need further discussion to formulate short/middle term plan.

*3: The estimated costs are rough direct cost **excluding** indirect cost, temporary works, cofferdam/dewatering cost, etc.

*4: The type/cost of countermeasures against snow disaster will be modified after inspection during winter season.

22

4. Longlist/Shortlist of Road Disaster Prevention

4.2 Shortlist

- Required cost/budget under the shortlist could be invested/allocated by the fund of Government of Kyrgyz Republic within the next decade.
- On the other hand, the large scale countermeasures in the longlist could be requested for technical and financial assistance from international donors.

23

4. Longlist/Shortlist of Road Disaster Prevention

4.2 Shortlist

Sample of Shortlist for Slope Disaster

No.	DEP #	Road	Sta. No. (Kilo Post)	Disaster	Site Photo	Structural/Nonstructural Measures	Image of the Measures	Cost (Millions KGS)
1, 2, 3	9, 30	Bishkek-Osh	85.5km 86km 395km	Landslide		Monitoring (for 10 years)		0.8
4, 5, 6	959	OSI Road	60km 61km 70km			Protection net H=20m(Average), L=130m		40.7
7	9	Bishkek-Osh	116.5km	Rockfall		Concrete Pavement (Causeway), L=80m Retaining H=2m, L=20m Groundfill work: H=5m		27.2
11	30	Bishkek-Osh	423.5km	Debris flow		Embankment: 1.250m ³ Gabion Mattress Reverment, L=50m Gabion Mattress Foot Protection: B=2m		6.8 (Excluding Cofferdam Cost)
13	50	Bazar-Korgon - Arstambap	15.6km	Riverbank Erosion				

24

4. Longlist/Shortlist of Road Disaster Prevention

4.2 Shortlist

Sample of Shortlist for Snow Disaster

No.	DEP #	Road	Sta. No. (Kilo Post)	Disaster	Site Photo	Structural/Nonstructural Measures	Image of the Measures	Cost (Millions KGS)
16	9	Bishkek-Osh	123.0km			Protection Wall L=50m		84.8
17	23	Bishkek-Osh	245.8km	Avalanche		Protection Wall L=60m		101.8
18	9	Bishkek-Osh	126.5-126.7km			Collector Snow Fence L=200m		19.0
19	9	Bishkek-Osh	127.4-127.7km	Snowdrift		Collector Snow Fence L=300m		28.5

* The type/cost of countermeasures against snow disaster will be modified after inspection during winter season.

25

4. Longlist/Shortlist of Road Disaster Prevention

4.2 Shortlist

Sample of Shortlist for Slope Disaster

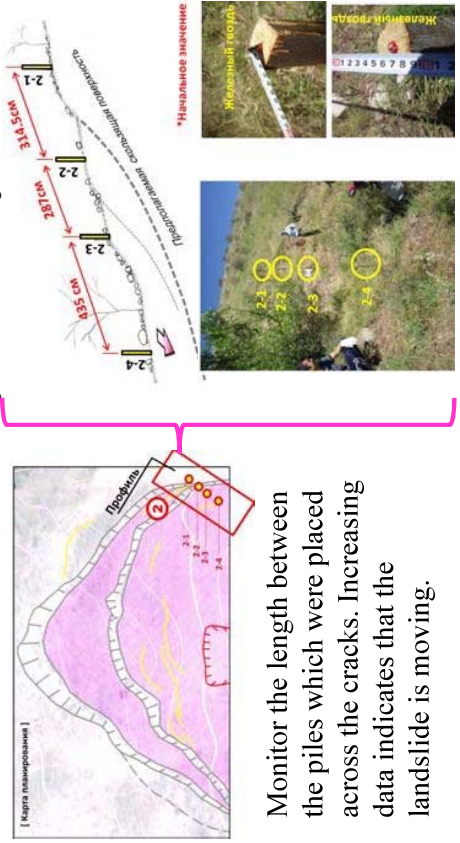
No.	DEP #	Road	Sta. No. (Kilo Post)	Disaster	Site Photo	Structural/Nonstructural Measures	Image of the Measures	Cost (Millions KGS)
1, 2, 3	9, 30	Bishkek-Osh	85.5km 86km 395km	Landslide		Monitoring (for 10 years)		0.8
4, 5, 6	959	OSI Road	60km 61km 70km			Protection net H=20m(Average), L=130m		40.7
7	9	Bishkek-Osh	116.5km	Rockfall		Concrete Pavement (Causeway), L=80m Retaining H=2m, L=20m Groundfill work: H=5m		27.2
11	30	Bishkek-Osh	423.5km	Debris flow		Embankment: 1.250m ³ Gabion Mattress Reverment, L=50m Gabion Mattress Foot Protection: B=2m		6.8 (Excluding Cofferdam Cost)
13	50	Bazar-Korgon - Arstambap	15.6km	Riverbank Erosion				

24

4. Longlist/Shortlist of Road Disaster Prevention

4.2 Shortlist

85.5~86km: BO Road (Monitoring for the activity of Landslide)

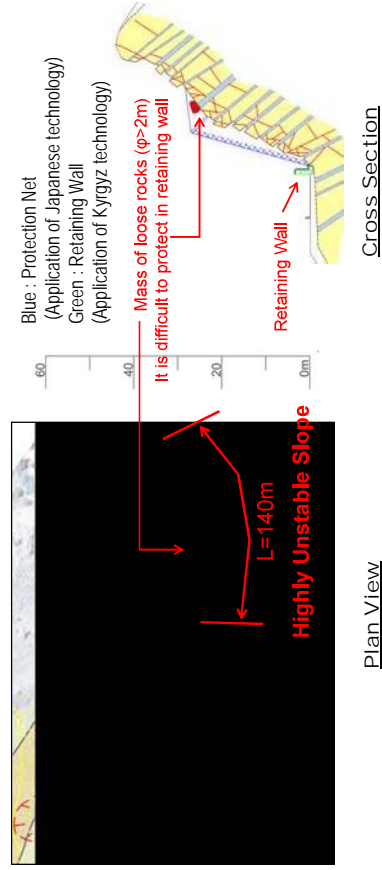


26

4. Longlist/Shortlist of Road Disaster Prevention

4.2 Shortlist

414.7km: BO Road (Countermeasures against Rockfall)



27

4. Longlist/Shortlist of Road Disaster Prevention

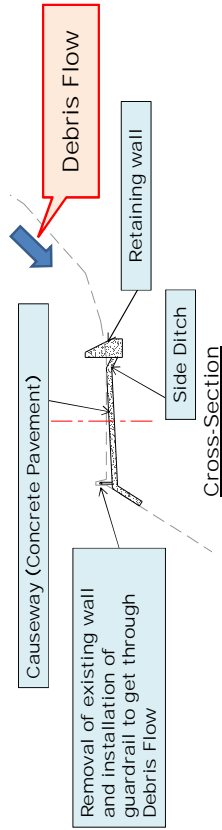
4.2 Shortlist

423.5km : BO Road (Countermeasures against Debris Flow)



Image of Causeway

Location of Causeway, L=80m

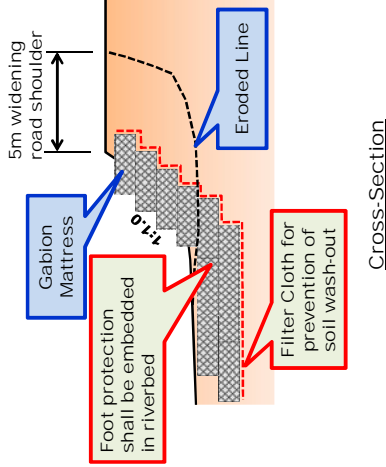


28

4. Longlist/Shortlist of Road Disaster Prevention

4.2 Shortlist

15.6km : Bazar-Korgon-Arstanbap Road (Countermeasures against Riverbank Erosion)

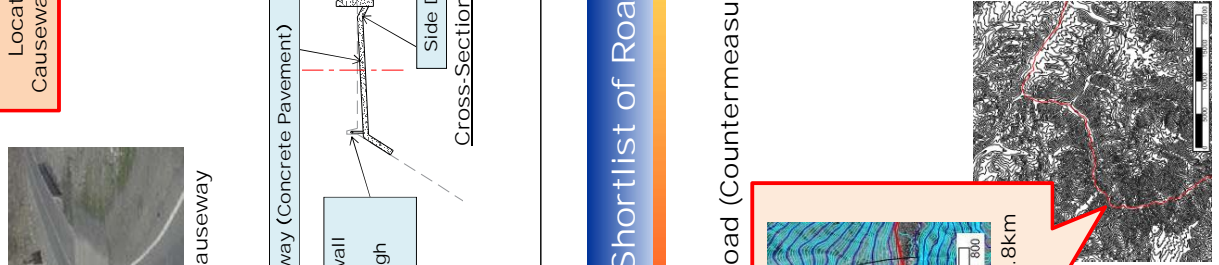


29

4. Longlist/Shortlist of Road Disaster Prevention

4.2 Shortlist

245.8 km : BO Road (Countermeasures against Avalanche)



- Applicable to the slope of less than 20 degree. (In case of steep slope, fence height becomes higher.)
- Prevention for full-depth avalanche and surface avalanche.

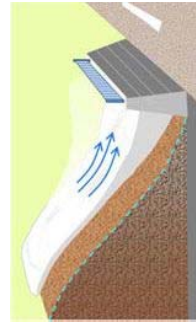


Image of Protection Wall

4. Longlist/Shortlist of Road Disaster Prevention

4.2 Shortlist

126.5 ~ 126.7km : BO Road (Countermeasures against Snowdrift)

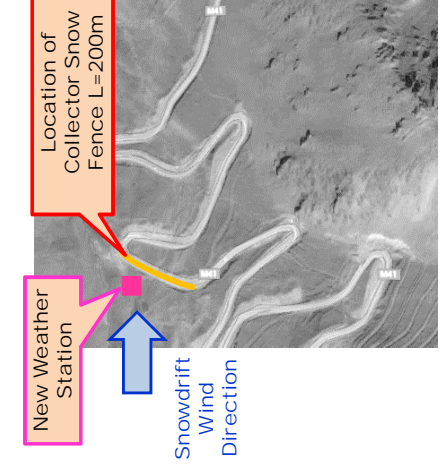


Image of Collector Snow Fence

Snow drifting due to downwash from the top of the slope. Visibility failure (Whiteout) is remarkable.
Snow Drift : Maximum 1.2m

30

31

5. Non-Structural Countermeasures against Road Disaster

5.1 List of Non-Structural Measures

Component of Evaluation		Continuity	Technical Difficulty	Notable Aspect*	Cost
Evolutional factor		1:yes, 0:no	1:low/0:high	1: N/A -1: yes	1:low 0:medium -1:high
Preparedness	Disaster monitoring / record	1	1	1	1
	Hazard / Alert	1	1	1	0
	Hazard map	1	0	1	1
	Alert / warning system	1	0	1	1
	Road Regulation	1	0	0	1
Sign	Road sign	0	1	1	1
	Sign board	0	1	1	0
	Electrical sign board	1	1	1	0
	Campaign	0	1	1	1
Mitigation	Education	0	1	1	1
	Artificial avalanche technique	0	1	1	0
	Artificial rock-fall technique	0	0	1	-1
Response	Disaster handling Ability	0	1	1	-1
	Heavy Equipment procurement	0	1	1	-1

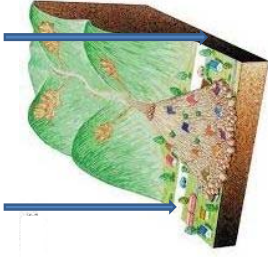
32

5. Non-Structural Countermeasures against Road Disaster

5.2 Sign Board Alert for debris flow area



Install both side of debris flow area



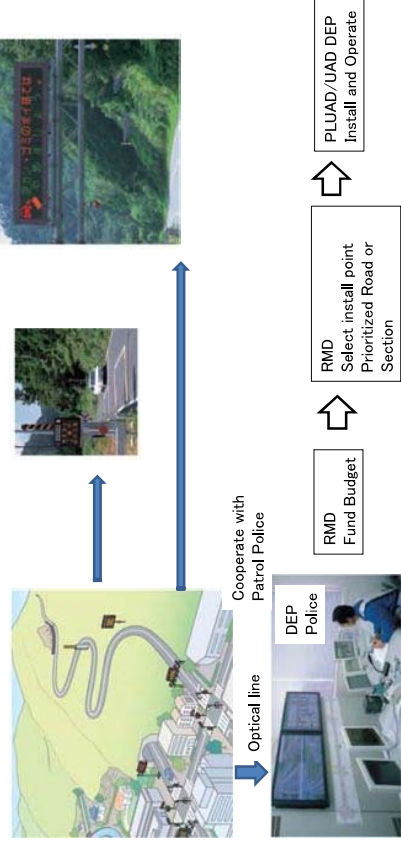
RMD Fund Budget

DEP / PLUAD UAD
Select install area by urgency

33

5. Non-Structural Countermeasures against Road Disaster

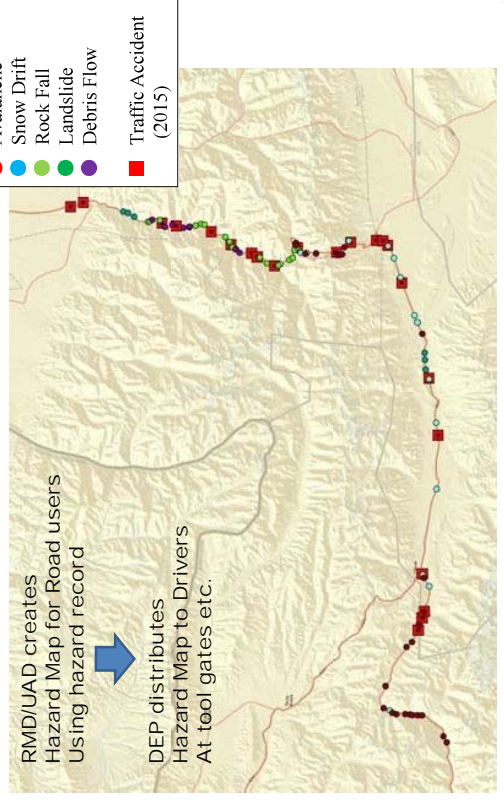
5.3 Electrical Sign Board



34

5. Non-Structural Countermeasures against Road Disaster

5.4 Hazard Map (Sample)



Hazard Distribution Map in DEP9

35

6. Meteorological Observation

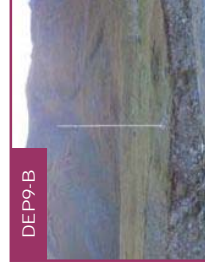
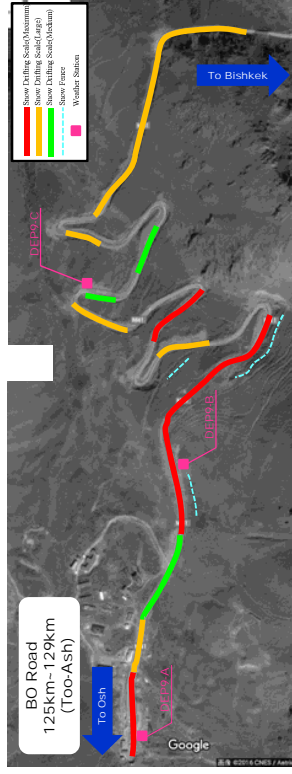
6.1 Time Schedule

Year	Month	Task
2016	June	<ul style="list-style-type: none"> Determination of Observation Condition Procurement of Pole Materials by BO-UAD
	July	<ul style="list-style-type: none"> Construction of Pole Foundation by BO- UAD (Too-Ash & Ala-Bel)
	August	<ul style="list-style-type: none"> Installation of Poles by BO-UAD (Too-Ash & Ala-Bel)
	September	
	October	<ul style="list-style-type: none"> Setting-up of Equipment for the Meteorological Observation by BO-UAD and JICE expert
	November	<ul style="list-style-type: none"> Start of the Meteorological Observation by BO-UAD

36

6. Meteorological Observation

6.2 Installed Location



37

6. Meteorological Observation

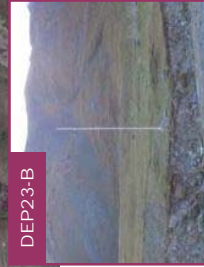
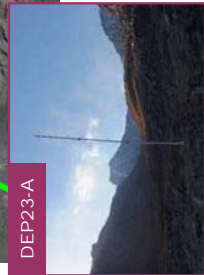
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	September	
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36

6. Meteorological Observation

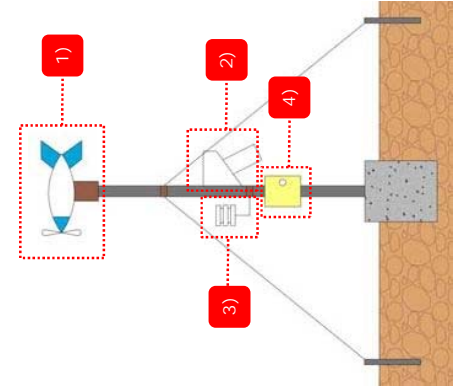
6.2 Installed Location



38

6. Meteorological Observation

6.3 Equipment for Meteorological Observation



39

7. Database Input & Data Collection

7.1 Purpose

- Data input & data browsing for the disaster inspection will be mastered by target PLUAD/UAD and DEPs.
- Inspection data of the road disaster prone area listed in Long List will be collected by target DEPs.

7.2 Number of Data Collection

DEP	Disaster Type							Total
	Falling Rock/ Bedrock Collapse	Slope Collapse/ Landslide	Debris Flow	Avalanche	Snow Drifting	River Bank Erosion		
DEP9	11	2	0	2	1	0	16	
DEP23	0	0	0	3	1	0	4	
DEP26	4	0	4	2	0	0	10	
DEP30	2	0	2	1	0	2	7	
DEP50	14	0	3	0	0	1	18	
DEP959	7	0	1	0	0	0	8	
Total	31	2	7	7	2	3	52	
	22	3	5	6	1	3	40	

RED: Collected Number

40

7. Database Input & Data Collection

7.3 Data Input Sample

13:18

contoplant_prototype160905 •
Форма инспекции по снежным лавинам
Inspection Sheet for Avalanche

название дороги Road Name	Bishkek-Osh	км Distance	233-225k
Дата инспекции Inspection Date	16.09.2016	широта N Latitude N	долгота E Longitude E
путь/участок Road Section	UAD_VO	деп DEP	23
Глубина сугроба Snow Depth		Уклон откоса Slope	40°<=4
Состояние растительности Vegetation Status	Отсутствие		
Азимут откоса Slope Azimuth	Юго-Запад/Юг/Юго-Восток		
Фото Photo	Фото-1 Photo 1	Фото-2 Photo 2	Фото-3 Photo 3
комментарий Comment	Данный район является зоной		
Имя инспектора Inspector Name	Аларбек		

Назад Back Карта Map Отправить Submit

41

2. Achievement of the Project

2.2 Achievement of Output-2

Output-2: Capacity of target UADs and DEPs for inspection and analysis of road disaster is enhanced			
Indicators	Achievement(%)		Achievement in April 2017
	Plan	Actual	
2-1. Road disaster hazard sections are determined with their feature and classification by target UADs and DEPs by [May 2017].	100	100	<ul style="list-style-type: none"> Road disaster hazard sections have been determined with their feature and classification. <p>Target in November 2017</p> <ul style="list-style-type: none"> Road disaster hazard sections will be reviewed, situationally.

4

2. Achievement of the Project

2.2 Achievement of Output-2

Output-2: Capacity of target UADs and DEPs for inspection and analysis of road disaster is enhanced			
Indicators	Achievement(%)		Achievement in April 2017
	Plan	Actual	
2-2. Inspection and Evaluation Manual for Road Disaster Prevention is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	40	40	<ul style="list-style-type: none"> Inspection and evaluation manual for road disaster prevention has been drafted. <p>Target in November 2017</p> <ul style="list-style-type: none"> Inspection and evaluation manual for road disaster prevention will be reviewed for more practical utilization nationwide.

5

2. Achievement of the Project

2.2 Achievement of Output-2

Output-2: Capacity of target UADs and DEPs for inspection and analysis of road disaster is enhanced			
Indicators	Achievement(%)		Achievement in April 2017
	Plan	Actual	
2-3. Countermeasures Manual for Road Disaster Prevention is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	40	40	<ul style="list-style-type: none"> Countermeasures manual for road disaster prevention has been drafted. <p>Target in November 2017</p> <ul style="list-style-type: none"> Countermeasures manual for road disaster prevention will be reviewed for more practical utilization nationwide.

6

2. Achievement of the Project

2.2 Achievement of Output-2

Output-2: Capacity of target UADs and DEPs for inspection and analysis of road disaster is enhanced			
Indicators	Achievement(%)		Achievement in April 2017
	Plan	Actual	
2-4. All the staff in target UADs and DEPs trained for inspection/evaluation and standard disaster prevention countermeasures based on the manuals pass the final exam prepared by the Project.	40	40	<ul style="list-style-type: none"> Staff of target UADs and DEPs were trained through the seminar, workshop, joint site inspection and preparation of manuals. <p>Target in November 2017</p> <ul style="list-style-type: none"> Staff of UADs and DEPs will be trained through the seminar, workshop, joint site inspection and review of manuals. Trained staff of UADs and DEPs will transfer their knowledge to other staff of UADs and DEPs through the manuals.

7

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in April 2017
	Plan	Actual	
3-1. A database format for information on road disaster prevention management planning (incl. costing for countermeasures) is prepared by RMD by [August 2016].	100	100	<ul style="list-style-type: none"> Database format for information on road disaster prevention management planning have been revised. <p>Target in November 2017</p> <ul style="list-style-type: none"> Database draft formats for information on road disaster prevention management planning will be reviewed, situationally.

8

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in April 2017
	Plan	Actual	
3-2. Practically usable Manual for Data Collection and Input is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	40	40	<ul style="list-style-type: none"> Practically usable manual for data collection and Input has been drafted. <p>Target in November 2017</p> <ul style="list-style-type: none"> Practically usable manual for data collection and Input will be reviewed for more practical utilization.

9

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in April 2017
	Plan	Actual	
3-3. Data collected and input by target UADs and DEPs are integrated to the database for prioritizing countermeasures and certified by RMD by [May 2017].	100	100	<ul style="list-style-type: none"> Collected data were integrated to the database for prioritizing countermeasures and certified. <p>Target in November 2017</p> <ul style="list-style-type: none"> Additional data will be integrated to the database for prioritizing countermeasures and certified.

10

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in April 2017
	Plan	Actual	
3-4. Staff of target UAD and DEPs trained for data collection and input based on the Manual pass the exam that evaluates their mastery in filling required information in database format.	60	60	<ul style="list-style-type: none"> Staff of target UADs and DEPs were trained through the seminar, workshop, joint site inspection and preparation of manual. <p>Target in November 2017</p> <ul style="list-style-type: none"> Staff of UADs and DEPs will be trained through the seminar, workshop, joint site inspection and review of manuals. Trained staff of UADs and DEPs will transfer their knowledge to other staff of UADs and DEPs through the manuals.

11

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in April 2017
	Plan	Actual	
3-5: Database Management System that contains information necessary for road disaster prevention management in the project area is developed for preparing budget by RMD by [May 2017].	100	100	<p>● Database management system has been developed.</p> <p>Target in November 2017</p> <p>● Database management system will be improved/updated as the occasion demands.</p>

12

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in April 2017
	Plan	Actual	
3-6: Practically usable Manual for Database Operation is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	40	40	<p>● Practically usable manual for database operation has been drafted.</p> <p>Target in November 2017</p> <p>● Practically usable manual for database operation will be reviewed.</p>

13

2. Achievement of the Project

2.4 Achievement of Output-4

Output-4: Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced

Indicators	Achievement(%)		Achievement in April 2017
	Plan	Actual	
4-1: Nation-wide management criteria for road disaster prevention is developed by RMD by [May 2017].	100	100	<p>● Nation-wide management criteria for road disaster prevention have been developed.</p> <p>Target in November 2017</p> <p>● Nation-wide management criteria for road disaster prevention will be reviewed, as necessary.</p>

14

2. Achievement of the Project

2.4 Achievement of Output-4

Output-4: Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced

Indicators	Achievement(%)		Achievement in April 2017
	Plan	Actual	
4-2: Short-Term Road Disaster Prevention Management Plan (urgent response plan) with cost estimation for road disaster prevention management of the target area is prepared by RMD by [September 2017 and September 2018].	30	30	<p>● Short-term road disaster prevention management plan has been prepared.</p> <p>Target in November 2017</p> <p>● Short-term road disaster prevention management plan will be revised to suit the situation.</p>

15

2. Achievement of the Project

2.4 Achievement of Output-4

Output-4: Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced		Achievement in April 2017	
Indicators	Achievement(%)	Plan	Actual
		4-3. Preparation Manual for Short-Term and Medium-Term Road Disaster Prevention Management Plans is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	40
		Target in November 2017	
			<ul style="list-style-type: none"> Preparation manual for short-term and medium-term road disaster prevention management plans will be reviewed, as necessary.

16

3. Amendment of PDM

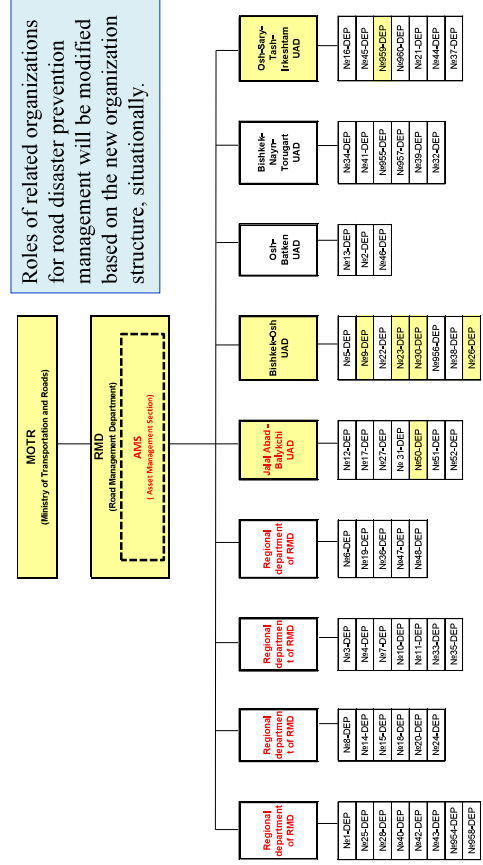
3.1 Review Points

- A part of target organization name in this Project was changed (PLUAD-6 was changed to Jalal Abad- Balykchi UAD)
- Activities related Output-2, Output-3 and Output-4 was modified.

17

3. Amendment of PDM

New MOTR Road Management Department Structure



Implementation Agency and Organization of the Project

RED: Review Points

18

3. Amendment of PDM

3.2 Activities

【Activities related Output-2】

2-2. To draft, review and finalize an Inspection Manual indicating check points for road disaster prevention **in consideration with disaster types not only on target roads but also on local roads** by RMD.

2-5. To draft, review and finalize a Countermeasures Manual for road disaster prevention including cost estimation to prepare budget **plan in consideration with disaster types not only on target roads but also on local roads** by RMD, UADs and DEPs.

RED: Review points

19

3. Amendment of PDM

3.2 Activities

【Activities related Output-3】

3-2. To establish the procedure for data input and reporting **while enhancing cooperativeness of existing databases** by RMD.

【Activities related Output-4】

4-1. To establish **priority criteria** for road disaster prevention **in consideration with the balance of the overall budget plan for the road sector** by RMD.

4-3. To prepare Short-Term Road Disaster Prevention Management **Plan in consideration with the balance of the overall budget plan for the road sector**.

RED: Review points

20

4. Preparation of the Manuals

4.1 Contents of Inspection Manual for Road Disaster Prevention (Output-2)

CHAPTER 1	INTRODUCTION
1.1	General
1.2	Outline of Road Disaster Prevention Management System in Kyrgyz
CHAPTER 2	TYPE OF ROAD DISASTERS
2.1	Classification and Type of Occurrence of Road Disasters
CHAPTER 3	INSPECTION AND EVALUATION
3.1	General
3.2	Inspection Method of Road Disasters
3.3	Monitoring of Road Disaster
3.4	Evaluation of Road Disaster

21

4. Preparation of the Manuals

4.2 Contents of Countermeasures Manual for Road Disaster Prevention (Output-2)

CHAPTER 1	INTRODUCTION
CHAPTER 2	TYPE OF ROAD DISASTERS
CHAPTER 3	COUNTERMEASURES AGAINST ROCKFALL
CHAPTER 4	COUNTERMEASURES AGAINST LANDSLIDE
CHAPTER 5	COUNTERMEASURES AGAINST SLOPE COLLAPSE
CHAPTER 6	COUNTERMEASURES AGAINST DEBRIS FLOW
CHAPTER 7	COUNTERMEASURES AGAINST RIVERBANK EROSION
CHAPTER 8	COUNTERMEASURES AGAINST AVALANCHE
CHAPTER 9	COUNTERMEASURES AGAINST SNOWDRIFT
CHAPTER 10	NON-STRUCTURAL MEASURES AGAINST ROAD DISASTER

22

4. Preparation of the Manuals

4.3 Contents of Database System Manual for Road Disaster Prevention (Output-3)

CHAPTER 1	GENERAL
1.1	Structure of Database
1.2	Kind of Database Information
CHAPTER 2	HOW TO INPUT THE DATA INTO EACH INFORMATION
2.1	Adding New Site to Disaster List
2.2	Inspection/Countermeasure List
2.3	Inspection Sheet
CHAPTER 3	ROAD DISASTER DATABASE SYSTEM (DATA BROWSING)
3.1	General
3.2	Road Disaster Database System (Data Browsing)

23

4. Preparation of the Manuals

4.3 Contents of Preparation Manual for Short-Term and Medium-Term Road Disaster Prevention Management Plan (Output-4)

CHAPTER 1	GENERAL
CHAPTER 2	EVALUATION OF HAZARD LEVEL
CHAPTER 3	EVALUATION OF ROADWAY PRIORITY
CHAPTER 4	PREPARATION OF SHORT-TERM AND MEDIUM-TERM ROAD DISASTER PREVENTION MANAGEMENT PLAN
CHAPTER 5	DOCUMENTATION OF BUDGETARY REQUEST

24

5. Database Seminar

5.1 Description

- Technical cooperation between MOTR and KSUCTA was consented on November 2, 2016 with support from Mr. Tanaka (JICA Road Administration Advisor) and the Project Team.
- In response to this, the 7 seminars on database development for road disaster prevention were held in KSUCTA from November 2016 to March 2017.
- Total 19 students of KSUCTA could learn the knowledge of database development such as general information of database software (FileMaker) and development method of database system through the seminars and mini exam.

25

5. Database Seminar

5.2 Seminar Schedule and Activities

Seminar No.	Date	Duration	Activity description
1	October 30 th 2016	2 hours	Introduction Course Introduction and Lecture of general information for the database development using FileMaker.
2	December 1 st 2016	2 hours	General Course for the Project Implementation Detailed information for the parts and components (model, script and algorithm) for database development.
3	December 14 th 2016	2 hours	Database Development Course Using FileMaker. (Practice Lessons 1) 1) General Description DBOS (Database Operation System). 2) Menu Contents (menu, sublevels, forms) of FileMaker Software. 3) Description of FileMaker Detailed Contents.
4	February 14 th 2017	2 hours	Database Development Course Using FileMaker. (Practice Lessons 2) 1) Form creation and script creation (program) for interaction between the forms. 2) Table creation (disaster type, disaster category) and table content (number, text). 3) Reference use by category for screen change(model).
5	February 28 th 2017	2 hours	Database Development Course Using FileMaker. (Practice Lessons 3) 1) Data base fields presentation as graph elements in the model. Elements - label, edit box, drop-down list, check box, radio button, drop-down calendar. 2) Presentation format of data base data in model. 3) Result presentation of the model.
6	March 23 th 2017	2 hours	Database Development Course Using FileMaker. (Practice Lessons 4) 1) Data import Excel files to data base. 2) Export Data presentation on the model. 3) Work result presentation on the model.
7	March 27 th 2017	2 hours	Final Course (Mini Exam) Knowledge testing

26

5. Database Seminar

5.3 Seminar Photos



[No. 1]: Introduction of DB Seminar



[No.3]: Situation of Seminar



[No.2]: Presentation of DB Development



[No.4]: Practical Lesson

THE PROJECT FOR CAPACITY DEVELOPMENT FOR ROAD DISASTER PREVENTION MANAGEMENT IN THE KYRGYZ REPUBLIC 4th Joint Coordinating Committee



Table of Contents

1. Outline of the Project
2. Achievement of the Project
3. Amendment of PDM
4. Road Disaster Prevention Management Plan
5. Non-Structural Measures
6. Expert Training System for Road Disaster Prevention

1. Outline of the Project

Phase	2016			2017			2018			2019				
	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Phase-1	Development of Basic Skills and Knowledge													
Output-1	Formulation of Responsibilities of MOTR, HQ, RMD, UADs and DEUs on road disaster prevention become clear.													
Output-2	Capacity of target UADs and DEUs for inspection and analysis of road disaster is enhanced.													
Output-3	Capacity of RMD to Operationalize Database Management System for road disaster prevention is developed.													
Output-4	Capacity of RMD for Preparing road disaster prevention management plans of the target areas is enhanced.													
Other Activities	JCC													
Japan Training Meeting / Seminar														
Report														

2. Achievement of the Project

2.1 Achievement of Output-1

Output-1: Responsibilities of MOTR on road disaster prevention, including specific duties to be performed by relevant units (HQ, RMD, UADs, and DEUs) with necessary staffing in each, become clear.

Indicators	Achievement(%)		Achievement in October 2017
	Plan	Actual	
1-1. Roles of MOTR HQ, RMD, target UADs and DEUs for road disaster prevention management are specified by MOTR.	40	40	<ul style="list-style-type: none"> Roles of related organizations for road disaster prevention management is being drafted.
			<p>Target in April 2018</p> <ul style="list-style-type: none"> Roles of related organizations for road disaster prevention management will be reviewed.

2. Achievement of the Project

2.2 Achievement of Output-2

Output-2: Capacity of target UADs and DEUs for inspection and analysis of road disaster is enhanced			
Indicators	Achievement(%)		Achievement in October 2017
	Plan	Actual	
2-1. Road disaster hazard sections are determined with their feature and classification by target UADs and DEUs by [May 2017].	100	100	<ul style="list-style-type: none"> Road disaster hazard sections was determined with their feature and classification. <p>Target in April 2018</p> <ul style="list-style-type: none"> Road disaster hazard sections will be reviewed, situationally.

4

2. Achievement of the Project

2.2 Achievement of Output-2

Output-2: Capacity of target UADs and DEUs for inspection and analysis of road disaster is enhanced			
Indicators	Achievement(%)		Achievement in October 2017
	Plan	Actual	
2-2. Inspection and Evaluation Manual for Road Disaster Prevention is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	80	80	<ul style="list-style-type: none"> Inspection and evaluation manual for road disaster prevention was drafted. <p>Target in April 2018</p> <ul style="list-style-type: none"> Inspection and evaluation manual for road disaster prevention will be reviewed

5

2. Achievement of the Project

2.2 Achievement of Output-2

Output-2: Capacity of target UADs and DEUs for inspection and analysis of road disaster is enhanced			
Indicators	Achievement(%)		Achievement in October 2017
	Plan	Actual	
2-3. Countermeasures Manual for Road Disaster Prevention is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	80	80	<ul style="list-style-type: none"> Countermeasures manual for road disaster prevention was drafted. <p>Target in April 2018</p> <ul style="list-style-type: none"> Countermeasures manual for road disaster prevention will be reviewed

6

2. Achievement of the Project

2.2 Achievement of Output-2

Output-2: Capacity of target UADs and DEUs for inspection and analysis of road disaster is enhanced			
Indicators	Achievement(%)		Achievement in October 2017
	Plan	Actual	
2-4. All the staff in target UADs and DEUs trained for inspection/evaluation and standard disaster prevention countermeasures based on the manuals pass the final exam prepared by the Project.	60	60	<ul style="list-style-type: none"> 72 Staff of target UADs and DEUs were trained through the seminar, workshop, joint site inspection and preparation of manuals. <p>Target in April 2018</p> <ul style="list-style-type: none"> Staff of UADs and DEUs will be trained through the seminar, workshop, joint site inspection and review of manuals. Non-structural measures will be discussed as an instance of avalanche disaster at 255km on BO-Road. As a result, the necessity and importance of non-structural measures for the secondary disaster prevention activities cooperated with other organizations including MES will be reflected to the manual.

7

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in October 2017
	Plan	Actual	
3-1. A database format for information on road disaster prevention management planning (incl. costing for countermeasures) is prepared by RMD by [August 2016].	100	100	<ul style="list-style-type: none"> Database format for information on road disaster prevention management planning was revised. <p>Target in April 2018</p> <ul style="list-style-type: none"> Database draft formats for information on road disaster prevention management planning will be reviewed, situationally.

8

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in October 2017
	Plan	Actual	
3-2. Practically usable Manual for Data Collection and Input is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	80	80	<ul style="list-style-type: none"> Practically usable manual for data collection and Input was drafted and reviewed. <p>Target in April 2018</p> <ul style="list-style-type: none"> Practically usable manual for data collection and Input will be reviewed for more practical utilization.

9

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in October 2017
	Plan	Actual	
3-3. Data collected and input by target UADs and DEUs are integrated to the database for prioritizing countermeasures and certified by RMD by [May 2017].	100	100	<ul style="list-style-type: none"> Collected data were integrated to the database for prioritizing countermeasures and certified. <p>Target in April 2018</p> <ul style="list-style-type: none"> Additional data will be integrated to the database for prioritizing countermeasures and certified as needed.

10

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in October 2017
	Plan	Actual	
3-4. Staff of target UAD and DEUs trained for data collection and input based on the Manual pass the exam that evaluates their mastery in filling required information in database format.	80	80	<ul style="list-style-type: none"> 33 Staff of RMD, UADs and DEUs were trained through the seminar, workshop, joint site inspection and review of manuals. Trained staff of UADs and DEUs transferred their knowledge to other 5 staff of RMD, UADs and DEUs through the manuals or seminar. 11 Staff of UADs and DEUs passed the mini exam that evaluates their master in filling required information in database format. <p>Target in April 2018</p> <ul style="list-style-type: none"> Trained staff of UADs and DEUs will transfer their knowledge to other staff (more than 15staff) of UADs and DEUs through the manuals. 20 Staff of UADs and DEUs passed the mini exam that evaluates their master in filling required information in database format.

11

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in October 2017
	Plan	Actual	
3-5. Database Management System that contains information necessary for road disaster prevention management in the project area is developed for preparing budget by RMD by [May 2017].	100	100	<ul style="list-style-type: none"> Database management system was developed. <p>Target in April 2018</p> <ul style="list-style-type: none"> Database management system will be improved/updated as the occasion demands.

12

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed

Indicators	Achievement(%)		Achievement in October 2017
	Plan	Actual	
3-6. Practically usable Manual for Database Operation is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	80	80	<ul style="list-style-type: none"> Practically usable manual for database operation was drafted and reviewed. <p>Target in April 2018</p> <ul style="list-style-type: none"> Practically usable manual for database operation will be reviewed.

13

2. Achievement of the Project

2.4 Achievement of Output-4

Output-4: Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced

Indicators	Achievement(%)		Achievement in October 2017
	Plan	Actual	
4-1. Nation-wide management criteria for road disaster prevention is developed by RMD by [May 2017].	100	100	<ul style="list-style-type: none"> Nation-wide management criteria for road disaster prevention was developed. <p>Target in April 2018</p> <ul style="list-style-type: none"> Nation-wide management criteria for road disaster prevention will be reviewed, as necessary.

14

2. Achievement of the Project

2.4 Achievement of Output-4

Output-4: Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced

Indicators	Achievement(%)		Achievement in October 2017
	Plan	Actual	
4-2. Short-Term Road Disaster Prevention Management Plan (urgent response plan) with cost estimation for road disaster prevention management of the target area is prepared by RMD by [September 2017 and September 2018].	30	30	<ul style="list-style-type: none"> Short-term road disaster prevention management was prepared with the revision of the prioritization procedure. <p>Target in April 2018</p> <ul style="list-style-type: none"> Short-term road disaster prevention management plan will be revised to suit the situation. MOTR will explain the short-term road disaster prevention management plan to MOF to promote budgeting for road disaster prevention. Publication skill will be enhanced by delivering the information using SNS & the hazard map.

15

2. Achievement of the Project

2.4 Achievement of Output-4

Output-4: Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced	
Indicators	Achievement(%)
	Plan Actual
4-3. Preparation Manual for Short-Term and Medium-Term Road Disaster Prevention Management Plans is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	40 40
Achievement in October 2017	
<ul style="list-style-type: none"> Preparation manual for short-term and medium-term road disaster prevention management plans was prepared. 	
Target in April 2018	
<ul style="list-style-type: none"> Preparation manual for short-term and medium-term road disaster prevention management plans will be reviewed, as necessary. The ability for the preparation of the countermeasures among RMD and UADs will be enhanced by the training using the revised preparation manual. 	

16

2. Achievement of the Project

2.5 Draft of Manuals

Inspection & Evaluation

Countermeasures

Planning

Database system



17

3. Amendment of PDM

3.1 Review Points

Inputs of "The Japanese Side" was amended for effective capacity development for road disaster prevention management in Kyrgyz Republic.

Additional Inputs of "The Japanese Side"	Related/Enhanced Output and Indicator
1. Experts	
• Construction Supervisor	Output-2, Indicator: 2-1,2-2 (To supervise the pilot project for snowdrift)
• Database Expert (2)	Output-3, indicator: 3-2 (To enhance cooperativeness of existing databases)
• Topographic Survey Expert	Output-2, Indicator: 2-1,2-2 (To enhance the skill for observation of landslide)
• Landslide Observation Expert	Output-2, Indicator: 2-1,2-2 (To enhance the skill for observation of landslide)
• Japan Training Assistant	All Output (To smooth and promote the efficacy of Japan Training)
2. Pilot Project for Snowdrift	Output-2, Indicator: 2-1,2-2 (To install snow fence for analysis of snowdrift phenomenon)

18

4. Road Disaster Prevention Management Plan

ショートリストの概要1 (構造物対策)

DEP	損傷・被害種別数				緊急性の判定数	対策費用C (Million \$ (KGS))	通行止め回避数 (想定)		交通量 (仮に1ヶ月設定) 費用B (Million \$/日)	通行止め回避率 (KGS)	費用と効果 B/C	資金調達
	地すべり	土石流	河川沿岸	雪崩			吹雪	3日以下				
DEP 9	2	2		1	AA 緊急	181.9	2	2	3,000	370	2	
DEP 23	1			1	(3) (JIC A)	102.8		2	3,000	336	3	
DEP 30	1	2			5	103.2	4	1	3,000	152	1	
DEP 26									1,000	0		
DEP 50			3		3	20.4	3	3	1,000	84	4	
DEP 959	3	1			4	13.9	1	2	2,000	235		(17)助成金削減のため参考
合計	6	5	3	3	2	422	7	8				

- 事業化にはこのようなリストを作成して予算化の議論が必要
- このリストを使用すれば自国で資金調達できるか、ドナーを要請するか議論できる

19

4. Road Disaster Prevention Management Plan

ショートリストの概要2 (構造物対策)

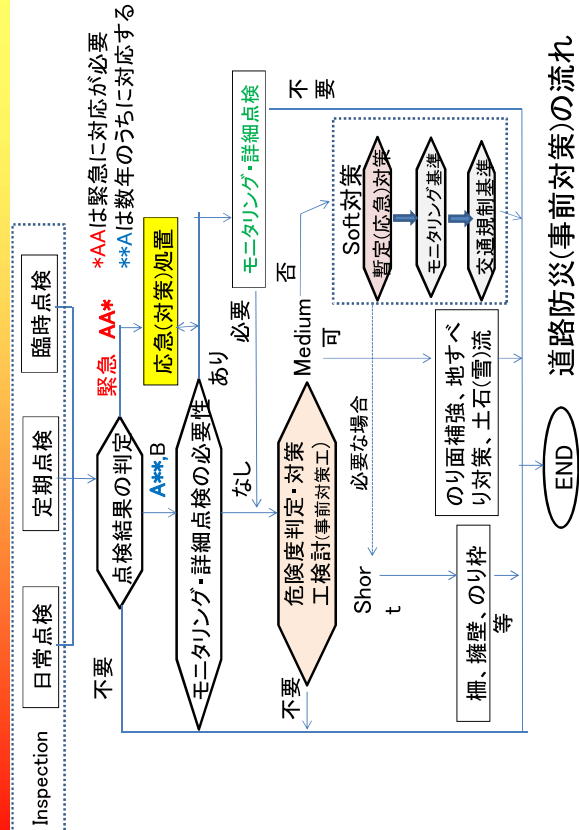
DEP	損傷・被害の特徴	写	真
DEP 9	<ul style="list-style-type: none"> ・85.5kmの地すべりは、移動速度が大きく崩壊の危険性高い、崩壊する河川を堰き止めダムアップし決壊すると下流域に被害が及ぶ。復旧に長期間(1ヶ月以上)の通行止めが生じかつ迂回路がない(AA) ・86kmに85.5kmと類似した地すべりがあり動態観測が必要 ・93km落石 擁壁が崩壊やオーバーフローし、機能せず利用者被害を与え危険が高く早期対応が必要(AA) ・123km雪害 数年に1回程度雪崩が発生し交通止めも発生している ・126.6km,127.5km,129.2km吹雪箇所はJICA支援が確定 		
DEP 23	<ul style="list-style-type: none"> ・245.8km毎年通行止めを伴う雪崩が発生し人命被害あり ・262km大きな巨石が不安定な状態にあり、落石も発生している。崩壊すると1ヶ月を超える通行止めが想定される。 		

4. Road Disaster Prevention Management Plan

ショートリストの概要2 (構造物対策)

DEP	損傷・被害の特徴	写	真
DEP 30	<ul style="list-style-type: none"> ・424.8kmに規模の大きな落石が頻発している ・422km,423.5kmで降雨時に通行止めとなる土石流が頻発している ・395km地すべりの動態観測が必要 		
DEP 26	<ul style="list-style-type: none"> ・雪害による2ヶ月間の交通止め(2009,12~2010,2)にあった。 ・河川の護岸浸食や落石や土石流の箇所が多くある。 		
DEP 50	<ul style="list-style-type: none"> ・15.6km,40.1km,40.2km 道路脇の河川護岸のエロージョンの損傷が著しく、進行中で道路への影響が及ぶと通行止めとなる 		
DEP 959	<ul style="list-style-type: none"> ・60km,61km,70kmに地すべりがあり特に61kmは崩壊すると1ヶ月を超える通行止めが想定される。早急に動態観測する必要がある。 ・96kmに土石流の箇所がある。 		

4. Road Disaster Prevention Management Plan



4. Road Disaster Prevention Management Plan

「応急対策処置(緊急)」とは

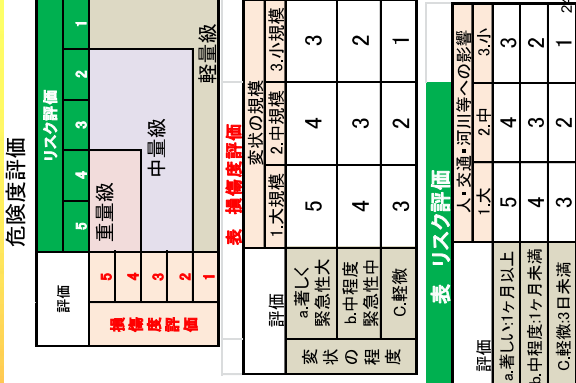
「応急対策処置(緊急)」とは、変状が著しく、機能面への影響が高く、安全な交通または第三者に対し支障となる恐れがあり緊急的な対策が必要な場合をいう。

「応急対策処置(緊急)」の場合は、ただちに必要な変状の監視、交通規制、の体制を整え、応急(対策)処置を実施する。

4. Road Disaster Prevention Management Plan

危険度を判定し年度計画の優先度の判断をする

◇危険度はリスク評価と損傷度評価の点数で判定する(10点満点)



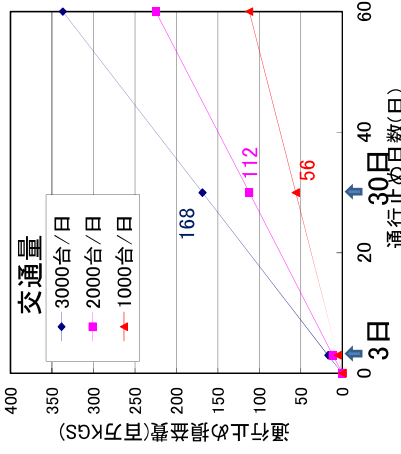
○損傷度評価は、損傷の程度(緊急性)、被害の規模で評価

○リスク評価は、通行止め期間 第三者被害で評価

4. Road Disaster Prevention Management Plan

通行止めによる損益費

～損益費は交通量と通行止め日数に比例して増える～



災害が発生すると通行止めによる損益費が生じるが、事前対策するとその損益を回避できる

5. Non-Structural Measures

Monitoring the Natural Disasters	Prepare the Natural Disasters	Publication of Road Conditions
Predict the Disaster Clarification of the Disaster	Speed Up the Road Cleaning and Road Regulation Period	Inform the Real-time Road condition to all the Stakeholders
Landslide Monitoring Snow Drift Monitoring	Meteorological Data Collection Enhancement of the heavy Equipment Control Heavy Equipment by GPS	Publication of the Road Disaster Information Using SNS

【Output-2】 Capacity of target PLUADs/IADs and DEUs for inspection and analysis of road disaster is enhanced.

5. Non-Structural Measures

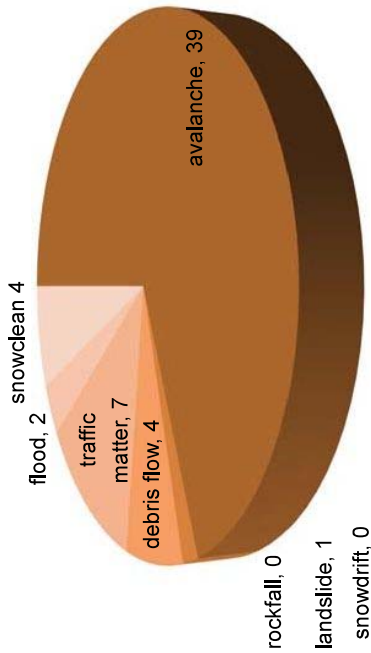
Landslide Monitoring 85.5 -86.0 K	Snow Drift Monitoring 126.5-129.3 K
To Measure the Movement of the Ground for the Emergency Situation	To Measure the Meteorological data for Detailed Design of Structural Measures
To prevent collapse which needs 1 year treatment	To prevent Road Close from abundant Snow Drift

5. Non-Structural Measures

Causes of the Road Close

BOUAD Jurisdiction 2014 - 2017

Total 57 times

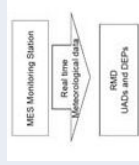


times

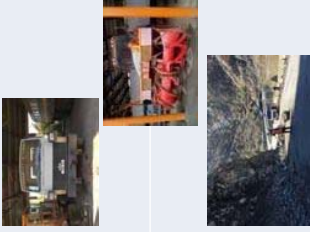
28

5. Non-Structural Measures

Share the Real-time Meteorological Data with MES



Heavy Equipment Installation



Heavy Equipment Management by GPS



Preparedness for Road Clean up
Correlate with disaster record
Establish protocol for disaster

Speed up the clean up activity by Sufficient Equipment

To manage the Heavy Equipment precisely
Share the Heavy Equipment in the DEUs

29

5. Non-Structural Measures

BOUAD Road Condition Information

by Facebook from MoTR

DEUs(9,23,30,50) and other road use Stakeholders

SNS Sender BOUAD use only existing Device and Staff (No additional manpower or equipment)

SNS Media Facebook



Sample Message

Message Send Time
Road Close (Start, Progress, End)
Road Disaster Alert Message (Bad Weather)
Road Condition (Obstacles, Freezing, Wet, Etc.)

30

5. Non-Structural Measures

BO-Road Hazard Map and Safety Guide Leaflet

Purpose Inform the road disaster to the Public

Creator BOUAD use only existing Device and Staff

Distributor At Tool Gates and Public Space by BOUAD, DEUs

Subject Drivers, Students, etc.



Sample

ROAD DISASTER HAZARD MAP of DEU #*
Safety Drive for your Families!

31

5. Non-Structural Measures

Road Close Case

Disaster

Road Close

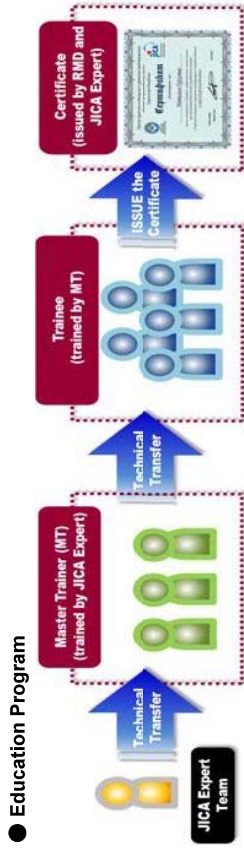
Clean Up Progress

Road Open



30

6. Expert Training System for Road Disaster Prevention

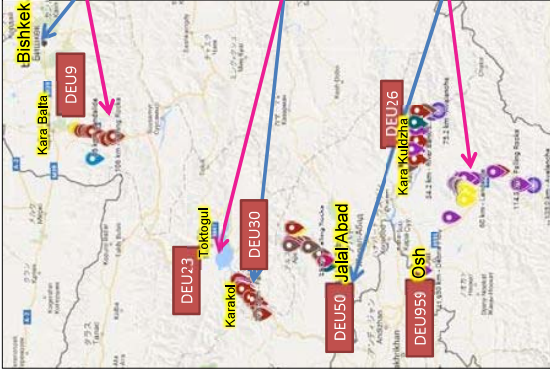


● **Number of Required Master Trainer for Road Disaster Prevention**

Master Trainer	Candidates of Master Trainer			Other PLUAD/UAD (DEUs)
	BO-UAD (DEU9, DEU23, DEU26, DEU30)	OSI-UAD (DEU959)	PLUAD6 (DEU50)	
Slope Disaster	3	3	3	6
Snow Disaster	3			

32

6. Expert Training System for Road Disaster Prevention



Lecture and Field training course in Bishkek
Introduction and the Lecture : Bishkek city(MOTR Head office)
Field training / Reporting and Testing: BO-road and DEU9
 Participants : BO-UAD (DEU9)

Lecture and Field training course in Jalal Abad region
Introduction and the Lecture : Kara-Köl city (BO UAD)
Field training / Reporting and Testing : Bishkek-Osh road
 Participants : BO-UAD (DEU23, DEU30)

Lecture and Field training course in Osh
Introduction and the Lecture : Osh city (OSI UAD)
Field training / Reporting and Testing : Osh-road and DEU 959, DEU 50, DEU 26
 Participants : OSI UAD (DEU959), UAD JAB/PLUAD 6 (DEU 50), BO UAD (DEU 26)

6. Expert Training System for Road Disaster Prevention

SAMPLE OF TRAINING FOR SLOPE PROTECTION

1st DAY

(Get together to UAD Office)

- PM
 【Introduction and the lecture of manuals】
1. INTRODUCTION OF TESTING AND CERTIFICATE PROGRAM
 2. ABOUT SLOPE DISASTER (60MIN)
 3. INSPECTION & EVALUATION METHOD OF SLOPE DISASTER (90MIN)
 4. COUNTERMEASURES AGAINST SLOPE DISASTER (60MIN)

2nd DAY

AM

【Field Training】

- (Moving to the site)
1. INSPECTION METHOD OF DISASTRE SITE (30MIN)
 2. PRACTICAL TRAINING AT ONE OF THE DISASTER RISC SITE(90MIN)

PM

(Moving to the DEU Office)

- 【Reporting and Testing】
1. REPORTING FOR TRAINING AT THE SITE (60MIN)
 2. TEST OF INSPECTION AND COUNTERMEASURES FOR SLOPE DISASTER (60MIN)
 3. EVALUATION OF RESULT OF TEST AND REVIEW (30MIN)
 4. CERTIFICATION FOR TRAINER (30MIN)

34

THE PROJECT FOR CAPACITY DEVELOPMENT FOR ROAD DISASTER PREVENTION MANAGEMENT IN THE KYRGYZ REPUBLIC

5th Joint Coordinating Committee



Table of Contents

1. Outline of the Project
2. Achievement of the Project
3. Training Program by Master Trainer
4. Short-term Road Disaster Prevention Management Plan
5. Countermeasure Plan at 85.5km on BO Road
6. SNS Information System
7. Hazard Map Distribution Plan

1. Outline of the Project

Phase	2016			2017			2018			2019				
	4	5	6	7	8	9	10	11	12	1	2	3	4	5
Phase-1	Development of basic Skills and Knowledge													
Phase-2	Trial Implementation													
Phase-3	Sustainable Implementation													
Output-1	Responsibilities of MOTR (HQ, RMD, UADs, DEUs) on road disaster prevention become clear.													
Output-2	Capacity of target UADs and DEUs for inspection and analysis of road disaster is enhanced.													
Output-3	Capacity of RMD to Operationalize Database Management System for road disaster prevention is developed.													
Output-4	Capacity of RMD for Preparing road disaster prevention management plans of the target areas is enhanced.													
Other Activities	JCC													
Japan Training Meeting / Seminar														
Report														

2. Achievement of the Project

2.1 Achievement of Output-1

Output-1: Responsibilities of MOTR on road disaster prevention, including specific duties to be performed by relevant units (HQ, RMD, UADs, and DEUs) with necessary staffing in each, become clear.	Achievement(%)		Achievement in April 2018
	Plan	Actual	
Indicators Roles of MOTR HQ, RMD, target UADs and DEUs for road disaster prevention management are specified by MOTR.	60	60	Planned Target in April 2018* <ul style="list-style-type: none"> Roles of related organizations for road disaster prevention management will be reviewed, situationally. Achievement in April 2018 <ul style="list-style-type: none"> Roles of related organizations for road disaster prevention management is reviewed.
			Target in November 2018 <ul style="list-style-type: none"> Roles of related organizations for road disaster prevention management will be finalized.

*This target was set in the Monitoring Sheet ver-4

2. Achievement of the Project

2.2 Achievement of Output-2

Output-2: Capacity of target UADs and DEUs for inspection and analysis of road disaster is enhanced			
Indicators	Achievement(%)		Achievement in April 2018
	Plan	Actual	
2-1. Road disaster hazard sections are determined with their feature and classification by target UADs and DEUs by [May 2017].	100	100	<p>Planned Target in April 2018*</p> <ul style="list-style-type: none"> Road disaster hazard sections will be reviewed, situationally. <p>Achievement in April 2018</p> <ul style="list-style-type: none"> Road disaster hazard sections were reviewed. <p>Target in November 2018</p> <ul style="list-style-type: none"> Road disaster hazard sections will be reviewed, situationally.

*This target was set in the Monitoring Sheet ver.4

4

2. Achievement of the Project

2.2 Achievement of Output-2

Output-2: Capacity of target UADs and DEUs for inspection and analysis of road disaster is enhanced			
Indicators	Achievement(%)		Achievement in April 2018
	Plan	Actual	
2-2. Inspection and Evaluation Manual for Road Disaster Prevention is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	80	80	<p>Planned Target in April 2018</p> <ul style="list-style-type: none"> Inspection and evaluation manual for road disaster prevention will be reviewed, situationally. <p>Achievement in April 2018</p> <ul style="list-style-type: none"> Inspection and evaluation manual for road disaster prevention was reviewed. <p>Target in November 2018</p> <ul style="list-style-type: none"> Inspection and evaluation manual for road disaster prevention will be finalized through the training program by Master Trainers.

*This target was set in the Monitoring Sheet ver.4

5

2. Achievement of the Project

2.2 Achievement of Output-2

Output-2: Capacity of target UADs and DEUs for inspection and analysis of road disaster is enhanced			
Indicators	Achievement(%)		Achievement in April 2018
	Plan	Actual	
2-3. Countermeasures Manual for Road Disaster Prevention is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	80	80	<p>Planned Target in April 2018*</p> <ul style="list-style-type: none"> Countermeasures manual for road disaster prevention will be reviewed, situationally. <p>Achievement in April 2018</p> <ul style="list-style-type: none"> Countermeasures manual for road disaster prevention was reviewed. <p>Target in November 2018</p> <ul style="list-style-type: none"> Countermeasures manual for road disaster prevention will be finalized through the training program by Master Trainers.

*This target was set in the Monitoring Sheet ver.4

6

2. Achievement of the Project

2.2 Achievement of Output-2

Output-2: Capacity of target UADs and DEUs for inspection and analysis of road disaster is enhanced			
Indicators	Achievement(%)		Achievement in April 2018
	Plan	Actual	
2-4. All the staff in target UADs and DEUs trained for inspection/evaluation and standard disaster prevention countermeasures based on the manuals pass the final exam prepared by the Project.	80	80	<p>Planned Target in April 2018</p> <ul style="list-style-type: none"> Staff of UADs and DEUs will be trained through the seminar, workshop, joint site inspection and review of manuals. Implementation of non-structural measures are prepared (Preparation of hazard map, launch of SNS). <p>Achievement in April 2018</p> <ul style="list-style-type: none"> 83 Staff of target UADs and DEUs were trained through the seminar, workshop, joint site inspection and revision of manuals, "Countermeasures Manual for Road Disaster Prevention" and "Inspection and Evaluation Manual for Road Disaster Prevention". Countermeasure plan for landslide at 85.5km on BO road was drafted by the Project team and MOTR.

*This target was set in the Monitoring Sheet ver.4

7

2. Achievement of the Project

2.2 Achievement of Output-2

Output-2: Capacity of target UADs and DEUs for inspection and analysis of road disaster is enhanced		Achievement in April 2018	
Indicators	Achievement(%)		
	Plan	Actual	
2-4. All the staff in target UADs and DEUs trained for inspection/evaluation and standard disaster prevention countermeasures based on the manuals pass the final exam prepared by the Project.	80	80	<p>Achievement in April 2018</p> <ul style="list-style-type: none"> SNS information system using "Facebook" has been commenced to establish real time road hazard information intercommunity between MOTR and the public from the end of February. Hazard Map for BO road, prepared by MOTR and the Project team and was printed the amount of 169,500 copies with the financial assistance of UNDP. RMD selected Master Trainers for road disaster prevention. Training program by Master Trainer for inspection and analysis was drafted by RMD.

8

2. Achievement of the Project

2.2 Achievement of Output-2

Output-2: Capacity of target UADs and DEUs for inspection and analysis of road disaster is enhanced		Target in November 2018	
Indicators	Achievement(%)		
	Plan	Actual	
2-4. All the staff in target UADs and DEUs trained for inspection/evaluation and standard disaster prevention countermeasures based on the manuals pass the final exam prepared by the Project.	80	80	<ul style="list-style-type: none"> Staff of UADs and DEUs will be trained through the training program by Master Trainers and pass the final exam of inspection and analysis prepared by the Project. The skill of countermeasure plan for landslide will be enhanced to MOTR staff by case study of 85.5km on BO road. Hazard Map will be distributed to the road users and MOTR will monitor/evaluate the effect of the distribution. MOTR staff will obtain knowledge of countermeasures from training in Japan (site visit, lecture, workshop, etc.)

9

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed		Achievement in April 2018	
Indicators	Achievement(%)		
	Plan	Actual	
3-1. A database format for information on road disaster prevention management planning (incl. costing for countermeasures) is prepared by RMD by [August 2016].	100	100	<p>Planned Target in April 2018*</p> <ul style="list-style-type: none"> Database draft formats for information on road disaster prevention management planning will be reviewed, situationally. <p>Achievement in April 2018</p> <ul style="list-style-type: none"> Database format for information on road disaster prevention management planning was revised. <p>Target in November 2018</p> <ul style="list-style-type: none"> Database formats for information on road disaster prevention management planning will be reviewed, situationally.

10

*This target was set in the Monitoring Sheet ver.4

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed		Achievement in April 2018	
Indicators	Achievement(%)		
	Plan	Actual	
3-2. Practically usable Manual for Data Collection and Input is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	80	80	<p>Planned Target in April 2018*</p> <ul style="list-style-type: none"> Practically usable manual for data collection and Input will be reviewed for more practical utilization. <p>Achievement in April 2018</p> <ul style="list-style-type: none"> Practically usable manual for data collection and Input was reviewed through the training and seminar. <p>Target in November 2018</p> <ul style="list-style-type: none"> Practically usable manual for data collection and Input will be finalized through the training program by Master Trainers.

11

*This target was set in the Monitoring Sheet ver.4

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed		Achievement in April 2018	
Indicators	Achievement(%)		Achievement in April 2018
	Plan	Actual	
3-3. Data collected and input by target UADs and DEUs are integrated to the database for prioritizing countermeasures and certified by RMD by [May 2017].	100	100	<p>Planned Target in April 2018*</p> <ul style="list-style-type: none"> Additional data will be integrated to the database for prioritizing countermeasures and certified as needed. <p>Achievement in April 2018</p> <ul style="list-style-type: none"> Collected data of road disaster site were integrated to the database for prioritizing countermeasures and certified. Data input system for road disaster record was developed additionally. <p>Target in November 2018</p> <ul style="list-style-type: none"> Collected data for road disaster history will be integrated to the database for prioritizing countermeasures and certified as needed.

*This target was set in the Monitoring Sheet ver.4

2

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed		Achievement in April 2018	
Indicators	Achievement(%)		Achievement in April 2018
	Plan	Actual	
3-4. Staff of target UAD and DEUs trained for data collection and input based on the Manual pass the exam that evaluates their mastery in filling required information in database format.	80	80	<p>Planned Target in April 2018*</p> <ul style="list-style-type: none"> Trained staff of UADs and DEUs will transfer their knowledge to other staff (more than 30staff) of UADs and DEUs through the manuals. 20 Staff of UADs and DEUs passed the mini exam that evaluates their mastery in filling required information in database format. <p>Achievement in April 2018</p> <ul style="list-style-type: none"> 33 Staff of RMD, UADs and DEUs were trained by trained staff through the seminar, workshop, joint site inspection and review of manuals. 11 Staff of UADs and DEUs passed the mini exam that evaluates their mastery in filling required information in database format, and were issued a certificate.

*This target was set in the Monitoring Sheet ver.4

3

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed		Achievement in April 2018	
Indicators	Achievement(%)		Achievement in April 2018
	Plan	Actual	
3-4. Staff of target UAD and DEUs trained for data collection and input based on the Manual pass the exam that evaluates their mastery in filling required information in database format.	80	80	<p>Achievement in April 2018</p> <ul style="list-style-type: none"> The training program by Master Trainers was prepared by MOTR. <p>Target in November 2018</p> <ul style="list-style-type: none"> More than 20 Staff of UADs and DEUs will pass the exam that evaluates their mastery in filling required information in database format.

4

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed		Achievement in April 2018	
Indicators	Achievement(%)		Achievement in April 2018
	Plan	Actual	
3-5. Database Management System that contains information necessary for road disaster prevention management in the project area is developed for preparing budget by RMD by [May 2017].	100	100	<p>Planned Target in April 2018*</p> <ul style="list-style-type: none"> Database management system will be improved/updated as the occasion demands. <p>Achievement in April 2018</p> <ul style="list-style-type: none"> Database management system was developed and improved to be able to input the road disaster record data. <p>Target in November 2018</p> <ul style="list-style-type: none"> Database management system will be improved/updated as the occasion demands.

*This target was set in the Monitoring Sheet ver.4

15

2. Achievement of the Project

2.3 Achievement of Output-3

Output-3: Capacity of RMD to operationalize Database Management System for road disaster prevention is developed			
Indicators	Achievement(%)		Achievement in April 2018
	Plan	Actual	
3-6. Practically usable Manual for Database Operation is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	80	80	<p>Planned Target in April 2018*</p> <ul style="list-style-type: none"> Practically usable manual for database operation will be reviewed, situationally. <p>Achievement in April 2018</p> <ul style="list-style-type: none"> Practically usable manual for database operation was drafted and reviewed. <p>Target in November 2018</p> <ul style="list-style-type: none"> Practically usable manual for database operation will be finalized through the training program by Master Trainers.

*This target was set in the Monitoring Sheet ver.4

6

2. Achievement of the Project

2.4 Achievement of Output-4

Output-4: Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced			
Indicators	Achievement(%)		Achievement in April 2018
	Plan	Actual	
4-1. Nation-wide management criteria for road disaster prevention is developed by RMD by [May 2017].	100	100	<p>Planned Target in April 2018*</p> <ul style="list-style-type: none"> Nation-wide management criteria for road disaster prevention will be reviewed, as necessary. <p>Achievement in April 2018</p> <ul style="list-style-type: none"> Nation-wide management criteria for road disaster prevention was reviewed. <p>Target in November 2018</p> <ul style="list-style-type: none"> Nation-wide management criteria for road disaster prevention will be reviewed, as necessary.

*This target was set in the Monitoring Sheet ver.4

7

2. Achievement of the Project

2.4 Achievement of Output-4

Output-4: Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced			
Indicators	Achievement(%)		Achievement in April 2018
	Plan	Actual	
4-2. Short-Term Road Disaster Prevention Management Plan (urgent response plan) with cost estimation for road disaster prevention management of the target area is prepared by RMD by [September 2017 and September 2018].	80	80	<p>Planned Target in April 2018*</p> <ul style="list-style-type: none"> Short-term road disaster prevention management plan will be revised to suit the situation. <p>Achievement in April 2018</p> <ul style="list-style-type: none"> Short-term road disaster prevention management plan was revised with the revision of the prioritization procedure. The budget for countermeasures against landslide at 85.5km on BO road was prepared by MOTR. <p>Target in November 2018</p> <ul style="list-style-type: none"> Short-term road disaster prevention management plan will be prepared by September 2018.

*This target was set in the Monitoring Sheet ver.4

18

2. Achievement of the Project

2.4 Achievement of Output-4

Output-4: Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced			
Indicators	Achievement(%)		Achievement in April 2018
	Plan	Actual	
4-3. Preparation Manual for Short-Term and Medium-Term Road Disaster Prevention Management Plans is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	80	80	<p>Planned Target in April 2018*</p> <ul style="list-style-type: none"> Preparation manual for short-term and medium-term road disaster prevention management plans will be reviewed, as necessary. The ability for the preparation of the countermeasures among RMD and UADs will be enhanced by the training using the revised preparation manual. <p>Achievement in April 2018</p> <ul style="list-style-type: none"> Preparation manual for short-term and medium-term road disaster prevention management plans was revised in terms of B/C and procedure of budgetary request. The ability for the preparation of the countermeasures among RMD and UADs was enhanced by training using the revised manual.

*This target was set in the Monitoring Sheet ver.4

19

2. Achievement of the Project

2.4 Achievement of Output-4

Output-4: Capacity of RMD for preparing road disaster prevention management plans of the target areas is enhanced		Target in November 2018	
Indicators	Achievement(%)	Plan	Actual
		4-3. Preparation Manual for Short-Term and Medium-Term Road Disaster Prevention Management Plans is drafted by RMD by [May 2017], reviewed by RMD by [May 2018] and finalized by RMD by [March 2019].	80

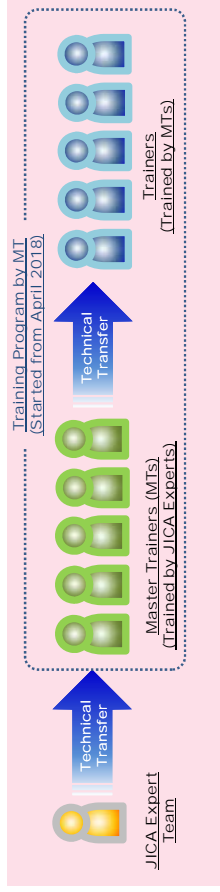
- Preparation manual for short-term and medium-term road disaster prevention management plans will be finalized.

20

3. Training Program by Master Trainers

3.1 Outline

- Master Trainers (MT) will train target UADs and DEUs staff through the seminar and site training at Bishkek and Osh.
- The skill and knowledge on the road disaster prevention and database system will be enhanced widely by themselves.



Point 1

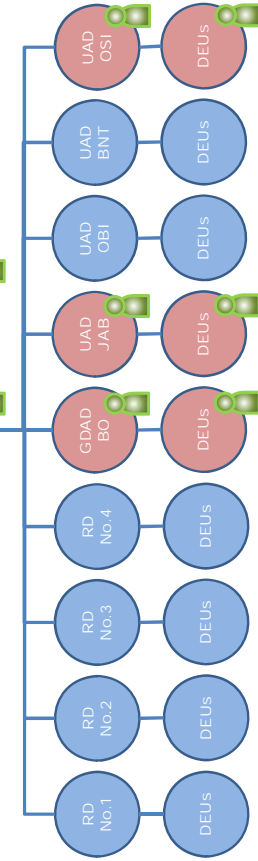
Through the Training Program by MT, it can be expected that technology transfer will be implemented continuously after the project.

21

3. Training Program by Master Trainers

3.1 Outline

- : Project C/P
- : Other Relevant Units
- : Master Trainers



Current

- Master Trainers were trained in target units (RMD, UADs, DEUs) by the Project.
- But the capacity is limited to the road disaster which occurred in the target area only.
- It is necessary to develop the capacity for inspection/countermeasure and evaluation of various disaster types and scale which may occur in the future.

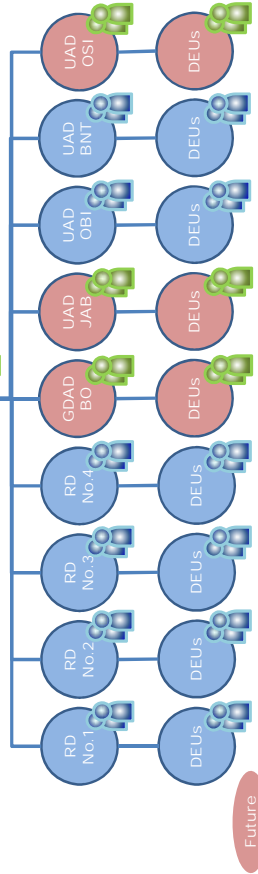
22

3. Training Program by Master Trainers

3.1 Outline

Training Program By Master Trainers

- : Project C/P
- : Other Relevant Units
- : Master Trainers



Future

- The capacity of MT for inspection/countermeasure and evaluation of various disaster types and scale will developed through the training program by training and discussion with other relevant units.
- The nationwide budget plan will prepared by the balanced level of countermeasure and evaluation. (Unification of the budget plan level)
- The above activities are one of the factor for Continuity of the Project.

23

3. Training Program by Master Trainers

3.3 Training Program

Training*	Database	River Bank Erosion	Snow Disaster	Slope Disaster
Guidance	Apr. 18th	May 28th	May 7th	Apr. 18th
1 st Term	Apr. 26th	Jun. 4~5th	May 24~25th	Apr. 26~27th
	May 2nd	May 30~31th	May 10~11th	May 24~25th
2 nd Term	Jul. 4th	Jul. 4~5th	May 30~31th	May 30~31th
	Jul. 11th	Jul. 11~12th	Jul. 4~5th	Jul. 4~5th
3 rd Term	Aug. 8th	Aug. 8~9th	Jul. 11~12th	Jul. 11~12th
	Aug. 15th	Aug. 15~16th	Aug. 8~9th	Aug. 8~9th
4 th Term	Sep. 5th	Sep. 5~6th	Aug. 15~16th	Aug. 15~16th
	Sep. 12th	Sep. 12~13th	Sep. 5~6th	Sep. 5~6th
Osh	Sep. 12th	Sep. 12~13th	Sep. 12~13th	Sep. 12~13th

* 1st Term is supported by the Project Team. 2nd - 4th Terms are implemented by MTs only.

4. Short-term Road Disaster Prevention Management Plan

4.1 Outline

- Short-term Road Disaster Prevention Management Plan is listed based on the current condition of the site.

Over 100 million KGS (1.25 million USD)

➤ Financial assistance of Donors is required.

Less than 100 million KGS (1.25 million ~ 12,500 USD)

➤ It is available by MOTR to conduct.



The site are listed as Short-term Road Disaster Prevention Management Plan

3. Training Program by Master Trainers

3.3 Training Program

Training*	Database	River Bank Erosion	Snow Disaster	Slope Disaster
Guidance	Apr. 18th	May 28th	May 7th	Apr. 18th
1 st Term	Apr. 26th	Jun. 4~5th	May 24~25th	Apr. 26~27th
	May 2nd	May 30~31th	May 10~11th	May 24~25th
2 nd Term	Jul. 4th	Jul. 4~5th	May 30~31th	May 30~31th
	Jul. 11th	Jul. 11~12th	Jul. 4~5th	Jul. 4~5th
3 rd Term	Aug. 8th	Aug. 8~9th	Jul. 11~12th	Jul. 11~12th
	Aug. 15th	Aug. 15~16th	Aug. 8~9th	Aug. 8~9th
4 th Term	Sep. 5th	Sep. 5~6th	Aug. 15~16th	Aug. 15~16th
	Sep. 12th	Sep. 12~13th	Sep. 5~6th	Sep. 5~6th
Osh	Sep. 12th	Sep. 12~13th	Sep. 12~13th	Sep. 12~13th

* 1st Term is supported by the Project Team. 2nd - 4th Terms are implemented by MTs only.

4. Short-term Road Disaster Prevention Management Plan

No	Road Name	Kilopost	DEU	Disaster Type	Cost (Millions KGS)	Countermeasure Type
Structural Countermeasures						
1	Bishkek - Osh	116.5km	9	Rockfall	37.7	Protection Net
2	Bishkek - Osh	414.7km	30	Rockfall	55.6	Protection Net
3	Bishkek - Osh	424.8km	30	Rockfall	54.6	Protection Net
4	Bishkek - Osh	423km	30	Debris flow	27.2	Concrete Pavement (Causeway), Retaining Wall
5	Bishkek - Osh	425.5km	30	Debris flow	27.2	Concrete Pavement (Causeway), Retaining Wall
6	OST Road	98km	959	Debris flow	13.6	Concrete Pavement (Causeway), Retaining Wall
7	Bazar-Korgon - Aytambap	15.6km	50	Riverbank Erosion	6.8	Embankment, Gabion Mattress Reinforcement
8	Bazar-Korgon - Aytambap	40.1km	50	Riverbank Erosion	6.8	Embankment, Gabion Mattress Reinforcement
9	Bazar-Korgon - Aytambap	40.2km	50	Riverbank Erosion	6.8	Embankment, Gabion Mattress Reinforcement
10	Bishkek - Osh	125.0km	9	Available	84.8	Protection Wall
11	Bishkek - Osh	245.8km	25	Available	101.8	Protection Wall
12	Bishkek - Osh	126.54267km	9	Snowdrift	19.0	Collector Snow Fence
13	Bishkek - Osh	127.421277km	9	Snowdrift	28.5	Collector Snow Fence
14	Bishkek - Osh	129.421293km	9	Snowdrift	19.0	Collector Snow Fence
Subtotal						489.4 (7.1 million USD)
Non-Structural Countermeasures						
15	Bishkek - Osh	85.5km	9	Landslide	0.1	Monitoring
16	Bishkek - Osh	82km	9	Landslide	0.1	Monitoring
17	Bishkek - Osh	398km	30	Landslide	0.1	Monitoring
18	OST Road	61km	959	Landslide	0.1	Monitoring
19	OST Road	61km	959	Landslide	0.1	Monitoring
20	OST Road	70km	959	Landslide	0.1	Monitoring
21	Bishkek - Osh	262km	25	Rockfall	1.0	Artificial Rockfall Removal
22	OST Road	425.5km	30	Debris flow	0.1	Stem Board Installation
23	OST Road	98km	959	Debris flow	0.1	Stem Board Installation
24	Bazar-Korgon - Aytambap	26.4km	50	Debris flow	0.1	Stem Board Installation
25	Myzrak - Karakulja - Alatum	42km	26	Debris flow	0.1	Stem Board Installation
26	Bishkek - Osh	81km	9	All kind of Disasters	0.3	Electrical Sign Board Installation
27	All Target Road	-	each DEU	All kind of Disasters	0.7	Monitoring of Meteorological Data
28	Bishkek - Osh	85.5	9	All kind of Disasters	5	Debris Removal Management System
29	Bishkek - Osh	-	9, 23, 30	Landslide	0.18	Drainage Drilling
30	Bishkek - Osh	-	9, 23, 30	All kind of Disasters	0.18	Hazard Map Distribution
Subtotal						8.88 (0.13 million USD)

Grand Total = 498.3 million KGS (7.3 million USD)

4. Short-term Road Disaster Prevention Management Plan

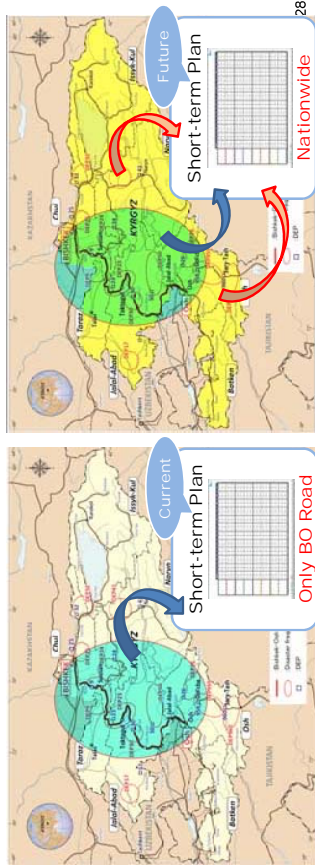
No	Road Name	Kilopost	DEU	Disaster Type	Cost (Millions KGS)	Countermeasure Type
Structural Countermeasures						
1	Bishkek - Osh	116.5km	9	Rockfall	37.7	Protection Net
2	Bishkek - Osh	414.7km	30	Rockfall	55.6	Protection Net
3	Bishkek - Osh	424.8km	30	Rockfall	54.6	Protection Net
4	Bishkek - Osh	423km	30	Debris flow	27.2	Concrete Pavement (Causeway), Retaining Wall
5	Bishkek - Osh	425.5km	30	Debris flow	27.2	Concrete Pavement (Causeway), Retaining Wall
6	OST Road	98km	959	Debris flow	13.6	Concrete Pavement (Causeway), Retaining Wall
7	Bazar-Korgon - Aytambap	15.6km	50	Riverbank Erosion	6.8	Embankment, Gabion Mattress Reinforcement
8	Bazar-Korgon - Aytambap	40.1km	50	Riverbank Erosion	6.8	Embankment, Gabion Mattress Reinforcement
9	Bazar-Korgon - Aytambap	40.2km	50	Riverbank Erosion	6.8	Embankment, Gabion Mattress Reinforcement
10	Bishkek - Osh	125.0km	9	Available	84.8	Protection Wall
11	Bishkek - Osh	245.8km	25	Available	101.8	Protection Wall
12	Bishkek - Osh	126.54267km	9	Snowdrift	19.0	Collector Snow Fence
13	Bishkek - Osh	127.421277km	9	Snowdrift	28.5	Collector Snow Fence
14	Bishkek - Osh	129.421293km	9	Snowdrift	19.0	Collector Snow Fence
Subtotal						489.4 (7.1 million USD)
Non-Structural Countermeasures						
15	Bishkek - Osh	85.5km	9	Landslide	0.1	Monitoring
16	Bishkek - Osh	82km	9	Landslide	0.1	Monitoring
17	Bishkek - Osh	398km	30	Landslide	0.1	Monitoring
18	OST Road	61km	959	Landslide	0.1	Monitoring
19	OST Road	61km	959	Landslide	0.1	Monitoring
20	OST Road	70km	959	Landslide	0.1	Monitoring
21	Bishkek - Osh	262km	25	Rockfall	1.0	Artificial Rockfall Removal
22	OST Road	425.5km	30	Debris flow	0.1	Stem Board Installation
23	OST Road	98km	959	Debris flow	0.1	Stem Board Installation
24	Bazar-Korgon - Aytambap	26.4km	50	Debris flow	0.1	Stem Board Installation
25	Myzrak - Karakulja - Alatum	42km	26	Debris flow	0.1	Stem Board Installation
26	Bishkek - Osh	81km	9	All kind of Disasters	0.3	Electrical Sign Board Installation
27	All Target Road	-	each DEU	All kind of Disasters	0.7	Monitoring of Meteorological Data
28	Bishkek - Osh	85.5	9	All kind of Disasters	5	Debris Removal Management System
29	Bishkek - Osh	-	9, 23, 30	Landslide	0.18	Drainage Drilling
30	Bishkek - Osh	-	9, 23, 30	All kind of Disasters	0.18	Hazard Map Distribution
Subtotal						8.88 (0.13 million USD)

Point ! These countermeasures (Non-structural) are implementing by MOTR budget and the financial assistance of UNDP ! (Details of both will be explained later)

4. Short-term Road Disaster Prevention Management Plan

4.2 Future Plans

- Based on the Short-term Road Disaster Prevention Management Plan, the implementation schedule will be prepared by MOTR.
- Since it takes time to prepare the budget for the structural countermeasures, Non-structural countermeasure will be also planned by the implementation plan.
- The implementation plan will be prepared in consideration of the short-term plan outside the target area.

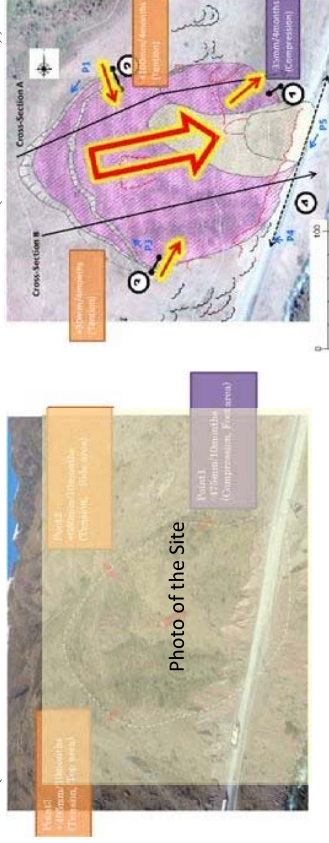


28

5. Drainage Drilling at 85.5km on BO Road

5.1 Outline

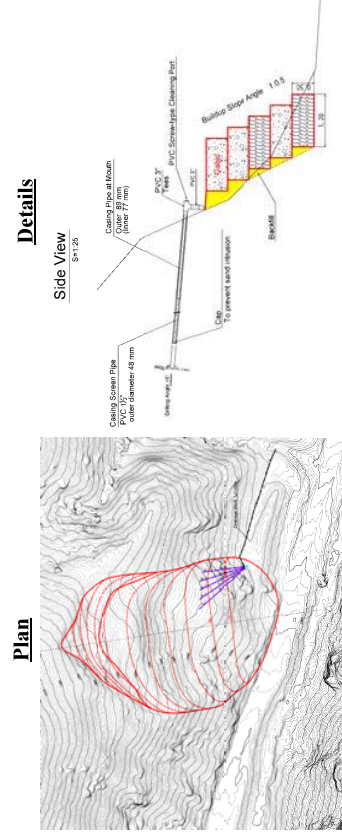
- Disaster mitigation countermeasure plan (Drainage Drilling) for landslide at 85.5km on BO road was drafted by MOTR and Project Team.
- On this site, the skill and knowledge regarding to the inspection, monitoring and countermeasure planning were transferred as one of good study case.
- Drainage drilling cost is around 5 million KGS (70,000 USD).
- (Structural countermeasure cost is around 2.1 billion KGS (30 million USD))



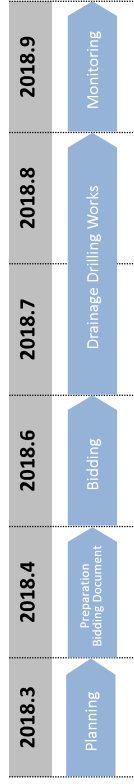
29

5. Drainage Drilling at 85.5km on BO Road

5.2 Countermeasure Plan and Schedule



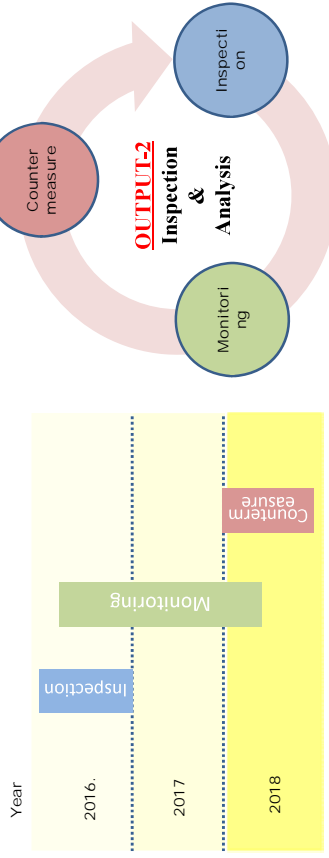
Time Schedule



30

5. Drainage Drilling at 85.5km on BO Road

5.2 Countermeasure Plan and Schedule



Point

- The capacity of target C/P for inspection, monitoring and countermeasure plan were developed through the study case of landslide at 85.5km on BO road.
- It is necessary to develop the capacity for inspection/countermeasure and evaluation of various disaster types and scale which may occur in the future

31

6. SNS Information System

6.1 Outline

- Under the cooperation of MOTR and JICA project team, a public relations system using SNS was created on January 2018.
- SNS information system using “Facebook” has been commenced to establish real time road hazard information intercommunity between MOTR and the public.
- As of now, RMD has been posted information on road, traffic condition and disaster more than 20 times.



32

6. SNS Information System

6.2 Details

- 1) Follower Number : 41
- 2) Posting of information: 23
- 3) Information:
 - Situation on the roads
 - Traffic restrictions
 - Artificial avalanche
 - Rockfall implementations
 - Occurrence of natural disasters on the roads etc.

Департамент дорожного хозяйства при Министерстве транспорта и дорог КР
 Апрель 2 at 10:51am ·
 На автодороге Бишкек–Ош проводятся работы по принудительному спуску снежных лавин, сообщила пресс-служба МЧС КР.
 По ее данным, на 121-129, 198-250 км указанной автодороги с целью предотвращения ЧС со 2 до 11 апреля будет проводиться артобстрел лавин.
 Сегодня, 2 апреля, в 09:00 работы начали проводить представители артиллерийского расчёта Генштаба вооружённых сил КР из села Кой-Таш Ала-Букаевского района Чуйской области вместе с сотрудниками МЧС... See more



На автодороге Бишкек–Ош сегодня начнут артобстрел снежных лавин
 В автодороге Бишкек–Ош проводятся работы по принудительному спуску снежных лавин, сообщила пресс-служба МЧС КР.
 TURMUSH.KG

33

7. Hazard Map Distribution Plan

7.1 Outline

- Under the cooperation of MOTR and JICA project team, a map of hazardous areas along the Bishkek-Osh road (Hazard Map) was prepared on January 2018.
- The number of copies to be printed is about 169 500 copies (for DEUs 9 & 23: 127 000 copies, for DEU 30: 42 500 copies) with financial assistance of UNDP.



34

7. Hazard Map Distribution Plan

7.2 Purpose

- To keep safety while driving by road users
- To notify road users Facebook page of MOTR
- To educate the activity of MOTR for cooperation with public

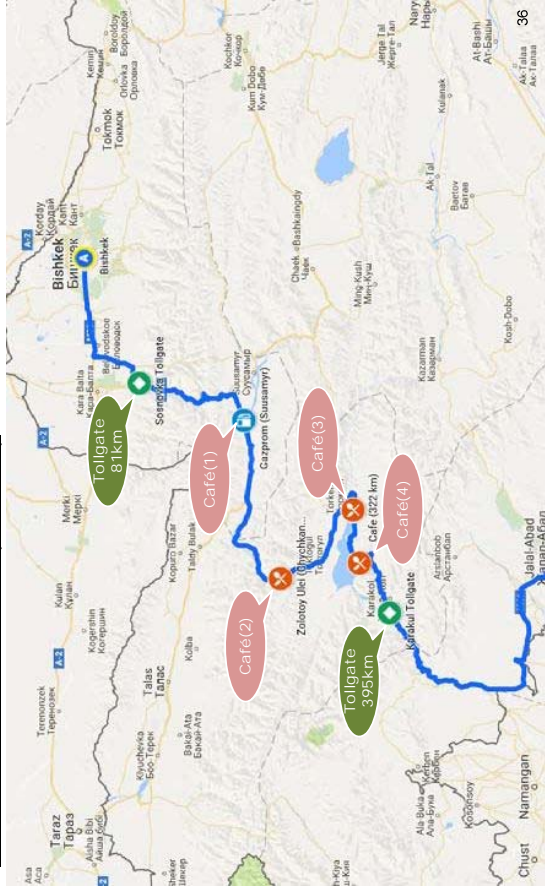
7.3 Distribution Plan (DRAFT)

Target	Details	Date & Copies	
		1st	2nd
Tollgates (BO Road)	1) 81km (Sosnovka) 2) 39.5km (Kara-Kul town)	15~16 th May 2018 (40,250 copies)	Before Winter (Sep-Oct) (40,250 copies)
School	1) MES will decide schools to distribute. 2) MES will do the presentation at school for the brochure distribution.	17~18 th May 2018 (11,500 copies)	Before Winter (Sep-Oct) 11,500 copies
Cafes	1) GazProm gas station 2) Pel'mennaya cafe, Chyechkan gorge 3) Cafe at Km 322 4) Cafe at Km.351	15~16 th May 2018 (20,000 copies)	Before Winter (Sep-Oct) 20,000 copies
Bus Station	Independent taxi stop @Osh bazaar	10~12 th May 2018 (13,000 copies)	Before Winter (Sep-Oct) 13,000 copies

35

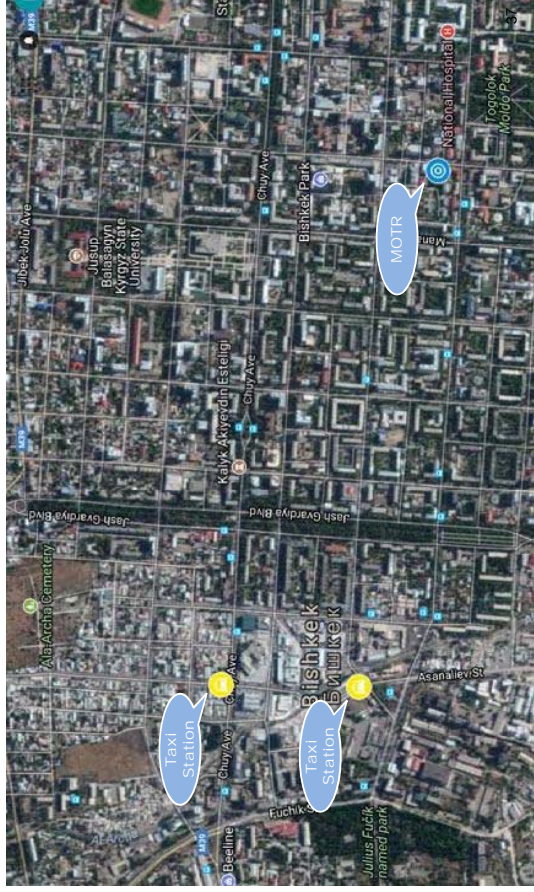
7. Hazard Map Distribution Plan

7.4 Distribution Plan (DRAFT)



7. Hazard Map Distribution Plan

7.4 Distribution Plan (DRAFT)



7. Hazard Map Distribution Plan

7.5 Monitoring and Evaluation of Effect

- To monitor the registration number of Facebook (To record the number by day or week)
- To interview to the driver about their opinion for road disaster, traffic condition and brochure (It is necessary to make the interview list and to consider human resources)
- To check/compare the situation such as number of affected people and car with the past data
- To apply for the budget for reprint of brochure in accordance with the above effect

Fin....

Thank You for Your Attention

2. Draft Project Evaluation

2.1 Relevance

- ◆ Were "Overall Goal" and "Project Purpose" relevant to the policy/needs of the Kyrgyz Republic, implementation agency and target group?

4

2. Draft Project Evaluation

2.1 Relevance

Relevance to the **policy of the Kyrgyz Republic**

Road Sector Development Strategy to 2025

- To improve road safety.

National Sustainable Development Strategy for the Kyrgyz Republic for the period of 2013-2017

- To establish a foundation for sustainable development.
- To prepare strategic documents to contribute to preventive measures against development risk.

5

2. Draft Project Evaluation

2.1 Relevance

- ◆ Were "Overall Goal" and "Project Purpose" relevant to the policy/needs of the Kyrgyz Republic, implementation agency and target group?

4

2. Draft Project Evaluation

2.1 Relevance

Relevance to the **National disaster risk reduction policy of the Kyrgyz Republic**

Resolution No.435 of the Government of the Kyrgyz Republic on the "Establishment of Permanent Headquarters for Prevention of Avalanches, Landslides and Other Slope Processes and for Mitigation of their Consequences on the Public Roads of the Kyrgyz Republic," dated July 29, 2011.

- To establish permanent headquarters for national disaster risk reduction.
- To determine the role and responsibility for road disaster prevention management between the government agencies, such as MES, MOTR, MIA, MOH, etc.

6

2. Draft Project Evaluation

2.1 Relevance

Relevance to the **assistance policy of Japan**

Priority areas for Japan's ODA Policy towards the Kyrgyz Republic:

- To enhance maintenance of transport infrastructure and resolve regional disparities;
- To restructure social infrastructure.

7

2. Draft Project Evaluation

2.2 Effectiveness

◆ Was the Project Purpose achieved by the Outputs?

8

2. Draft Project Evaluation

2.2 Effectiveness

(1) Output-1

- Responsibilities and activities of MOTR on road disaster prevention, including specific duties to be performed by relevant units (HQ, RMD, RDs/UADs, DEUs), were clearly determined through the discussion with the relevant unit of MOTR, DI and MES.
- Responsibilities and activities of MOTR on road disaster prevention will be institutionalized by the Project as RMD Director's Order.

9

2. Draft Project Evaluation

2.2 Effectiveness

(2) Output-2

- The Longlist with the road disaster hazard sections, hazard types and their features was prepared by target RDs/UADs and DEUs on the basis of the site survey of the Project.
- Inspection and Countermeasure manuals for road disaster prevention were prepared by RMD, and is used in the lecture of KSUCTA.
- In total 170 members of staff in the relevant units of MOTR were trained for inspection and countermeasures against road disaster based on the manuals. MOTR's staff passed the final exam prepared by the Project.

10

2. Draft Project Evaluation

2.2 Effectiveness

(3) Output-3

- As database formats for information on road disaster prevention management planning, "Disaster Hazard List", "Disaster Record List", "Disaster Record Sheet" and "Monitoring Sheet for Landslide" were prepared by the RMD.
- Database operation & input manuals for the road disaster prevention and the bridge & tunnel were prepared by RMD, and is used in the lectures of KSUCTA.

11

2. Draft Project Evaluation

2.2 Effectiveness

(3) Output-3

- The inventory data of disaster hazard section (total 137 data entries) and the past disaster record data (total 913 data entries) were collected and input by target RDs/UADs and DEUs. Likewise, this data was integrated into the road disaster database by RMD.
- Total of 60 staff in relevant units of MOTR were trained for data collection and input based on the database manuals. The MOTR's staff passed the final exam prepared by the Project.
- The road disaster database system including information on the road past disaster records, priority of road disaster hazard sections and landslide monitoring was developed for preparing the short-term road disaster prevention management plan by the RMD.

12

2. Draft Project Evaluation

2.2 Effectiveness

(4) Output-4

- Nation-wide management criteria for road disaster prevention was developed by the RMD.
- "The Short-term Road Disaster Prevention Management Plan in 2017" for the target area was prepared by the RMD.
- "The Short-term Road Disaster Prevention Management Plan in 2018" for nationwide hazardous areas was prepared by RMD.
- Preparation manual for short-term and medium-term road disaster prevention management plan was prepared by the RMD.

13

2. Draft Project Evaluation

2.3 Efficiency

◆ Were Quantity, Quality and Means of Input appropriate?

14

2. Draft Project Evaluation

2.3 Efficiency

(1) Intensive Expert Input in Winter Season

- The initial plan was to dispatch an expert (Snow Disaster Prevention Expert (1)) in winter season. However, two experts (Snow Disaster Prevention Expert (1) and (2)) were simultaneously dispatched in winter season so that the experts could efficiently provide appropriate guidance for snow disaster prevention activities.

15

2. Draft Project Evaluation

2.3 Efficiency

(2) Capacity Development for Snowdrift Prevention by Pilot Project at 128.5km of BO Road

- The pilot project for snowdrift that considers construction of the snow fence (L=50m), monitoring of the amount of snow at snowdrifts and verification of effectiveness of the snow fence by the snowdrifts simulation, was implemented by adding to 3.70 MM (man months) of the experts' input.
- Capabilities for collection and analysis of snowdrift data was enhanced by the pilot project.

16

2. Draft Project Evaluation

2.3 Efficiency

(3) Enhancing the cooperativeness between the Road Disaster Database and Bridge & Tunnel Database

- The bridge & tunnel database system was developed under three previous JICA's Project.
- The bridge & tunnel data in the previous database were manually input from Excel file. Besides, the previous database system had not been updated and the reliability and continuity was lower.
- The database system for bridge & tunnel was improved to the same system as the road disaster database system to enhance the cooperativeness of both database systems by adding to 2.33 MM of the expert's input.

17

2. Draft Project Evaluation

2.3 Efficiency

(4) Preparation of Manual corresponding to Various Disaster Type

- As the road disaster types occurring on the target roads (international and national road) are limited, it was necessary to survey at the road disaster site on local road in order to prepare the manuals covering various road disasters.
- The inspection and countermeasure manuals covering various road disasters could be prepared by adding to 2.00 MM of the experts' input.

18

2. Draft Project Evaluation

2.3 Efficiency

(5) Technical Transfer of Countermeasure against Landslide

- Based on the results of the monitoring of landslide at 85.5km of the BO road, it was found necessary to urgently plan countermeasures against landslide.
- By adding to 0.50 MM of the expert's input, the detailed plan for countermeasure including the topographic survey and preparation of the drawings was provided to engage in technical transfers.

19

2. Draft Project Evaluation

2.3 Efficiency

(6) Training Program by Master Trainers

- Training program for road disaster prevention was prepared by Master Trainers in cooperation with JICA Experts. Trainings were held in Bishkek and Osh under MOTR's budget.
- Master Trainers trained the total of 36 staff of project target units under the MOTR to enhance and expand the knowledge for road disaster prevention.
- Furthermore, in addition to the target units (HQ, RMD, 3 UADs, 6 DEUs), Master Trainers trained the staff of 36 more DEUs other than target units without additional JICA Expert input.

20

2. Draft Project Evaluation

2.4 Impact

◆ What were direct or indirect positive/negative impact by the Project?

21

2. Draft Project Evaluation

2.4 Impact

■ Overall Goal:
Safety of the road traffic at the selected disaster prone areas is improved.



■ Objectively Verifiable Indicator for Overall Goal:

1. In reference to the Project experiences and Manuals produced under the Project, the Short-Term Road Disaster Prevention Management Plan continues to be prepared by RMD of MOTR every year.
2. Road disaster prevention work is implemented based on the Short-Term Road Disaster Prevention Management Plan prepared by RMD of MOTR.

22

2. Draft Project Evaluation

2.4 Impact

Verifiable Indicator

In reference to the Project experiences and Manuals produced by the Project, Short-Term Road Disaster Prevention Management Plan continues to be prepared by RMD of MOTR every year

Road disaster prevention work is implemented based on the Short-Term Road Disaster Prevention Management Plan prepared by RMD of MOTR.

Status of Achievement

Before the Project, the road disaster prevention plan was not formulated by MOTR in the Kyrgyz. After the Project, MOTR worked out the Short-Term Road Disaster Prevention Plan for the target areas in 2017. Besides, nationwide Short-Term Road Disaster Prevention Plan was prepared by MOTR in 2018 in cooperation with JICA Experts.

Before the Project, MOTR seldom conducts preventive measures against road disasters. After the Project, MOTR budgeted for preventive measures against road disaster. Besides, road disaster prevention work (like landslide monitoring, horizontal drainage drilling against landslide, electronic message board for emergency warning) is implemented based on the Short-Term Road Disaster Prevention Management Plan.

23

2. Draft Project Evaluation

2.4 Impact

Activities to prepare Short-Term Road Disaster Prevention Management Plan

- Selection and verification of applicable measures using the data provided by meteorological observation equipment and results of pilot project.
- Collection of road disaster information using the database system

24

2. Draft Project Evaluation

2.4 Impact

Activities to execute Road Disaster Prevention Work based on the Short-Term Road Disaster Prevention Management Plan

- Countermeasures against landslide at 85.5km of the BO Road was conducted by the MOTR by **landslide monitoring** with simple devices, **analysis of landslide behavior**, construction of **horizontal drainage drilling work**, etc.
- Road disaster risk reduction activities were conducted by MOTR as non-structural measures. These activities include preparation and distribution of **hazard map**, sharing road disaster information through **SNS (Facebook)**, installation of **electronic message board for emergency warning**, etc.

25

2. Draft Project Evaluation

2.4 Impact

Activities to prepare Short-Term Road Disaster Prevention Management Plan

- Selection and verification of applicable measures using the data provided by meteorological observation equipment and results of pilot project.
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24

2. Draft Project Evaluation

2.4 Impact

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- Road disaster risk reduction activities were conducted by MOTR as non-structural measures. These activities include preparation and distribution of **hazard map**, sharing road disaster information through **SNS (Facebook)**, installation of **electronic message board for emergency warning**, etc.

25

2. Draft Project Evaluation

2.4 Impact

Spreading Effect -1
Contribution to/ collaboration with new project

- [“Feasibility Survey for Slope Disaster Prevention on Road in the Kyrgyz Republic”](#): The hazardous area list which was prepared by the Project contributed to this feasibility survey. After this feasibility survey, countermeasure against rockfall (Rock Net) will be implemented on Km 414 of the BO Road.
- [“The Project for Snowdrift Protection on BO Road”](#): Sharing meteorological observation data and result of analysis of snow disaster data. The countermeasure against snowdrift will be implemented on the BO Road.

26

2. Draft Project Evaluation

2.4 Impact

Spreading Effect -2
Enhancing cooperation with educational institutions

- Lectures were given at the Kyrgyz State University of Construction, Transport and Architecture (KSUCTA) on database programming, establishment of database and on each manual for road disaster prevention management prepared by this project.
- Each manual for road disaster will be utilized by the KSUCTA as part of lecture materials. Hence, this activities contribute to human resource development for road disaster prevention management.

27

2. Draft Project Evaluation

2.5 Sustainability

◆ Will the Project effect sustain after the Project's completion?

28

2. Draft Project Evaluation

2.5 Sustainability

Technical Aspect -1

Training Program on road disaster prevention management

- MOTR prepared and implemented a Training Program on road disaster prevention management.
- Master Trainers from the MOTR, who were trained by JICA Experts educate/train other engineers of the MOTR. Besides, the training program and trainees are spread nationwide.
- Budget for the Training Program on road disaster prevention management was allocated and executed by the MOTR.

29

2. Draft Project Evaluation

2.5 Sustainability

Technical Aspect -2

Comprehensive disaster prevention activities in cooperation with MES

The following activities are conducted in cooperation with the MES:

- To specify the roles and responsibilities for road disaster prevention management of MOTR;
- To prepare and distribute the road disaster hazard map on BO Road;
- To conduct for periodical road disaster inspection;
- To conduct joint session and inspection of landslide at 85.5km of the BO Road;
- To carry out cooperative consultation about MOTR's roles on national disaster prevention management

30

2. Draft Project Evaluation

2.5 Sustainability

Organizational Aspect -1

Institutionalization of roles and responsibilities for road disaster prevention management of MOTR

- MOTR's roles and responsibilities for road disaster prevention management were not clearly stipulated before the Project.
- MOTR's roles and responsibilities for road disaster prevention management are institutionalized by the Project as per RMD Director's Order.

31

2. Draft Project Evaluation

2.5 Sustainability

Organizational Aspect -2

Integrated road disaster prevention management by AMS (Asset Management Section) in RMD

- Disaster data, implementation plan, budget plan, activities and training program for road disaster prevention management are managed by AMS on Database System.

32

2. Draft Project Evaluation

2.5 Sustainability

Financial Aspect -1

Budget for road disaster prevention management

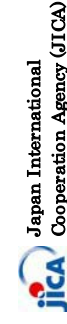
- Before the Project, MOTR seldom conducts preventive measures against road disasters.
- After the Project, MOTR budgeted for preventive measures against road disaster. Besides, road disaster prevention work (landslide monitoring, horizontal drainage drilling against landslide, electronic message board for emergency warning) is implemented based on the Short-Term Road Disaster Prevention Management Plan.

33



Thank You for Your Attention

34



Japan International
Cooperation Agency (JICA)



Ministry of Transport and Roads of
the Kyrgyz Republic

THE PROJECT FOR CAPACITY DEVELOPMENT FOR ROAD DISASTER PREVENTION MANAGEMENT IN THE KYRGYZ REPUBLIC

The 6th Joint Coordinating Committee



Table of Contents

Sample activities for Project sustainability

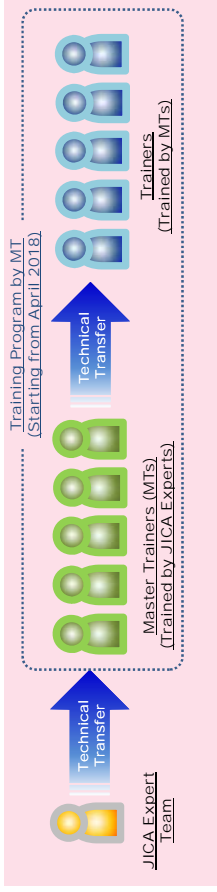
1. Training Program by Master Trainers
2. Landslide Monitoring along BO-Road
3. Utilization Flowchart for Disaster Risk Reduction Technology

36

1. Training Program by Master Trainers

1.1 What is Training Program by MT?

- Master Trainers (MT) will train target UADs and DEUs staff through the seminar and site training in Bishkek and Osh.
- The skill and knowledge on the road disaster prevention and database system will be enhanced widely by the trainees.



Point 1

Through the Training Program by MT, it can be expected that technology transfer will be implemented continuously after the project.

37

1. Training Program by Master Trainers

1.2 Master Trainers (MT)

Name	Position	Organization
ABDYRASHYM KYZ Y Algerim	Chief Specialist	Road Assets Management Section (AMS), RMD
Abyshev Turunbek	Chief Specialist	RD №1
KALYSHULOV Bek	Head	Production & Technical Department, DEU 30, GDAD BO
KULUEV Nurbek	Quantity Surveyor	GDAD BO
TULEYEVA Gulzada	Chief Specialist	RMD
Usunbekov Altbek	Specialist	RMD

DATABASE OPERATION

Name	Position	Organization
MAKSUTOV Sulaiman	Chief Engineer	DEU-959
ABDRAKHMANOV Mirbek	Chief Engineer	DEU-9
ADYLBKOVA Narghiza	Chief Specialist	Production and Technical Department, RMD
TAAI AIBEK Oulu Nuribek	Chief Specialist	Production and Technical Department, UAD BNT
SAMAGOV Taalibek	Chief Specialist	BO-4
ABDYRASHYM KYZ Y Algerim	Chief Specialist	AMS, RMD
MATSANOV Neursultan	Chief Specialist	RMD

SLOPE DISASTER

Name	Position	Organization
SABIRALIEV Asylybek	Leading specialist	UAD OBI
USUNBEKOV Aydybek	Specialist	RMD
ABDYRASHYM KYZ Y Algerim	Chief Specialist	RMD AMS
KULUEV Nuribek	Chief Specialist	BO UAD
KYDYRMYSHEV Temirbek	Leading specialist	RMD

SNOW DISASTER

Name	Position	Organization
ISMAILOV Myktybek	Chief Mechanic	DEU 50
ERGESHOV Nurgazy	Chief Specialist	UAD OBI
SHEKEEV Azat	Leading Specialist	RMD
KYDYRMYSHEV Temirbek	Leading Specialist	RMD
ABDYRASHYM KYZ Y Algerim	Chief Specialist	AMS RMD

RIVER BANK EROSION

38

1.3 "Training Program by MT" assisted by JICA Experts

Training*	Database	River Bank Erosion	Snow Disaster	Slope Disaster
Guidance	Apr. 18th	May 28th	May 7th	Apr. 18th
1 st Term	Bishkek	Jun. 4~5th	May 24~25th	Apr. 26~27th
	Osh	May 30~31th	May 10~11th	May 2~3rd
2 nd Term	Bishkek	—	—	May 24~25th
	Osh	May 31st	May 30~31th	May 30~31th

39

1. Training Program by Master Trainers

1.3 "Training Program by MT" assisted by JICA Experts



40

1. Training Program by Master Trainers

1.4 "Training Program by MT" carried out by the MOTR

(1) Outline

Area	Bishkek	Osh
Date	September 27 th to 28 th 2018	September 27 th to 28 th 2018
Venue	27 th : MOTR Building 28 th : 85.5km of BO Road (Landslide)	27 th : UAD OSI Building, c. Osh 28 th : 22-26km of Osh-Nookat Road (River Bank Erosion/ Landslide)
MT	Mr. Kultuev Nurbek Mr. Abyshov Tursunbek Ms. Abdyrashim k. Aigerim Mr. Isakov Erlan Mr. Usonbekov Aitbek	Mr. Zalov Altynbek S.
Number of Participants	23	13
Training Contents	- Database Operation - Slope and Snow Disaster Prevention	- Database Operation - River Bank Erosion - Slope and Snow Disaster Prevention
Material	- Presentation Documents - Manuals	- Presentation Documents - Manuals

1. Training Program by Master Trainers

1.4 "Training Program by MT" by the MOTR

(2) Situation Photos in Bishkek Training



42

1. Training Program by Master Trainers

1.4 "Training Program by MT" by the MOTR

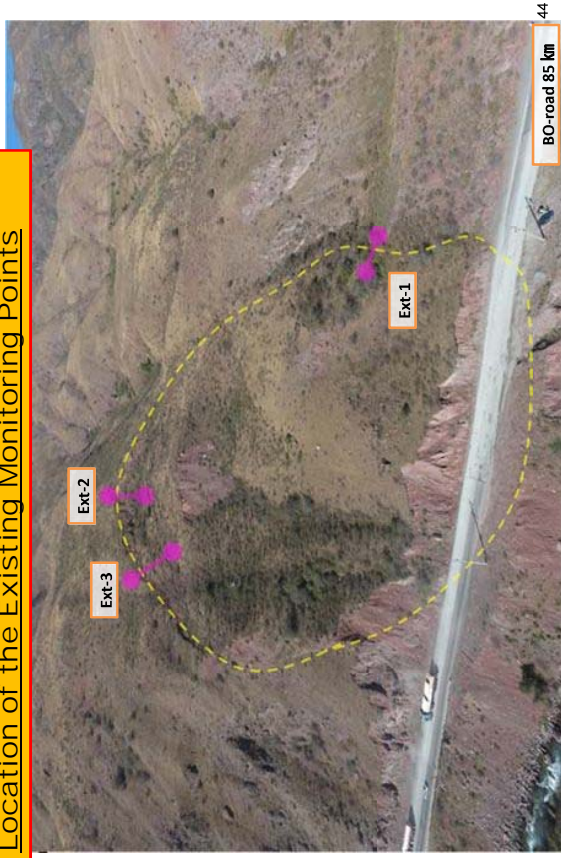
(2) Situation Photos in Osh Training



43

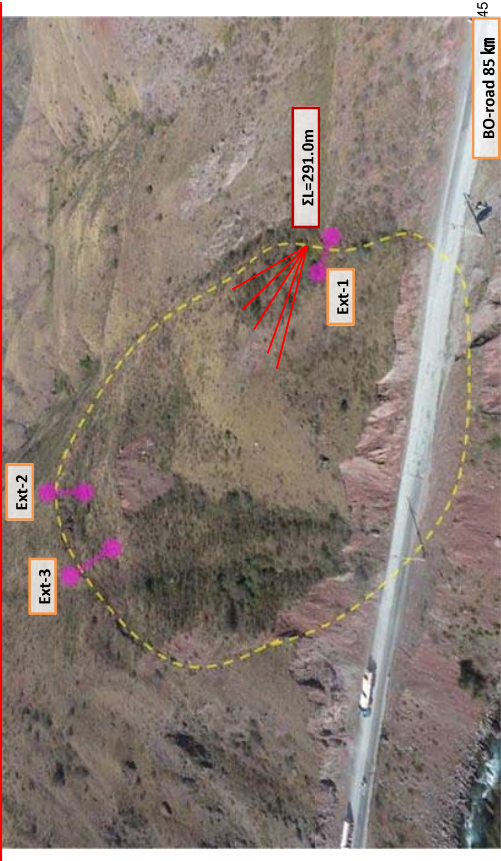
2. Landslide Monitoring along the BO-Road

Location of the Existing Monitoring Points



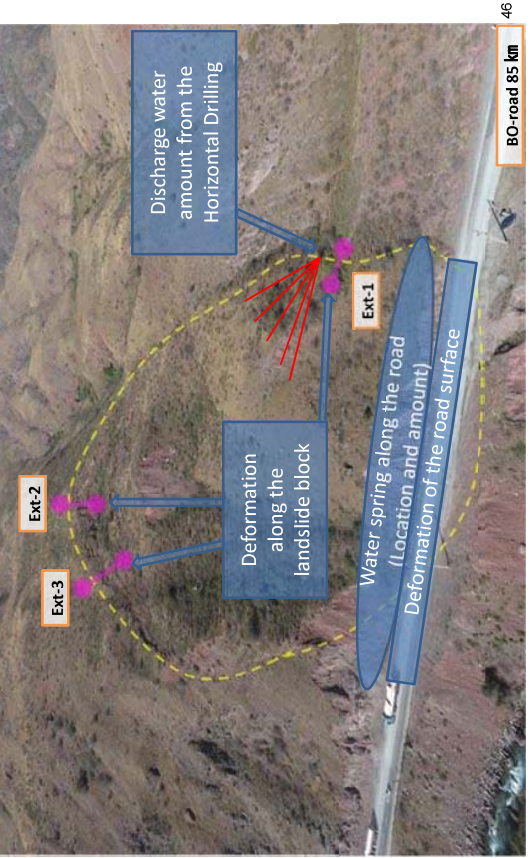
2. Landslide Monitoring along the BO-Road

Horizontal Drainage Drilling Work (Countermeasures against Landslide)



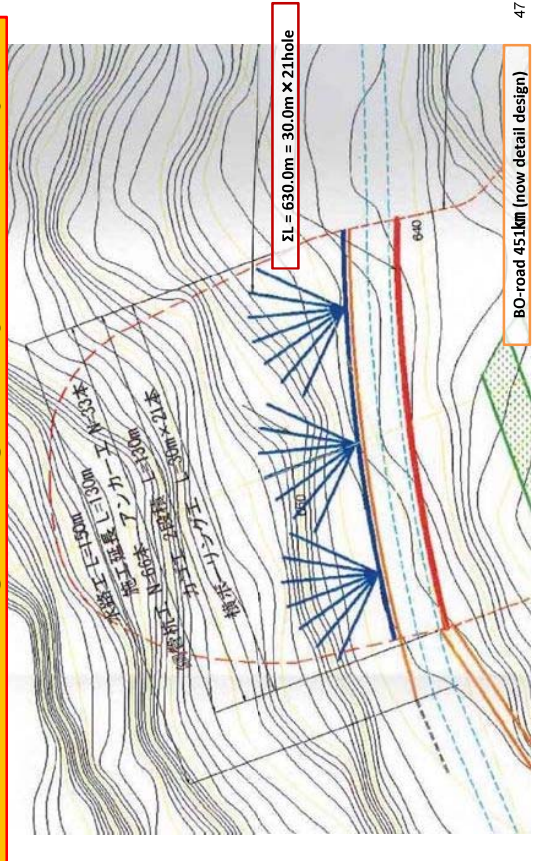
2. Landslide Monitoring along the BO-Road

Monitoring Work After Horizontal Drainage Drilling Work

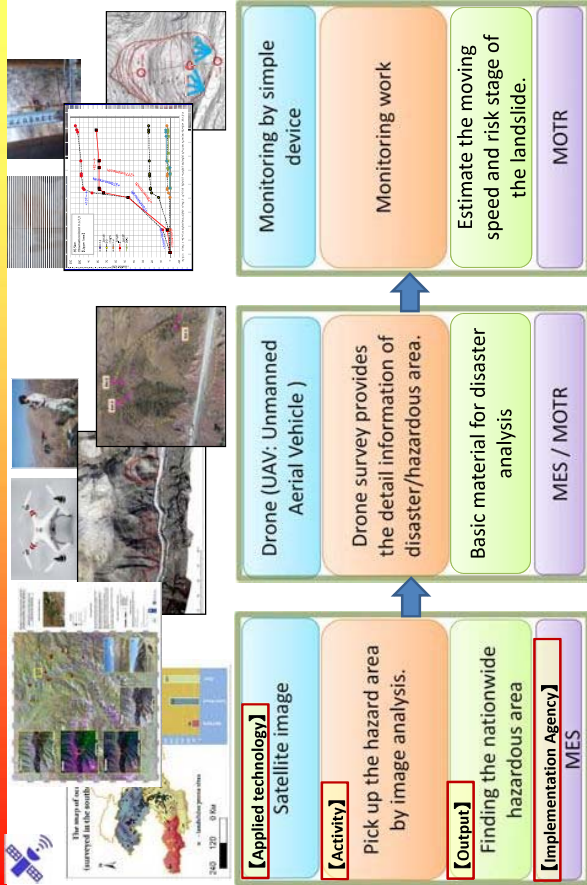


2. Landslide Monitoring along the BO-Road

Horizontal Drainage Drilling Work by JPY Loan Project



3. Utilization flowchart for Disaster Risk Reduction Technology



Thank You for Your Attention

THE PROJECT FOR CAPACITY DEVELOPMENT FOR ROAD DISASTER PREVENTION MANAGEMENT IN THE KYRGYZ REPUBLIC

The 6th Joint Coordinating Committee



Table of Contents

Proposed Monitoring Plan to achieve Overall Goal

1. Overall Goal and the Indicators
2. Proposed Monitoring Plan to achieve Overall Goal after the Project's completion
 - 2.1 To update Short-Term Road Disaster Prevention Management Plan
 - 2.2 To implement Road Disaster Prevention Work

1. Overall Goal and the Indicators

Overall Goal:

Safety of the road traffic at the selected disaster prone areas is improved.



Objectively verifiable indicator for Overall Goal:

- In reference to the Project experiences and Manuals produced by the Project, Short-Term Road Disaster Prevention Management Plan continues to be prepared by RMD of MOTR every year.
- Road disaster prevention work is implemented based on the Short-Term Road Disaster Prevention Management Plan prepared by RMD of MOTR.

52

2. Proposed Monitoring Plan to achieve Overall Goal after the Project

2.1 To update Short-Term Road Disaster Prevention Management Plan

Indicator	Target in 3 years	Actions to take
In reference to the Project experiences and Manuals produced by the Project, Short-Term Road Disaster Prevention Management Plan continues to be prepared by RMD of MOTR every year	<ul style="list-style-type: none"> To continue training program on road disaster prevention management (once a year) 	<ul style="list-style-type: none"> Budget for training program Update of contents of training program and documents Situational update of: <ol style="list-style-type: none"> Inspection Manual, Countermeasures Manual, Preparation Manual for Short-Term and Medium-Term Plan

54

2. Proposed Monitoring Plan to achieve Overall Goal after the Project

2.1 To update Short-Term Road Disaster Prevention Management Plan

Indicator	Target in 3 years	Actions to take
In reference to the Project experiences and Manuals produced by the Project, Short-Term Road Disaster Prevention Management Plan continues to be prepared by RMD of MOTR every year	<ul style="list-style-type: none"> To update Short-Term Road Disaster Prevention Management Plan (once a year) To continue to use the provided database system 	<ul style="list-style-type: none"> Update of disaster record and priority list on DB Proposal/planning on structural/non-structural measures from DEU/UAD Utilization of the manuals for database input & management Update of the manuals for database input & management as needed

2. Proposed Monitoring Plan to achieve Overall Goal after the Project

2.1 To update Short-Term Road Disaster Prevention Management Plan

Indicator	Target in 3 years	Actions to take
In reference to the Project experiences and Manuals produced by the Project, Short-Term Road Disaster Prevention Management Plan continues to be prepared by RMD of MOTR every year	<ul style="list-style-type: none"> To conduct Joint Coordination Meeting with MES and related agencies (once a year) 	<ul style="list-style-type: none"> Information sharing with MES and related agencies for road disaster prevention management

55

2. Proposed Monitoring Plan to achieve Overall Goal after the Project

2.2 To implement Road Disaster Prevention Work

Indicator	Target in 3 years	Actions to take
Road disaster prevention work is implemented based on the Short-Term Road Disaster Prevention Management Plan prepared by RMD of MOTR.	<ul style="list-style-type: none"> To allocate budget for road disaster prevention work (once a year) To continue monitoring of landslide at 85.5km along the BO Road (quarterly) 	<ul style="list-style-type: none"> Securing budget frame for road disaster prevention work Monitoring of: <ol style="list-style-type: none"> Deformation along the landslide block; Discharge water amount; Deformation of the road surface.

56

2. Proposed Monitoring Plan to achieve Overall Goal after the Project

2.2 To implement Road Disaster Prevention Work

Indicator	Target in 3 years	Actions to take
Road disaster prevention work is implemented based on the Short-Term Road Disaster Prevention Management Plan prepared by RMD of MOTR.	<ul style="list-style-type: none"> To implement road disaster prevention work 	<ul style="list-style-type: none"> Development and update of SNS to share the road disaster information (quarterly); Preparation and distribution of hazard map (once a year); Installation of warning board at road disaster prone area (once a year).

57

Thank You for Your Attention

56