

**SECTOR 7 SOCIO-ENVIRONMENT
AND INSTITUTION**

SUPPORTING REPORT

SECTOR 7 SOCIO-ENVIRONMENT AND INSTITUTION

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7.1 BASIC INFORMATION

7.1.1 Overview of Environmental Status and Institutional Arrangement

1) Environmental Status

Tajikistan is suited in southeastern of central Asia and bordered on the north by Kyrgyzstan, on north and west by Uzbekistan, on east by China and on the south by Afghanistan. It occupies an area of 143,100 km², of this 142,700 km² is land and 400 km² is water bodies. Country has been divided into four major administrative regions as in Table 7.1.1

Table R. 7.1.1 Areas, Population and Population Density in Regions of Tajikistan

Region	Area (km ²)	% Of the Country Area	Population (Million)	Population Density (Person/km ²)
Sughd	25,400	17.8	2.0	78.7
Direct Rule Districts*	28,700	20.0	2.1	73.1
Gorno-Badakhshan	64,200	44.9	0.2	3.1
Khatlon	24,800	17.3	2.3	92.7
Whole country	143,100	100.0	6.6	46.1

Includes Dushanbe, the capital of Tajikistan.

Data compiled by JICA study team- June 2006.

In Tajikistan average age and life expectancy are 20.0 and 64.9 years, respectively. Overall literacy rate is 99.4%. Official language is Tajik, about 90% of population is Muslim, and the ethnic groups are Tajik (80%), Uzbek (15%), and others (5%).

Economic growth rate of Tajikistan in the year 2005 was 8%, and share of major sectors in GDP (gross domestic product) was as shown below.

Sector	Services	Agriculture	Industry and mining
Share (%)	50	22	28

About 7.5 of Tajikistan land is arable and occupied by crops such as cotton, wheat alfalfa, chickpea, lentil, oilseeds, grape, apricot, walnut, pistachio, fig, plum, and peach. Major domestic livestock are sheep, goat and cattle.

Mineral resources are silver, gold and uranium. Industry consists of a large aluminum plant, hydropower facilities, and small factories in light industry and food processing.

About 90% of Tajikistan is mountainous, and half of the country lies above an elevation of 3,000 meter, mainly in Gorno-Badakhshan region. Lowest point is only 300 meter in height. Since the country lies in an active seismic belt, occurrence of earthquake is very common. Owing to its geography (steep slope) and amply precipitation, Tajikistan is also prone to water related disasters (flood, landslide). Average annual precipitation variation is very pronounced as it varies between 70 to 2000 mm depending on localities. Average annual temperature also ranges from +17°C to -7°C depending on locality. Geology of Tajikistan is principally comprised of formation and intrusive rocks belonging to Quaternary, Neogene, Palaeogene, Precambrian, and Cretaceous Ages.

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Twenty-three sites, covering a total area of 26,030 km² have designated as environmentally protected area and are under particular attention for their valuable flora and fauna.

Table R. 7.1.2 Statuses of Flora and Fauna Species in Tajikistan

Species	Total number	Threatened species
Higher plants	5,000	2
Mammal	84	9
Birds	210	7
Reptile	51	1
Amphibian	7	0
Fish	6	3

Source: IUCN (international union for conservation of nature)-2003.

Major environmental issues (problems) in Tajikistan are:

- Inadequate sanitation facilities and lack of access to clean water
- Increase in industrial wastes
- Increase in soil erosion and salinity rate
- Reduce in soil fertility and land productivity
- Increase in deforestation and desertification rate.

Tajikistan has furnished many laws, regulations, and guidelines for protection and sustainable utilization of **natural** resources, safety and productivity of **socio-economic** environment, as well as conservation of **historic and cultural** assets, some being tabulated below. For more information also see section 7.2 Environmental Scoping.

Criminal Code- 1998	Deals with crimes against ecological safety and social environment, address pollution issue and set punishment for the polluters. Among the stipulated Articles, the following are noticeable: Article 226 deals with water pollution; 227- air pollution; 228- soil pollution; 230 and 232 illegal hunting of wild animals; 234- destroying natural vegetation. Articles 146 and 148 set punishment for individuals who damage social infrastructures, and official refusing to provide citizens with information relating to their rights/interests.
Law on external economic activities- 1993	Encourages foreign investment, and protect the rights, interest and properties of participants in external economic activities. The law aims at economic development, thereby enhancement of living standards of citizen.
Law on Specially Protected Territories- 2002	Gives priority to specially protected territories over socio-economic interested. Prohibits the economic activities in strict nature reserves, and furnishes criteria under which certain portion of natural parks can be used for tourism and other limited economic activities.
Procedure for Licensing Activities in the Field of Ecological expertise- 2003.	Provides for both individuals and legal entities that want to be ecological experts to apply for a License to State Committee for Environmental Protection and Forestry. Successful candidates will received a license valid for two years.
Administrative Violation Code- 1998	Establishes administrative liability for individuals and institutions that violate environmental laws, and sets fine for the violators.

2) **Institutional Arrangement**

Institution is a purposeful social structure created by people (informal) or government (formal) for making and enforcing rules governing cooperative human activities, as well provision of defined public services.

At national level the following institutions/organizations are somewhat relevant to this project. Therefore study team should regularly consult them and receive their advices/support, as well as supply them with findings of its study to create technical understanding and mutual cooperation with these bodies. Such understanding/cooperation would avoid duplication of works as well contribute to efficiency and success of the project. Relevant Structural Charts are attached at end of this text.

a) **Hydro-meteorological Organization**

Hydro-meteorological organization of Tajikistan has close relation with world meteorological organization (WMO), as well as with counterpart organizations in neighboring countries such as Uzbekistan and Russia. In recent years it has received support from WMO for upgrading its instruments and transmittal system. This organization, having its central command (headquarters) in Dushanbe, possesses an efficient nation-wide network being operated/ maintained by about 900 personnel. It provides hydrological and meteorological services to more than 25 institutions, and contributes to safety/welfare of nation by providing data on runoff in flood-causing rivers, and information on status of air pollution in large cities. Followings are among the tasks being routinely performed by this organization.

- Daily (twice) measurement of water level in principal rivers
- Daily weather forecasting
- Measurement of water turbidity (pollution) of main rivers
- Measure annual snowfall in glacial zone, and estimate the amount of runoff that it could produce upon melting
- Measurement of air pollution basing on WMO standards.

For networking and mechanism of data/information transmission by hydro-meteorological organization see Attachments at end of this text.

b) **Republican Project Coordination Center for Liquidation of Consequences of Natural Disasters**

This center was established in August 1998 in accordance with decree number 311 of the government of Tajikistan to coordinate the rehabilitation works on liquidation of consequences of natural disasters. From 1998 to 2003 this center carried out its tasks as an independent body, but in 2004 it was incorporated in the ministry of emergency situations and civil defense to work under ministry administration. Tajikistan government each year allocates a certain budget to this center for being used in rehabilitation activities. In 2006 allocated budge was 5.5 million Somoni (1.8 million US\$) Besides managing its own budget, this center also manages/ supervises the utilization of funds provided by national government and/or international donors (World Bank, Asian development bank) in execution of disaster related projects. This center usually performs the following tasks:

- Coordination and effective management of project works for rehabilitation/ restoration of disaster affected areas

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- Preparation of technical specification for components of disaster related projects, cooperation in selection of contractors, and supervision/verification of execution works
- Financing of emergency works for quick restoration of disaster affected infrastructures by using its own annual budget, as well as seeking support of interested bodies, including NGOs.

c) State Committee for Environmental Protection and Forestry (EPF)

The Committee which was established in 2004, now has about 2,400 personnel and performs the following tasks:

- Define strategies for protection, conservation and sustainable use of natural resources
- Draw initial documents of environmental laws, regulation and standards, and seeks their approval by government
- Issue permits for utilization of natural resources and decide the relevant fee to be paid by users
- Set quotas for hunting and collection of fauna and flora
- Designate specially protected territories (nature reserves)
- Decides on types of protect/activities for which full-scale environmental impact assessment is mandatory.

d) Ecological Expertise Department of EPF

- Carry out ecological expertise of planned activities
- Review/verify project documents related to environmental study, and provide its comment/decision on environmental soundness of project to the proponents
- Draft the format of terms of reference for environmental study
- Oversee the project/activities to check their compliance with environmental laws, regulations, and standards.

e) State Committee for Land Administration

- Establish land use policy and carryout land reform
- Maintain land cadastre and take measures for efficient utilization and proper protection of state lands
- Register rights to land use and propose rate of land tax
- Endeavor for rehabilitation of polluted/degraded lands.

f) Ministry of Melioration and Water Resources

- Establish and maintain the irrigation networks, and reservoirs
- Supply water to agricultural consumers and collect water fee
- Establish norm and limits on water withdrawn by consumers and monitor water use efficiency

- Maintain land reclamation cadastre, and issue permit for use of irrigation water to the users.

g) Ministry of Emergency Situations and Civil Defense (MoES)

- Facilitate quick response to nightmare of disasters (flood, earthquake) through assessment and preparation of documents on status of damaged sites
- Endeavor for protection of citizen and territory against natural and industrial (technical) disasters
- Collaborate with governmental institutions, local authorities, humanitarian and non-governmental organizations for quick liquidation of consequences of disasters
- Absorb and coordinate the international technical and financial assistances for promoting disaster preparedness and management tasks in the country.

h) Information Management and Analytical Center (IMAC)

This center is within MoES, and performs tasks such as:

- Collect, analyze and disseminate data/information on disasters
- Prepare hazard maps to facilitate planning for mitigation and allocation of resources for coping with disasters
- Organize and develop monitoring and early warning systems in most vulnerable areas.

i) Networking of Information Management and Analytical Center

Networking of Information Management and Analytical Center is shown in the Attachments.

j) Division for Conservation of Historical Assets

This division is within the Ministry of Culture and endeavor for conservation of historical assets. It also repair/rehabilitate the damaged items through archaeological techniques in workshops, which have been set in different regions for this purpose.

k) Red Crescent Society of Tajikistan

This is a member of International Federation of Red Cross and Red Crescent Societies, and has an agreement with the Ministry of Emergency Situations and Civil Defense for cooperation and joint response to disasters. Followings are among the tasks performed by this society:

- Provide urgently needed materials such as first aid, water container and utensils to disaster affected people
- Provide preparedness training to volunteers in communities, NGO and governmental institutions, such as MoES
- Train the school students to increase their capability and preparedness for responding to disasters and emergency situations

- Maintain year-round equipped sentinel teams for quick response to disasters
- Endeavor for establishing communication and reunion of family members, who have separated as a consequence of disaster/emergency situation
- Undertake some works activities such plating the bare-lands to reduce flooding and its disastrous consequences
- Absorb international donations and perform fund raising activities to strength its budget status.

I) Non-Governmental Organization (NGOs)

However there are many international NGOs providing support to Tajikistan for realizing its tasks, national NGOs are not fully active, partly due to unavailability of budget. Some of local NGOs relevant to environmental protection are listed below:

Junona Center for Nature Conservation, established in 2005, is an NGO, initially formed by staff and students of Tajik Technical University in Dushanbe. Its members endeavor for preventing/reducing environmental pollution through increasing public awareness and arranging waste-collection activities. This center identifies natural places, which are polluted by human wastes (camping sites) and then mobilize its members for their collection and destruction in a safe area. It also publishes simple materials describing importance of a clean living environment to increase awareness of people and encourage them for taking nature conservation works.

Republican Society for Nature Protection- forms public movement and makes propaganda for natural protection.

Republican Union of Ecologist and Specialist in Climate- endeavors to combine the scientific knowledge of citizens with environmental conservation tasks, including introduction of new technology and program to monitor status of the environment.

Other NGOs that can be named are Fund for Ecology and health, and Fund for Supporting Citizens Initiatives.

7.1.2 Environmental Status and Institutional Arrangement

1) Environmental Status

Natural Environment

Wildlife of the study areas includes creatures such as *Canis lupns* (wolf), *Canis aureus* (jackal), and *Vulpes vulpes* (fox), *Sus scorofa* (boar) *Hystrix indica* (porcupine).

Many kinds of snakes, lizards, and scorpions, and tarantula are seen in the area.

Eagle, partridge, crow, sparrow, and ducks are among the birds seen in the area.

Shark, anchovy and other fishes as well frog, and tortoise are among aquatic creatures of the area.

Characteristics of Flora of the study area are tabulated below:

Species	Common name	Brief description
Gundelia	Artichoke	The plant belongs to Compositae family and has wide leaves, which are edible. It also has medicinal and industrial uses, but of low pasturage value. Such plants are seen in mountainous areas of the study area in vicinity of Chubek Jamoat.
Agropyron	Wheat-grass	This is a cold resistance plant, with short vegetative part and deep roots, through which contribute to soil conservation.
Hordeum	Wild-barley	It belongs to Graminaceae family, grows at mid-altitude, and has high pasturage value.
Bromus	Brome-grass	The plant grows at low to mid-altitude, and attains its maximum vegetative growth in spring season. The plant has high pasturage carrying capacity and good palatability, thereby contributes to feeding of domestic livestock.

Source: Socio-environment survey by JICA study team- June 2006.

Other species such as Euphorbia, Phlomis, and Trifolium also grow in the area.

Principal water source in the study area is Pyanj river, which is conveyed to command area by a canalling network. A small salty stream originating in Kuh-namak (salt mountain) travels in the area and pours into Pyanj river through Sorkhab river. In some Jamaots groundwater is also exploited through wells and used for domestic use and watering the livestock and plants.

Socio-economy

Hamadoni district with a total area of 50,979 ha and total population of 115,422 is situated in Khatlon province in southern part of the republic of Tajikistan, which borders Afghanistan. Population density is about 2.3 persons/ha, and female population is slightly (1%) higher than that of male population. Being adjacent to Pyanj River, this district annually suffers flood damages. Hamadoni district has been divided into eight sub-districts, locally called as Jamoat. Each Jamoat is composed of several rural settlements (village), composing of few to numerous households. A local government, called as Hukumat, governs the district, and an administrative office deals with affairs of its relevant Jamoat. Chairman of Hukumat is selected by provincial administration, and chairman select head office of each Jamoat. Usually official tenure is for a 5-year term, and it seems that the administrators are democratically selected based on their capability and efficiency, rather than race, tribal affiliation or sex orientation, as head of one of the Jamaots is a woman, and one deputy head is a gay. Almost entire inhabitants are Tajik and Muslim, with generous and cooperative characteristics.

Some of social nuisances of Hamadoni district are listed below:

- Subject to frequent floods
- Unavailability of safe drinking water
- Unemployment
- Improper access to mass media
- Poor overall sanitation
- No access to balanced food and proper nutrition

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- Lack of recreational facility and no activity for student in long vocations
- Occurrence of diseases such as Tuberculosis
- Psychological stress as consequences of floods
- Lack of sporting and gathering space.

Historic and religious sites

Totally six sites with cultural/religious importance exist in study area, which are indicated in the Fig. 7.1.1 and briefly described herein below:

S1 Dahaneh ruin village

This site, which is delineated with metallic fence, encompasses ruin of Dahaneh, just beside the Pyanj river at Tajikistan-Afghanistan border. This site is in Chubek Jamaot, and has been registered by division for conservation of historical assets, ministry of culture as a historic spot. It is said that the site bears ruin of a village, which had been covered/destroyed by mud and debris a long time ago.

S2 Abku graveyard

This site contains the remains of a graveyard dating back to Bronze Age, about 1000 years before Christ (BC). In this graveyard, many utensils such as pot, tray, bowl, and candle-stand had been found beside the remains of corpses. This site is in Moskva Jamaot, has been registered as an ancient graveyard and still is under archaeological investigation by researchers of ministry of culture and other relevant institutions.

S3 Khahareh Khajeh tomb

This is a newly constructed tomb just at foot of Kuh Namak (salt mountain), and has not been yet registered by ministry of culture as a historic/religious asset. Custodian of the tomb says that it belongs to sister of Khajeh moamin, who is buried in site S4. In search of her brother, she arrived in Hamadoni area, where she died. Local people go to her tomb, particularly in Wednesday to pray and pay respect. They donate some money, which is used for expansion and maintenance of the tomb.

S4 Khajeh Moamin graveyard

This is a graveyard on top of mountain, belonging to Khajeh Moamin, a sincere Muslim, who was highly respected at his time. However many people, some staying overnight, regularly visit the graveyard, they have no much information on life, activity and even nationality of Khajeh Moamin, since the case has not been investigated yet.

S5 Shahidjan graveyard

This is a graveyard, which is in Panjab Jamaot, belongs to Khajeh Ahyee (locally known as Shahidjan), who was killed by Soviet troops in 1930. He was a leading Muslim who resisted the communist army to prevent occupation of Tajikistan territory. When the strong soviet troops defeated his group, he came to Hamadoni district with the idea of crossing Pyanj river and reaching Afghanistan. But in Panjab Jamaot he was shot by communist soldiers and died. Later on people buried his dead body in a place, where now is registered as a graveyard of historic/religious importance.

S6 Sayad old town

This site, which is well enclosed by a wooden fence is situated in Turdiev Jamaot, and is registered as an ancient town. Archaeologists believe that this town belongs to Samanied era, when the first well-organized government was established in Tajikistan territory. During the years 1970 to 1982, archaeologists investigated this site and discovered a rectangular residential block with 50 x 50 meter dimension, having compartments for living,

working, praying, and dining, which is supposed to belong to ruling family. Pictures of animals such as lion have been observed on wall of the buildings. It has been recorded that flooding of Pyanj river in 1904 washed away most of remains in the town, before being access and investigated by archaeologists.

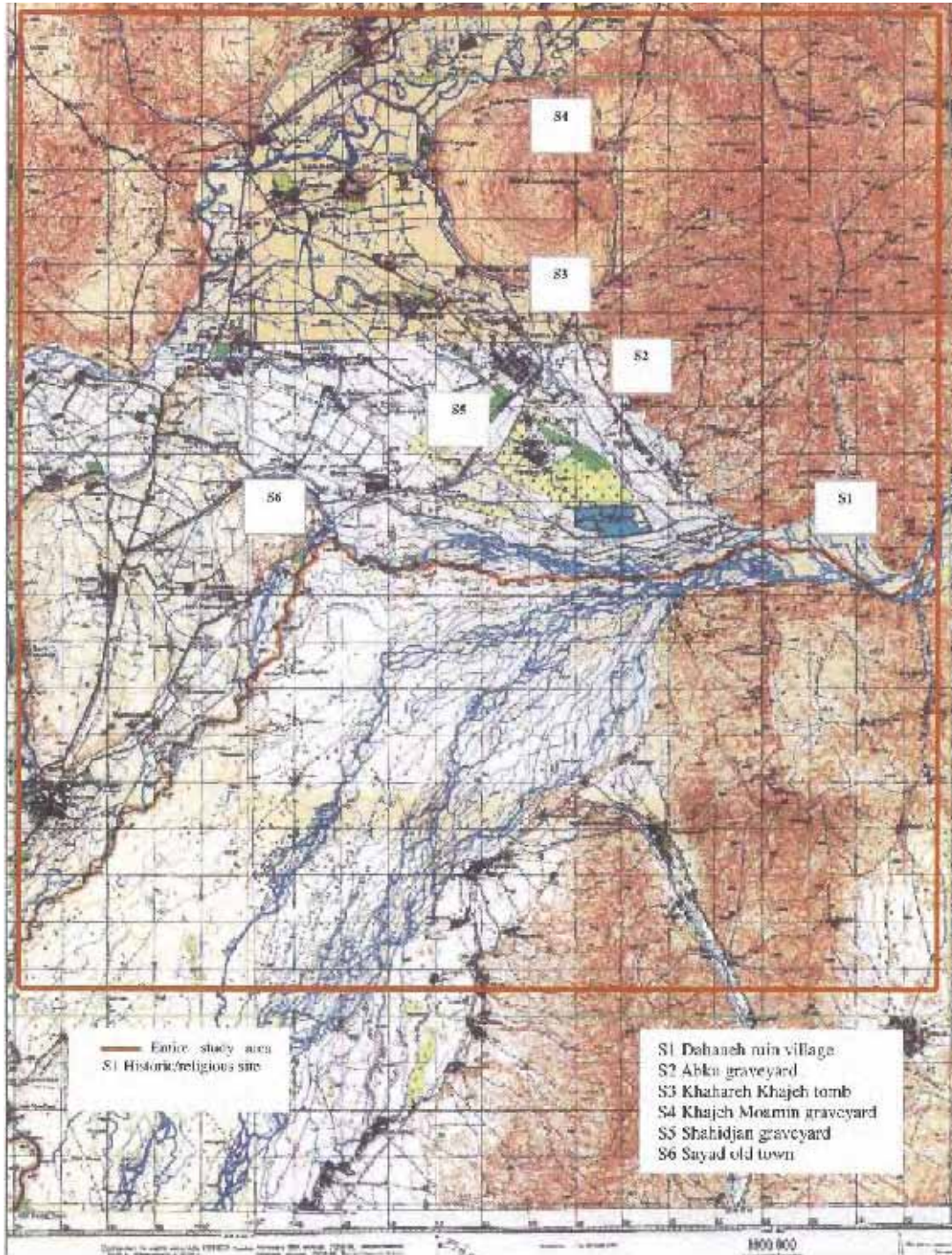


Fig. R.7.1.1 Historic/Religious Sites in the Study Area

2) Institutional Arrangement

Major *institutions/organizations* in the Study Area are local government of Hamadoni district, administrative office of Jamoats, office of environmental protection and forestry committee, office of land committee, and local committee of Red Crescent society. Structure and some of tasks of these institutions are provided herein below:

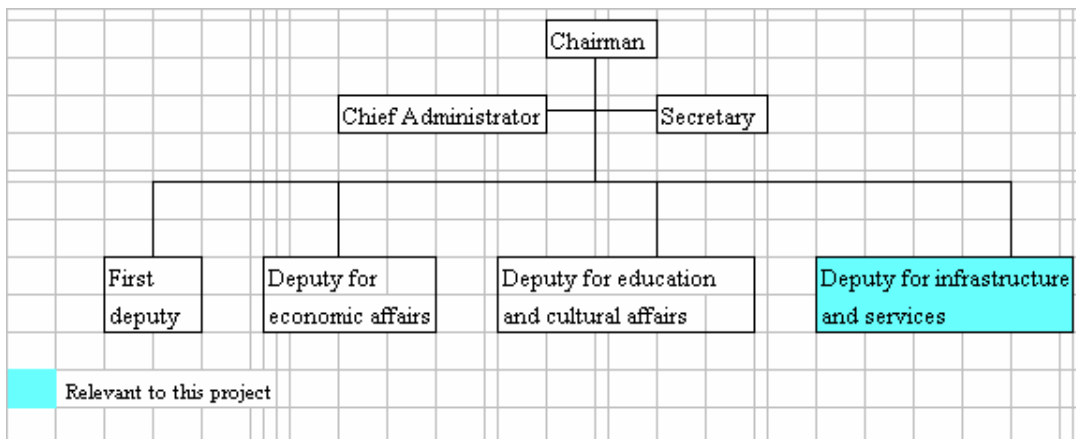


Fig. R.7.1.2 Structure of Local Government of Hamadoni District

Local government (Hukumat) of Hamadoni district

It is responsible for all affairs in the district, including ensuring security and welfare of people and overseeing their compliance with prevailing laws and regulations. Protecting the inhabitants against disasters by taking proper and timely measures is a responsibility of local government. It also undertakes tasks such as:

- Provision of public infrastructure and services in the district
- Arrangement of facilities for education and cultural enhancement
- Introduction of means/ measures for economic development of the district
- Facilitate dispatch of youth people to Tajik army for performing national duty.

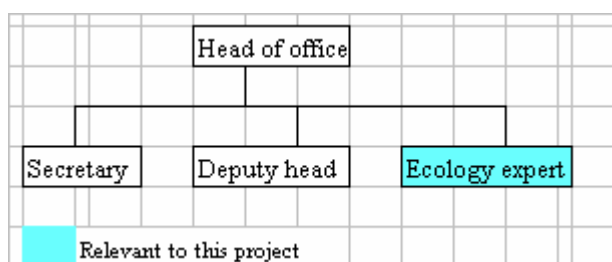


Fig. R.7.1.3 Structure of Office of EPF

Office of environmental protection and forestry committee (EPF)

This office usually performs the following tasks:

- Oversee the status of environment and encourage people for environment conservation works
- Assure that the environmental laws/regulations are observed in the area
- Discourage the public from damaging the nature by explaining the importance and benefits of a health environment

- Set penalty for individual, who cause environment pollution or remove natural vegetation illegally
- Decide the fee and collect revenue from individual/enterprises willing to utilize natural resources for own purposes. It should be noted that in Tajikistan natural materials are not free, but exploiters should pay for them.
- Provide advice to project executors in conducting environmental study for their projects
- Oversee project/economic activities routinely to make sure that they operate in accordance with environmental regulation and standards
- Provide information and answer the questions on general environmental issues.

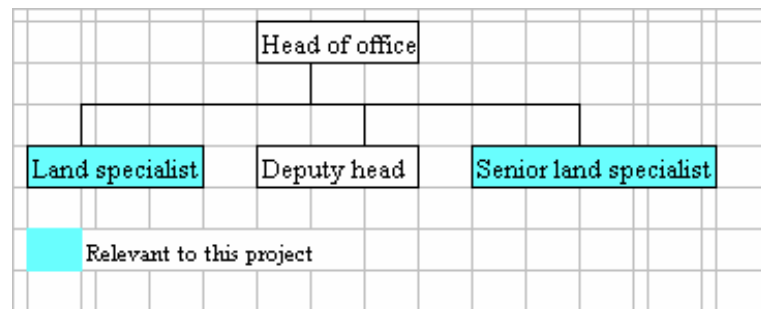


Fig. R.7.1.4 Structure of Office of Land Committee

Office of land committee

Main task and responsibilities of this office are:

- Introduce measures for conservation and proper utilization of land resources
- Collect data and prepare document/statistics on lands and land users
- Delineate land for land users and provide them with relevant certificates
- Assist in forming farmer's organization
- Cooperate in establishing/reforming agriculture related enterprises.

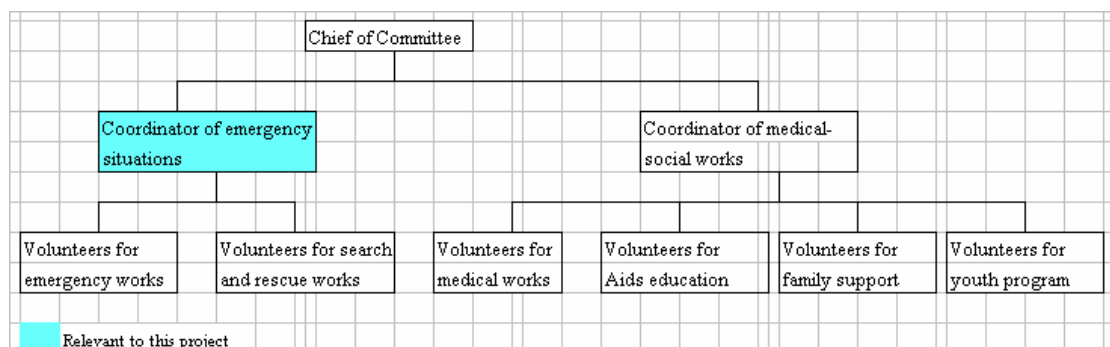


Fig. R.7.1.5 Structure of Red Crescent Committee in Hamadoni District

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Red Crescent committee

This committee is under Red Crescent Society of Tajikistan, and usually performs tasks such as:

- Absorb the volunteers and provide training for coping with disasters
- Maintains a team of volunteers with ability to provide first aid and disseminate
- Information relating to prevention of AIDS
- Provide information and guidance in family planning (birth control measures)
- Cooperate in arranging health recreation programs for the youths.
- Endeavor for preventing/reducing damage of flood by undertaking measures such as planting on bare and sloppy lands.

Typical structure for Jamoat Administrative Offices with description of their tasks are presented in section 7.2 Environmental Scoping.

Farmer's organization

At Jamoat level farmer's organizations exist. Usually total members of each organization ranges between 20 to 30 persons, however far larger ones also have been reported. Present (2006) about 361 farmer's organizations are active in the study area. Each organization uses its own designated land for production and pays annual land tax in accordance with land holding size. Current annual tax for land under cotton is 74 Somoni/hectare, while for other plantations is 148 Somoni per hectare.

No NGOs (non-governmental organizations) exist (stationed) in Hamadoni district.

For more information see section 7.2 Environmental Scoping.

7.2 ENVIRONMENTAL SCOPING

7.2.1 Full Title of the Project and Relevant Report

Title of the Project: The Study on Natural Disaster Prevention in Pyanj River in the Republic of Tajikistan.

Relevant Report: Progress Report I

7.2.2 Type of the Study

Pilot project, Master plan and Feasibility study

7.2.3 Environmental Category and Reason for Categorization

Environmental Category: C

Reason for Categorization:

The proposed project falls in Category C of JICA (Japan International Cooperation Agency) categorization, with following reasons:

- It is a disaster prevention project for safeguarding people lives and properties, as well as reducing rate of soil erosion caused by flood water
- Project components are of small scale, being implemented in a limited area
- No relocation of households is planned under this project

- All groups of people regardless of their ethnic background and religious beliefs are benefited from the project
- Project cause no any damage to historic remains or cultural assets
- Almost all negative impacts of project are temporary, being eliminated after completion of the construction works
- During construction works, the project uses locally available materials and applies simple methods, which promote its safety and acceptability by local people
- Implementation of the project would bring-about the improvement in overall status of natural and socio-economic situation, through reduction in rate of land deterioration and provision of incentive for farming and other activities.

7.2.4 Agency Responsible for Implementation of the Project

Basically Government of Republic of Tajikistan has nominated the Ministry of Emergency Situations and Civil Defense (MoES) as executive agency for this project. In order to deal with project tasks efficiently, the Ministry has formed a Working Group head by its First Deputy Minister (Abdurahim RAJABOV) by incorporating personnel from various institutions, as shown in Table 7.2.1. Structure of MoES is also illustrated below.

Table R. 7.2.1 Members of Working Group Cooperating with the Project

Ministries/Institutions	Personnel	
	Post	Name
Ministry of Land Reclamation and Water Resources	First Deputy Minister	Kodir SAIDOV
Ministry of Land Reclamation and Water Resources	Advisor	Nurullo ASHUROV
Ministry of Land Reclamation and Water Resources	Head of Exploitation and Repair Department	Ismoil NAJMIDDINOV
Gyprowodkhoz Institute	Director	Akbar NABIEV
State Water Control Inspection	Head	Mumimdjon ABDUSAMADOV
State Geology Department (Tajik-geology)	Head	Akmal AKHMEDOV
Meteorological Services of Tajikistan (Tajik-meteorology)	Deputy Director	Anvar HOMIDOV
Scientific Research Center (Agency Tajik-koinot)	Expert Staff	Abdusattor HAFIZOV

Source: Minutes of meeting for the Study, agreed between MoES and JICA in March 2006.

It should be noted that following persons from MoES are also member of working group:

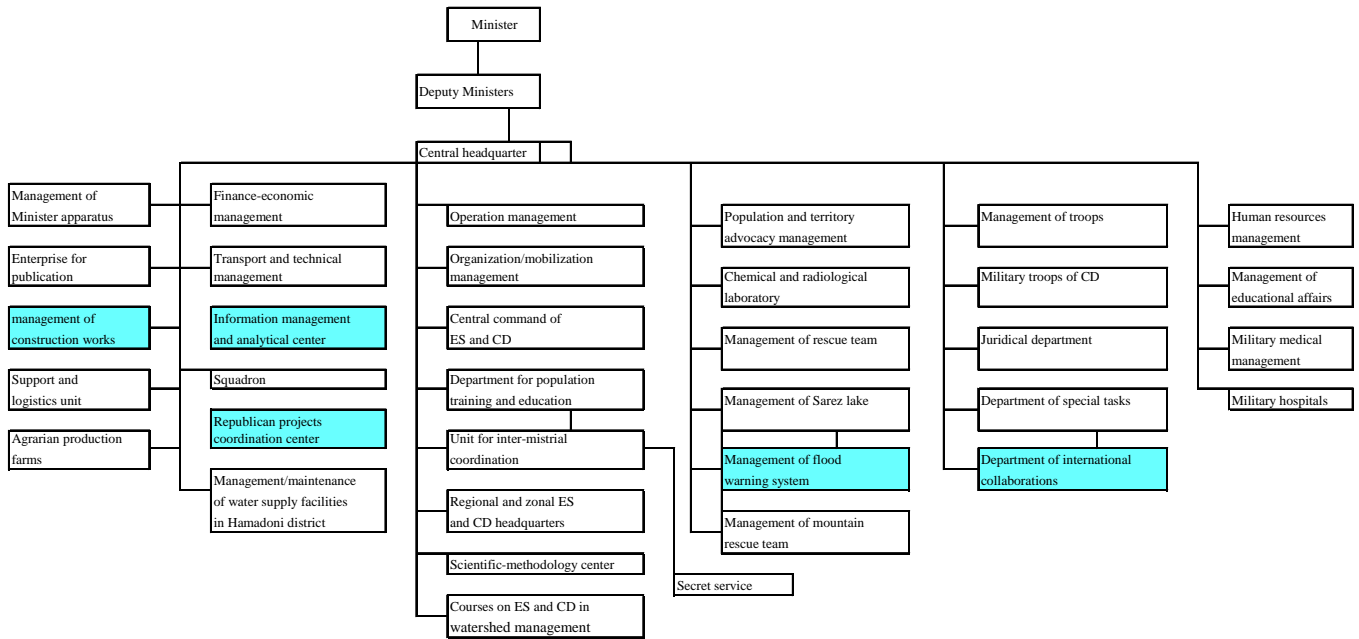
Alisho SHOHMAHMADOV, Head of Information Management and Analytical Center

Shogunbek AZIZBEKOV, Head of Population Protection Division

Rustam ZIKAEV, Deputy Head of Construction Department

Rustam ABDULLAEV, Deputy Director, Republication Project Coordination Center for Liquidation of Consequences of Natural Disasters.

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7.2.5 Outline of the Project

Objectives

Principal objectives of the Study are stated as follows:

- Formulate a master plan for flood disaster prevention in the Study area, which includes a flood control plan, a flood fighting plan and a flood forecasting, warning and evacuation plan
- Implement a pilot project to evaluate validity of river training in Study area
- Carry out technical transfer to the staff of Ministry of Emergency Situation and Civil Defense and other relevant agencies through the Study activities.

Goals

- Improve the security and preparedness of inhabitants of Hamadoni district against flood for minimizing the overall causality of natural disasters
- With reduction in damage of natural disasters, socio-economic situation and ecosystem of the area are improved, contributing to prosperity of region.

Justification

Hamadoni district, which encompasses Pyanj river basin, is subjected to frequent floods caused by melting snow and glaciers, thereby suffering economic damage and human casualties. Damages of recent flood are shown in Table R 7.2.2.

Table R. 7.2.2 Causality of Flooding of Pyanj River in July 2005

Item	Magnitude	Remark
Arable land	482 ha	Cotton, wheat, vegetable, grape
Livestock	64 head	Mainly cow
Human	1 person	
Main road demolition	4.4 km	
River dikes demolition	5.2 km	
Bridge	3 units	
House	266 units	136 units fully destroyed
Pump station	11 units	
Economic damage	22,446,500 Somoni	3 Somoni = 1 US \$ (Average for 2005)

Source: Population Protection Division of MoES- June 2006.

It should be noted that above Table shows only the physical and economic damages of flood. Stress and psychological damages imposed by flood on inhabitants should also be considered.

Location

Study area covers alluvial fan of Pyanj river in Hamadoni district of Khatlon region in southern part of the Republic of Tajikistan.

Activities

In principle the Study team aims at formulating flood mitigation plan for the area. Prior to formulation of Master Plan, the team will execute a small-scale pilot project to be used as reference in actual planning. Framework of flood mitigation plan is presented in below:

Category	Objective	Means/Arrangement
Structural Measures	Reducing flooding	Flood control Sediment control Engineering support for planning, design, construction and maintenance
Non-structural Measures	Reducing susceptibility to damage	Legal arrangement Institutional arrangement Monitoring, forecasting, warning, and communication systems
	Mitigating the impacts of flooding	Preparedness: hazard map, education, information management Emergency services Insurance
	Preserving the natural resources of floodplains	Floodplain management

Scope

The Study team will execute a small scale pilot project for riverbank stabilization, formulate a Master Plan composing of components with emergency, short and middle terms target, and then conduct feasibility study on priority components. Planning will cover both the establishment of structural measures, and introduction of non-structural to prevent/ minimize damages of natural disasters (flood) in an efficient way. Time schedule for the entire Study, and that of Pilot Project are shown herein below.

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Year	2006											2007										
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Inception Stage	█																					
Preparation Data Collection		█	█	█	█	█	█															
Analysis					█	█	█	█	█	█												
Master Plan										█	█	█	█	█								
Feasibility Study													█	█	█	█						
Pilot Project										█	█	█	█	█	█	█						
Draft Final Report																				█		
Final Report																						█

Time Schedule for Entire Study

Phase	1 st										2 nd			3 rd	
	06/4	5	6	7	8	9	10	11	12	07/1	2	3	4	5/after	
Establish cooperation system	█														
Site Survey	█	█	█												
Primary Design			█	█											
Consensus				▽											
Design				█	█										
Costruction Plan/cost					█	█									
Contract Document					█	█									
Announcement								▽							
Bidding									▽						
Evaluation/Contract									█						
Notice to Proceed										▽					
Costruction										█	█	█	█	█	
Completion														▽	
Post Evaluation														█	
Monitoring														█	

Time Schedule for Pilot project

7.2.6 Description of the Project Site

Locations and population

Study Area covers entire Hamadoni district (locally known as Nahiyeh Mirsaeed Ali Hamadani) being situated at right bank of Pyanj river in Khatlon region in southern part of the republic of Tajikistan. District has been divided into 8 administrative units (sub-district) called Jamoat, alignments of which are shown in Fig. 7.2.1.

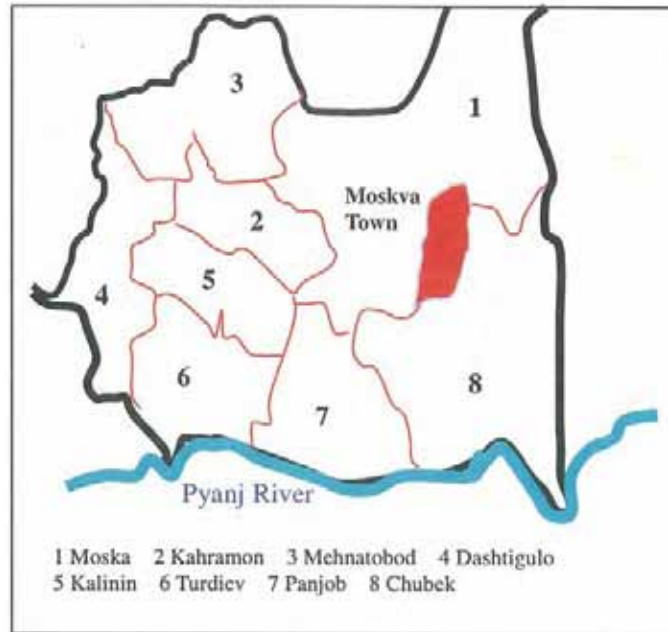
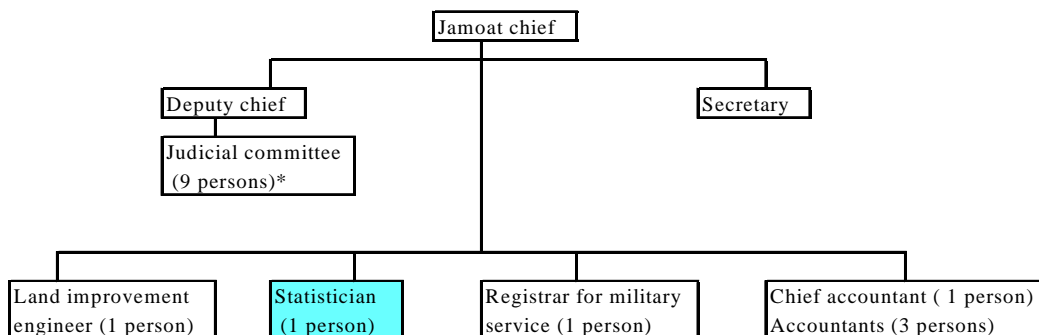


Fig. R.7.2.1 Alignments of Jamoats in Hamadoni District

Each Jamoat is composed of several villages (rural settlements). In January 2006, total number of households and population for the district were 14,125 and 115,422 respectively. Distribution of households and population in Jamoats of district are shown in Table 7.2.3. It should be noted that female population is slightly (1%) higher than that of male, which can be attributed to migration of men to other areas for seeking job opportunity. Each Jamoat is governed by an administrative office comprising of chief, deputy, secretary, engineer, accountant and service personnel, who are selected by local government for a five-year tenure. Typical structure of Jamoat administrative office is shown herein below.



It should be noted that the judicial committee (9 persons) is composed of representative from villages (8 persons) and chair by deputy chief of Jamoat (1 person). Statistician of Jamoat is directly related to this captioned project.

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Table R. 7.2.3 Households and Population in the Jamoats

	Jamoat	Household	Population
1	Moskva	2,794	19,965
2	Kahramon	1,760	15,441
3	Mehnatobod	2,052	18,449
4	Dashtigulo	1,828	16,015
5	Kalinin	1,376	11,107
6	Turdiev	1,009	8,490
7	Panjob	1,079	8,537
8	Chubek	2,227	17,418
	Total	14,125	115,422

Source: Statistics Department of local government of Hamadoni district- June 2006.

Average family size for the district is 8 persons, and life expectancy is about 63 years.

Land use and crop production

Land use in Hamadoni district is simplified into 12 categories, with higher share (about 38%) for rangeland (grass and shrub), followed by farmland (29%) and water body (10%). Marshland covers only a small part (0.2%) of the district. A portion of land belonging to local government has been allocated to poor/landless people to work on it for subsistence. Users do not pay any rent or taxes for these lands, which are known as presidential land. Share of such lands in land use of Hamadoni district is about 3% (Table 7.2.4).

Table R. 7.2.4 Land use in Hamadoni District

	Category	Area (ha)	% Of total	Remarks
1	Farmland	14,889	29.2	Cotton, wheat, potato,
2	Orchard	770	1.6	Grape, apple, berry, plum
3	Grassland	177	0.3	Mostly annual grass
4	Rangeland	19,591	38.4	Perennial grass and shrub
5	Residential area	1,926	3.8	Building and yards
6	<i>Presidential land</i>	1,598	3.1	Usually subsistence crop
7	Bush-land	573	1.1	Includes wild pistachio
8	Marshland	121	0.2	Groundwater level is high
9	Water body	5,310	10.4	Lake, pond, fish pond
10	Road	780	1.6	Main road and pathways
11	Public infrastructures	1,057	2.1	Office, school, clinic
12	Bare-land and others	4,187	8.2	Partially damaged by flood
	Total	50,979	100	

Source: Office of land Committee in Hamadoni District- June 2006.

Amount of commodity produced in the district during year 2005 is shown in Table 7.2.5.

Table R. 7.2.5 Commodity Produced in Hamadoni District in 2005

Commodity	Amount produced (ton)	Remark
Field grain	17,606	Wheat
Industrial crops	7,314	Oilseeds
Cotton	7,188	-
Potato	4,773	-
Vegetable	8,118	Onion, cucumber, cabbage
Melons	3,871	Watermelon and other kind included
Meat	2,267	Sheep and goat
Milk	10,531	Cow
Wool	80	
Honey	2	
Silk (cocoon)	89	
Egg	1	Million pieces

Source: Statistics Department of local government of Hamadoni district- June 2006.

Number of livestock and poultry for each is indicated in Table 7.2.6.

It should be noted that the economy of district is principally based on farming and livestock raising activities, largely traditional and involving women and children.

Table R. 7.2.6 Livestock and Poultry in Each Jamoat- June 2006

Jamoat	Livestock					Poultry
	Sheep	Goat	Cow	Horse	Donkey	
Moskva	-			-	-	-
Kahramon	2,208	637	3,650	15	-	2,956
Mehnatobod	1,472	1,180	3,562	86	540	5,280
Dashtigulo	1,404	381	2,766	51	372	3233
Kalinin	98	30	1,550	40	124	1,610
Turdiev	981	210	1,130	5	-	3,763
Panjob	316	58	2,739	32	103	1,643
Chubek	1,453	2,030	3,015	74	-	1,156
Total	7,932	4,526	18,412	303	1,139	19,641

Source: Socio-environment survey by JICA study team- June 2006.

Infrastructures and services

Availability of infrastructures in Jamoats of Hamadoni district is simplified in Fig. 7.2.2. As shown in this Figure, only 75% of Jamoats are supplied by piped water, which is usually turbid and of low quality. However all the Jamoats possess electricity, but power failure is common, making the supply irregular and unreliable. Absence of gas supply network and postal service is big disadvantage to district. As former encourages removal of natural vegetation for fuel, and latter halter flow and distribution of information, including those relevant to awareness raising and disaster prevention matter. This figure has been furnished based on information collected through socio-environment survey conducted by JICA study team in June 2006.

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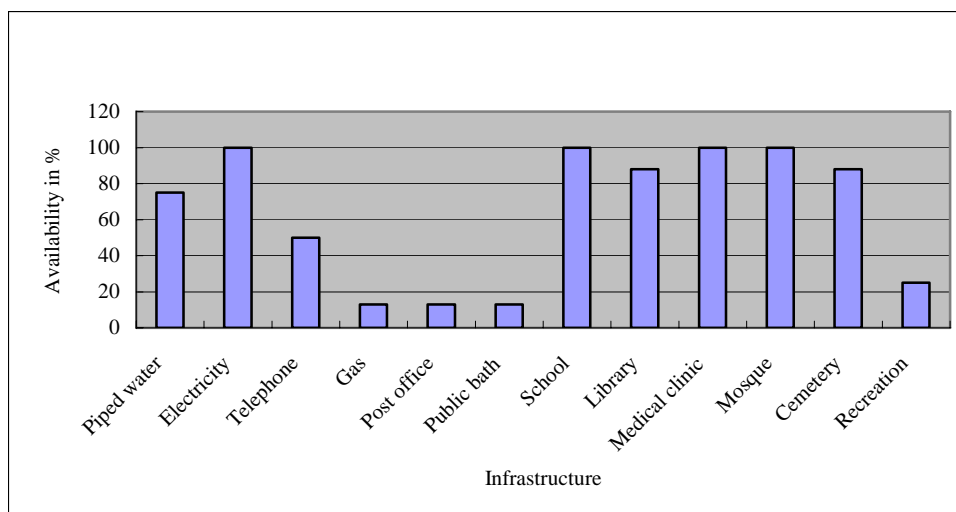


Fig. R.7.2.2 Availability of Infrastructure in Jamoats of Hamadoni District

The same survey also listed the followings as major environmental issues in the area:

- Frequent overflow of Pyanj river, causing land degradation through sedimentation and accelerating soil erosion by water
- Raise in groundwater, which brings-about water logging, affecting productivity of orchards and stability of houses
- Inefficiency of drainage canal, due to accumulation of mud (sediment)
- Unavailability of safe drinking water, which threatens the public health
- Unavailability of recreational/sport facilities, which could lead the young people to unhealthy entertainments
- Lack of employment opportunity due to absence of large industry/service sector
- Limited rangeland for livestock grazing, which result in overgrazing of vegetation and low productivity of livestock.

Natural vegetation and wildlife

Vegetation of the area includes wild pistachio, Hordeum (wild barley), Bromus (brome grass), Stipa (needle grass), Gundelia (artichoke), Poa (blue grass) and Agropyron (wheat grass).

Wild creatures of the area include Capra (wild goat), Canis (wolf), Vulpus (fox), Sus (boar), snake, scorpion, and lizard. Birds commonly seen are Chukar (partridge), Aquila (eagle), Strix (owl), and woodpecker. Shark, anchovy and other fishes, frog and tortoise are among aquatic creatures in Pyanj River.

Historic and Religious sites

Besides mosques, which are very common, six sites of historic/religious importance exist in Hamadoni district as tabulated below.

Name	Type	Location (Jamoat)	Remark
Dahaneh ruin village	Old village	Chubek	Destroyed long ago by flooding of Pyanj river
Abku graveyard	Graveyard	Moskva	Belongs to Bronze Age
Khahareh Khajeh tomb	Tomb	Moskva	Religious (Islamic) spot
Khajeh Moamin graveyard	Graveyard	Moskva	Historic/religious (Islamic) spot
Shahidjan graveyard	Graveyard	Panjob	Established in 1930s
Sayad old town	Old town	Turdiev	Of Samanian dynasty period



Khajeh Moamin Graveyard

7.2.7 Legal Framework of Environmental and Social Considerations

1) Environmental laws, regulation and standards

Constitution of the Republic of Tajikistan (November 1994) addresses environmental issues and lays foundation for all environmental legislations prevailing in the country. Article 44 of constitution states: “Every person is obligated to protect nature and historic and cultural monuments”. Article 13 stresses on importance of flora, fauna, water, air and other natural resources, and requires the Government to guarantee their effective utilization in the interests of the people. Articles 38 and 46, deal with healthcare, and security of people against natural disasters. Social rights, freedom of economic activity and equality of citizens before the law; have been guaranteed by Articles 8, 12 and 17 of the constitution.

Environmental legal framework of Tajikistan consists of republic law, government resolution, and decrees of various ministries/committees, some given in Table 7.2.7.

Table R. 7.2.7 Summaries of Environmental Legislations Prevailing in the Republic of Tajikistan

Law/Resolution	Brief Content
<i>Constitution</i> of the Republic of Tajikistan- 1994 (Article 44)	Obligation of citizen to conserve natural, historic and cultural environments
Law on utilization of wildlife- 1994	Protection of wildlife and their habitats as well creation of favorable conditions for their reproduction and growth
Law on air protection- 1996	Protection of air quality, introduction of measures for pollution control and improvement of air quality
Resolution on state control of environmental protection and use of resources- 1994	Establishes role, functions and tasks of state in inspecting human and economic activities to access their compliance with law and regulations
Resolution on state ecological program- 1997	Defines fundamental goals and tasks for ecological-economic development of the country
Resolution on unauthorized collection of substances- 1990	Regulates use of medicinal plants found in nature
Law on external economic activities- 1993	Defines external economic relations of the country and insures protection of rights, interest and properties of participants in external economic activities
Criminal code- 1998	Defines and classifies the social crimes and set punishment terms for the criminals
Law on Ecological Expertise- 2003	Requirement of conduction of environmental impact assessment for large projects, prevention of negative impacts of economic/ human activities on environment, and creation of database on environmental status of the country
Law on Nature Protection- 1993 (amended in 2002)	Identification of activity and stages of projects for which environmental impact assessment (EIA) should be undertaken, and its mandatory review by state ecological expertise upon completion.

2) Environmental impact assessment (EIA) requirement and procedures

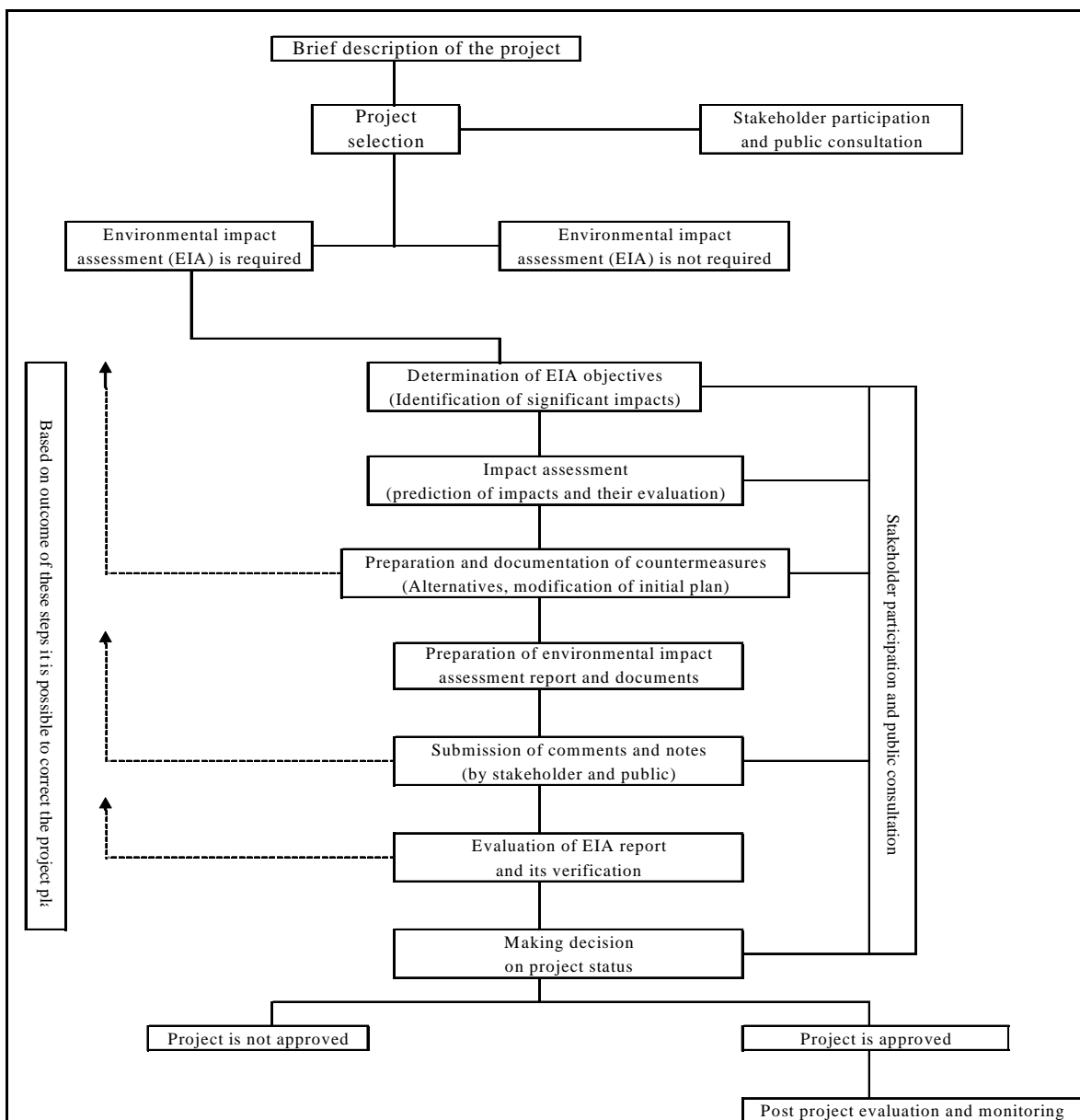
In Tajikistan, presently in accordance with the Law on Ecological Expertise-2003, nineteen type of projects listed below require conduction of a full-scale environmental impact assess.

- Power plants
- Steel industries
- Asbestos, cement, asphalt and concrete producing factories
- Chemical and petrochemical plants
- Highways, railways, and airport construction
- Oil and gas conveyance pipeline establishment
- Refineries and petroleum storage facilities
- Establishment of water intake structures and water supply facilities
- Hydro-technical structures (dam and reservoir)
- Forest utilization and establishment of industrial vineyards
- Sewage and waste treatment facilities
- Creation of dumping site for industrial waste and radioactive materials
- Mining activities (limestone, sand, gravel, clay)

- Large scale drilling for petroleum, gas and coal
- Large storage facilities for oil, gas, chemical and petrochemical products
- Establishment of dye and non-ferrous industry
- Chemical industry with a complete (full) cycle
- Pumping of large volume of groundwater (more than 10 MCM/year)
- Exploitation and enrichment of large amount of ARKD coals

3) Procedures of environmental impact assessment (EIA)

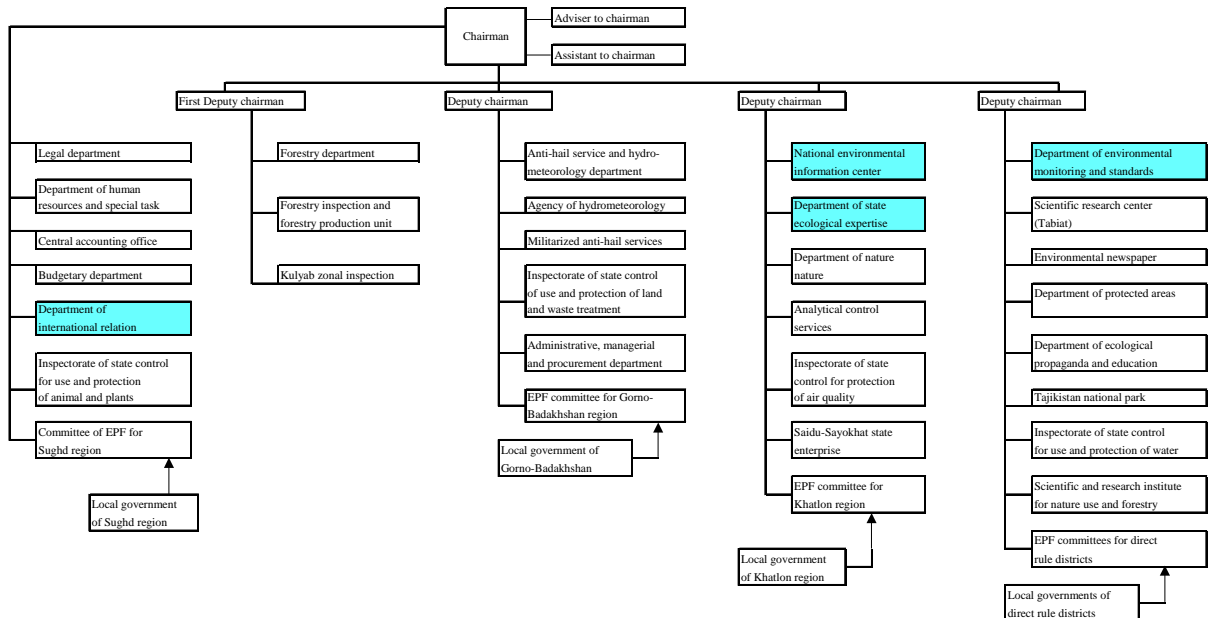
Procedure to be taken by project proponents to get environmental clearance for their projects is illustrated below.



Inviting outside environmental experts to participate in review of project documents and provide their comments, as well as holding public consultation meeting to disclose project information and grasp people views are also stipulated in Law on Ecological Expertise-2003.

4) Environment related agencies and institutions

The State Committee for Environmental Protection and Forestry, established in 2004, is the principal agency for administering the environment status and dealing with environmental issues in the country. It should be noted that this Committee replaced the Ministry of Nature Protection, which was abolished pursuant to a presidential decree in January 2004. Structure and major functions of Committee are given below:



- Define environmental law, regulation and standards
- Prepare strategies for conservation and sustainable utilization of resources
- Delineate environmentally sensitive areas for protection
- Develop economic system focusing on sustainable utilization of natural resources
- Promote eco-tourism and manage the environmental fund
- Conduct ecological studies and publish reports on state of the environment
- Set quota for hunting of animals and collection of plant, and issue relevant permits
- Suspend economic activities that violate environmental legislations, and prohibit projects that violate environmental requirements.

Other principal bodies dealing with environmental issues and cooperating with the State Committee in performing its tasks are:

- Ministry of Melioration and Water Resources- is in-charge of water resources, waterworks, as well as establishes norms for water utilization, maintains the land reclamation cadastre, and provides water related data to the Committee
- State Committee for Land Administration- is responsible for developing land-use policy and carrying out land reform
- Ministry of Culture- endeavors for conservation of historical heritage and cultural assets
- Local Governments- coordinate environmental protection tasks and facilitate efficient and sustainable utilization of natural resources by enterprises in their jurisdictions.

7.2.8 Alternatives to the Project

Alternative **ONE**: Without project (no action)

With no project, there will not be any adverse impact on natural environment, but social (people, infrastructures) and economic environments (farmlands, production units) remain target of disaster (flood) to deteriorate. Inhabitants remain under disaster stress, imposing psychological damage and additional medical expense on them. People are not motivated to enlarge/intensify their economic activities (agriculture, livestock), and investors find no intensive to participate in business tasks. With poor economy, no efficient health care, sanitary, education and recreational facilities can be furnished, inhering progress and productivity of the society. Under such vulnerable condition, gradually young people will migrate to safer places (big cities) with better living facilities, causing over-crowding and other problems in those areas. According to Constitution and republic laws, government should protect citizens against nightmares, including disasters (flood), thus no action is not in harmony with prevailing state laws and social norms.

Overall poverty rate in the region is already high (78%), with no mitigation against flood the situation will get worse to bring-about social problems such as migration and falling school quality and attendance.

Alternative **TWO**: Relocation of people and movable properties to a safer place

- Mainly 4 Jamoats (Dashtigulo, Kalinin, Turdiev and Panjob) out of 8 Jamoats of the district are threaten by floods. However relocation of these Jamoats can be considered, as an alternative to the proposed project, but it would have the following demerits.
- Finding and acquiring land for establishment of new residential complexes and affiliated social infrastructures is a lengthy and complicated task
- Construction of new house and infrastructures demand long time and huge money
- Prolong construction activities inserts adverse impacts on the environment
- Some people have inherited the land/property from their ancestors and emotionally bind to it, such persons may not easily agree with relocation plan
- There are many graveyards, mosques and sites of religious/cultural importance in the area, project need to clarify their fates in a way acceptable to inhabitants
- Since inhabitants are not in good economic situation, securing fund for relocation purpose is a big challenge to project proponents.

With its numerous demerits, relocation has few **merits** as indicated herein below:

- New residential complex and infrastructures are established with standard design and improved construction methods, ensuring their safety and strength
- With new houses in a safer place people are more comfortable and free from disaster stresses.

Considering overall impacts of relocation, this alternative is discarded.

Alternative **THREE**: Construction of large flood retention dams on upstream of Pyanj River

- Tajikistan lies in an active seismic belt and faces occurrence of earthquakes, thus construction of large dams is not advisable
- Tajikistan is not yet self-equipped with adequate technology and sufficient budget to carry out large project on its own, so small projects are more appropriate to this country.

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Alternative **FOUR**: Introduction of integrated approach consisting of construction of small structures and provision of efficient non-structural measures

This alternative seems quite realistic and rational, since it involves limited construction works, requires less budget, has least adverse impacts on the environment, but more reliable and efficient in saving people lives and properties. This alternative is more acceptable than others, because:

- Construction of small structures, require less land acquisition
- Limited construction works with simple equipment, thus less air and noise pollution
- Simplicity of works permits engagement of local people in project activities
- With their small size, the structures will not cause significant changes in natural landscape
- Easy operation and maintenance, and low risk of collapse and failures.

7.2.9 Public Consultation Meeting and its Outcome

JICA study team for Natural Disaster Prevention in Pyanj River in accordance with its work-plan held its first public consultation meeting in Hamadoni district to disclose the project information to people and concerned authorities, as well grasp their views on the project. Main points of the meeting are provided herein:

Title: First Public Consultation Meeting on Natural Disaster Prevention in Pyanj River

Date: June 6, 2006(Tuesday)

Time schedule: 10:0 to 12:0 (2 hours)

Venue: Hall of the education department in Moskva Jamoat in Hamadoni district

Participants:

Representatives of local government of Hamadoni district

Representatives from farmer organizations

Chiefs of all eight Jamoats of Hamadoni district

Representatives from health center, school and other public facilities

Representatives from all eight Jamoats of the Hamadoni district were also present.

Number of participants: Totally 65 persons

Issues discussed and the speakers:

At first deputy chairman of local government of Hamadoni district (Abdujabbor KATAEV) opened the meeting with a short and informative speech. He explained the purpose and activities of the JICA study team in the area, and asked the participants to pay full attention to contents of the meeting, and provide their comments/questions in appropriate timing.

Then deputy team leader of JICA study team (Toshihiro GOTO) explained outline of the proposed project to participants, including:

- Objective of the project
- Project goals
- Project phases and plan of approach
- Estimation on dimension/volume of works to be undertaken at pilot project.

Thereafter socio-environment/institution expert of the JICA study team (Gholamhossein SHOKOHIFARD) discussed the environmental issues relevant to the project and provided information on:

- Necessity and procedures of conducting environmental study on project activities
- Environmental laws, regulations and guidelines based on which environmental study is being conducted
- Outcome of preliminary environmental study, including probable beneficial and adverse impacts of the project on socio-economy, natural and cultural environments
- Mitigation measures for reducing the adverse impacts of the project
- Alternatives to the proposed project
- Importance and means of people participation in project activities.

Question and answer:

At the end of meeting participants asked their questions, express their views, and gave suggestion for making project successful. Key questions and relevant answers are mentioned herein.

Question 1. From representative of office of environmental protection and forestry: according to regulations prevailing in Tajikistan, utilization of naturally available materials is not free of charge and the users should pay for them to state committee for environmental protection and forestry, is the project ready for such payment?

Answer 1. The project proponent (ministry of emergency situations and civil defense) will deal with this matter and make arrangement for utilization of locally available natural materials, whenever required. The project will strictly observe all the prevailing laws and regulations.

Question 2. From representative of office of environmental protection and forestry: Dumping wastes generated during construction period is an important issue requiring careful attention. Have you found a suitable place to dump such wastes?

Answer 2. Before looking for dumping site, we should have some idea about the volume of wastes, which would be generated during the construction period. Relevant expert in JICA study team is now working on this matter, as soon as estimation work is completed and approximate figure is known, we will look for suitable dumping place.

Question 3. From a housewife: As the JICA environmental expert mentioned in his presentation, the machinery working for construction, will generate smoke and noises, which are nuisance to inhabitants, what countermeasures project takes for reducing such impacts?

Answer 3. Project seeks your understanding on this point, as full elimination of these impacts is impossible, thus your cooperation and patient during the construction period is highly appreciated. We assure that the project will make maximum effort to minimize these adverse impacts by taking timely and proper measures, by applying experiences gain in previous similar projects.

Lastly one member of the Working Group for the project (Nurullo ASHUROV) made the closing speech by thanking all the participants for devoting their time to the meeting, asking questions and expressing views on project activities.

Conclusion:

Based on expression of views and comments made by people and authorities in the meeting, it can be concluded that in principle they are agree with implementation of the project, and would cooperate/endeavor for its realization. They advised the team to pay attention to environmental regulation/issues and take proper measures for minimizing negative (adverse) impacts of project on the environment. They expect the project to introduce efficient/advanced methodology, and engage local people in its activities as much possible.

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Notes:

- During the meeting electricity was cut for about 20 minutes, interrupting the power-point presentation and causing delay in initial schedule
- However the JICA study team made its presentation in English, all the points were translated into local language (Tajik) by a highly professional interpreter
- After meeting participants while having snack (served by study team) had informal talk for a couple of minutes.



Opening of public consultation meeting by deputy chairman of Hamadoni District



Explanation of environmental impacts of the proposed project by JICA study team

7.2.10 Scoping of Environmental and Social Impacts

Result and matrix for environmental Scoping of natural disaster (food) prevention project in Pyanj river in republic of Tajikistan, are provided in Table 7.2.8 and Table 7.2.9, respectively.

Table R. 7.2.8 Result of Environmental Scoping

	Environmental Elements	Rating	Justification
1	Involuntary resettlement	D	Not planned by the project because the project site is located mostly within river area.
2	Changes in economic activity	D	No adverse effects are expected with security against disasters (flood) economic activities are enhanced
3	Impacts on indigenous people, ethnic minority, nomadic tribe	D	No adverse effects are expected because the Project will protect all the groups against disaster
4	Impact on agriculture and forestry	D	No adverse effects are expected because the Project will protect farmlands against disasters (flood) and no forestry activities in construction site
5	Local community disruption	D	Communities are located outside of the project area. All communities are benefited from the project
6	Increase in use of agrochemicals, its residue in soil	D	Project will not affect agroforestry technique and protection of farmlands against flood, may encourage the farmers to use more agrochemicals
7	Generation of waste, dredged and excavated soil	D	Excavation is to be carried out as moving from one place to the other place in the area of river course and the materials taken from the riverbed are suitable for aggregates without any disposals. Therefore no soil will be generated to give any adverse effect to the environment.
8	Degradation of sanitary condition during construction period	D	The construction site is located in the border control area so that no one is allowed to live in the construction site even during construction period. Therefore, no degradation of sanitary condition is expected.
9	Damage to natural, historical and cultural heritages	D	No historical/cultural heritage has been identified in construction site
10	Degradation of valuable landscape	D	No valuable landscape has been identified in construction site.
11	Impacts on downstream reaches	D	Quantity of the river flow will not change according to the project implementation so that any adverse effects are expected to the downstream reaches
12	Soil erosion	D	The Project will provide reinforcement of existing protection works against land erosion so that any adverse effects are not expected to soil erosion condition.
13	Ground subsidence	D	Not expected
14	Soil contamination	D	Not expected
15	Impacts on groundwater	D	Not expected after the Project effect.
16	Change of river flow regime	C	River course is always changed in alluvial fan because of its nature. Analysis with hydraulic digital simulation will distinguish man-made effect from natural effect in the course of the Study.
17	Turbid water flow	D	Not expected because the construction works are carried out within cofferdam, temporary dike enclosure, and riverbed material includes no mud.
18	Change in composition of river bed materials	D	Any adverse effects are not expected because quantity of the river flow will not be changed.
19	Impacts on terrestrial flora and fauna	D	No adverse effects are expected to the terrestrial flora and fauna because the project site is located in the riverbed area, which is clearly separated from the land area.
20	Impacts on aquatic organisms	D	Any adverse effects are not expected because quantity of the river flow will not be changed.
21	Air pollution	D	Not expected
22	Emission gas/odor	D	Not expected
23	Noise pollution /vibration	D	Not expected

Rating: A, potential for significant adverse impact
 B, potential for some adverse impact
 C, not clear (impact should be identified in the course of Study)
 D, Unlikely to have adverse impact on the environment.

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Table R. 7.2.9 Environmental Scoping Matrices for the Study on Natural Disaster Prevention in Pyanj River in the Republic of Tajikistan

Name of Cooperation Project		The Study on Natural Disaster Prevention in Pyanj River										
Environmental Elements	Overall rating	Planning Phase			Construction Phase				Operation Phase			
		Land acquisition	Changes in use and control of rights for water use in construction works	Extension of river width	Construction of dike, bankings, and related Facilities	Operation of construction equipments and vehicles	Restriction of economic and other activities around river	Drainage	Water sharing	Occupancy of structures such as embankment, water control facilities, and floodgates	Increasing influx of settlers	
1	Involuntary resettlement	-	-	-	-	-	-	-	-	-	-	-
2	Changes in economic activity	-	-	-	-	-	-	-	-	-	-	-
3	Impacts on indigenous people, ethnic minority, nomadic tribes	-	-	-	-	-	-	-	-	-	-	-
4	Impact on agriculture and forestry	-	-	-	-	-	-	-	-	-	-	-
5	Local community disruption	-	-	-	-	-	-	-	-	-	-	-
6	Increase in use of agrochemicals, its residue in soil	-	-	-	-	-	-	-	-	-	-	-
7	Generation of waste, dredged and excavated soil	-	-	-	-	-	-	-	-	-	-	-
8	Degradation of sanitary condition during construction period	-	-	-	-	-	-	-	-	-	-	-
9	Damage to natural, historical and cultural heritages	-	-	-	-	-	-	-	-	-	-	-
10	Degradation of valuable landscape	-	-	-	-	-	-	-	-	-	-	-
11	Impacts on downstream reaches	-	-	-	-	-	-	-	-	-	-	-
12	Soil erosion	-	-	-	-	-	-	-	-	-	-	-
13	Ground subsidence	-	-	-	-	-	-	-	-	-	-	-
14	Soil contamination	-	-	-	-	-	-	-	-	-	-	-
15	Impacts on groundwater	-	-	-	-	-	-	-	-	-	-	-
16	Change of river flow regime	C	-	-	-	-	-	-	-	-	C	-
17	Turbid water flow	-	-	-	-	-	-	-	-	-	-	-
18	Change in composition of river bed materials	-	-	-	-	-	-	-	-	-	-	-
19	Impacts on terrestrial flora and fauna	-	-	-	-	-	-	-	-	-	-	-
20	Impacts on aquatic organisms	-	-	-	-	-	-	-	-	-	-	-
21	Air pollution	-	-	-	-	-	-	-	-	-	-	-
22	Emission gas/odor	-	-	-	-	-	-	-	-	-	-	-
23	Noise pollution /vibration	-	-	-	-	-	-	-	-	-	-	-

Rating: A, Serious impact is expected
 B, Some impacts are expected
 C, Extent of impact is unknown (examination is needed, impacts may become clear as study progresses)
 -, No impact is expected.

7.2.11 Terms of Reference for Environmental and Social Considerations

Objectives

Principally in Tajikistan environmental study is conducted with the following objectives:

- Disclosure of information relevant to proposed projects in an early stage, to gain the public views and support for its realization
- Assure accountability, transparency and smooth implementation by incorporating stakeholders into decision-making and all other phases of project (planning/design, construction, and operation and maintenance)
- Predict adverse environmental impacts of proposed projects, and identify efficient means/ measures for nullifying/minimizing such impact.

Requirement of environmental examination

According to Tajik legislations, all planned activities/projects need to be examined for verifying their environmental soundness and social acceptability, and assuring post-implementation evaluation and monitoring. In general, large projects (establishment of new facilities) require mandatory intensive environmental assessment, while renovation of existing facilities and construction of small structures are usually furnished with simpler environmental examinations.

In preparing initial environmental documents for their projects, proponents may refer to the following format:

Name, address, telephone and fax number of proponents (client)

Title, location, and time schedule for execution of the proposed project

Full name, telephone and fax number of contact person

Salient features of project

Prediction of overall effect of project

Requirements and potentials for realization of project

Description of alternatives to project, including no action option

Documentation of positive and adverse impacts of all the alternatives

Identification of mitigation measures for eliminating/minimizing the adverse impacts

Provision of program for operation, maintenance, monitoring and post-evaluation tasks

Documents on holding public consultation and stakeholders meeting for disseminating project information, including date, time, location and means of presentation

List and particulars of persons participated in the public consultation and stakeholder meetings, including name, affiliated organization (if any), addresses and telephone numbers

Issues discussed in relevant public consultation/stakeholder meetings, reaction of people and their concerns about project

Conclusion of public consultation/stakeholder meetings and relevant memorandum

Any supportive and non-technical note providing information about the project.

Components to be considered in environmental study

Major components that usually need to be considered in environmental study are:

Soil and land

Geological condition

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Hydrology and hydrogeology

Surface and groundwater

Fauna and flora

Climate and air quality

Habitants of wildlife

Historical heritage and cultural assets

Natural monuments and landscape

Rare and valuable plants and animal species

Land use and socio-economic situations.

Submission of documents

Project proponent submits documents of the environmental study to State Committee for Environmental Protection and Forestry (State Ecological Expertise Department) for review. The Committee examines the document and provides its preliminary decision/comments to project proponent within 45 days. If yes (initial approval) project can go ahead. If no, further environmental consideration and provision of strong evidence on efficiency of mitigation measures, otherwise rejection of the project.

7.2.12 Other Relevant Information

Republic of Tajikistan had ratified many international agreements on environment protection, some of which are mentioned herein:

- United Nations Convention on Biodiversity
- United Nations Convention to Combat Desertification
- Ramsar Convention on Wetlands
- Convention on Climate Change
- Tajikistan has intergovernmental agreements on nature protection, with Iran, Turkey and China, as well an environmental agreement (pollution control) with Uzbekistan.
- The country has a partnership agreement with ADB (Asian development bank) on poverty reduction
- Tajikistan has already joined NATO (north Atlantic treaty organization) partnership for peace, and is in the early stages of seeking membership in WTO (world trade organization).

Such international cooperation can play important roles in nature conservation, creation of job, social stability, and overall prosperity of the nation in long-term.

7.3 DETAIL STUDY

7.3.1 Environmental Evaluation

1) Overview

In accordance with chart of official development assistance (ODA) of Japan, stipulation of Japan international cooperation agency (JICA) environmental guidelines, the study team should endeavor and cooperate with counterpart institutions in environmental evaluation tasks.

This part furnishes Environmental Evaluation (EE) of project for Natural Disaster Prevention in Pyanj River, undertaken jointly by Japan International Cooperation Agency (JICA) Team and Committee of Emergency Situations and Civil Defense (CoES), formerly Ministry of Emergency Situations and Civil Defense. The Project Area is suited at right bank of Pyanj River in Khatlon region in southern Tajikistan. Basic Study on environmental status of the area has been largely carried out in 2006, as outline in previous Sections of this text. Throughout the study, field surveys were conducted to reveal the status of natural, socio-economy and cultural environments in project area. Surveys were performed in accordance with JICA Guidelines for Environmental and Social Considerations- 2004, Tajik Law on Ecological Expertise- 2003 and documents of international convention, treaties such as Agenda 21 of Earth Summit- Rio 1992.

In Environmental Scoping, JICA guidelines identify adverse impacts of project with following ratings:

- A**, potential for significant adverse impact
- B**, potential for some adverse impact
- C**, not clear, impact should be identified in the course of the Study
- D**, Unlikely to have adverse impact on the environment.

Result of Scoping for the captioned project indicated its rating is D, means implementation of project is unlikely to have adverse impact on the environment. Following among the reasons for D rating:

- Minor adverse impacts (noise/air pollution, soil contamination) occurring during construction phase are temporary and reversible
- Project activities does not include relocation of households
- No historical/cultural heritage has been identified in construction site
- The project aims to protect all inhabitants against disaster, regardless of their ethnic background, social status and religious beliefs. Thus it is environmentally sound and socially acceptable.

According to the Law on Ecological Expertise-2003, presently in Tajikistan nineteen types of projects are expected to have adverse impact on the environment, thus requiring conduction of a full-scale environmental impact assessment, while project proposed by JICA Team is not of such types.

By referring to impact categorization in JICA guidelines and project typology in Tajikistan, this Natural Disaster Prevention Project undertaken by JICA and CESD, does not requires a full-scale environmental impact assessment (EIA), but need to be furnished with a simple Environment Evaluation (EE) Report, covering just the relevant environmental issues. Generally EE is carried out over a short period with a limited budget and use of existing data/ information coupled with reconnaissance surveys. In environmental evaluation, *principles* of JICA guidelines, *spirit* of Japanese Official Development Assistance (ODA), *standards* of Tajikistan and international *norms* were highly observed.

Objectives of Environmental Evaluation (EE)

- Describe outline of the project and condition of relevant construction site
- Identify adverse and beneficial impacts of the project
- Provide measures and guidance for eliminating/reducing adverse impacts and enhancing beneficial ones

- Holding public consultation meetings to disclose the project information, receive opinions and comments of stakeholders, and encourage people participation in project activities.

2) Justification of Project Implementation

The project is formulated for an area where overall poverty rate is very high (more than 70%) and farming and livestock breeding are main sources of livelihood. Flooding of Pyanj River ever threatens land, property and lives of inhabitants. Public infrastructures are not secured, investors find no incentive to get involve in economic activities, and young people are not ascertaining of residing therein. In this context this project has been designed with a supper goal to improve security against flood through establishment of appropriate structures coupled with non-structural means (preparedness). It is inline with article 46 of Tajikistan *constitution*, infused with *spirit* of JICA technical cooperation and matches international *effort* for disaster prevention and risk management.

3) Outline of the Project

The supper goal of the captioned project is to improve a security and preparedness against and mitigate damages of floods in Hamadoni area, through realization of *structural* and *non-structural* measures. Non-structural measures include institutional strengthening, awareness raising and preparedness and provision of introduction of means for provision of quick and efficient services in case of emergency, all have no adverse impact on the environment and thus are not further discussed in this EE report. For details on these measures refer to JICA Progress Report named above.

The structural measures are implemented to provide protection to the area and secure life and property of inhabitants against flood disaster. Since establishment of physical structures involves construction activities, which could insert adverse impacts on the environment, the EE will focus principally on measures requiring construction works.

The structural measures are designed for bank of Pyanj River to furnish the Hamadoni area with flood protection dikes, for safeguarding its habitants and facilitating/accelerating its socio-economic development. Target year for accomplishment of required facilities is 2018. Basically this is a project for renovation and improvement of flood prevention facilities, which had been established over the time, some dating back to soviet era. Overall length of structural flood protection measures along the Pyanj River in Tajikistan is about 18 km, which extend from Chubek head works to Panjob Jamoat and involve main dike, spur dike and canals. Periodically these facilities have been damaged by annual floods, particularly flood of 2005, and thereafter rehabilitated by relevant Tajik institutions such as ministry of emergency situations and civil defense (now CoES) and ministry of water resources and melioration. Budget for these works was secure from local fund and international Grant Aid provided by Asian development bank (ADB). But dike failure and collapse of affiliated concrete blocks had occurred along riverbank, affecting efficiency and safety of structures. Dike Vulnerability to erosion, being attributed to poor design, use of inferior material and improper installation of concrete blocks are among causes listed for inefficiency/failure of the system.

In this context JICA team and CoES have formulated the proposed project to improve the overall situation through introduction of new materials and type of structure suited to nature of Pyanj river, as well as improvement of workability of construction and quality control. According to its Framework Plan, the project intends to find an ultimate engineering solution to eliminate the problems in mainstream of Pyanj river by introducing short, middle and long terms plans with different technical approaches as abstracted herein:

a) Short term plan and relevant technical approaches

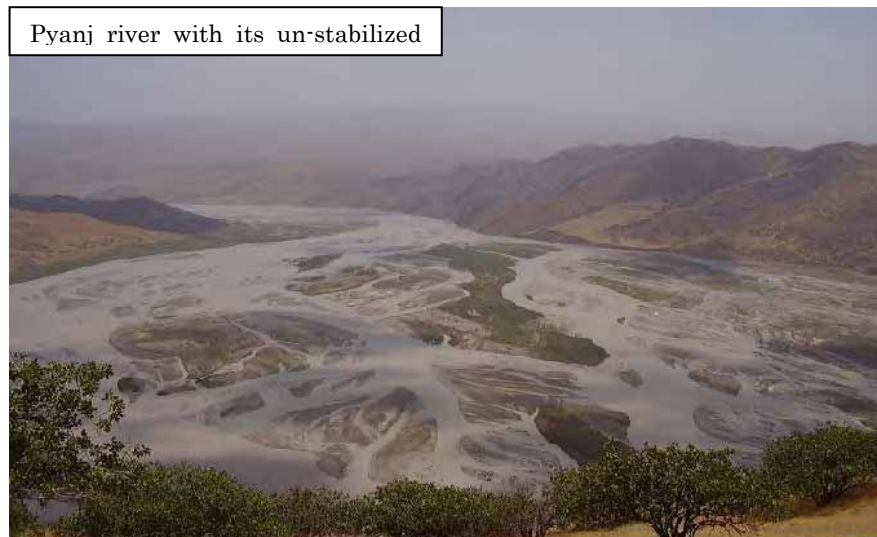
This plan involves strengthening and rehabilitation of existing dike at vulnerable parts, and heightening of dike up to level with the scale of 30 years return period or past maximum flood. These require activities for construction of spur dike, revetment and dike heightening to be accomplished in a 5-year period.

b) Middle and long terms plan and relevant technical approaches

Upon completion of works stipulated in short term plan, middle and long term plan would be launched, aiming at strengthening/enforcing the main dike at scale of 100 years return period. In this plan three approaches are examined:

- Stabilization of river course, which requires works for excavation of riverbed and holms, extension of spillway guide dike, and construction of spur dike.
- Construction of inland dike, which requires works for backfill and dike construction, excavation of holms, strengthening of Dehkonobod canal, and establishment of overflow dike for fixing the international boundary between Tajikistan and Afghanistan.
- Enhancement of dike without spur dike, requiring heavy foot protection works for sustainment of revetment.

Since all the approaches involve construction works with more or less similar environmental impacts, decision on selection of most suitable approach for actual implementation is based on cost/benefit ratio declared by economist of the project, and detailed in other chapter of this Report. For details of technical approaches also refer to relevant chapters in this Report.



To examine validity of its new design and materials the project executes a *pilot project* covering two locations on existing dike, where dike failure/collapse of concrete block is more evident. This Environmental Evaluation has been furnished by grasping impacts (adverse and beneficial) of pilot project (small scale) and their simulation for entire area (large scale). Its Means environmental issues discussed for pilot project are approximately applicable to project planned for the entire area (large scale).

Construction Activities

Project for rehabilitation/renovation of entire dike is accomplished by undertaking civil-works, principal ones being listed below:

- Establishment of temporary coffer dams in vicinity of construction sites
- Removal of existing damaged/un-successful structures (gabion, concrete blocks)
- Excavation for establishment of foundation
- Construction of embankment
- Revetment and pavement completion works at riverbank (dike).

Machinery, which would be engaged in construction works, is listed below. Regrettably some of these machines are aged, with old design, thus of high polluting probability.

Name of Equipment	Horse power
Backhoe, hydraulic crawler mounted	170
Dump truck 10 ton (t)	220
Cargo truck 5 t	160
Crawler crane 35 t	190
Truck crane, Hydraulic telescopic boom 5 to 10 t	100
Bulldozer 15 to 21 t	140 to 215
Loader	-
Drum roller, static 9-11 t	105
Water tanker 4 t	-
Generators 30 150 kW	-
Pumps 4- 8 inch	-
Concrete mixer	105

Considering technology and industrial level of Tajikistan, and project budget, this point is un-avoid, but affiliated pollution impact is minimized through appropriate countermeasures.

Site of Renovation/Construction of Structural Measures

Construction activities for rehabilitation of existing dike and constructing structures with new design and materials are undertaken on bank of Pyanj river in Hamadoni, starting with pilot project, result of which will be gradually propagated to entire bank. View of target dike and location selected for pilot activity are shown in Fig. 7.3 1. Portion with evidence of dike failure and collapse of concrete block is shown in Fig. 7.3 2 for indicating situation of bank, as well as justifying the necessity of project. Details of pilot project are in other Chapters of this Report.

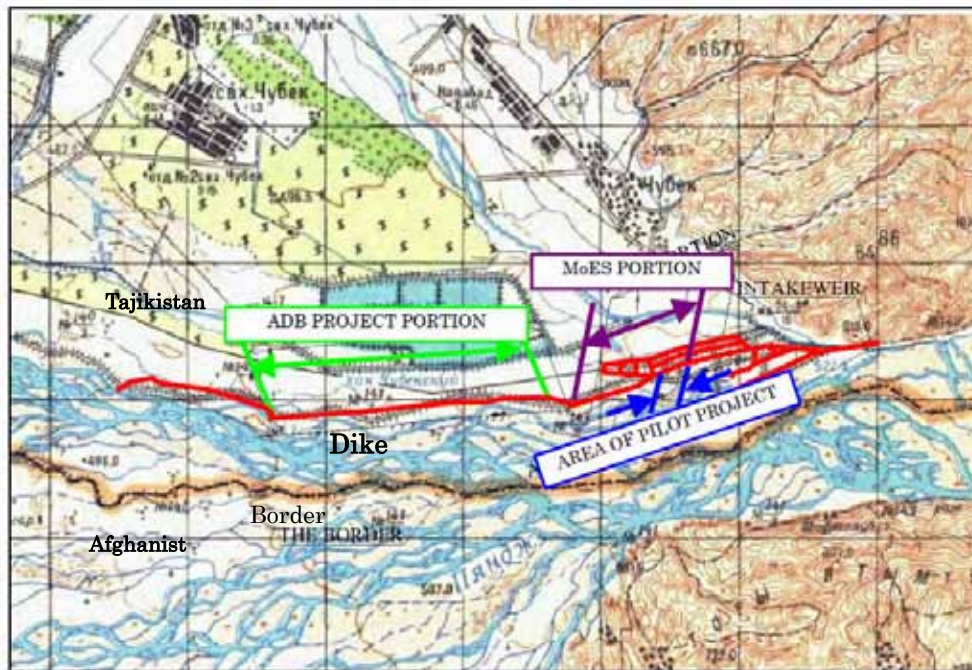


Fig. R.7.3.1 Dike and Location of Pilot Project



Fig. R.7.3.2 Dike Failure and Collapse of Blocks at Dike (River bank)

4) Impact Evaluation

a) Adverse (negative) impacts of the project

Construction activities for rehabilitation/renovation of existing dike would collectively have adverse impacts on the environment, some being listed below:

- Natural vegetation/organisms in construction sites are removed to facilitate operation and establish the designed structures
- Establishment of Cofferdam nearby construction site, will temporarily divert river flow from its natural course, being a nuisance to aquatic creatures
- Construction equipment and activities along river bank will affect its scenery
- Machinery engaged in construction works generates gas and smoke, causing air pollution
- Vehicles carrying construction materials to construction site would cause noise pollution to people residing at road sides
- Displacement of soil materials at site during construction period would accelerate soil erosion, particularly by water in rainy days
- Discarded oil and fuel leakage from operating machines would cause soil contamination
- People engaged in construction works would generate solid waste and sewage, bringing about an increase in volume of wastes in the area. These wastes would attract mosquitoes and other parasites, affecting public health
- During construction works, an increase in the number of traffic accidents is highly possible
- Construction activities collectively would cause some water turbidity/pollution
- Vibration of machinery affects the health of operators
- These impacts collectively will affect the health of people subjected to project activities, imposing medical expenses on them



Fig. R.7.3.3 Machinery at Construction Site of Pilot Project

- Securing arable lands against flood would encourage the people to intensify their farming with application of a larger amount of agro-chemicals, residue of which may affects the quality of soil and groundwater
- Removal of materials (sand/gravel) from riverside for being used in construction works, may cause changes in morphology of the area
- Since exact archeological status of Pyanj river is not known, there is possibility that construction activity cause unintentional damage to historical ruin/objects.

These are adverse environmental impacts of the project directly imposed to Tajikistan side. Some indirect impacts would also be inserted to Afghanistan side. With fixing strong dike in Tajikistan side, flood is pushed toward Afghanistan to impose its damages to people residing/ cultivating nearby river. But this impact would be temporary, perishing with policy and technical approaches of Afghanistan for developing and utilizing its water resources in future.

b) Beneficial (positive) impacts

- With completion of project, flood threat to people lives and properties decreases to enhance confidence of inhabitants in life and daily activities
- Security against disaster (flood) would encourage the inhabitants to undertake more farming and other economic activities, which leads to reduction in poverty rate and raise in living standards in the area
- With no flood threat, investors find incentives to invest in agriculture, livestock (and other) sectors with relevant industries to boom economy of the area

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- At present large area of arable lands in vicinity of Pyanj river are left unused, because are subject to floods. With protection measures these lands would be utilized for production of grain, vegetable and fruits to improve diet of inhabitants
- With completion of project, rate of bank erosion and entry of soil particles into river is minimized to attain better water quality for aquatic creatures and other users
- Flood hinders growth and propagation of natural vegetation and destroys habitats of wildlife. With stabilization/fixation of riverbank, status of flora and fauna is improved
- It brings security and comfort to the area, which is a need of all groups- women, children and persons with disability
- In secure and favorable living conditions, people find more time to concentrate on religious and spiritual matters, which strength the moral values of society
- Project will engage the local people in its activities, contributing in elevation of their monetary status and technical skills

However project under present condition inserts indirect adverse impact on Afghanistan, but if that country undertakes measures for accommodating floodwater and its utilization in farming/development activities, the impact will become an indirect beneficial impact in that country. It is highly possible in future Afghanistan adopt some measures such as establishment of facility to divert flood to areas in need of water and/or create huge pond (artificial lake) in vicinity of river to store water for being use in dry season. Thus impact on Afghanistan is altered with time and in accordance with actions taken by that country. *Water* is one of the main issues in this 21st century and each country is making effort to develop and manage its water resources by adopting appropriate timely measures, and Afghanistan is not an exception.

5) Precaution and Countermeasures

Most of adverse (negative) impacts of the projects occur during construction phase, and upon completion of construction works, impacts are nullified. Thus precautionary and mitigation measures should principally be considered in this phase. These include:

- Routes for accessing construction sites should be so decided to cause minimum damage to vegetation, and be least nuisance to people
- Do not remove much materials (sand/gravel) from riverside, to avoid changes in morphology of the area
- Halt the works of displacing soil materials in hours with heavy rain or strong winds, to avoid soil erosion by water and wind
- Waste materials generated by construction crew should be collected in a suitable place and disposed in proper and sanitary manners
- Discarded oil of construction machinery should be pooled and disposed in an appropriate manner to avoid soil/water contamination
- Construction crew must be equipped with mask and ear-pad to be least affected by air and noise pollutions cause by operating machines
- Construction site and route of machinery should be clearly indicated to people by fixing signboards at appropriate points for ensuring their safety and comfort.

6) Overall Environmental Evaluation of the Project

Fundamentally each individual project results in *direct* and *indirect* impacts, being *adverse* (negative) or *beneficial* (positive), aggregate of these is termed as *cumulative* impact, based on which overall environmental soundness of project is judged. Considering the opinion of inhabitants of the area revealed during *public consultation meeting* and its cumulative impact, project is judged as environmentally sound and socially acceptable. Thus its implementation is endorsed, with the condition that all points stipulated in precaution and countermeasures section are highly considered and strictly followed.

7) Available Alternatives

As mentioned in other chapters of this report, relevant engineers are considering few technical approaches to realize the project, environmental impacts of which are more or less similar. Any of these approaches requires construction works, which insert some adverse impacts on the environment. Such impacts along with necessity precaution and mitigation measures were discussed in other section of this text. Therefore decision on most suitable technical approach is based on cost/benefit ratio declared by the project economist, and detailed in other chapters of this Report. In this context two discussable options remain available to proponents:

- (a) *With project*- implementing the project by paying full attention to environmental matters,
- (b) *Without project*- giving up the project to avoid its adverse impacts on the environment.

a) With project

Pyanj river is a wild and disastrous river ever threatening lives and properties in Hamadoni area. Idea and efforts for preventing its damages persist since Soviet era, and intensified in recent years. For decades a lot of time, energy and money have been spent to provide some sorts of security and comfort to people residing/performing economic activity in the area. But most of these efforts have not been successful in attaining their targets, which could be attributed to unavailability of required technology and absence of experienced staffs to perform designing inline with international engineering standards. In this context the Tajik side has requested JICA (Japan international cooperation agency) to endeavor for structural improvement of dike and stabilization of river course, based on which territorial boundary between Tajikistan and Afghanistan is delineated. JICA with its rich international experiences in disaster prevention task got involve in efforts for disaster prevention in Pyanj river, and has come up with proper design and list of efficient materials for fixing the dike and stabilization of river course, based on its long and intensive investigation in the area. Tajik side is also pleased with JICA plan and is eager to realize it by mobilization of available resources and considering all aspects of the project, including precautionary and mitigation measures for making project environmentally sound and socially acceptable. Public cooperation, political-will, experienced personnel and financial sources are aligned to eliminate a chronic problem in one of the most productive areas of Tajikistan. With these opportunities at hands, execution of project with its countermeasures to adverse impacts occurring in construction phase would be appreciated at local, national and even international levels. Completion of project will bring security and peace of mind to inhabitants, boom economy of the area to reduce poverty rate, and improve status of natural environment, all justifying the with project option.

b) Without project (no action)

With no project implementation, construction works are avoided and no adverse impact is imposed on the environment. But dike and other structures, which had been established by spending huge amount of money and energy, will remain subjected to flood to deteriorate. Collapse of dike will impose psychological stress on inhabitants to affect their health and increase medical expenses. Floods will regularly threat the social infrastructure, farmland and other economic establishments, bring-about decline in education, sanitary and economic situations of area. Under fragile condition inhabitants find no motivation to enlarge/intensify their economic activities, and investors find no incentives to participate in business tasks. Young people will move to a safer area (mostly large cities) for establishing households with more confidence. Migration to large cities has its own unfavorable consequences, being obvious to social experts. Floods wash-away natural flora and fauna and deposit them at downstream to increase volume of waste and cause trouble to people. All these collectively will result in deterioration of social, economic and natural conditions of the area, leaving it in poverty and trouble. According to *Constitution* of the Republic of Tajikistan-1994, taking measures for securing citizens against disasters (flood) is mandate of government. Caring for fragile areas has been stipulated in Agenda 21 of Earth Summit- 1992. Basing on points discussed above, it is realized that *without project* (no action) option is not in harmony with social norms, national legislations and international conventions. So proponents are advised to discard the *no action* option and take action for executing project in an environmentally sound and socially acceptable manner.

7.3.2 Public Consultation

1) Generalities

In accordance with *principle 5* of JICA environmental guidelines, *regulations* of Tajikistan and international *norms*, project proponent is required to hold *public consultation* meeting for disclosing project information to stakeholders, hear their opinions and encourage them for participating in project activities. Principally Tajikistan is a Moslem country, and the Islamic *teachings* emphasizes on consultation in decision-making processes. In this context the second public consultation meeting on proposed project was held, outline of which is provided herein. It should be noted that the first public consultation meeting was held in June 2006, detail of which is provided in Progress Report published in October 2006 by JICA Study Team.

Title: Second Public Consultation Meeting on Project for Natural Disaster Prevention in Pyanj River

Date: January 30, 2007 (Tuesday)

Time: 14:00 to 16:00 (2 hours)

Venue: Hamadoni district, Panjob Jamoat, Secondary school No. 23, Geography classroom

Participants:

- People from Jamoats of Hamadoni district, particularly those affected by floods
- Personnel of local government and Jamoat offices in Hamadoni
- Personnel of service center and public facilities (school)
- People engaging in investigation and construction works in Pyanj river

Number of participants: 44 persons



Means of presentation:

Tajik counterparts spoke directly in local language (Tajik)). Members of JICA study team spoke in English, but all points were translated into Tajik through a professional interpreter. All materials used in Power-point presentation were arranged in Tajik and Russian languages.

2) Opening and Welcoming Speech

At first deputy chief of Panjob Jamoat (Mrs. Goljahan NAZAROVA) opened the meeting by welcoming and thanking people for attending the meeting. She outlined the present situation of Panjob Jamoat, and mentioned that the Jamoat, particularly its farmland was badly hit by flood in 2005, thus any idea and effort for disaster prevention in Pyanj River is appreciated and supported by inhabitants of Jamoat. Lastly she advised the participants to pay careful attention to contents of meeting and raise their questions in appropriate timing.



3) Presentation by JICA Study Team

JICA Study Team started describing the project to participants from various aspects, with following sequences:

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Socio-environment/institution expert of JICA Study Team (G. Shokohifard) explained the **purpose** and **necessity** of holding public consultation meeting as well as the **importance** of people participation in project activities. He stressed that- holding **public consultation** meeting is inline with Charter of ODA (official development assistance) of Japan, laws of Tajikistan, international conventions and the Islamic doctrine. He said that purpose of meeting is to brief the inhabitants on project activities and disclose relevant information to them, as well seek their opinion, understanding and cooperation in realizing the project.



Deputy leader of JICA study team (T. Goto) described the **terms** (short, mid, long) and technical **approaches** being considered in realization of project. He provided information to participants under following headings:

- Objectives of the project
- Mechanism of flooding in project area
- Framework of flood mitigation plan
- Short term plan and relevant technical approaches
- Middle and long term plan and relevant technical approaches
- Time period and schedule for realization of entire project.



Socio-environment/institution expert of JICA study team (G. Shokohifard) described the environmental **impacts** (*adverse* and *beneficial*) of the project and discussed the counter-measures require for eliminating/reducing the **adverse** (negative) impacts, and means for enhancing the **beneficial** (positive) impacts. Issues discussed by Shokohifard are itemized herein below:

Negative environmental impacts of project, which principally occur at construction period include:

- Air and noise pollution caused by operating machineries
- Generation of waste by construction crew and discarded oil by machineries
- Destruction of natural vegetation, acceleration of erosion and increase in water turbidity as a result of soil displacement for establishing coffer dam/structures
- Possibility of increase in accidents (traffic and others) in construction period
- Probable negative impact of project on Afghanistan side.

Positive impacts (benefits), being gained after completion of project include:

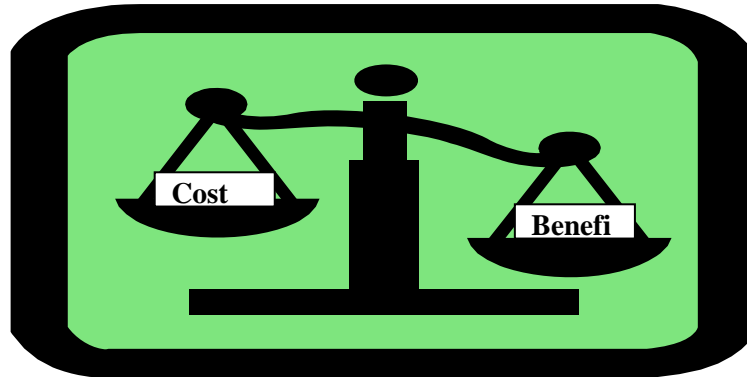
- Security of people and their properties (farmland, livestock) against flood
- Prevalence of security will encourage the people to undertake more activities, and attract the investors, contributing to improvement in economic situation and reduction in poverty rate in the area
- Arable lands presently being subjected to flood and left unused, will be brought under cultivation to make the land use more efficient and productive
- Project will engage the local people in its activities, contributing in elevation of their monetary status and technical skills
- Flood hinders growth and propagation of vegetation and destroys habitants of wildlife, affecting ecosystem of the area. With flood prevention measures status of flora and fauna is enhanced to improve the natural condition of the area
- In a secure and favorable living condition, people find more time to concentrate on religious and spiritual matters, which strengthen moral values of the society.



Economist of JICA team (Y. Ishizuka) provided information on **economic** evaluation of the project, which is an important task for clarifying its **viability** (possibility of execution).

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He also discussed the basic concept of project evaluation from viewpoint of **cost/benefit**. In some part of his presentation Mr. Ishizuka stated that: economic evaluation means- what kind of, and how much benefit will return to people living in flood prone area upon completion of project. So project evaluation is to be made at the stance of humanitarian. Simple drawings were used to make the points clearer to people.



Expert for non-structural measures (T. Hatori) discussed the **preparedness**, forecast, warning, and **evacuation** issues being considered by project for improving the security of inhabitants against flood damages. He said that these **non-structural** means are taken in couple with structural measures to increase efficiency and productivity of project. Hatori provided information to participants under next headings:

- Category of flood warning (long, medium, and short range)
- Flood warning level (stand-by, warning, alert, and critical level)
- Flood information dissemination, and flood management plan for Hamadoni
- Warning dissemination, and evacuation framework in Hamadoni.



4) Questions and Answer

After description of project by JICA team, the participants were allowed to ask questions and express their views/concerns about project and its activities. The questions/matter raised in the meeting with relevant answer/response by JICA team are summarized herein:

Question 1 (By Mr. Akramov Saeed, a farmer in Panjob Jamoat)- Will project implementation engage the local people in its construction activities?

Answer 1 (By JICA Study Team)- Yes, as a general norm the project would engage local people in its activities, even now some local persons are working in affiliated pilot project.

Question 2 (Mr. Akramov Saeed, a farmer in Panjob Jamoat)- In past years different contractors have undertaken construction activities in Pyanj river. However they engaged the local people in their activities, but did not paid their wages as promised. Will this project take precautions to avoid such unfavorable condition?

Answer 2 (JICA study team)- In principle project will entrust its works to local construction companies based on tendering result and conclusion of written agreement. Such companies usually approach the local people and hire them. One of precautionary means is that- to have written work agreement with contractors, if no payment, then employees can complain to relevant authorities and appeal for payment.

Question (comment) 3 (Mr. Laeqov Zarif, staff of administrative office of Panjob Jamoat)- JICA team explain various technical approaches for realization of project, among those in my opinion construction of super dike is most fit for Pyanj river, because other approaches are costly or may create territorial problem.

Answer (reply) 3 (JICA study team)- Thank you for your comment, we will consider your opinion in our planning and decision-making processes.

Question 4 (Mr. Rahimov Hamid, residence of Panjob Jamoat)- Are you (JICA team) considering relation of river flow velocity and sedimentation rate in designing your project?

Answer 4 (JICA study team)- Yes, we are considering this relation in our designing task.

Question 5 (Mr. Rahimov Hamid, residence of Panjob Jamoat)- Project would bring many machines and equipments for being used in its activities. After completion of construction works, such machineries are left in the area for further uses or taken away?

Answer 5 (JICA study team)- Project will entrust its works to construction companies, which bring their machinery and equipments in the area for construction purpose. As a

Sector 7
Socio-Environment and Institution

general rule upon completion of construction works they will take away all their property and belongings.



Question 6 (Mr. Madaminov Qurbonmad, residence of Panjob Jamoat)- Does this project inserts any impact on Afghanistan side of Pyanj river?

Answer 6 (JICA study team)- Impact of project on Afghanistan side is currently under study through numerical simulation, result of which is not clear yet. So I cannot tell you about exact impact of project Afghanistan side.

Question 7 (Mr. Madaminov Qurbonmad, residence of Panjob Jamoat)- In Soviet era natural plantation in vicinity of Pyanj river was vigor, but people gradually removed a part of it for various uses, and another portion was destroyed by floods, resulting in magnification of flood damages. Is this project considering re-plantation of the area?

Answer 7 (JICA study team)- Thank you very much for pointing out an important point. We will consider your advice in planning process of project.

5) Closing Word

After description of project by JICA team, the participants were allowed to ask questions. Lastly deputy chairman of local government of Hamadoni district (Mr. Abdujabor KATAEV) closed the meeting by saying few words. Mr. Kataev in his short and informative speech pointed out that- in last two years JICA team is conducting study in Pyanja river, and so-far has attained satisfactory progress in collecting data/information for formulating Master Plan, as well being successful in arrangement for implementation of its on-going pilot project. He said: since Hamadoni is a flood prone area, much resource and intensive efforts are required to create a secure living environment for its inhabitants. National government of Tajikistan and local government of Hamadoni are endeavoring for elimination of flooding problem and development of the area by all means. So in addition to JICA team, a team from ADB (Asian development bank) has also entered into the area to get involve in disaster prevention efforts. I seek your cooperation and support to these teams and wish for removal of problems, development of the area and prosperity of its inhabitants. Thank you for participating in this meeting and look forward to seeing you in other occasions.



6) Outcome of the Meeting

Based on question, view and comments expressed by local participants and official authorities in the meeting the following points can be drawn:

- They fairly understood the objectives, goal and scope of project, as well as its approaches for establishing structural measures and provision of non-structural measures
- They are fairly familiar with approaches for flood control, as reminded the JICA team to consider re-plantation of the area in its plan formulation processes. Means introduction of biological measure for coping with flood hazard
- They wish for quick and smooth implementation of project with engagement/participation of local people
- They hope for ever elimination of flood damages, so suggested establishment of a strong and efficient super dike in the area to achieve a lasting security against disasters
- They are eager to get engage in project activities, and receive their wages in a fair manner
- Officials in local government of Hamadoni and Jamoat administrative offices expressed their support and readiness to cooperate fully with project for realization of its goal. They also encouraged the people to be cooperative with JICA team members and assist them in collecting accurate and updated data/information about the area.

7) Explanatory Notes

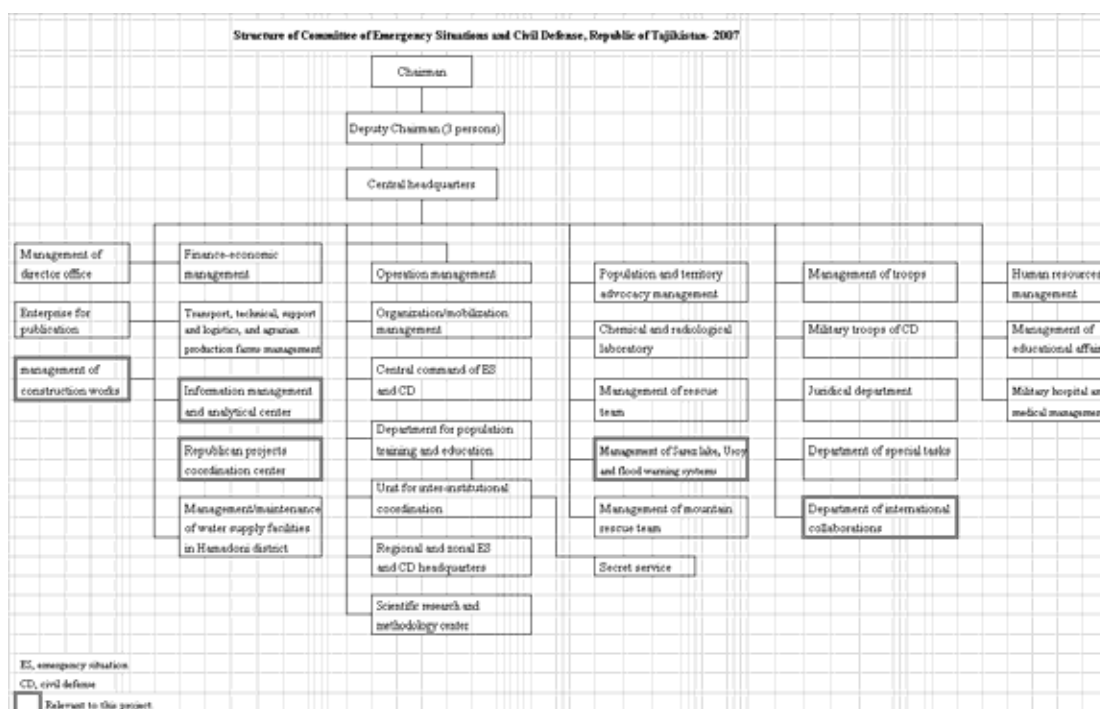
- Meeting started with 10 minutes delay at 14:10, because some elderly persons from neighboring Jamoats upon arrival kept greeting each other for a couple of minutes. The meeting also lasted more than expected time of 2 hours, and terminated at 16:35, due to intensive arguments by participants.
- After the meeting all participants were served with snacks and soft drinks (arranged by JICA study team) to provide opportunity for informal talks and getting more familiar with each other opinions.

7.3.3 Institutional Arrangement

Project completion and post evaluation follow-up is *principle 3* of JICA (Japan international cooperation agency) guidelines for technical cooperation. To execute, operate and maintain the project facilities, some capable, experienced and equipped institutions are required to get involve in the affairs. Based on its investigation on institutional alignment at national and local levels, JICA Study Team has identified some institutions that can provide such services to the project. Details on structure, duty and responsibilities of surveyed institutions are provided in Progress Report published by JICA Team in October 2006. However thereafter realignment of institutions has occurred, information provided here are for current (reshuffled) situation- 2007. In accordance with *principle 7* of its guidelines for technical cooperation, JICA should endeavor for organizational capacity strengthening of relevant institutions to assure proper execution and efficient operation and maintenance of projects.

1) Committee of Emergency Situations and Civil Defense (CoES)

Under new institutional alignment in Tajikistan, basing on governmental decree number 611 dated December 28, 2006; the ministry of emergency situations and civil defense (MoES) was abolished and renamed as *Committee of Emergency Situations and Civil Defense (CoES)*. The CoES with slight structural changes is committed to perform all function and services that were provided by MoES. Units with more or less similar tasks under MoES have been combined to form new units in structural organization of CoES, which is shown below.



Some of function and services of CoES are listed below:

- Facilitate quick response to nightmare of disasters (flood, earthquake) through assessment of damages and preparation of relevant documents
- Endeavor for protection of citizens and territory against disasters
- Collaborate with governmental institutions, local authorities, humanitarian and non-governmental organizations for liquidation of consequences of disasters

- Absorb and coordinate the international technical and financial assistances for promoting disaster preparedness and risk management in the country.

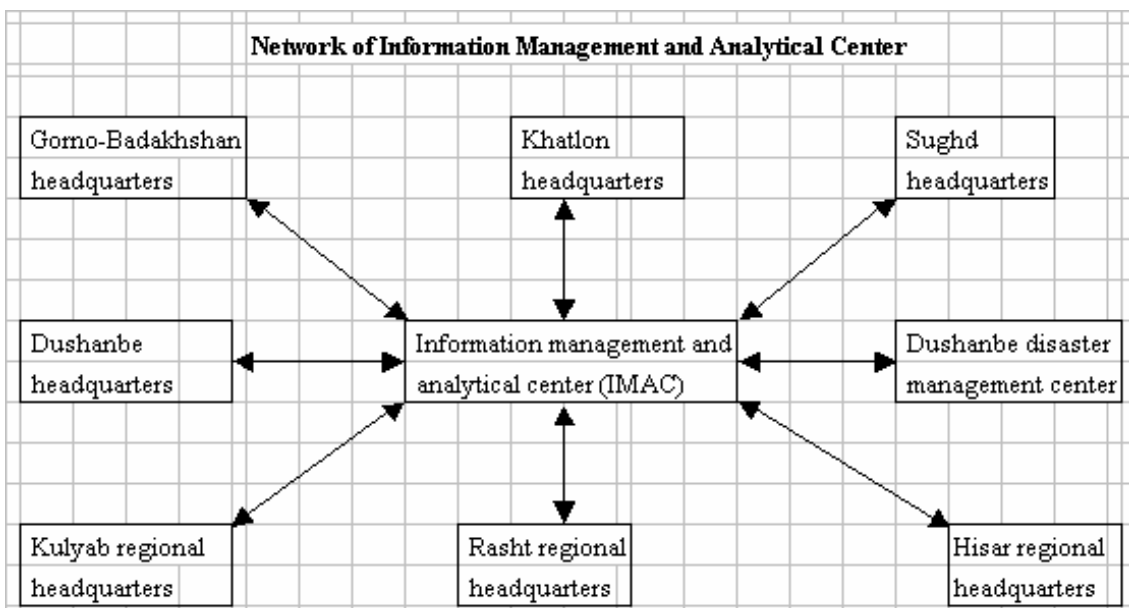
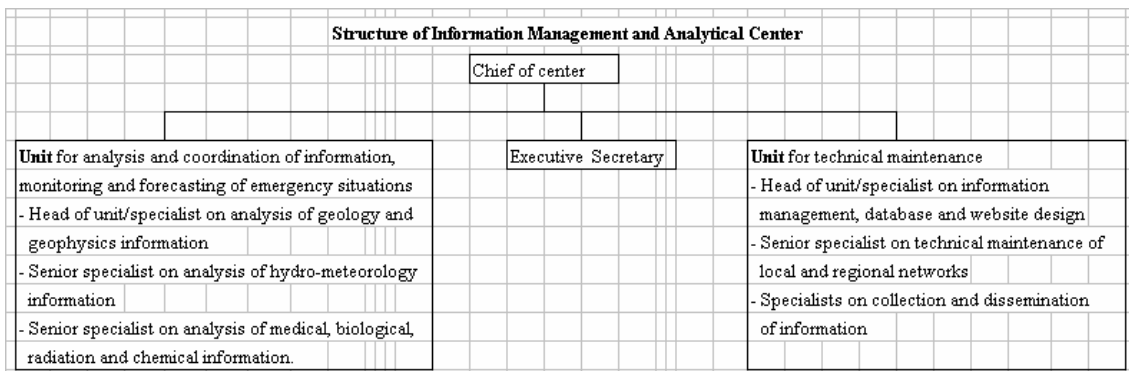
CoES is the direct national counterpart of JICA team and authorized body for realizing the project for Natural Disaster Prevention in Pyanj River. It has skilled and experienced personnel, well-established structure, popular face and helping hands, so entrusting project affairs to it seems wise and rational. Within CoES some sections can be of assist to project for dealing with its affairs, these are listed below. Activity of all the department/units within CoES is based on decree No. 611 mentioned earlier.

a) Information Management and Analytical Center (IMAC) and its Network

This center is within CoES and specialized in gathering, analyzing and disseminating disaster related data/information through its network. It has immediate and cooperative relation with national and international institutions working in disaster prevention and risk management aspects. It also performs tasks such as:

- Prepares hazard maps to facilitate planning for mitigation and allocation of resources for coping with disasters
- Establishes monitoring and early warning systems in most vulnerable areas, though which disaster causality is minimized.

Alignment of IMAC and its **Network** are illustrated below:



- Prospective of IMAC in implementation and continuation of project can be itemized as:
- Provision of accurate chronic data/information on disaster events to project authority for being used in planning and propagation of project
- Cooperation in analysis and dissemination of disaster related data/information
- Preparation of hazard and risk maps.

IMAC has 9 personnel in its main office in Dushanbe, and 15 personnel stationed in its regional offices throughout the country. Presently the center possesses equipment such as computer with network server, telephone communication facility, projector and other audiovisual aid, copy machine, printer and plotter. Budget annually provided to center is only amount for paying salary to its personnel. It does not receive any money for expansion of activities or improvement of working condition.

To strengthen the IMAC and making it capable for dealing with project matters efficiently, following materials need to be supplied to it, as pointed out by its head:

- Scanner (A1 and A0 size)- 1 unit
- Softer-ware of (licensed) Arc-Info- 1 unit
- External hard disk (memory) with high capacity (80 GB)- 2 units
- Common USB (universal serials bus) stick- 10 pieces
- SQL (structured query language) server standard edition 2005 Win 32 Russian- 1 unit
- Easy Trace software (program)- version 8.3 (1 package)
- GPS (geographic positioning system)- 3 units
- ADSL (asymmetric digital subscriber line) Modem- 7 units
- Ultra short band radio with 15 receivers- 7 units
- Router system- 1 unit
- Radio flash player.

b) Republican Project Coordination Center for Liquidation of Consequences of Natural Disasters

Formation of this center was stipulated in decree number 311 of Tajikistan government in August 1998, and actually came to existence with presidential order number 401 dated October 5, 1998, to coordinate the works on liquidation of consequences of natural disasters. From 1998 to 2003 this center carried out its tasks as an independent institution. But basing on governmental decree number 581 dated December 29, 2003, in year 2004 it was incorporated in ministry of emergency situations and civil defense (now Committee), to work under ministry administration. Presently the center has 24 regular staffs, of these 16 are experts in various fields, and 8 are administrative personnel. Annual budget for running the center is 110,000 Somoni, being supplied from national budget of the country. In addition to running cost, government each year allocates a certain budget to this center for being used in rehabilitation/improvement activities. In 2006 allocated budge was 5.5 million Somoni (1.8 million US\$). Besides managing its own budget, this center manage/supervises utilization of funds being provided by central government and/or international donor/financial institutions (World Bank, Asian development bank) for execution of disaster related projects. However this

center has personnel with supervision and consultancy capability, its possess no construction equipment/machinery or construction crew. Therefore it hires capable construction companies to execute the works under its guidance and supervision. In 2006 the center had 83 projects throughout the country in which 15 construction companies with 20 bulldozers, 6 excavators, many light machinery/equipments, and about 600 persons were engaged. The followings are also among tasks of this center:

- Coordination and effective management of project works for rehabilitation/restoration of disaster affected areas
- Preparation of technical specification for components of disaster related projects, cooperation in selection of contractors, and supervision/verification of implementation works
- Financing emergency works for restoration of disaster affected infrastructures by using national budget and seeking support of helping bodies such as NGOs.

However recently ministry of emergency situations and civil defense has been somewhat realigned and renamed as committee of emergency situations and civil defense, services of this center are not altered. It is carrying out the assigned tasks as usual. The center has predicted volume of its works and estimated the required money till 2010, and appealed the government for receiving 3 million Somoni per year for the next 3 years.

c) Department for Management of Sarez lake, Usoy and Flood-warning System

This department has 48 personnel with following tasks- technical 15, administrative/logistic 14, security and other 19. It annually receive limited budget just for wage of personnel and running expenses. It possesses computer with network server, machinery for transport of personnel and carrying supplies to designated sites, satellite communication facility, snow mobile, water boats, and radio communication facilities.

d) Department for Management of Construction Works

Totally 16 staffs have been assigned to this department. Of these 5 are technical and 11 are administrative and accounting personnel. This depart presently possesses computer (3 units), light vehicle (1 unit) and telephone communication facility. Principally its regular annual budget is the amount satisfying salary of staffs. But whenever required, CoES provides funds to this department for being used in works for renovation/construction of CoES affiliated buildings. Average figures for this fund stand at about 1 million Somoni per year. It also represents the CoES in any disaster prevention projects in which the Committee is by some means involved.

e) Department of International Collaboration

This is a small department within CoES, comprising of 8 staffs dealing with formal affairs of international organizations working with CoES, as well facilitate their communication with other Tajik institutions. Its budget is equal to amount of salary of its staffs, means does not receive budget for any particular task. Presently this department possesses only one telephone, and has no fax or transportation facility.

It should be noted that authorities in all of these department/units mentioned the budget shortage, and lack of equipments such computer, printer, software for engineering works, communication facility (fax , mobile), transport vehicles as major problems of their affiliated department/units.

2) Agency of Land, Geodesy and Mapping

This is one of the new institutions that have been created as a result of recent institutional shuffling. With new alignment, former Agency Tajik-koinot and Committee of Land administration have been merged to establish the *agency of land, geodesy and mapping* with responsibility for performing tasks of two previous institutions. Creation of new agency has been authorized with Governmental Decrees Number 9, dated November 30, 2006. This agency with 350 regular personnel has an advisor board (7 persons), one director and three deputy directors. The agency has been provided with 19 units of light vehicles, 6 of which assigned to headquarters in Dushanbe and remaining to regional branches. Agency will receive its required annual budget from national budget upon demand. Basically the agency is comprised of:

Institute *Tajik-Zaminsaz* and its branch in Sughd region for land administration

Research Institute *Faza* in Dushanbe, conducting aeronautic research

Enterprise *Markaz-Zamin* with affiliated units in region, district and town to deal with land matters such as registration and taxation

Enterprise *Aero-geodesy* in Dushanbe (and some regions) which deals with geodesy tasks

Enterprise *Aero-geodesy* in Sughd

Enterprise *Aero-geodesy* in Khatlon

Enterprise *Aero-geodesy* in Badakhshan

Enterprise *KartographichesKaya Fabrica*, for map production

Scientific Research Center, conducting research mostly in the fields of soil and geology.

Followings are among **tasks** assigned to this agency:

- Establish land use policy and carryout land reform
- Maintain land cadastre and take measures for efficient utilization and proper protection of state lands
- Register rights to land use and propose rate of land tax
- Endeavor for rehabilitation of polluted/degraded lands

This Agency can get involve and contribute in project activities by providing chronic data, information, map and satellite images on project site characteristics such as geology, soil, changes in river course and rate of sedimentation. It also can play supervision role in execution of project components.

While talking to expert of Socio-environment/Institution of JICA study team on means for strengthening the Agency, authorities listed the next materials:

- Large capacity and high performance computer- 3 units
- Scanner (A1 and A2 size)- 3 units
- Color printer (A1 and A2 size)- 3units
- Uninterruptible power supply system (UPS)- 3 units
- Regular access to large scale SPOT satellite image for comparison and situation update
- Easy Trace software- version 8.3 (1 package)

- External hard disk (memory) for data storage/management- 3 units

3) Ministry of Water Resources and Melioration

In this ministry the **Department** of Irrigation System Exploitation is in-charge of management of irrigation cannel, gate and other facilities. Department has 11 experts, mostly engineer in water resources/irrigation, and is equipped with light transport vehicle, computer, printer and tele-fax communication system. Its regular allocated annual budget is only salary of personnel, but depending on situations and upon demand it may receive some budget for doing specified tasks. Responsibility/duties of this department are stipulated in *Water Code of Tajikistan- 2004*, which has its root in Constitution of the country.

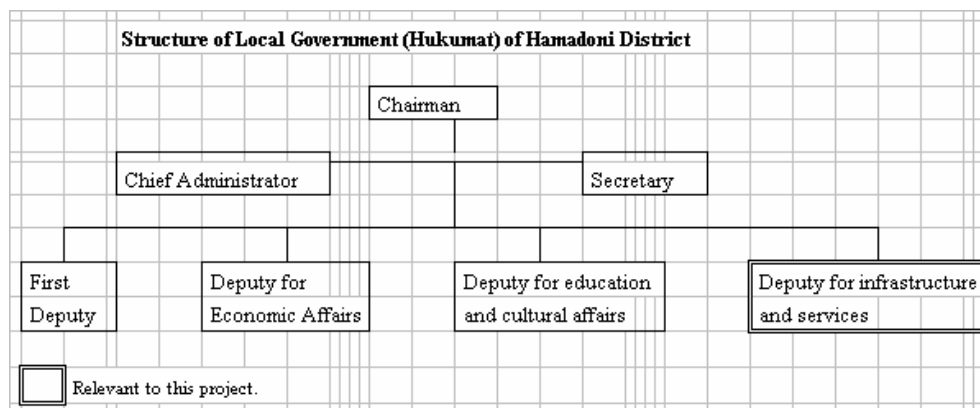
4) Hydro-meteorological Organization

Within this organization the **Center** for Hydrological Study is responsible for management and maintenance of river related instruments (current meter) in the country (covering Pyanj river). This center has 7 staffs (5 engineers and 2 technicians) and possesses computer with server network at national and international levels, printer, computers with GIS software, and Tele-fax communication facilities. Address of its homepage is: <http://www.meteo.tj>.

The center annually receives a certain budget just to pay salary of its staffs, and no other regular budget is allocated to it. Its director claim that the equipment/instruments available to center are old and inefficient. Thus to improve the working quality of center its modernization is required. It should be noted that the hydro-meteorological organization initially had been established in 1926 with affiliation to Soviet army. But in 1933 it was given authority by government to work as an independent institution, the status that is still attaining under present republic government.

5) Local Government (Hukumat) of Hamadoni District

In Hukumat, **Deputy** for Infrastructure and Services is responsible for establishment and maintenance of public facilities, as well as protection of inhabitants against disasters (flood) by taking proper and timely measures. This Deputy has 7 personnel, being expert in various fields, including riverbank protection. Deputy has no any equipment/instruments at its disposal, except telephone communication facility, and annually receives only some budget just to pay salary of its staffs. Establishment and scope of Hukumat are stipulated in constitution of the country.



6) Administrative Office of Jamoat

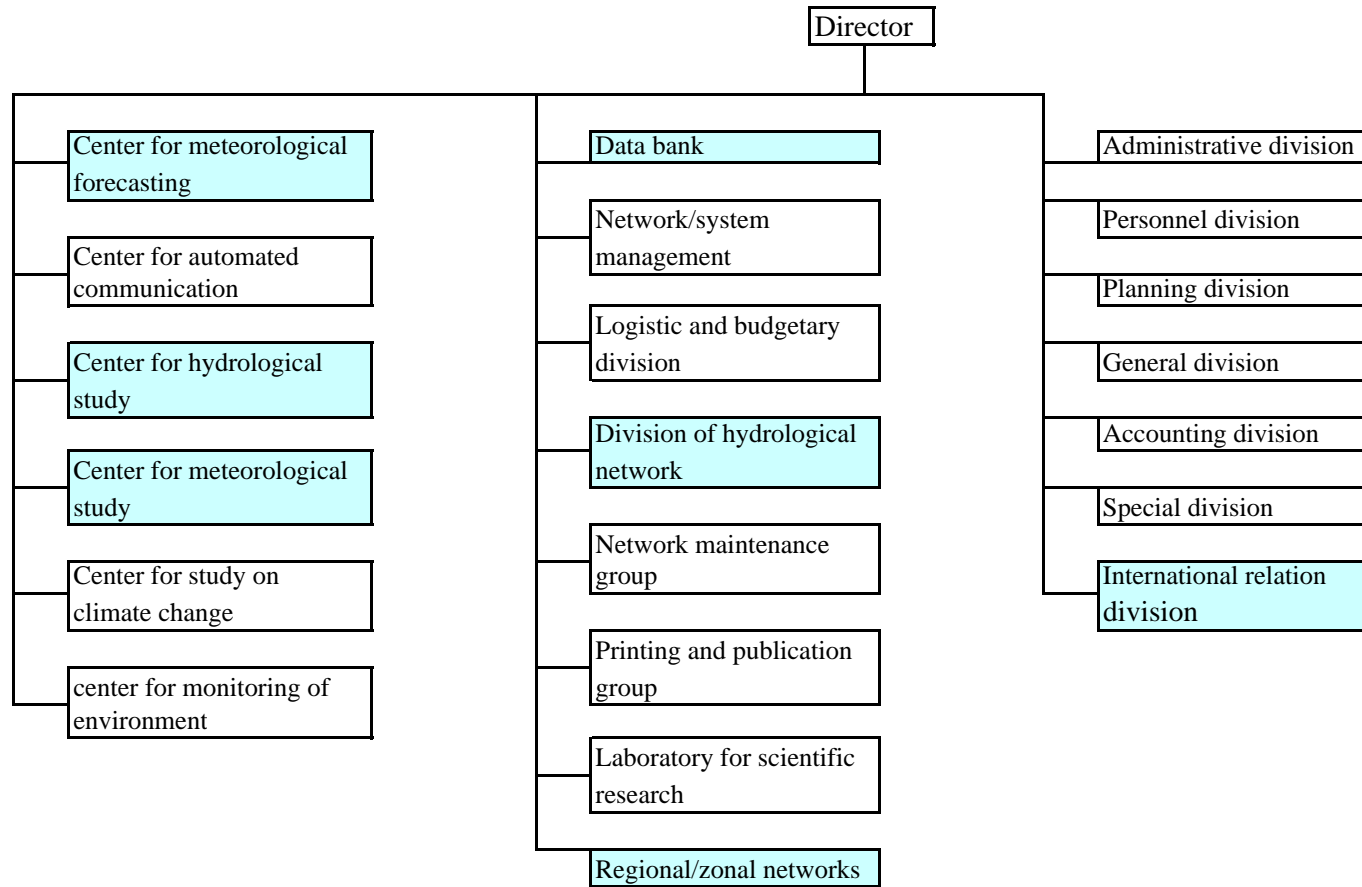
Personnel of Administrative Office of each Jamoat are collectively responsible for maintenance of public facilities, as well undertaking flood-fighting works. Average number of staffs in each office is about 9, who work under supervision of Jamoat chief. Office possesses no equipment, with no annual budget except money that receives for paying salary of its staffs. Establishment and scope of Jamoat office is in accordance with constitution of the country.

In Hamadoni, two Jamoats namely Panjob and Mehnatobod have formed special 9-member committees known as judicial (development) committee. The committee is comprised of representatives (8 persons) from Jamoat villages and deputy chief of Jamoat (1 person) who lead them. Committee endeavors for development of Jamoat and welfare of its inhabitants by getting involved in usual activities and emergency tasks.

ANNEXES

Structure of Hydro-Meteorological Organization, Republic of Tajikistan

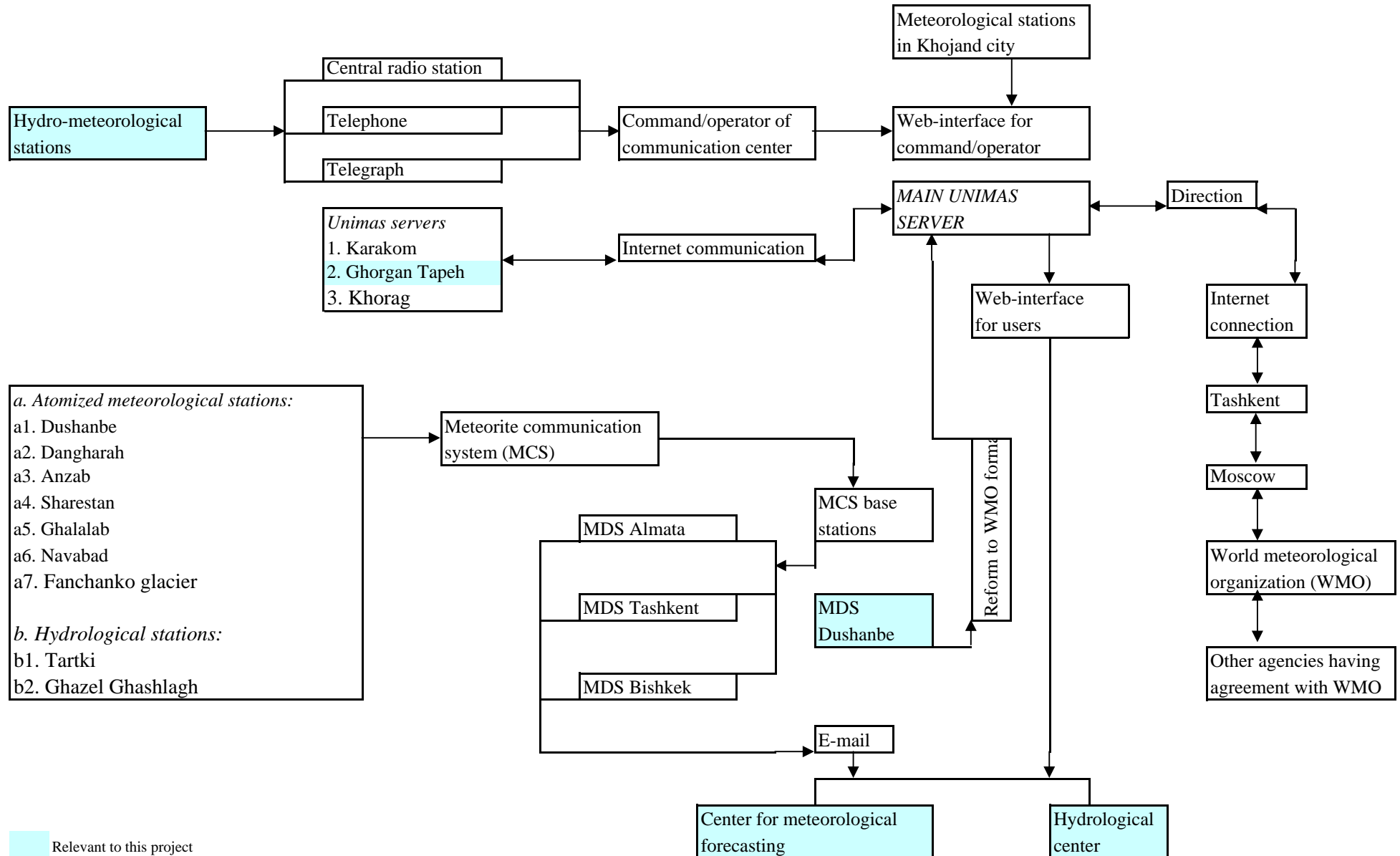
Annex 7.1-1



Relevant to this project

Scheme of Data Transmission through Hydro-Meteorological Organization, Republic of Tajikistan

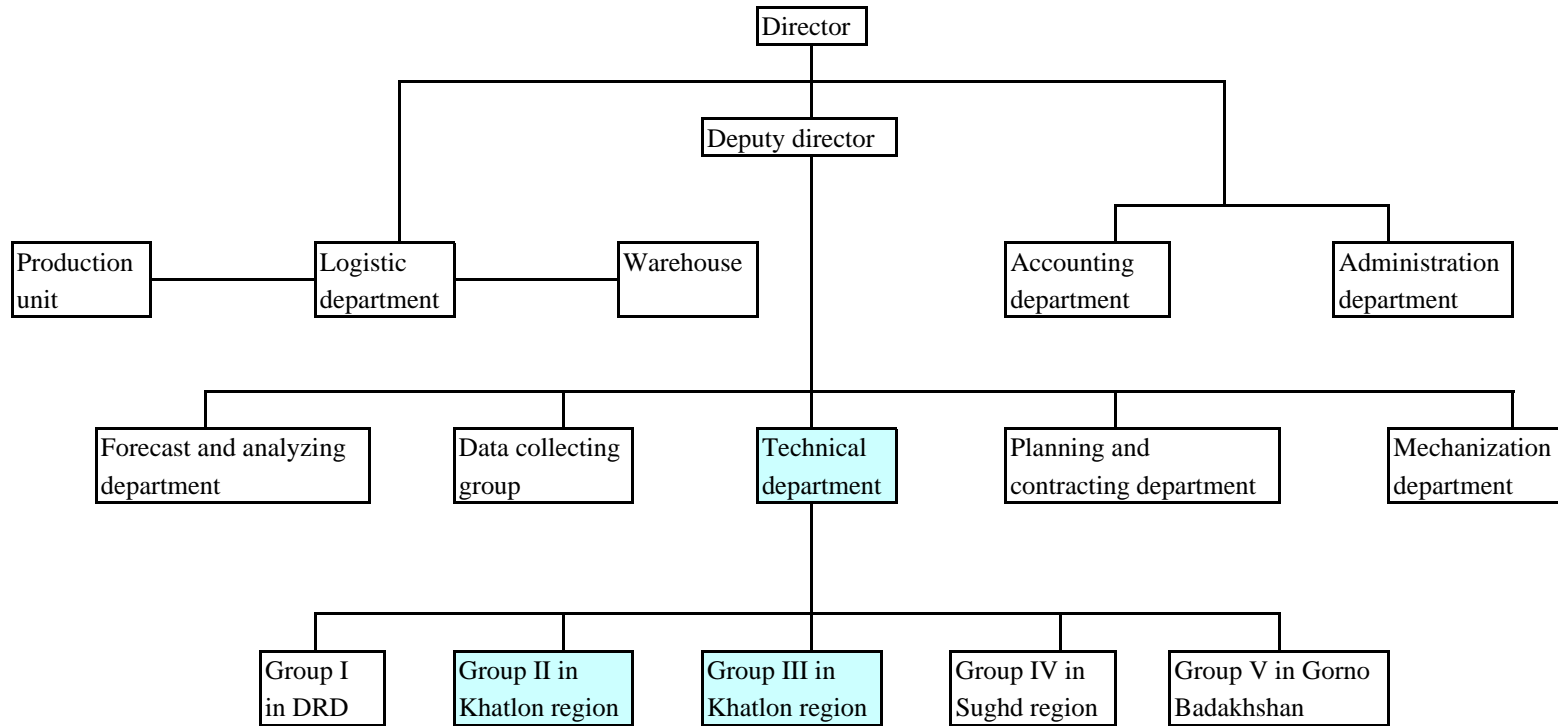
Annex 7.1-II



Relevant to this project
 Unimas; Universal meteorological automatic system
 MDS; Meteorological data system.

Structure of Republican Project Coordination Center for Liquidation of Consequences of Natural Disasters, Republic of Tajikistan

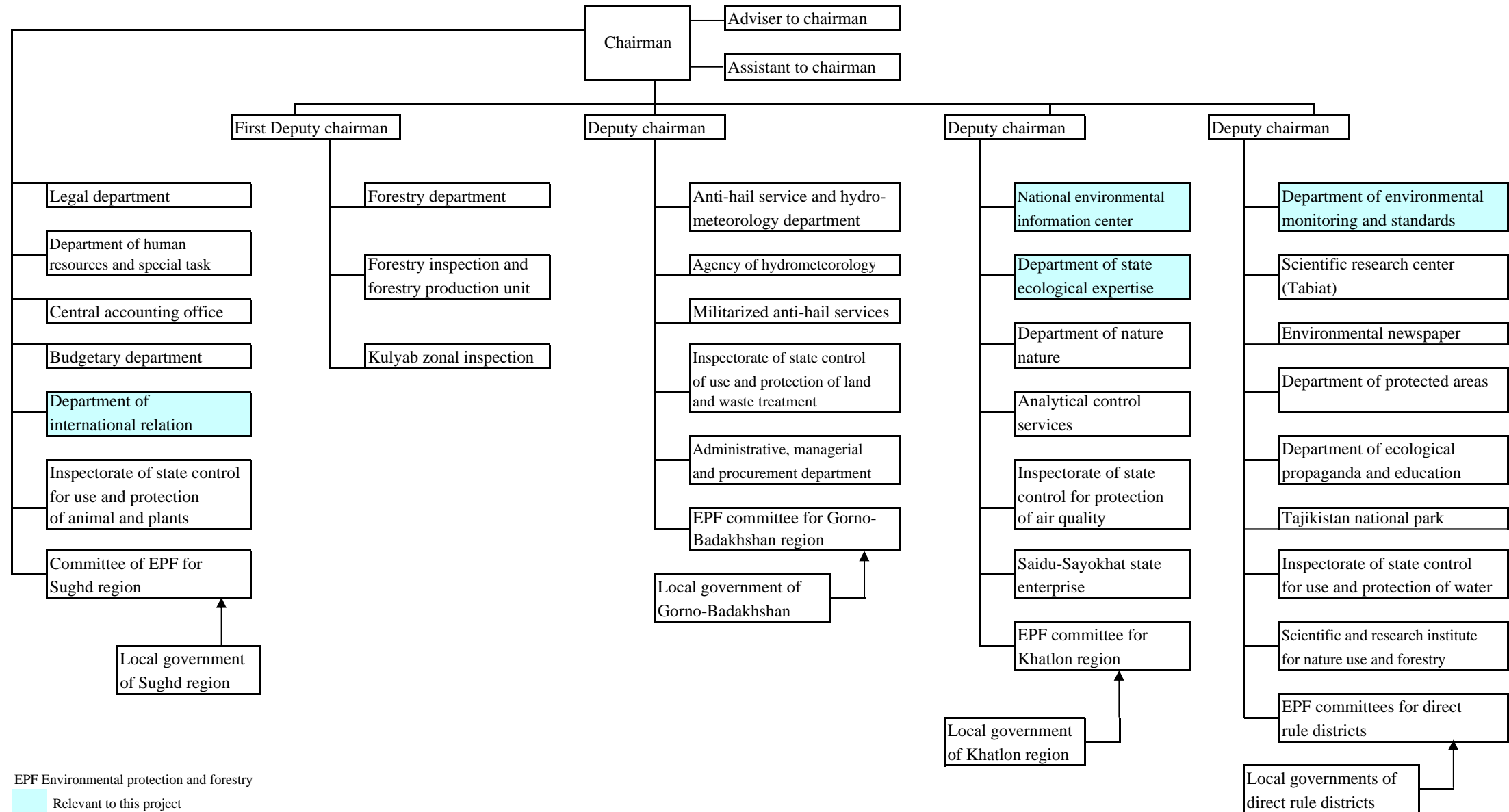
Annex 7.1-III



DRD Direct rule districts
Relevant to this project

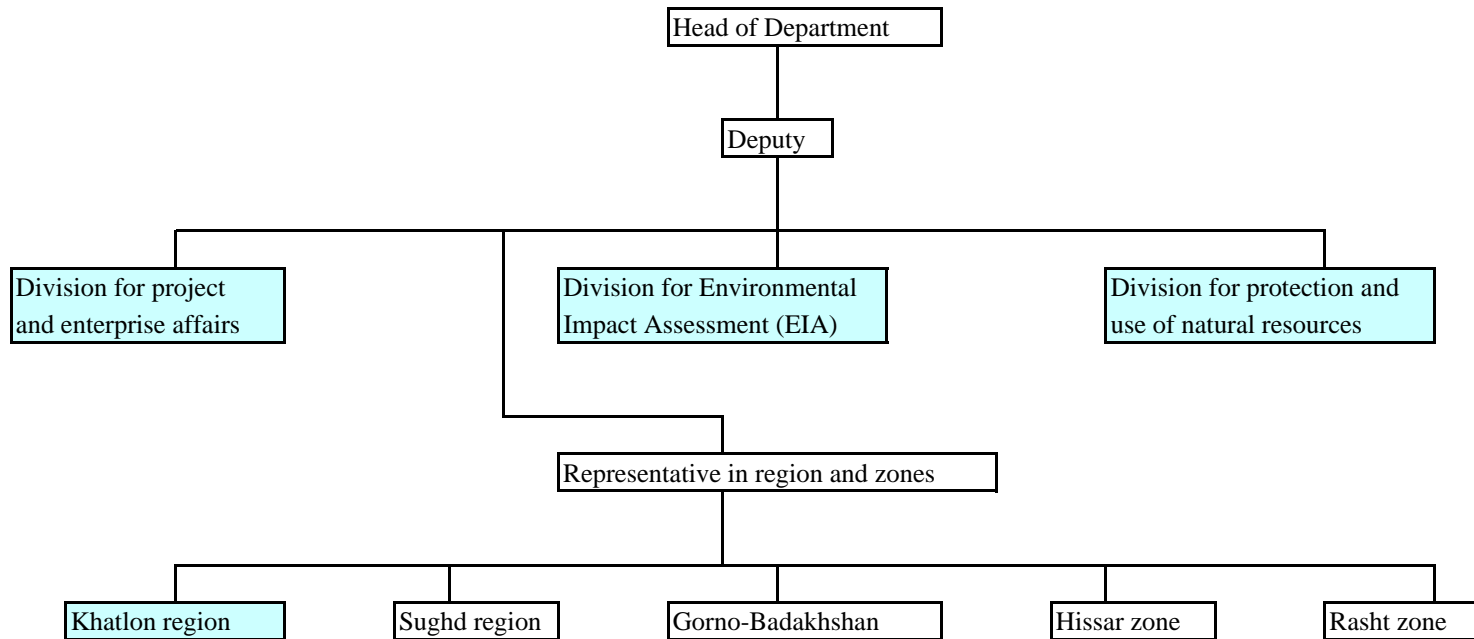
Structure of State Committee for Environmental Protection and Forestry, Republic of Tajikistan


Annex 7.1-IV



**Structure of Ecological Expertise Department in
State Committee for Environmental Protection and Forestry,
Republic of Tajikistan**

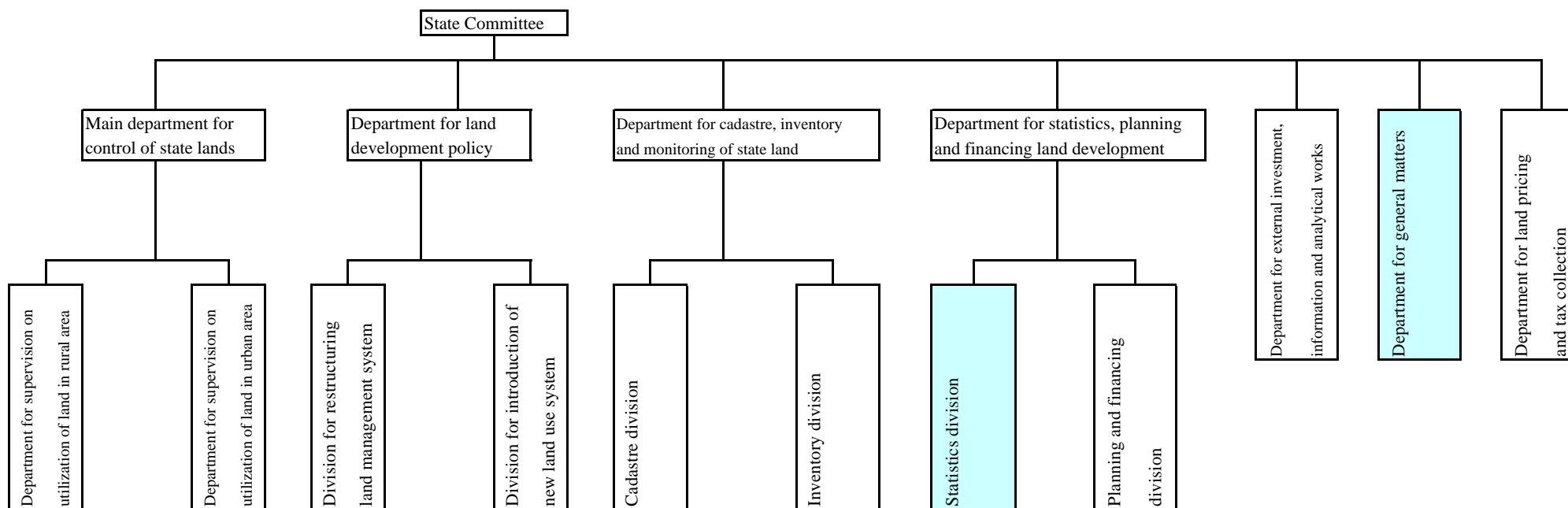
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 Relevant to this project

Structure of State Committee for Land Administration, Republic of Tajikistan

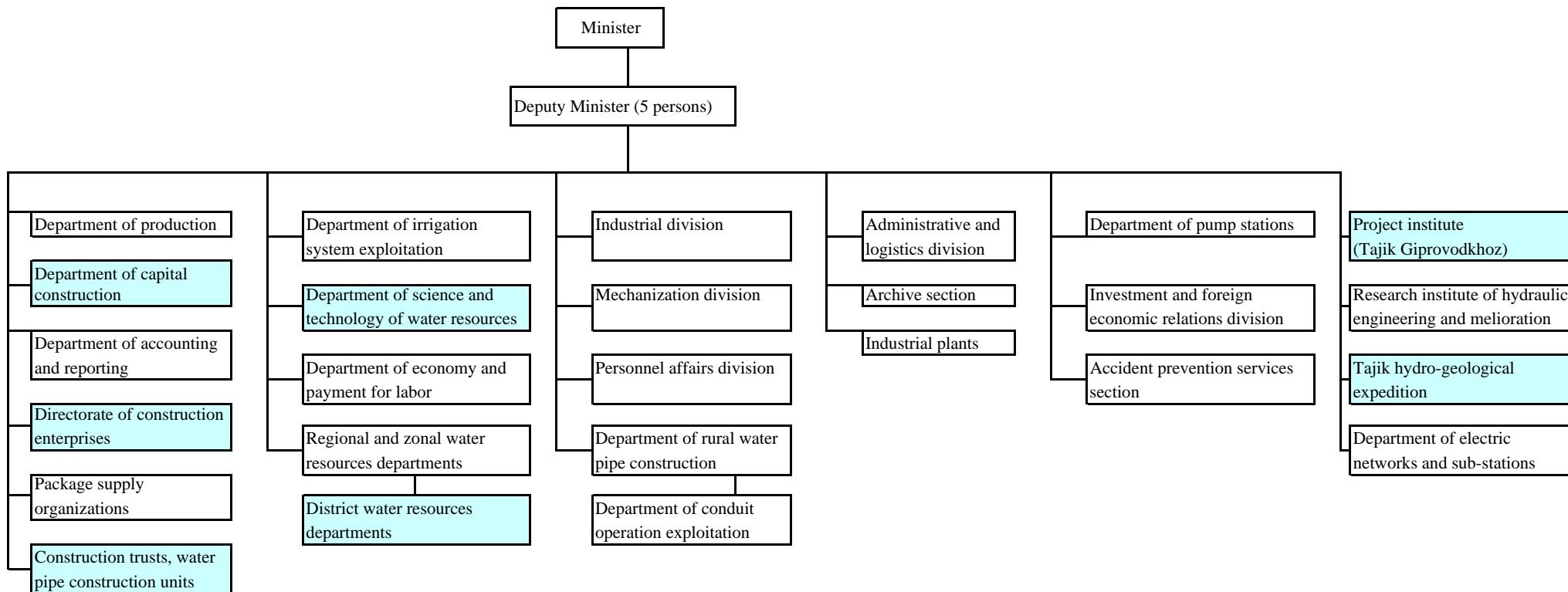
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 Relevant to this project.

Structure of Ministry of Water Resources and Melioration, Republic of Tajikistan

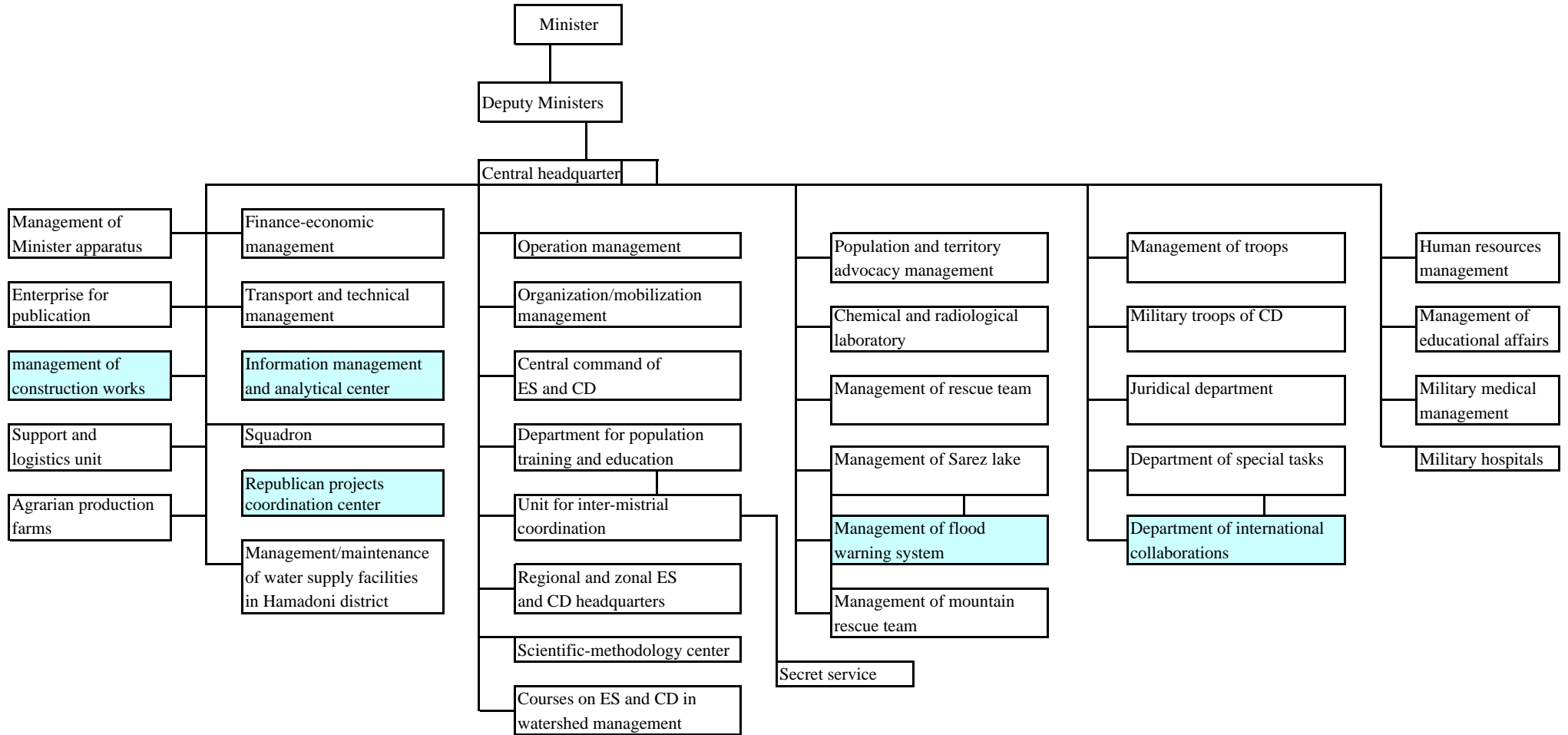
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Relevant to this project

Structure of Ministry of Emergency Situations and Civil Defense, Republic of Tajikistan

Annex 7.1-VIII



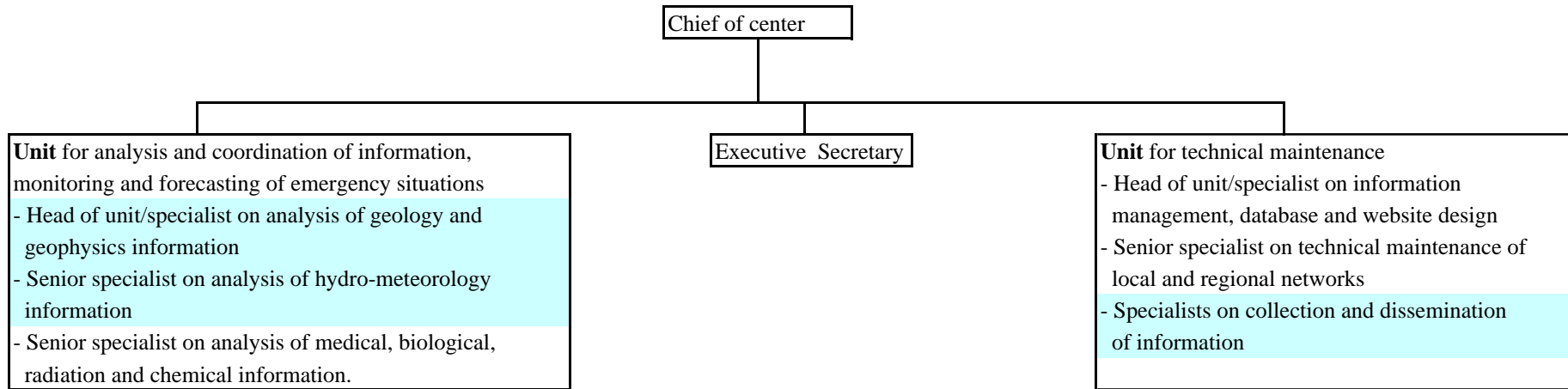
ES Emergency situation

CD Civil defense

Relevant to this project.

Structure of Information Management and Analytical Center of Ministry of Emergency Situations and Civil Defense, Republic of Tajikistan

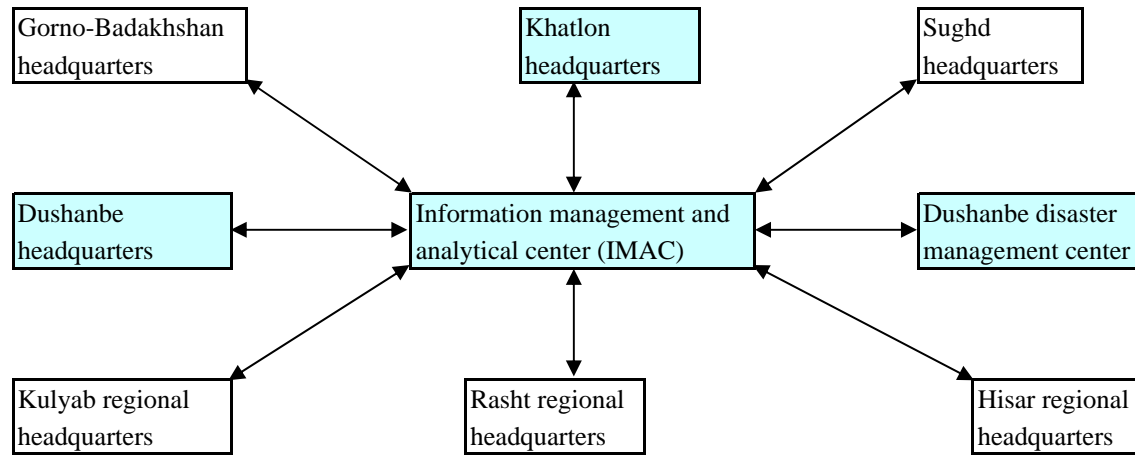
Annex 7.1-IX



Relevant to this project

**Network of Information Management and Analytical Center within the Ministry of
Emergency Situations and Civil Defense, Republic of Tajikistan**

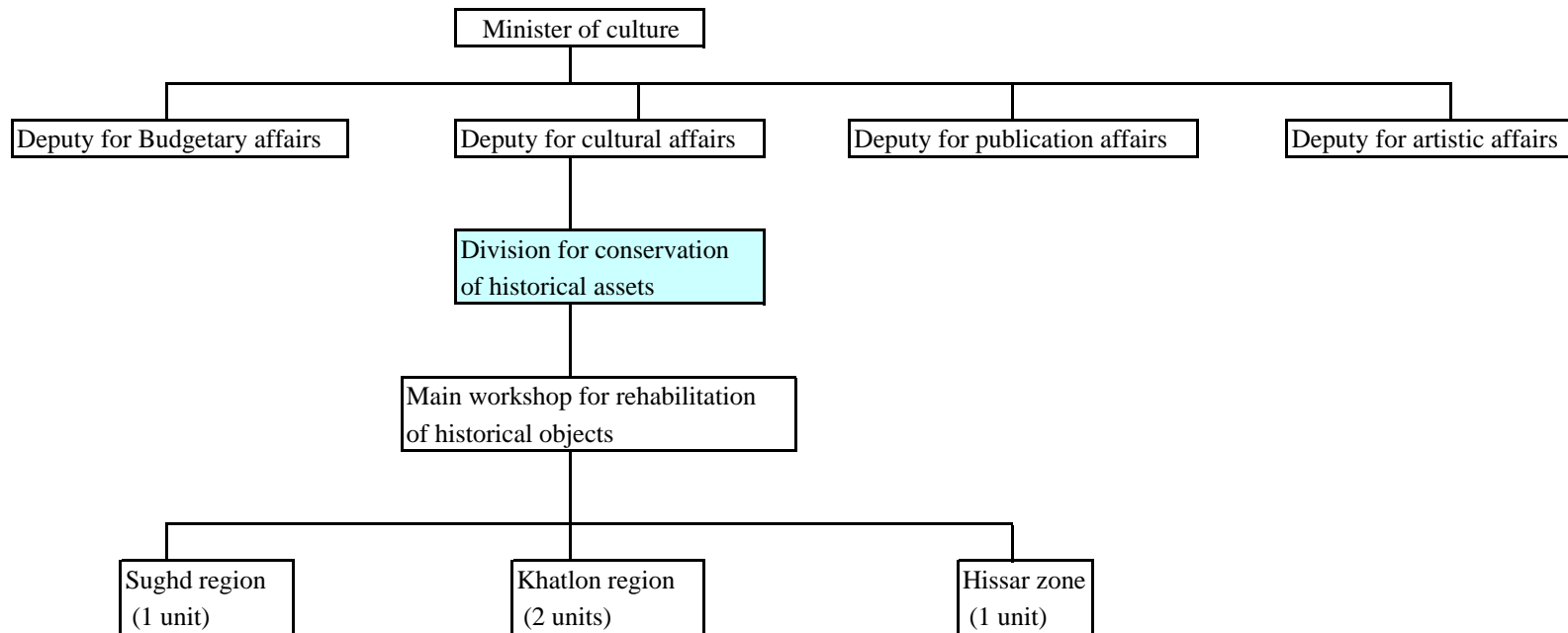
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


Relevant to this project.

**Position and Structure of Division for Conservation of Historical Assets
within the Ministry of Culture, Republic of Tajikistan**

Annex 7.1-XI

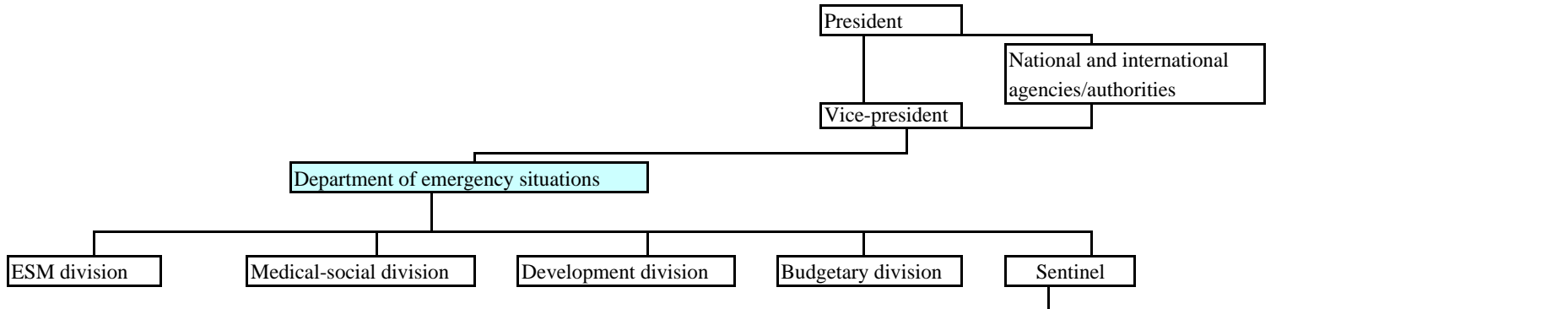


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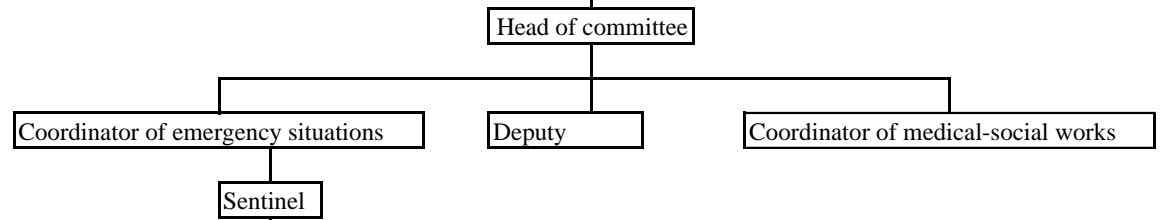
Structure of Tajikistan Red Crescent Society and Means of Reaching Disaster Affected People (simplified)

Annex 7.1-XII

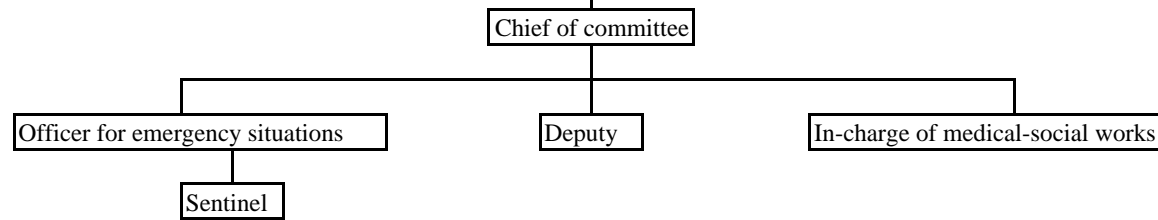
National/international level



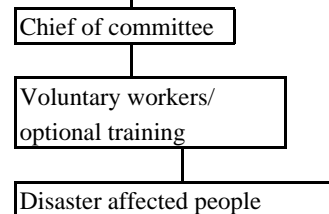
Regional/Zonal level



District and city level



Village and grassroots level



ESM Emergency Situation Management

Relevant to this project.

**SECTOR 8 PREPAREDNESS,
FORECASTING, WARNING
AND EVACUATION**

SUPPORTING REPORT

SECTOR 8 PREPAREDNESS, FORECASTING, WARNING AND EVACUATION

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SECTOR 8. PREPAREDNESS, FORECASTING, WARNING AND EVACUATION

8.1 PRESENT SYSTEM OF PREPAREDNESS

Definition of “preparedness” in disaster risk management is activities to reduce damages from possible future disasters.

8.1.1 Residents’ Awareness Research

1) Residents’ Consciousness Survey

JICA Study Team conducted a questionnaire survey to identify local peoples’ awareness on their own living and flood disaster in Rayon Hamadoni.

a) Survey Period and Places

The questionnaire survey was carried out during 26 April – 12 May 2006. The questionnaire sheets have been prepared by JICA Study Team in Tajik / Russian languages. Four (4) local staff (mainly the officials of the Hukumat of Hamadoni) was hired for interviewing to one hundred (100) local residents.

The targeted Jamoats are Turdiev, Dashti Gulo, Kalinin, Panjob and Chubek. Those are mainly located in southern part of Rayon Hamadoni. Except of Chubek, these 4 Jamoats have been affected by the 2005 flood. (People in Chubek have also taken refuge at mountainous area temporary but not been affected.)

b) Analysis of the Result

Based on the analysis of the results, some tendencies of peoples’ consciousness become clear.

i) General Livelihood

Most major mean of livelihood in the target area is agriculture. The farmers live near the flat agricultural field with irrigation system. Even non-farming people also have their kitchen fields usually. Most common style of residential building is one-storied brick construction. They can not evacuate to upstairs at flood. So once a large flood occurs, a lot of agricultural fields, irrigation system, roads, houses, and properties will be damaged immediately. Besides, the farmer's busy season is May to August in common. These months are also the flood season. The economic losses to agricultural production are serious problem. (Detail results are attached as Annex 1: Results of The Residents’ Consciousness Survey on General Livelihood.)

- Average number of household members is 9.01. The 6 to 10 member household accounts for 58%.
- Television set is in widespread use almost all households (92%). Television has a role of important information resource both daily and in emergency situations.
- Potato, tomato, wheat, onion and haricot (bean) are the major agricultural product in the households. The cotton is mainly produced in dehkan farms.
- Because of a hydrologic aspect of alluvial cones, wells are available as water resource. However 18 of 100 households answer that daily water is not enough. Only 27 households can access the piped water system for daily use.

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- Regarding agricultural water including livestock, local residents depend on the irrigation system, river water, and wells. Over 70% of households reply that agricultural and livestock water is enough.
- People obtain wood resource from their own homestead or dehkan farms for heating and cooking mainly. Cow-dung is also important as fuel.

ii) Consciousness on Flood

Almost half of interviewees answered that they have damaged from flood in past. Other half is no-damage experience or no answer. The gap between damaged person and no-damaged person shows a prominent tendency. The lack of preparedness is also significant. Nobody expresses their interests to hazard map / risk map. (Detail results are attached as Annex 2: Results of The Residents' Consciousness Survey on Flood Damages.)

- Even in the affected Jamoats, nearly half (48%) of local residents still think that they are “safe” or relatively safe (“not bad”) on the aspect of natural disaster risk and climate conditions including flood.
- People are afraid of anxieties and damages from flood. Power cut and economic (money) problems are also indicated. However, the consciousness on the threat to the people’s lives is not so urgently. Difficulty of livelihood is more common problem.
- 57 out of 100 interviewee reply that flood is impossible to manage. Only 10% answered “possible to manage.” There are 20% of “no concern” people in the community.
- The half of interviewees thinks that the reason of flood is an extra high-water level of the river simply. 23 people mention that the weather conditions such like Pamir’s snow-melting by high temperature. 14 and 2 persons mentioned the insufficient work of river bank and canal respectively.
- 70 % of the people reply that they have no idea about how to obtain information on future possible flood.
- In past experiences, people got the flood information mainly from the Jamoat Office, neighbors and mass media including television and radio. (They also expect that they can get information in the same ways in future.) However one-fifth of the people answered they got no information in past.
- Many interviewees said they would move to somewhere safe places like a hill, mountain or others if a flood occurred. 8 interviewees answered they did not have any idea about evacuation areas.
- 65 % of the interviewees answered that the community or individual level efforts to avoid damages from flood have been implemented. Over half of the interviewees recognize that those measures are effective.
- Nearly 80 % of the interviewees think that their villages conduct measures against flood. Principal villages’ measures against flood are the reinforcement or construction of dikes.
- 50 % of the interviewees think existing flood prevention structures are very effective or effective. 39 % of the interviewees think that their effectiveness is limited. 5% think practically not effective.

- The flood control plan of the government is not popular among the local residents. Less than 10% of the people obtain the information about the national flood management plan, mainly through television news or radio rather than Jamoats or kishlaks.
- Three quarters of the interviewees think they do not want to move to another place. One fifth of the interviewees express their will to move because their houses are located in flood prone area.
- Nearly half of the local residents want that the dikes are constructed or reinforced to prevent flood. 35 interviewees show their ambiguous expectations to be better.
- About 90 percent of the interviewees express their positive will to participate in flood prevention activities. The activities they want to participate are water-level monitoring, evacuation training, and joining the rescue teams chiefly. Nobody express their interest in hazard mapping / risk mapping.
- The top five important properties are houses, livestock, belongings, cars and agricultural fields.

8.1.2 Present System of Forecasting and Warning

There are 3 levels of warning in CoES. The level 1 means a daily situation report. The level 2 activates and puts the staff on standby. The level 3 declares an emergency situation. At the level 3, the local residents in target territory should be evacuated according to the orders and supports from the government officials.

1) Official Information Dissemination of Warnings

The law of the Republic of Tajikistan on Protection and Territories against Natural and Man-made Disasters designates CoES as the authorized national body that performs national management and coordination of activities of regulatory executive bodies of the republic of Tajikistan in the area of population and territory protection against disasters. Besides, each ministries and institutions organize activities in the area of population and territory protection against disasters in their relevant field of expertise. On the aspect of flood monitoring, the Tajikmeteorology collaborates with CoES about the monitoring and early warning. The summary of official information dissemination flow of the flood early warning system on Pyanj River is as follows.

a) Monitoring at the Khirmanjo Observatory

Tajikmeteorology has an observation network which consists of 30 meteorological observatories and 15 hydrological observatories in whole Tajikistan territory, as of September 2006. The network is connected through HF radio (shortwave / long range 2-way wireless communication system). The Khirmanjo Observatory, one of the hydrological observatories, is in charge of monitoring for the flood early-warning system of the Pyanj River. The Khirmanjo Observatory is located around 113km above the Chubek Intake along the Pyanj River. A staff of the Khirmanjo Observatory observed the water level of Pyanj River usually twice (more often in flood season) a day. The staff observes water level manually using water gauges. If the water level is raised beyond 70cm during 12 hours, after the water depth of Pyanj River reached 2 meters (usually it starts in May), the staff will inform to the Tajikmeteorology Headquarters in Dushanbe by HF radio from the residential building. (The Khirmanjo Observatory itself has no communication system.)



Fig. R 8.1.1 Khirmanjo Observatory

The current meter system is not available because of lack of maintenance.



Fig. R 8.1.2 Khirmanjo Observatory

Those water level gauges are used to observe the Pyanj River.

b) Information Dissemination by Tajikmeteorology Headquarters

After receiving an early warning from the Khirmanjo Observatory, the Headquarters of Tajikmeteorology in Dushanbe makes telephone calls and send e-mails to 20 concerned government offices including Committee on Emergency Situation and Civil Defense (CoES) in Dushanbe.

Besides, the Headquarters of Tajikmeteorology disseminates the information to mass media involving 4 or 5 radio stations, 2 television stations and over 10 newspapers. The information is also open to public through the website of Tajikmeteorology (<http://www.meteo.tj>).

Usually Tajikmeteorology sends a daily situation report on their meteorological and hydrological monitoring to central government offices and mass media, by e-mail or telephone at 13:00 everyday. This daily procedure is seemed to be helpful to submit early warnings in emergency situations.

c) Information Dissemination by CoES in Dushanbe

The Operational Room of CoES is located in the ground floor of the building of CoES Headquarters in Dushanbe. It is open 24 hours at all times of the year in order to communicate with other organizations, whichever governmental or non-governmental. When the Operational Room receives the warning message through telephone (the Operational Center does not have a facsimile nor e-mail address), a staff will take a note about it and pass the handwritten note to Information Management and Analytical Centre (IMAC) in the third floor. (IMAC is also able to receive a warning message from Tajikmeteorology by e-mail.)

IMAC will type out the handwritten memo as an official format. Then, IMAC will pass the typed statement to one of the Deputy Minister in charge of the management of local headquarters of CoES, in the second floor. The Deputy Minister will sign the statement to approve the contents and pass it back to the Operational Room. Finally, the Operational Room will send the information to 6 local head quarters of CoES

(Dushanbe, Khatlon, Sughd, Gorno-Badakhshan Autonomous Oblast (GBAO), Hissor, and Rashit) through telephone (telephonogram).

d) Information Dissemination by Local Headquarters of CoES

The local headquarters of CoES in Khatlon Oblast is located in Kurgan-Tyube, the capital of Khatlon Oblast. A branch is also placed in Kulyab and covers the eastern zone of Khatlon Oblast. (Kurgan-Tyube is located in the western zone of Khatlon Oblast. The eastern and western zones consist of 11 and 14 rayons respectively.) Once a warning message reaches to the local headquarters of CoES in Khatlon Oblast, Kurgan-Tyube, it will transfer to the branch in Kulyab as well as 14 rayons in the western zone. The branch of CoES local headquarters in Kulyab will inform the warning message to all 11 rayons including Rayon Hamadoni, immediately.

e) Information Dissemination by Hukumat of Hamadoni and Jamoats to Local Residents

The Hukumat of Hamadoni will forward the warning message to all 8 Jamoats. Each Jamoat Office will inform the warning message to local residents directly or through the heads of villages by face-to-face verbal communication basically. The Jamoat staff goes to the village to inform to local residents, sometimes using car-mounted loudspeaker in emergency situations.

The Hukumat of Hamadoni has a VHF (Very High Frequency / Very Short Wave) radio (short range (see-through distance) 2-way wireless communication system) as well as a HF (High Frequency / Short Wave) radio (long range 2-way wireless communication system) in the chairman's office room and all 8 Jamoat Offices have VHF radio system which are able to communicate each other. These wireless communication system have been deployed under the collaboration between CoES and FOCUS HUMANITARIAN ASSISTANCE (an international non-governmental organization to complement the provision of emergency relief, <http://www.akdn.org/focus/>) in 2003, as a part of the lake Sarez Risk Mitigation Project.

Personal mobile phone is also an important and useful tool of communication.

Some of Jamoat Offices have no fixed-line telephone.

2) Actual Decision making of Warning Level in Emergency Situations

In actual emergency situations, the decision making process sometimes becomes more simple.

The issuances of level 2 or 3 are decided by the chairman of Hamadoni, Jamoat Chiefs and CoES resident staff in Hamadoni, based on only the eye observation of Pyanj River in Hamadoni. Their decision would be informed to CoES Headquarters on late notice.

That is, the monitoring at the Khirmanjo Observatory is not considered.

8.1.3 Present System of Evacuation

1) Evacuation Areas

The JICA Study Team has conducted a questionnaire survey on present measures against flood as well as the 2005 flood damages, targeting all 8 Jamoat Chiefs in Rayon Hamadoni in May 2006. They answer that the evacuation area is the same as the case of the flood in 2005. Each Jamoat have their own evacuation plan including evacuation areas. JICA Study Team has gained their evacuation plans, however, basically they are targeting the outburst of Lake Sarez (see Table 8.1.1). For example, people in Panjob Jamoat are indicated to evacuate to Khoja Mumin Mountain although nobody evacuated to Khoja Mumin

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Mountain at the 2005 flood. Affected people of Panjob Jamoat at the 2005 flood have evacuated just near their damaged house and agricultural land because water had not reached the center of Panjob Jamoat. Besides, the population and number of vehicles in the evacuation plans should be updated. Evacuation routes which were destroyed at the 2005 flood should be also re-considered.

2) Remained damages after the 2005 flood as of October 2006

The evacuation activity at the flood in 2005 can be considered as a largest scale on-site drill. Around 10,000 people including the need-to-be-supported people like small children, elder person, etc. were evacuated with no death toll. It seems that the existing system of evacuation is demonstrated successfully.

However, still some damaged individual properties (houses, agricultural fields, etc.) and infrastructures (roads, bridges, water supply systems, etc) are remained with no clear prospects for recovery over one year. How to reduce the economic damages is important. Not only the emergency response (evacuation, etc.) and prevention / mitigation (construction of dikes, etc.), the activity of preparedness (hazard mapping, etc.) and reconstruction / rehabilitation should be focused more clearly in the days ahead, for sustainable development.

3) Training and Methodological Center of CoES

The “Training and Methodological Center of CoES in Kulyab” conducts trainings for local government officials, school teachers, representatives of dehkan farms, etc. in the eastern half of Khatlon Oblast about emergency situation activities as well as civil defense.

4) Lake Sarez Risk Mitigation Project (LSRMP)

The FOCUS HUMANITARIAN ASSISTANCE has conducted an evacuation drill in Hamadoni rayon in the spring of 2003 in collaboration with CoES. They implemented 15-day drills in all 8 Jamoats as well as Hukumat of Hamadoni on the assumption that the Usoy Dam of Lake Sarez was broken. This drill would be helpful for the actual evacuation at the flood in 2005.

5) Warning Dissemination Tool

In Panjob, a gong and electric bell are used as tools to disseminate an emergency warning to local residents in case of the Lake Sarez outburst. Unfortunately electricity has been down for long time (as of October 2006) so the electric bell is not available.



Fig. R 8.1.3 Gong (hanged from a tree) and electric bell in Panjob

8.1.4 Experience of the 2005 Flood

1) Turdiev Jamoat

The Hamadoni Traffic Police has supported the evacuation of thousands of residents in Turdiev Jamoat on 23 June 2005 in cooperation with the Internal Affairs Department (a

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branch of Ministry of Internal Affairs), by order of the chairman of the Hukumat of Hamadoni. The local residents in flood-prone villages have been evacuated to the foot of Sayyod Hill at the west end of the same Jamoat. 15 tracks and tractors (belonging to the Hukumat of Hamadoni and some individuals) were used to carry the local residents. A big track can transport 50 – 70 persons at one time. Simultaneously the Hamadoni Traffic Police visited to the villages by staff members' personnel cars in order to disseminate the evacuation order to the people. A lot of local residents, chiefly in Metintugay Kishlak, moved to the foot of Sayyod Hill individually. It took around whole one day (24 hours) for the completion of evacuation. There were hundreds of tents at the evacuation site during about three month evacuation period. Some of refugees were back to their houses after the first one month and the others kept remained there. The tents, blankets, food, etc. were provided from CoES to the evacuees.

United Nations Coordination Unit in Tajikistan reported that 258 households (2050 persons) of Metintugay Kishlak were evacuated to Sayyod Hill on 29 June 2005. Through the questionnaire survey, the Jamoat Chief of Turdiev answered to the JICA Study Team that more than 2500 people were evacuated.

The Hamadoni Traffic Police had been informed of the abnormal water level of the Pyanj River from the Hukumat of Hamadoni in advance so that they have stood by for supporting the evacuation activities.



Fig. R 8.1.4 Panoramic view of Sayyod Hill

The hill shows over 50 meters in relative elevation. The evacuation area was located at the foot of the hill, not at the flat plain on the hilltop.



Fig. R 8.1.5 The Foot of Sayyod Hill

One of major evacuation areas at the 2005 flood. It is located at the west edge of Sayyod Kishlak.

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Fig. R 8.1.6 The Evacuation road from Metintugay Kishlak to the foot of Sayyod Hill.

The road is flat, straight and asphalt paved so it is easy to go through by car or truck.

2) Kalinin Jamoat

Kodara-1 Village was damaged by the flood severely. Their homes, belongings, agricultural fields, roads, and bridges were swept away. The residents were evacuated to the east edge of Kodara-2. A private company (concrete factory) in Qahramon Jamoat voluntarily provided their building as a shelter for around 70 affected people of Kodara-1 about 3 months. In September 2005, over 30 permanent houses for refugees were built in the east edge of Kodara-2.

Through the questionnaire survey, the Jamoat Chief of Kalinin answered to the JICA Study Team that about 300 – 400 people were evacuated in 4 evacuation areas, Olimtoy Hill, Urtabuz Hill, Okamazori Hill and Sayyod Hill.

3) Dashti Gulo Jamoat

Around 20 households of Fayzobod Kishlak were evacuated to the Hospital named after Murod Rahim in the same Jamoat. School No.4 named after Komil Nazarov also accepted around 10 households from Fayzobod as well as Anjirkon Kishlak. 10 to 15 tents were set up at the playing field of School No.52. The refugees stayed in the schools during a summer vacation, until 31 August 2005.



Fig. R 8.1.7 Hospital named after Murod Rahim, Fayzobod Kishlak, Dashti Gulo Jamoat

This place was used as an evacuation area at the 2005 flood.

Through the questionnaire survey, the Jamoat Chief of Dashti Gulo answered to the JICA Study Team that 40 – 700 people stayed in each evacuation areas, Safedob Kishlak in Kalinin Jamoat, Sayyod Kishlak in Turdiev Jamoat, Buston, Archa and Urtabuz Kishlaks in Farkhor Jamoat.

4) Panjob Jamoat

Through the questionnaire survey, the Jamoat Chief of Panjob answered to the JICA Study Team that 136 people were evacuated to near the Panjob Village, 110 people stayed in the dormitory of the OKT #17, 60 people in the Camp Chorboqh, 157 people in their relatives' houses.

5) Chubek Jamoat

Some of local residents living near the Pyanj River have been evacuated to the hill top, Buzakhona, Qiyomchashma, Qaraghoch, etc., however, the flood water was not affected to the villages in Chubek Jamoat eventually.

6) Mehnatobod, Qahramon and Moskva Jamoats

The flood water was not reached to these 3 Jamoats. Moskva Jamoats accepted some evacuees from other affected Jamoats.

8.2 SEMINAR ON FLOOD FIGHTING

A seminar on flood fighting was conducted by CoES and JICA Study Team.

8.2.1 Objective

The main objective of the seminar is discussion and information sharing among the Working Group members as well as other concerned agencies about the introduction of new categorization of flood forecasting and warning as a part of the master plan and the WG members' activities at each forecasting and warning level. The Rayon Headquarters for Emergency Situations in Hamadoni and the Patrol Teams are also introduced to the Master Plan.

8.2.2 Time and Date, Venue and Participants

1) Time and Date

The seminar was held on Friday, 9 February 2007. It has started at 14:00 and ended at 16:40.

2) Venue

The venue of the seminar was the Conference Hall in CoES Headquarters, Dushanbe.

3) Participants

There were 17 participants from both governmental organizations and non-governmental organizations. CoES, Ministry of Melioration and Water Resources (MMWR), Ministry of Agriculture and Protection of Nature (ex-Committee of Environment and Forest Economy), Agency on Hydrometeorology (Tajikmeteorology), Main Geology Department (Tajikgeology), National Space, Geodetic and Cartographical Agency (Tojikkoinot) have participated as the Working Group members. Institute of Earthquake Engineering and Seismology (IEES) and Mission East have also participated as concerned agencies.

8.2.3 Summary of Discussion at the Seminar

After the explanation about the draft categorizations of forecasting and warning on flood, participants were discussed as follows;

- The draft categorization of forecasting and warning were basically welcomed. However, the numerical standard of water level (discharge) should be discussed more among the working group, especially CoES, JICA Study Team and MMWR. Not only the discharge values as Long Term Plan (10 years) after completion of the designed dike construction, some interim discharge values should be introduced until completion of the designed dike construction.
- The monitoring network on river flow and snow depth in the master plan should be discussed among CoES, JICA Study Team and Tajikmeteorology.
- The participants recognized an importance of patrol team to monitor the erosion of dikes. The local staff of MMWR in Hamadoni has already been implementing such a

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monitoring (only the daytime-watch is permitted because of the border zone policy). The possibility of collaboration between MMWR and the planed patrol team should be considered.



Fig. R 8.2.1 Scene of discussion at the Seminar on Flood Fighting

8.3 WORKSHOP ON FLOOD FIGHTING

A series of workshop on flood fighting in Hamadoni was conducted by CoES and JICA Study Team during 17-18 February 2007 under collaboration with Hukumat of Hamadoni.

8.3.1 Objective

The main objective of the workshop is developing a basic consensus on how to disseminate the warning from Jamoat Offices to local residents through Kishlak or Mahalla (Mahalla means “(self-governing) community” in Tajiki. Kucha is also used in referring to a local community) in flood prone areas. How to monitor the water level and erosion of dikes / canals is also discussed.

8.3.2 Time and Date, Venue and Participants

1) Time and Date

Saturday, 17 February 2007

10:00-12:30 (Kishlak Metintugay, Jamoat Turdiev),

14:00-16:30 (Kishlak Sovetobod, Jamoat Turdiev),

Sunday, 18 February 2007

10:30-12:30 (Kishlak Tagnob, Jamoat Dashti Gulo),

14:00-16:30 (Kishlak Fayzobod-1, Jamoat Dashti Gulo),

2) Venue

Metintugay:	School No.9
Sovetobod:	School No.27
Tagnob:	School No.16
Fayzobod-1:	School No.52

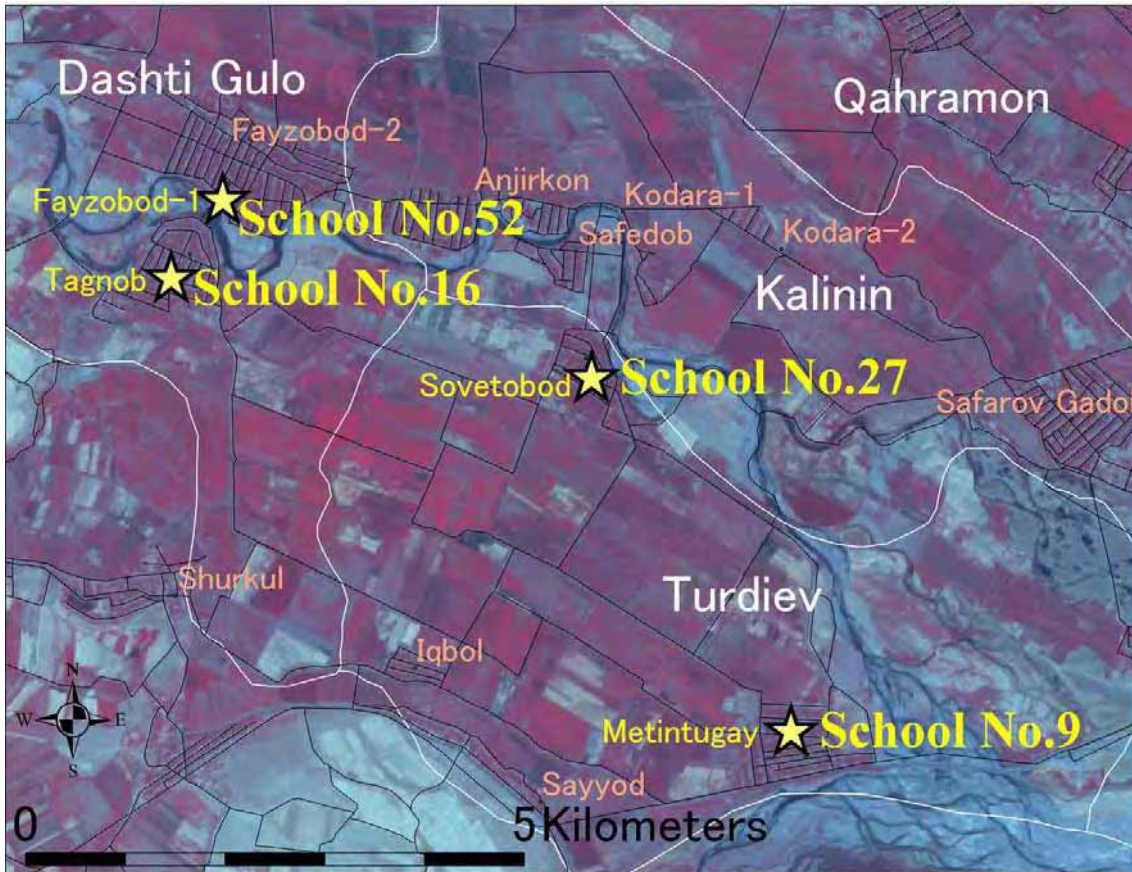


Fig. R 8.3.1 Location of the workshop venues

3) Participants

Metintugay:	28 (26 from Metintugay, 1 from Sayyod, 1 from Beshkappa)
Sovetobod:	27 (all from Sovetobod)
Tagnob:	72 (all from Tagnob)
Fayzobod-1:	38 (4 from Fayzobod-1, 33 from Fayzobod-2, 1 from outside of Fayzobod)

(Local residents, Deputy Jamoat Chiefs of Jamoat Turdiev and Dashti Gulo, Local Representative of CoES in Hamadoni, and other concerned organizations)

8.3.3 Outlines of the each Workshop's Discussions

In each workshop, firstly the outline of current progress of the Study, the 2005 flood analysis, draft categorizations of warning on flood and warning dissemination framework were explained by the JICA Study Team. Then, participants were discussed about;

Discussion 1: How to Disseminate the Warnings

- Who can be the members of the Patrol Teams for the dikes in the border-zone and canals near the residential areas?
- How to disseminate each warning, especially from Jamoat Office to local residents (each household) through Kishlak or Mahalla

Discussion 2: How to Evacuate

- Consensus in community level on evacuation area, evacuation route, evacuation time, etc.

The summary of discussion in each workshop is described from 1) to 4).

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1) School No. 9, Metintugay

- The population of Kishlak Metintugay is about 4,100. There are 8 Mahallas in Metintugay. These Mahallas are formed on each main street from No.1 to 8 in the residential area.
- If the water level of Pyanj River is raised, some people of Mahalla will come to the Office of Jamoat Turdiev in Metintugay to get information on an individual basis. Then they will go back to each Mahalla and transfer the information to each household through face to face, verbal communication basically. They will go from house to house on foot.
- If local residents participate in the Patrol Team, they need equipments and salaries.
- There was a gong for emergency warning in Metintugay as well as Panjob. Unfortunately it has been lost.
- Hand Siren in the Master Plan will be useful for warning dissemination among local residents at each Mahalla. From the top of high building, it will reach long distance, beyond 500m.
- Whistle is used for child's game or play. If we use a whistle as warning dissemination tool, it is difficult to distinguish an evacuation warning from such a child's game.
- Loud speaker (fixed system) has been set up in front of the Jamoat Office until around 10 to 15 years ago. Unfortunately it has also been lost. If the loud speaker is re-established, it will be very useful to disseminate warnings.
- Hand Speaker (cell battery type) would be also helpful for warning dissemination among local residents in each Mahalla.
- People can share information about water levels and flood warnings at chaikhana (tea-house), mosque, etc.
- The population of Kishlak Beshkappa is around 600. Beshkappa have 2 Mahallas. There is a gravel factory in Beshkappa. Usually the head of the factory would get emergency information and transfer to local residents in Beshkappa. At the 2005 flood, some of local residents in Beshkappa have evacuated to PTU-17 (Vocational School No. 17) in Moskva Town.
- Kishlak Sayyod has 2 Mahallas.

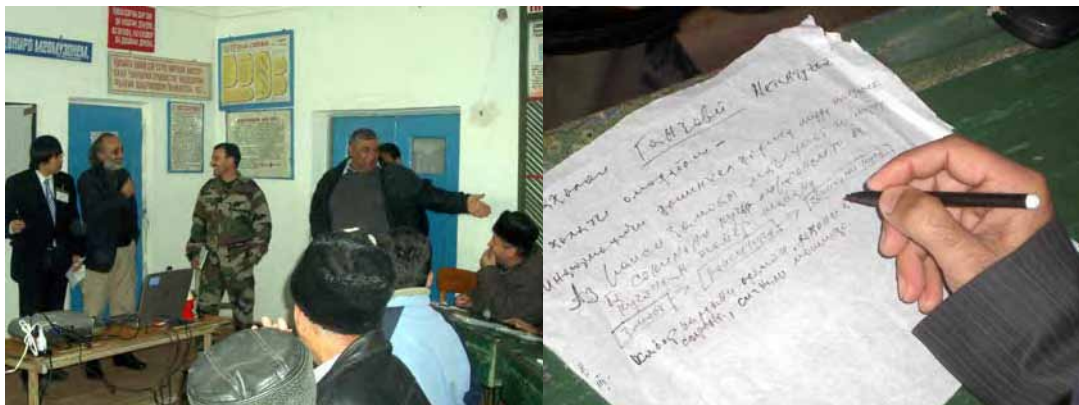


Fig. R 8.3.2 Role Playing Game of Warning Dissemination and its scenario by the Participants at the Workshop in School No. 9, Metintugay

2) School No. 27, Sovetobod

- The population of Kishlak Sovetobod is about 2,100. There are 3 Mahallas in Sovetobod, named Markaz (it means “center”), Turdiev and Lohuti. At the workshop in the school No. 27, 7 people have come from Mahalla Markaz (it means “central”), 9 people from Mahalla Turdiev and 11 people from Mahalla Lohuti.
- The day before the flood occurred in June 2005, a Jamoat Representative informed local residents of the water level rising in Pyanj River. However, nobody started to evacuate at that time.
- Before the occurrence of the 2005 flood, some of local residents went and see the situation of canals near Sovetobod on a voluntary basis. In the evening of 23 June 2005, people in Metintugay were informed of the broken of Dehkonobod Canal. However, still people did not start to evacuate.
- People have suddenly started to evacuate at the midnight (around 22 o'clock for Lohuti, 24 o'clock for Markaz and Turdiev) of the 23 June 2005. The main reasons of starting evacuations were unofficial information from their neighbors. For example, rumors from different people that the water level of the Pyanj River was increasing (Mahalla Markaz and Lohuti), rumors among women that all bridges would be broken (Mahalla Turdiev), etc.
- The morning of 24 June 2005, the bridge between Sovetobod and Kodara-2 has been washed away by the flood. Some people had already evacuated to Kodara-2 during the night before. However, the others should evacuate to Sayyod after the washing out of the bridge.
- Only 40% of people in Sovetobod has evacuated during the 2005 flood. Other 60% has remained in Metintugay. Main evacuation areas were Kodara-2, Sayyod Hill, Kurgan-Tyube, and Kulyab. Some people have taken refuge with their relative's house.
- Damage by flood has varied each year.
- It is possible for local residents to participate in or cooperate with the Patrol Team on a voluntary basis because several local residents had already gone to see the water level of the canals near Sovetobod independently at the 2005 flood.
- Sovetobod has no gongs or electric bells such like Panjob's ones. If there are any available, gongs and electric bells are useful to disseminate warnings.
- Hand Siren in the Master Plan will be useful for warning dissemination among local residents at each Mahalla.
- Whistle is used for child's game or play. If we use a whistle as warning dissemination tool, it is difficult to distinguish an evacuation warning from such a child's game.
- People will evacuate to Sayyod Hill via Kishlak Iqbol in next flood.
- 6 of 27 participants have their own mobile phones. No household has a fixed-line phone.



Fig. R 8.3.3 Discussion using a flood risk map at the Workshop in School No. 27, Sovetobod

3) School No. 16, Tagnob

- Population of Kishlak Tagnob is about 3400. Totally 15 Mahallas are formed on each main street in Tagnob. Participants of the workshop came from 5 of 15 Mahallas. 17 participants have come from Mahalla Punkti Tibbi (it means “medical point”), 8 from Mahalla Lobi Obi Surkhob (it means “coast of Surkhob River”), 25 from Mahalla Kinoteatr (it means “cinema”), 12 from Mahalla Navobod Tagnob (it means “newly constructed Tagnob”) and 10 from another Mahalla.
- Inundation of Surkhob River is also concerned by the people in Tagnob as well as Pyanj River.
- It is possible for local residents to participate in or cooperate with the Patrol Team on a voluntary basis because several local residents had already gone to see the water level of the canals and the water gate near Tagnob independently at the 2005 flood.
- At the 2005 flood, the evacuation was implemented without any support or information from the Hukumat of Hamadoni. People decided to start to evacuate at the midnight of 23 June 2005 because some of themselves observed that the water level at the water gate had reached a dangerous level. They have evacuated to Grachev Farm, Zoli Zar Hill (in Rayon Farkhor), Kishlak Buston and Sayyod Hill.
- Hand Siren in the Master Plan will be useful for warning dissemination among local residents at each Mahalla.
- Whistle is used for child’s game or play. If we use a whistle as warning dissemination tool, it is difficult to distinguish an evacuation warning from such a child’s game.
- People will evacuate to Grachev Farm, Zoli Zar Hill (in Rayon Farkhor), Kishlak Buston and Sayyod Hill, or other evacuation areas indicated by Hukumat of Hamadoni in next flood, as same as the 2005 flood.
- Mobile phone is popular (they said approximately 50%) but they have no fixed-line telephone in their house.



Fig. R 8.3.4 Group Discussion about Warning Dissemination Procedures by the participants at the Workshop in School No. 16, Tagnob

4) School No. 52, Fayzobod-1

- Fayzobod is separated into Fayzobod-1 and Fayzobod-2 by an east-west direction central road located in the north of School No. 52. The southern part is Fayzobod-1 and the northern part is Fayzobod-2. Total population of Fayzobod is about 9,500. Fayzobod-1 is divided into 5 Mahallas and Fayzobod-2 has 8 Mahallas. These Mahallas are basically formed on each main street in the residential area as well as other Kishlaks. Participants of the workshop have mainly come from Fayzobod-1, Mahalla No. 6, No. 7, No. 8, No. 10 and PMK of Fayzobod-2. (The number indicates each street. The “PMK” here is a name of the two-story apartment building for 36 households, not so-called “PMK” (Mobile Mechanical Division).)
- How to get emergency information from the Jamoat Office (current situation) are:
 - Some of local residents are working voluntarily at the Jamoat Office on the Emergency Situations. They provide the water level information or warnings to the Mahalla.
 - Some Mahallas are close to the Jamoat Office so the people can go there on foot.
 - Mobile phone is used to gather information from the Jamoat Office.
 - Somebody is sent to the Jamoat Office by car or bicycle in order to get information.
 - The Chairman or Representative of Jamoat Office comes to Mahallas by car, bicycle or on foot.
- How to transfer the information to local residents (current situation) is basically on-foot and verbal communications. Other measures are also taken by each Mahalla.
 - Mahalla No. 6 will organize an Information Dissemination Team (consists of 5 to 6 persons from different parts of the Mahalla) briefly.
 - Mahalla No. 7 has a gong as same as Kishlak Panjob. Face to face verbal communication is also used.
 - Representatives of each household are gathered at a place and informed from the representative in the Mahalla No.8. (The place is varied case by case.)
 - Verbal and on-foot communication (walk from house to house, talk with face to face) is used in Mahalla No. 10.
 - Mahalla PMK is one building so information is shared among all households there and then.
 - In Fayzobod-1, each Mahalla consists of 10 to 15 households. So each Chairman of Mahalla can walk from house to house and talk with the people face to face.

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- It is possible for local residents to participate in or cooperate with the Patrol Team on a voluntary basis because several local residents had already gone to see the water level of the canals near Fayzobod independently at the 2005 flood.
- Both Hand Siren and whistles in the Master Plan will be useful for warning dissemination among local residents at each Mahalla.
- Evacuation area and route are;
 - Mahalla No. 6 and No. 7 to Zoli Zar Hill: about 1 hour, to Olimtoy via Razvilka: about 2 hours.
 - Mahalla No. 5 to Olimtoy via Razvilka: about 7 km, 30 minutes are needed. Transportation is tractors, mini buses, donkeys, horses.
 - Mahalla PMK to Grachev Farm: about 3km. 7 minutes by car, 20 minutes by bicycle, 30 minutes on foot, to Olimtoy: about 6km. 15 minutes by car, 30 minutes by bicycle, 1.5 hours on foot, 1.5 hours by donkey.
 - Mahalla No. 8 to Olimtoy via Razvilka: about 9km.
- At least one mobile phone is available in each household although only 5 of 38 participants of the workshop carried it. Any fixed-line telephone is not available in their house.



Fig. R 8.3.5 Establishment of Consensus on Evacuation Areas and Route for each Mahalla through Group Discussions, at the Workshop in School No. 52, Fayzobod-1

8.3.4 Achievement of the Workshops

- Local residents have understood the meaning and responsible actions for each flood warning levels in the Master Plan.
- They also understood the importance of the Patrol Teams to monitor the erosion of canals. The Patrol Team along the canal is possible to be supported by local residents on a voluntary basis or persons hired by the government temporarily.
- Evacuation area and route are identified in each Mahalla.
- Hand sirens are helpful to disseminate the “Alert” level of flood warning among each Mahalla, as well as gongs and electric bells. Whistle need to be re-considered how to use in order to distinguish “Alert” level from a child’s play.

8.4 MASTER PLAN OF DISSEMINATION OF FORECASTING AND WARNING

8.4.1 Master Plan of Dissemination of Forecasting and Response Activities

Flood forecasting in Long-, Medium-, Short-Range and Current Situation Report is introduced as a part of the master plan

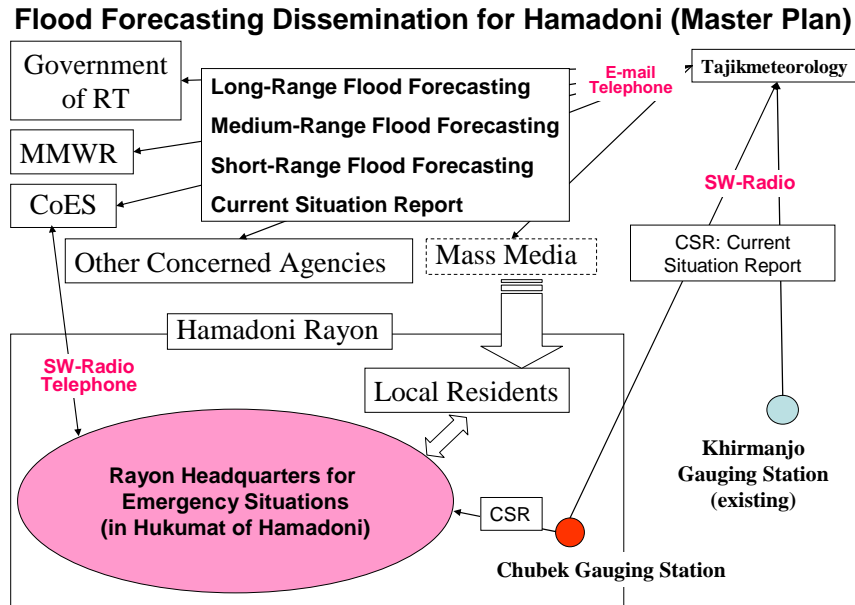


Fig. R 8.4.1 Schematic View of Forecasting Dissemination

1) Long-Range Flood Forecasting (LRF), Current Situation Report (CSR)

a) Dissemination

LRF is separated into 2 announcements; a beginning of snow-melt season (1st April) and a beginning of flood season (1st June). The Current Situation Report (CSR) about the water levels of Pyanj River are sent to Tajikmeteorology from the Gauging Stations along the Pyanj River

The LRF and CSR are disseminated from Tajikmeteorology to concerned governmental organizations including CoES and mass media by telephone or e-mail. After receiving the forecasting, the CoES Headquarters in Dushanbe transfers them to the Hukumat of Hamadoni by HF Radio or telephone. The Hukumat of Hamadoni transfers them to local residents through Jamoat Offices. (Hukumat of Hamadoni has a regular meeting with all 8 Jamoat Chiefs.) Local residents will also get those announcements through mass media. Mass media should disseminate the warning to public through their own way.

b) Response Activity

i) Rayon Headquarters for Emergency Situations and the Patrol Team

According to the law of the Government of the Republic of Tajikistan about emergency situations, a Rayon Headquarters for Emergency Situations are established under the supervision of the Chairman of the Hukumat of Rayon in emergency situations.

Following the dissemination of snow-melt season beginning (1st April), the Hukumat of Hamadoni and Jamoat Offices check the flood disaster management plan, the equipments including VHF radios and other flood-fighting activity preparations.

Following the dissemination of flood season beginning (1st June) and CSRs from Tajikmeteorology, the Rayon Headquarters on Emergency Situations in Hamadoni make the Patrol Team start the monitoring of the water levels and erosions of dikes / canals at least one time in a day (depend on the situation).

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The Patrol Teams also arrange the Current Situation Report (CSR) about the water levels and erosions of dikes / canals.

The Rayon Headquarters share the information about LRF and the CSR with Jamoat Chiefs at their regular meeting.

Each Jamoat Office transfers the LRF and a summary of CSRs to local residents through Kishlak / Mahalla in order to raise their awareness on flood.

ii) Local residents

Local residents raise their awareness on flood and keep in touch with the information. They prepare food, water, fuels, etc. in case of evacuation. They also reconfirm the evacuation areas and routes. Other activities based on the evacuation guidelines are also required.

2) Medium-Range Flood Forecasting (MRF) and Short-Range Flood Forecasting (SRF)

a) Dissemination

MRF is a flood forecast for a few weeks ahead of occurrence. SRF is a flood forecast for 1 - 2 days ahead. These forecasts are disseminated from Tajikmeteorology to concerned governmental organizations including CoES and mass media by telephone or e-mail. After receiving the forecasting, the CoES Headquarters in Dushanbe transfers them to the Hukumat of Hamadoni by HF radio or telephone. The Hukumat of Hamadoni transfers them to local residents through Jamoat Offices. Local residents will also get those announcements through mass media. Mass media should disseminate the warning to public through their own way.

b) Response Activity

i) Rayon Headquarters for Emergency Situations and the Patrol Team

The Rayon Headquarters for Emergency Situations in Hamadoni transfers the MRF and SRF to Jamoat Chiefs at the regular meeting, as well as the CSRs from the Patrol Teams.

Each Jamoat Office transfers the forecasting to local residents through Kishlak / Mahalla in order to raise their awareness on flood.

ii) Local residents

Local residents raise their awareness on flood and keep in touch with the information.

3) Current Situation Report (CSR)

Current Situation Report (CSR) shows a present situation of water levels. The Flood Warnings (Stand-By / Warning / Alert / Critical) are treated in CSR.

a) Dissemination

Observatories which have instruments of measuring water levels or related issues submit CSRs to Tajikmeteorology or Rayon Headquarters for Emergency Situations in the Hukumat of Hamadoni. Tajikmeteorology will transfer the CSR to all concerned agencies and mass media as well as the LRF, MRF and SRF. Mass media disseminate the CSR to public through their own way.

The Patrol Teams along dikes / canals also submit CSRs to the Rayon Headquarters for Emergency Situations. The Rayon Headquarters will share the CSR with CoES Headquarters in Dushanbe. The CoES Headquarters will share the CSR with Tajikmeteorology and other concerned governmental agencies.

b) Response Activity

i) Rayon Headquarters for Emergency Situations

The Rayon Headquarters obtain CSRs from the Patrol Teams and prepare the regular meetings with Jamoat Chiefs to share the information.

The Rayon Headquarters for Emergency Situations also decides the level of flood warning based on the CSRs from Patrol Teams. Decided warning should be sent to Jamoat Office by VHF radios.

ii) Patrol Team

The Patrol Teams submit the CSRs to the Rayon Headquarters for Emergency Situations about water levels and erosion situations along dikes / canals. Especially, once an erosion of dikes / canals is found, the Patrol Teams should send the CSR to the Rayon Headquarters for Emergency Situations by VHF Handie-Talkies / Mobile (vehicle-mounted) Radio immediately.

iii) Local residents

Local residents prepare for an immediate threat of flood risk if the CSR is higher than or equal to “Warning” level.

The concrete rules of mass media’s procedures of warning dissemination should be prepared. The standard procedures of efficient dissemination should be also established.

8.4.2 Maser Plan of Flood Warning and Evacuation System

1) Comparison of Master Plan Warning Levels with Current (Existing) Levels

Flood warning Level in the Master Plan is compared with present ones in the figure below.

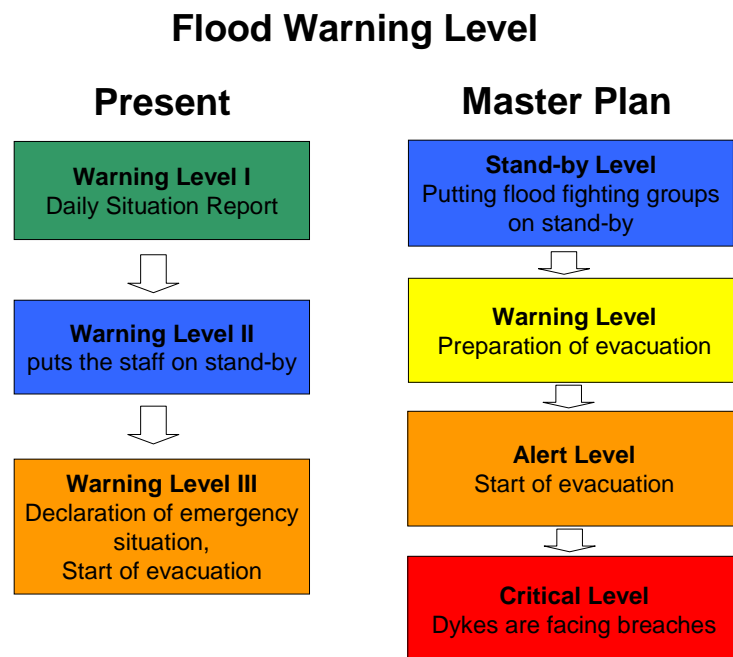


Fig. R 8.4.2 Comparison of M/P Warning Level with the Present Definition

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Major differences between the present warning levels and the master plan are summarized into two points. One is the names of each warning levels and the other is an introduction of a level for starting of evacuation preparation for local residents.

The definition, decision making and dissemination procedures of the present 3 warning levels are described in “8.1.2 Present System of Forecasting and Warning.” According to the questionnaire survey to local residents about the 2005 flood experience (refer to “1.3.2 Questionnaire and Interview Survey) Sudden evacuation orders (at night) and insufficiency of information dissemination made people confuse and upset. In consequence, information on preparation of evacuation should be involved in the information network for people’s evacuation in order to avoid confusions. That is why the “Warning Level” is newly introduced to the Master Plan for local residents to start their preparation of evacuation well in advance of the starting of actual evacuation.

Names of the present warning levels, Level 1, 2 and 3, are ambiguous expressions for their contents. In contrast, the Master Plan uses the names which show the extent of dangers more concretely.

Important Reminder:

Basically the flood warning levels are raised from “Stand-by” -> “Warning” -> “Alert” -> “Critical” in response to the water levels in Pyanj River observed by the Patrol Teams. However, once an erosion of dike / canal is identified by the Patrol Team, the flood warning level should be raised to “Critical” immediately so as to whole the people in flood prone areas start to evacuate.

a) Stand-by Level

At the occasion of the dissemination of flood season beginning (1st June), the “Stand-by” level warning is disseminated from Rayon Headquarters for Emergency Situations in Hamadoni to flood-fighting bodies to prepare the Patrol Team.

According to the Stand-by level, the Rayon Headquarters for Emergency Situations in Hamadoni dispatches the Patrol Teams to dikes and canals in order to monitor the water levels and erosions of structures. The frequency of patrolling is at least one time in a day (depend on the situation). The Patrol Teams send the Current Situation Report (CSR) to the Rayon Headquarters.

The information meeting should be organized among the Rayon Headquarters and Jamoat Chiefs at least one time in a day. This level is not informed to local residents, only for flood fighting bodies. Each Jamoat Chief asks representatives of Kishlak or Mahalla to gather at the Jamoat Office at least one time in a day to collect the latest information from the Rayon Headquarters.

The Patrol Team consists of Local staff of CoES, Representatives of Hukumat of Hamadoni and Jamoat Office, and members from other concerned organizations.

b) Warning Level

The Patrol Teams send Current Situation Report (CSR) to the Rayon Headquarters for Emergency Situations by VHF Handie-Talkies or VHF Mobile (vehicle-mounted) radios. The frequency of patrolling is at least two time in a day (depend on the situation).

The information sharing (regular meeting or telecommunication) should be organized among Rayon Headquarters and Jamoat Chiefs at least two times in a day (depend on the situation). Each Jamoat Chief holds regular meetings with representatives of Kishlak / Mahalla at least two times in a day (depend on the situation) in order to share the latest information from the Rayon Headquarters for Emergency Situations in Hamadoni.

The “Warning” level and following situations are informed to local residents from the Jamoat Office to local residents through the representatives of Kishlak / Mahalla.

The local residents begin the preparation of evacuation and keep in touch with the following information from the authority.

c) Alert Level

Based on the CSR from the Patrol Teams, the Rayon Headquarters for Emergency Situations decides to disseminate the “Alert” level of flood warnings. This flood warning level is disseminated to all 8 Jamoat Office through VHF base radio or other communication procedures immediately after the decision. The “Alert” level is informed to local residents from the Jamoat Office through the representatives of Kishlak / Mahalla.

Local residents start to evacuate.

The Patrol Teams continue the monitoring of the dikes, canals, or water gate for water levels and erosions more carefully. The frequency of patrolling is at least three time in a day (depend on the situation).

d) Critical Level

Based on the CSR from the Patrol Teams, the Rayon Headquarters for Emergency Situations decides to disseminate the “Critical” level of flood warnings. At the “Critical” level, the dikes are facing a high risk of brake. The “Critical” level is disseminated to all 8 Jamoat Office, the Patrol Teams and other flood-fighting bodies through VHF base radio, VHF Handie-Talkies or other communication procedures immediately after the decision.

The Patrol Teams and other flood fighting bodies should also start to evacuate immediately.

Evacuations of local residents have been completed before the dissemination of “Critical” level. The “Critical” level is informed to local residents (both evacuated and remained in non-affected area) through the representatives of Kishlak / Mahalla. It is restricted to close to the (possible) flooded area during the “Critical” Level.

2) Evacuation System

There are 8 Jamoats (consist of 57 Kishlaks) in Rayon Hamadoni. Kishlak consists of one to several Mahallas. Population of Kishlaks (See Table 8.1.1) varies from less than one hundred to nearly ten thousand, except Moskva Town (Moskva Town is a Jamoat consists of around 40 Mahallas, no Kishlak, with approximately twenty thousands population). The communication procedure for each stakeholder is as follows;

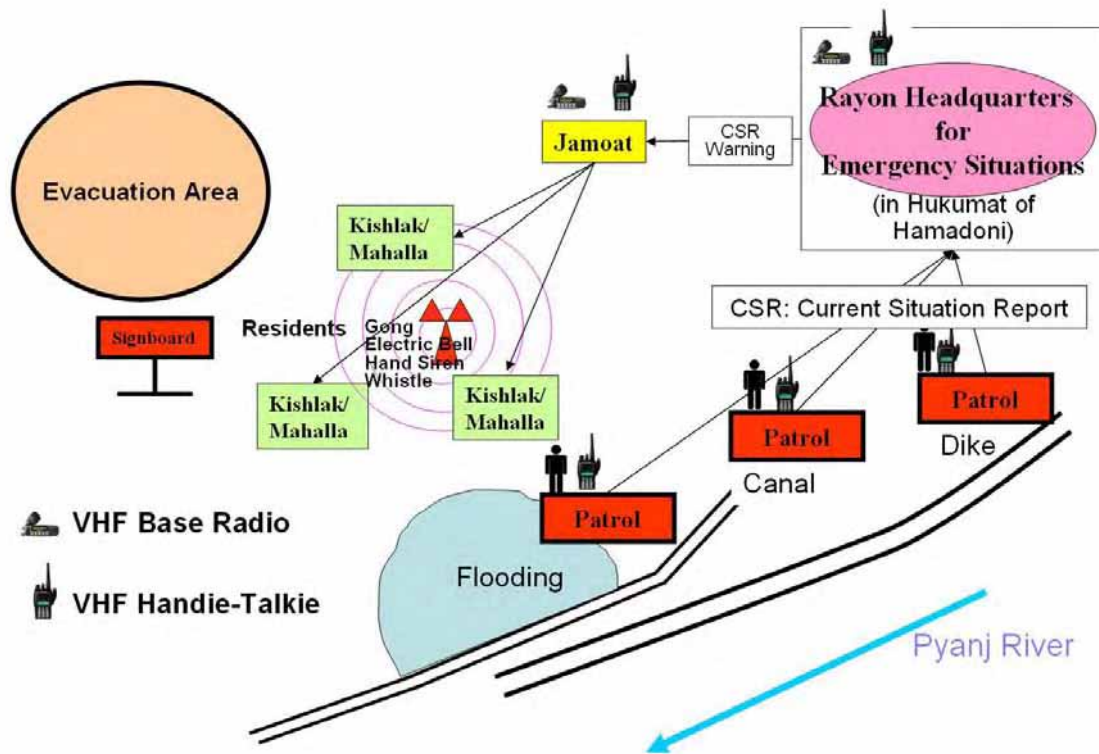


Fig. R 8.4.3 Evacuation Framework in Hamadoni

a) **Communication between Rayon Headquarters for Emergency Situations and the Patrol Teams**

The Patrol Teams send Current Situation Report (CSR) to the Rayon Headquarters for Emergency Situations by VHF Handie-Talkies or VHF Mobile (vehicle-mounted) radios.

b) **Communication between Rayon Headquarters for Emergency Situations and Jamoat Offices**

The communication between the Rayon Headquarters for Emergency Situations and Jamoat Office is implemented through regular meetings and VHF base radio basically. (Hukumat of Hamadoni and Jamoat offices have VHF base radio which installed as a part of the Lake Sarez Risk Mitigation Project under the collaboration between CoES and FOCUS Humanitarian Assistance.) Rayon Headquarters and all Jamoat Chiefs hold a regular meeting during the flood season to share the latest situation. The frequency of the regular meeting is at least one time in a day (depend on the situation) during the threat of flood.

If the flood warning levels are raised to “Warning” level, the Rayon Headquarters informs to the Jamoat Chiefs at the regular meeting. If the flood warning levels are raised to “Alert” or “Critical” level, the VHF base radio or other telecommunication tools are used to inform immediately.

c) **Communication between Jamoat Office and Kishlak / Mahalla**

Representative of Jamoat on Emergency Situations and Representative of Kishlak / Mahalla hold a regular meeting at least one time in a day (depend on the situation) during the threat of flood. If the flood warning levels are raised to “Warning” level, the Jamoat Office informs to representatives of Kishlak / Mahalla at the meeting. If the

flood warning levels are raised to “Alert” or “Critical” level, Representatives of Jamoat Office will contact to the Representatives of Kishlak / Mahalla by mobile phone, car, on foot or other available communication measures as soon as possible. The gongs, electric bells, Hand Sirens and whistles are also used to inform the starting of evacuation to the local residents.

The list of mobile phone numbers of key-persons in Kishlak / Mahalla should be prepared by each Jamoat Offices.

d) Communication among Kishlak / Mahalla

i) Stand-by Level

This level is informed to flood-fighting bodies only.

ii) Warning Level

After Representatives of Kishlak / Mahalla come back to their communities with a “Warning” level of flood warning, the information is disseminate to each household by face-to-face verbal communications basically. Mobile phone or meetings are also used.

iii) Alert Level

After Representatives of Kishlak / Mahalla are informed an “Alert” level of flood warning, the information is disseminate to each household by gongs, electric bells, Hand Sirens, whistles, as well as face-to-face verbal communications or mobile phone. The list of mobile phone numbers of key-persons in each Kishlak / Mahalla should be prepared by the representatives of Kishlak / Mahalla.

iv) Critical Level

As same as the Alert level.

8.4.3 Communication Tools

1) Hand Siren

a) Reason of Introduction of Hand Siren

Existing warning dissemination tools for local residents are gongs and electric bells. The good point of these equipments is that everybody can use easily, without special instructions. The bad point is that they are fixed and not movable. Besides, electric bell is not available if power supply is cut off (see 8.1.3).

To improve those disadvantages, a utilization of Hand Siren is considered in the Master Plan. Hand Siren is a manually operated (hand cranking) siren. It is easy to convey and works without electricity. (See Table 8.4.1 and Fig. 8.4.1 for the planned number and arrangement of Hand Sirens)

b) Field Test of Hand Siren

JICA Study Team and Hukumat of Hamadoni conducted a field test of Hand Siren on 24 January 2007 at the main street of Jamoat Panjob in Hamadoni, under collaboration with volunteers in Panjob. At the field test, the alarm sound was recognized up to around 400 meters radius. In the river plain of the Pyanj River (flat, no building, no disturbing noise), it was recognized at around 500 meter distance.



Fig. R 8.4.4 Field Test of Hand Siren in Panjob

2) VHF Handie-Talkies and VHF Mobile (Vehicle-Mounted) Radio

a) Reason of Introduction of VHF Communication System

Monitoring of water levels and dike / canal erosions are inevitable for suitable timings of flood warning disseminations.

Mobile phone is unstable along dikes in the border zone between Tajikistan and Afghanistan. Phone charge is also a problem that who should pay. Besides, there is a risk of communication congestions for mobile phones during emergency situations.

VHF radio system is already installed for the emergency communication between the Hukumat of Hamadoni and each Jamoat Office, as a part of the Lake Sarez Risk Mitigation Project under the collaboration between CoES and FOCUS Humanitarian Assistance. Basically the users of VHF equipments are requested to register their frequency in VHF Band and pay an annual fee every year. However, CoES have already registered their frequencies for LSRMP. Those frequencies are also available for flood fighting activities in Hamadoni. The LSRMP's VHF radio equipments are desktop type with a tall (10 meters) antenna so not movable. This is why VHF Handie-Talkies and VHF Mobile (vehicle-mounted) Radio are considered as communication tools for the Patrol Teams in the Master Plan. (See Table 8.4.2 for the planned number of new VHF radios, with or without a Repeater System. Also see 8.6.1, 2) for Repeater System)

b) Field Test of VHF Radios

JICA Study Team and CoES conducted a field test of both VHF Handie-Talkies and VHF Mobile (Vehicle-Mounted) Radio.

i) Location of Test Site

A field test was conducted to connect 4 test sites in Hamadoni; Hukumat of Hamadoni, Chubek Intake, New Dehkonobod Canal in Panjob and Dehkonobod Canal in Metintugay.

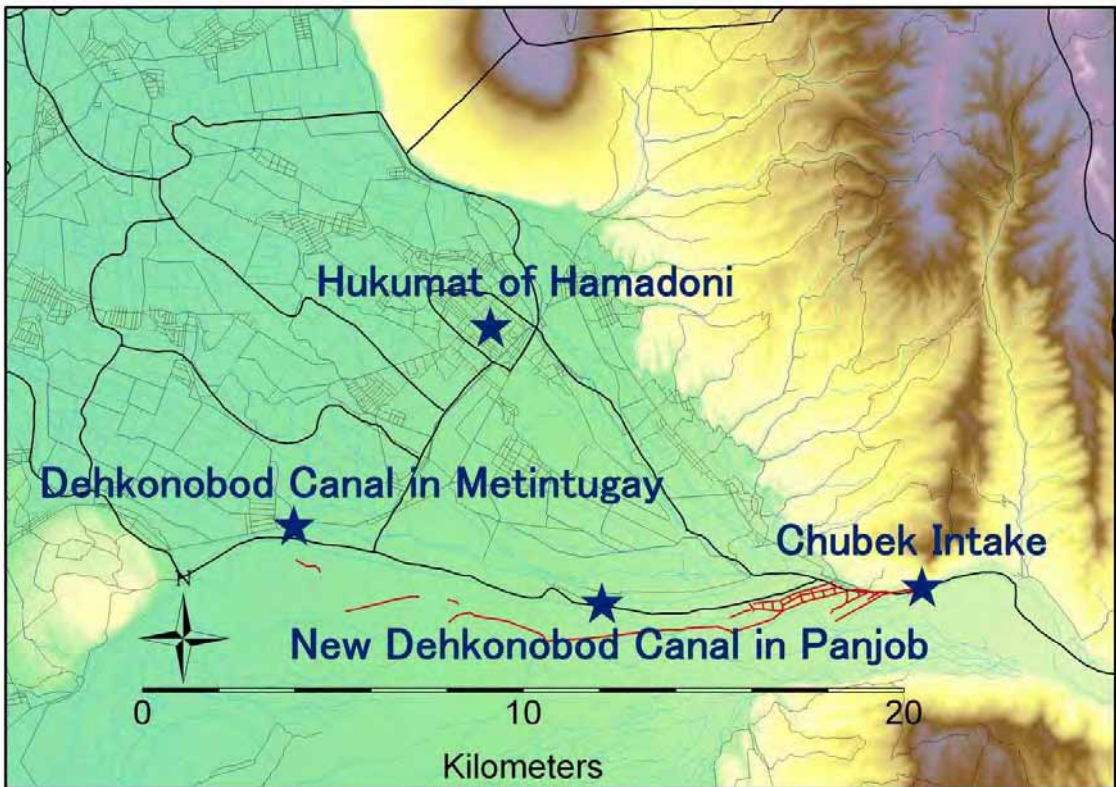


Fig. R 8.4.5 Location of Test Sites

ii) VHF Equipments

Handie-Talkie, Mobile (vehicle-mounted) Radio and Base Radio were used for the connection test from site to site.



Fig. R 8.4.6 VHF Handie-Talkie Test Sites at New Dehkonobod Canal in Panjob (left) and Dehkonobod Canal in Metintugay (right)



Fig. R 8.4.7 VHF radio Test Site of Chubek Intake



Fig. R 8.4.8 Mobile Radio (left) and Magnetic Mount Antenna (right)



Fig. R 8.4.9 VHF Base Radio and HF Radio (Short Wave Radio) in Hukumat of Hamadoni

iii) Summary of the Field Test Result

It would be anticipated that the steep mountain next to Chubek Intake might be an obstacle to communicate from Chubek Intake to Hukumat of Hamadoni directly. However, the Handie-Talkie to Base Radio communication is available between Chubek Intake and Hukumat of Hamadoni (about 13km). It is also available between New Dehkonobod Canal in Panjob and Hukumat of Hamadoni (about 8km), as well as the Dehkonobod Canal in Metintugay and Hukumat of Hamadoni (about 7km). The reason of good communication with Hukumat of Hamadoni is probably that the antenna of Base Radio in Hukumat of Hamadoni works very well.

The Handie-Talkie to Handie-Talkie communication is available between Chubek Intake and Panjob (about 8.5km). However, the signal becomes weak and noisy between Chubek Intake and Metintugay (about 16.5km).

The Handie-Talkie – Mobile Radio communication is either bad condition between Chubek Intake and Metintugay.

The Mobile Radio – Mobile Radio communication is always good condition even between Chubek Intake and Metintugay.

According to these results, the VHF Handie-Talkies and VHF Mobile Radios are suitable for the Patrol Team communication as the reinforcement and utilization of present communication system.

Table R 8.4.1 Results of Handie-Talkie (HT) and Mobile (MB)

	Chubek - Panjob (8.5km)	Chubek - Metintugay (16.5km)
HT - HT	good	weak and noisy
HT - MB	good	weak and noisy

Table R 8.4.2 Results of Handie-Talkie (HT), Mobile (MB) and Base (BS)

	Chubek – Hukumat of Hamadoni (13km)	Panjob – Hukumat of Hamadoni (8km)	Metintugay – Hukumat of Hamadoni (7km)
HT - BS	good	good	good
MB - BS	good	good	good

3) Whistle



Fig. R 8.4.10 Whistle

One of advantages of whistle is even children can use it without any special instruction. Whistle is cheap (a few somoni), easy to be supplied, and needs no maintenance. The bad point is that whistle is used for child’s game or play. If we use a whistle as warning dissemination tool, it is difficult to distinguish an evacuation warning from such a child’s game.

When using whistles as dissemination tool of evacuation warning, a rule is needed to distinguish an emergency warning from a football referee or others. For example, repeated long sounds (3 times whistling sustained for 3 seconds each, then repeated again and again) are identified as emergency situation.

8.5 GUIDELINE OF EVACUATION PLAN

8.5.1 Evacuation Guideline

1) Evacuation Areas, Route

a) Local Residents (potential evacuees)

The Hazard map (including evacuation routes) should be distributed each household and important public spaces (Hukumat of Hamadoni, Jamoat Office, school, hospital, chaikhana (tea house), etc.).

Local residents should discuss the evacuation area, route and transportation procedures among their family members and neighbors well in advance of the flood season.

b) Local Officials

Evacuation areas and evacuation route are identified under the coordination of local officials including experts and local residents as hazard map.

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Signboards indicating evacuation routes and evacuation areas are placed along the major road.

The road availability will be changed during emergency situations. If any obstacle to evacuate on the routes (sudden washed away of bridges, etc.) are identified, those information should be shared among all stakeholders through the Rayon Headquarters for Emergency Situations.

2) Food, Water, Cooking Fuels

a) Local Residents (potential evacuees)

Each household provides their food, drinking water, cooking fuels for at least 3 days. Those stuff should be conveyed easily. How to convey and who is the person in charge of conveying should be also decided.

Devices for eating (dish, spoon, etc.) and matches / lighters should be also prepared.

b) Local Officials

Local officials provide preservative foods and cooking fuels for evacuees in case of long-term evacuation. Water-supply wagons are also prepared by the local officials under the supervision of the Government of the Republic of Tajikistan.

3) Important Documents

a) Local Residents (potential evacuees)

The important documents (ID, passport, registrations, certifications, etc.) should be easy and immediately to take out in emergency situations.

b) Local Officials

Make backups of important documents on some regular basis.

4) Money / Budget

a) Local Residents (potential evacuees)

Some money for livelihood during evacuation should be also prepared by each household.

b) Local Officials

The contingency fund should be included in the annual budget plan.

5) Clothes, Blanket, Tents

a) Local Residents (potential evacuees)

Extra clothes and blankets to avoid low temperatures during nighttime should be also prepared.

b) Local Officials

Tents for evacuees are prepared by local officials under collaboration with the central government and other concerned organizations.

6) Medicines, Daily Necessities

a) Local Residents (potential evacuees)

Basic medicines and daily necessities should be prepared based on each household condition.

b) Local Officials

Emergency medical services should be supplied by local officials under collaboration with the central government and other concerned organizations.

7) Livestock

a) Local Residents (potential evacuees)

How to care for livestock (cattle, sheep, goat, donkey, horse, poultry, etc.) in emergency situations should be decided in advance of evacuation.

b) Local Officials

How to evacuate the large number of livestock in emergency situations should be coordinated by local officials.

8) Transportation

a) Local Residents (potential evacuees)

Basically the people should walk to evacuation areas. The vehicles should be used for the people who need-to-be-supported.

Keep a full tank of gasoline for vehicles if an evacuation seems likely. Gas stations may be closed during emergencies and unable to pump gasoline.

b) Local Officials

Each Jamoat Office has a transportation plan (number of house hold and population in each Kishlaks, how many cars, trucks, tractors, etc.) for the Lake Sarez Risk Mitigation Plan (LSRMP). The transportation plan is applicable to other emergency situations. The LSRMP transportation plan should be updated every year before starting the flood season.

Gasoline for vehicles in emergency situation is also prepared.

9) Information

a) Local Residents (potential evacuees)

Listen to the battery-powered radio and follow local evacuation instruction.

Get endorsed information (not rumors) from Jamoat Office directly or through the representatives of Kishlak / Mahalla about flood level warnings and share it with your families as well as your neighbors.

b) Local Officials

Check every communication channels and tools in advance of the flood season.

10) Family

a) Local Residents (potential evacuees)

The roles and behaviors of each family members in emergency situations should be recognized well in advance of the flood occurrence, through the talking each other as a part of ordinary life.

b) Local Officials

Local Officials also have their families. Safety of the Local Officials and safety of their families should be informed each other.

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11) Neighbors

a) Local Residents (potential evacuees)

Arrangement to assist babies, small children, pregnant females, elders, handicapped, injured or sick persons in evacuation should be considered among neighbors well in advance of their evacuation.

b) Local Officials

Hold meetings to encourage the local residents to arrange their collaborations in emergency situations well in advance of the flood season.

12) Dangerous Situation

a) Local Residents (potential evacuees)

Do not visit your house and agricultural land during a flood. Stay away from dangerous situation like flooded areas, downed power lines, broken roads / bridges, etc.

b) Local Officials

Keep patrolling and share the information among stakeholders through the Rayon Headquarters for Emergency Situations in Hamadoni.

13) Exercise of Evacuation

a) Local Residents (potential evacuees)

Participate in the evacuation drills actively and improve the evacuation plan.

b) Local Officials

Establish “Disaster Prevention Day” in Hamadoni and implement an evacuation drill every year on the “Disaster Prevention Day.” The contents should be changed every year (targeting small flood, large flood, outburst of Lake Sarez, bush fire, landslide, earthquake, etc.)

Map exercise (indoor simulation), role playing game or other various participatory approaches should be also considered as well as actual outdoor actions.

The evacuation plans of Hukumat of Hamadoni and Jamoat Offices should be improved based on the results of the evacuation drills.

14) Coordination with Non-governmental Organization (NGO)

a) Local Officials

A coordination body (including basic maps and interpreters of Tajiki-Russian, Tajiki-English, and Tajiki-Russian) for support from NGOs should be established under the Rayon Headquarters for Emergency Situations.

8.6 RECOMMENDATION

8.6.1 Recommendation for Disaster Management

1) Self Decision Making of Evacuation in case of Communication Machinery Failures

In case of the “Alert” level (starting evacuation) of flood warning does not reach to Mahallas for what ever reason (cf. accident to machinery, etc.), each representative of the Mahalla is responsible to make a decision of evacuation order by themselves. So the evacuation areas, route and transportation procedures should be identified for each household in Mahalla well in advance of the actual stating of their evacuation.

2) Repeater System

According to the result of a field test of VHF communication system in Hamadoni, the direct communication between a Handie-Talkie and another Handie Talkie is well only less than around 15 km or so. In order to reinforce the availability of VHF communication system, a Repeater System is recommended to be set up at the Hukumat of Hamadoni. Repeater System is consists of a booster amplifies weak signals from a Handie-Talkie and retransmits to other Handie-Talkies. The unit price of a Repeater System is around \$3,500 except VAT, delivery and installation. If a Repeater System has been introduced, Handie-Talkie will be possible to connect each other within all Hamadoni alluvial fun.

3) Loud Speaker and Handy Speaker

Hukumat of Hamadoni and Jamoat Office put a loud speaker outside to disseminate a warning to the public. Handy Speaker (dry-cell-battery-operated) is also helpful to inform people of warnings and indications at evacuations.

4) Utilization of Training and Methodological Center of CoES

As mentioned at “8.1.3 Present System of Evacuation”, CoES has the “Training and Methodological Center of CoES in Kulyab” conducting trainings for related local officials and key members in local societies about emergency situations and civil defense. Those trainings should treat the experiences of the 2005 flood as well as other disasters in not only Tajikistan but also other Central Asia Region.

Because natural conditions of countries in Central Asia are quite similar, other countries disaster will be possible to occur in Tajikistan also. However, devastating disasters generally occur in low-frequency. The experiences of tackle with those serious and rare situations are valuable to be learned by all the people living in disaster prone areas. Sharing the experiences including both good points and bad points are important.

Raising awareness on reconstruction / rehabilitation after flood is also essential. How to reconstruct and rehabilitate the society should be more concerned than now.

5) Collaboration between the Damaged and Non-damaged Areas as Mutual Assistance

If the flood damage is restricted in only a part of the Rayon Hamadoni, non-damaged Jamoat should collaborate to transport and accept evacuees. The coordination between Jamoats should be organized by the Hukumat of Hamadoni.

6) Clarification of Mass media’s Concrete Roles and Procedures

The legislation of mass media’s duty of warning dissemination should be prepared. The standard procedures of efficient dissemination should be also established. For example, how to transfer the forecasting and warning by each mass media immediately, regular news programs on disaster information, educational programs on disaster risk management, etc.

7) At Least Two Evacuation Areas for each Household

Because water duration time of a flood is very difficult to estimate in advance, local residents should recognize at least two evacuation areas; One is for relatively small scale of floods, the other is relatively large scale of floods. The elevation of evacuation areas for relatively large scale floods should be higher than the areas for relatively small scale of floods. The evacuation areas identified in case of the Lake Sarez outburst are possible to be assigned as the evacuation areas for relatively large scale floods.

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Table R 8.6.1 Evacuation Areas assigned by the Lake Sarez Risk Mitigation Project (LSRMP)

Jamoat	Evacuation Areas (LSRMP)
Moskva Town	Khoja Mumin Mountain
Panjob	Khoja Mumin Mountain
Turdiiev	Urtabuz Hill
Kalinin	Urtabuz Hill, Khoja Mumin Mountain
Qahramon	Khoja Mumin Mountain
Mehnatobod	Northern Part of Mehnatobod, Rayon Vose
Dashti Gulo	Urtabuz Hill
Chubek	Khoja Mumin Mountain

8) Discussions among Family Members based on Hazard Maps

Each household keeps a hazard map (including evacuation areas, routes). All family members should recognize the evacuation areas and routes through the discussion at each household. The roles of each family member (who will bring foods, who will take care of livestock, etc.) should be also discussed before the starting of flood season.

9) List of Contact Address with Telephone Numbers

Emergency contact addresses with telephone (both mobile phone and fixed-line telephone) numbers should be prepared by each household. Not only schools or workplaces of family members, relatives, close friend, hospital, etc. are also included.

10) Disaster Prevention Poster Contest

Toward the Disaster Prevention Day, the local officials invite children to offer their poster about flood disaster risk management. The poster should be clear to understand and raise people's awareness on flood disaster risk management. The Hukumat of Hamadoni and several external knowledgeable persons conduct a screening to give the awards to the most impressive posters. The prize-winning poster is advertised and used to stimulate the people's awareness on flood disaster risk management.

11) Disaster Management Slogan Contest

Toward the Disaster Prevention Day, the local officials invite the public to offer the slogan about disaster risk management. The slogan should be a short phrase that is easy to remember and is used in raising people's awareness on flood disaster risk management. The Hukumat of Hamadoni and several external knowledgeable persons conduct a screening to give the awards to the most impressive slogans. The prize-winning slogan is advertised and used to stimulate the people's awareness on flood disaster risk management.

12) Website of CoES

The information about disaster management policy, situation report, knowledge of how to reduce the disaster damages including hazard maps, how to recovery and rehabilitate / reconstruct, etc. should be disseminate through the Internet website of CoES. The languages of website are Tajiki, Russian and English.

13) Collaboration among Related Governmental Organizations about the Patrol Team along the Dikes including Nighttime Patrolling

MMWR has already been implementing the monitoring of the dike regularly. The collaboration of dike monitoring by MMWR and the Patrol Team makes flood monitoring efficiently.

The nighttime patrolling is also important to identify the risk of flood. The permission of nighttime patrolling in the border zone during nighttime is needed as well as daytime.

14) Internet Environment

Internet Environment (including e-mails) in Hukumat of Hamadoni and Jamoat Offices should be arranged to share information.

8.7 FLOOD-EVACUATION DRILL

8.7.1 Outline of the Flood-Evacuation Drill

The CoES and the JICA Study Team conducted a flood-evacuation drill in Rayon Hamadoni on 5 - 6 May 2007, in cooperation with the Hukumat of Hamadoni. One of the main objectives is a verifying the Master Plan by a flood-evacuation drill in a selected area. Through the experience of preparing and conducting the flood-evacuation drill, the problems and their improvement measure will be discussed, if needed. A technical transfer is also conducted about the methodologies of how to conduct a flood-evacuation drill and how to reflect the results of the drill in the current evacuation plan for improvement. After that, it is recommended that the persons in charge of disaster management in Hamadoni will make self-help efforts to conduct the drills in other areas in Hamadoni in the future.

This flood-evacuation drill consists of two parts: a flood-evacuation map exercise and a field flood-evacuation drill.

8.7.2 Flood-Evacuation Map Exercise

On the first day, targeting the responsible persons in charge of emergency situations, a flood-evacuation map exercise, including a VHF radio lecture, was conducted. The venue was the conference hall in the Hukumat of Hamadoni. The number of participants was twelve: CoES Headquarters in Dushanbe (1), CoES Zonal Headquarters in Kulyab (2), CoES Local Headquarters in Hamadoni (1), Hukumat of Hamadoni (2), Jamoat Offices (5), and Representative of Mahalla (1).

1) VHF Radio Lecture

a) Objective

The objective of the VHF radio lecture is that the responsible persons in charge of emergency situations learn how to use both VHF Handie-Talkies and VHF mobile (vehicle-mounted type), which the JICA Study Team purchased for the flood-evacuation drill. The lecturer is invited from a private company of communication equipments in Dushanbe. The CoES Communication Center participated in the lecture as an advisor, even though they are not directly responsible for the emergency situations in Hamadoni.

b) Equipments

Types and numbers of the VHF radios which newly introduced in the second fiscal year of the Study are listed in a following table.

Table R 8.7.1 Types and Numbers of the VHF Radios

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#	Type	Model Number	Number	Remarks
1	KENWOOD TK-2212 VHF HT, 16 Ch, 5W, 10Hr Charger	TK2212	15	Handie-Talkie
2	KENWOOD TK7160 Mobile, Magnetic mount antenna	TK7160	1	Mobile (vehicle-mounted type)

c) Frequency Band

The frequency band for the newly introduced VHF radios is registered by CoES to the Ministry of Transport and Communication: therefore all the VHF equipments are used under the supervision of CoES.

d) Results of the Lecture

The trainees practiced and confirmed the procedures of the communication by VHF radios through an indoor lecture and actual communication training.

e) Summary of the VHF Radio Lecture

The trainees, who are responsible for emergency situations in Hamadoni, learned how to use both the VHF Handie-Talkies and VHF Mobiles.

2) Flood-Evacuation Map Exercise

a) Objective

The objective of the flood-evacuation map exercise is that the responsible persons in charge of emergency situations in Hamadoni learns suitable behaviors at each level of the flood warning for Pyanj River through indoor training. The participants are expected to grasp the whole picture of emergency communication and confirm each procedure efficiently, using maps and scenarios.

b) Merit of Flood-Evacuation Map Exercise

Not only for floods, the disaster map exercise is conducted by disaster management organizations in various parts of the world. The major merits are:

- Trainees can image a whole picture of the emergency situation. (If you can not image, you can not take any countermeasure either.)
- Various situations can be simulated. (You can simulate and go through an experience the situations before actual occurrences of the disasters.)
- A present plan is reviewed from a lot of view points. (You can improve the plan based on the results of the map exercise.)
- Easy to repeat and reproduce the same situations. (You should repeat trainings in order to develop skills.)
- An active network for the persons in charge of disaster management is established. (Through a face-to-face discussion in a room, all participants can promote better understanding each other. It will help you to communicate in emergency situations more efficiently.)

c) Implementing Procedure

A scenario for communication in emergency situation is developed. The scenario consists of “from which organization”, “to which organization” and “how the information is disseminated” in order of time. The necessary behavior at each occasion is also described in the scenario. Time settings and organizations are arranged along the vertical and horizontal axes respectively. The situations and necessary actions are described in the cells. The considered stakeholders are: CoES, Hukumat of Hamadoni,

Patrol Team (monitoring group for dikes and canals which proposed in the draft Master Plan), Jamoat Office, Head of Kishlak, Head of Mahalla and local residents.

The Master Plan places the following four levels of flood warning in Hamadoni.

- Stand-by: Start to dispatch Patrol Teams for monitoring the dikes and canals.
- Warning: Inform to local residents about preparation for evacuations.
- Alert: Start to evacuate.
- Critical: Dike / canal are facing breaches. All the residents in flood prone areas as well as the Patrol Teams should start to evacuate immediately.

Вaст	Вазъияти умуми	КЧС ш. Душанбе	Штабхон ноҳияи вобаста ба ҳолатҳои фавқулодда (Ҳукумати н. Ҳамадонӣ)	Гуруҳи Патрули	Раиси Ҷамоат (Идораи Ҷамоат)	Намоишдаи киншлoк: Намоишдаи Мақсала	Силасо (Сокинони мақсали)
16:04	асидани асоси оби шлоо ти Чубек ба араҷани оғизкуни.		Штабхон ноҳияи вобаста ба ҳолатҳои фавқулодда (Ҳукумати н. Ҳамадонӣ)	Гуруҳи Патрули	Раиси Ҷамоат (Идораи Ҷамоат)	Намоишдаи киншлoк: Намоишдаи Мақсала	Силасо (Сокинони мақсали)
16:07			Пасикуни маълумоти оғозкуни онди обҳои дар асоси Ҳисоботи Вазъияти Кулуни.				
16:08			Фиритодани хабари оғозкуни и барои оғози эвакуатсия ба Сардорони Ҷамоатҳо ба воситаи радиостан VHF.				
16:10						Баъди гирифтани хабари оғози аз Штаби ноҳияи, расонидаи он ба намоишдагони Киншлоку Мақсалаҳо ба таври фарри.	
16:12						Баъди гирифтани хабари оғози аз Идораи Ҷамоатҳои, расонидаи он ба сокинони мақсали ба воситаи гуфтутуи ба Ҷамоатҳои, сиренаҳои дастӣ, гудокҳо, телефонҳои мобили ва ғ.	
							Оғози Эвакуатсия

Fig. R 8.7.1 Scenario for Flood-Evacuation Map Exercise (extract)

A large-size and large-scale map is essential for a map exercise because situations and actions along the scenario are integrated on the map during the exercise. A 1:20,000 scale map consisting of 16 sheets of A3-size color printouts is used for the map exercise. For reutilization, the map was covered with a clear plastic sheet for drawing the situations and actions on the map in color permanent markers.

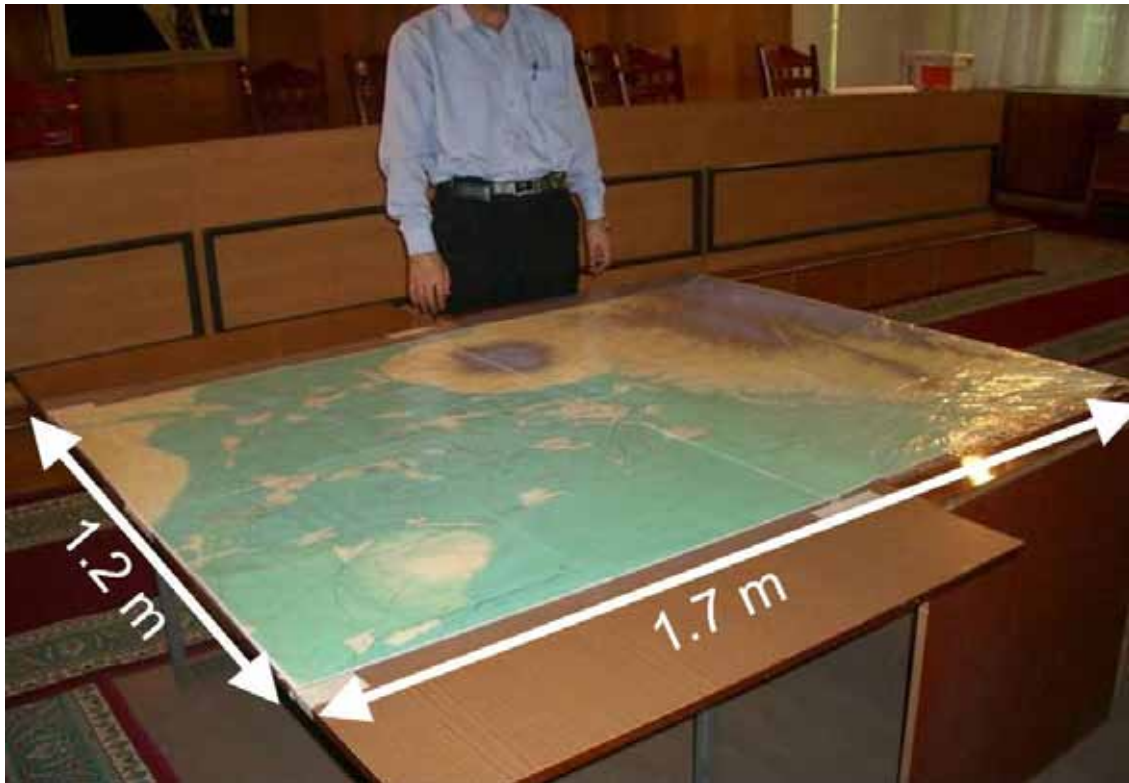


Fig. R 8.7.2 Large-Size / Large-Scale Map of Hamadoni (1:20,000)

d) Results of Implementation

The participants (responsible persons in charge of emergency situations) concretely grasped communication procedures and necessary actions at each flood warning level through the exercise using the map and scenario. The necessity of cooperation among stakeholders for Patrol Teams was recognized again. Participants also identified several problems for information dissemination procedures: there were some ambiguities of communication network between Jamoat Offices and Kishlaks, as well as Kishlaks and Mahallas. In these two communication levels, “from whom”, “to whom” and “how” were not clear in some areas.



Fig. R 8.7.3 Flood-Evacuation Map Exercise



Fig. R 8.7.4 Information Integration on the Map at the Exercise.

Cones on the map indicate the locations of Jamoat Chiefs or Patrol Teams.

e) Summary of the Flood-Evacuation Map Exercise

Through the experiences of the flood-evacuation map exercise, participants who are responsible for emergency situations in Hamadoni confirmed:

- Necessary actions and communication procedures in emergency situations,
- Problems: Some areas have ambiguities of communication procedures (“from whom”, “to whom”, and “how”) between Jamoat Offices and Kishlaks, and also Kishlaks and Mahallas,
- Cooperation among CoES, MMWR, Hukumat of Hamadoni and other related organizations is essential for the Patrol Teams.

8.7.3 Field Flood-Evacuation Drill

Based on the experiences on the first day, a field flood-evacuation drill involving local residents was conducted in a target area on the second day.

1) Objective

The communication network system, evacuation routes, evacuation areas, time to need for evacuation, etc. are checked through an actual evacuation drill involving local residents. Then, the problems and causes of the problems are identified if needed. The countermeasures for the problems are also discussed.

2) Target Area

The target area is Mahalla Navobod in the south western part of Kishlak Tagnob, Jamoat Dashti Gulo, which is one of the farthest affected areas in the 2005 flood from the Hukumat of Hamadoni. The population and number of households in Navobod are about 400 and 60 respectively.

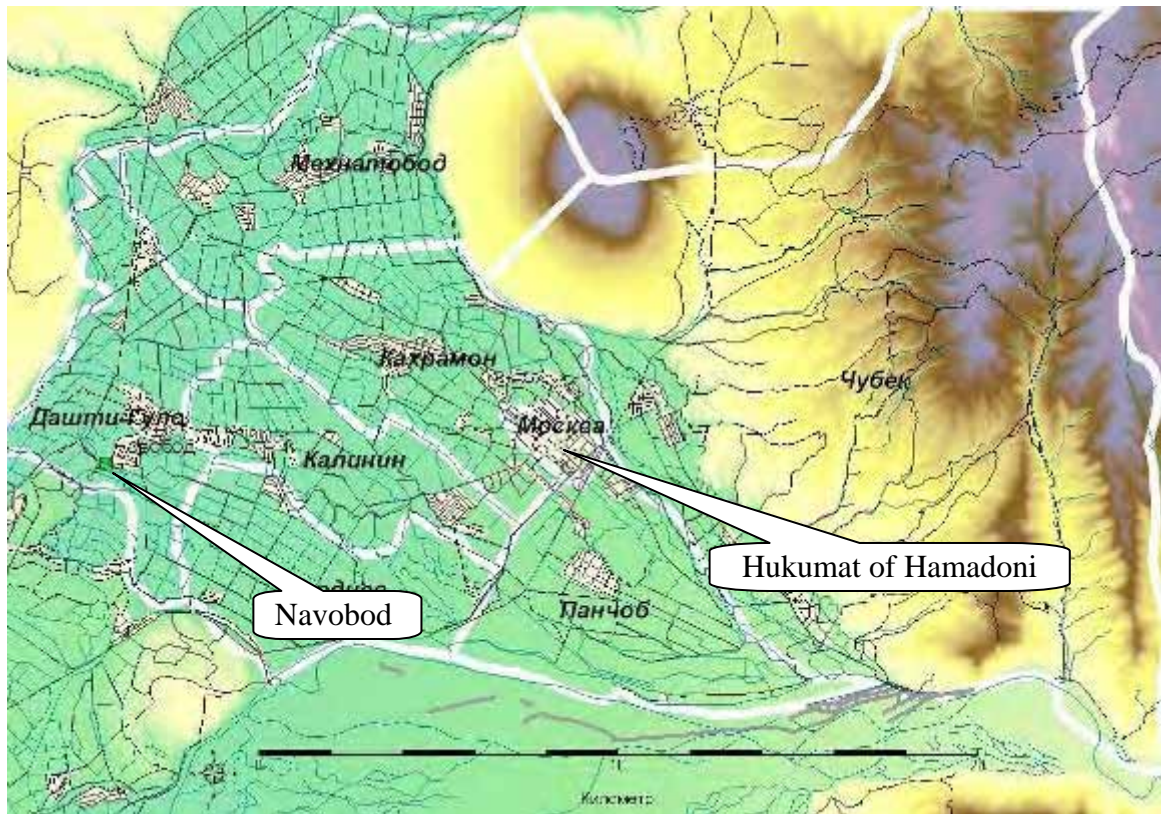


Fig. R 8.7.5 Location of Navobod

3) Implementation Procedure

For preliminary coordination of the drill, several preparatory meetings with Head of Kishlak Tagnob and Representative of Mahalla Navobod were carried out to check the details of evacuation procedures, routes, etc. The evacuation route map indicating evacuation routes and areas for Navobod was distributed to each household in Navobod in advance. There are two types of evacuation routes on the map: the one is a vehicle available route, which is selected as a part of the Master Plan (about 3.8 km), the other is only for foot traffic, which is identified by the Jamoat Office and local residents (about 1.3 km). The latter, the walking evacuation route, was actually used at the 2005 flood.



Fig. R 8.7.6 Evacuation Route (red line) and Evacuation Area (red circle) for Navobod

4) Results of Implementation

a) Participants

The participants on the second day were around 220: residents in Navobod (about 210), head of Tagnob, Representative of Navobod, Jamoat Office (1), Hukumat of Hamadoni (1), CoES Kulyab (2), and CoES Communication Center (1). Females and children made up the vast majority of the participants.

The Representative of Navobod said that females, aged and children held a majority in Navobod because averagely one or two males in each household worked away from Hamadoni, for example, in Russia.

b) Moving to Evacuation Area

According to the procedures confirmed at the Flood-Evacuation Map Exercise on the day before, the evacuation order was assumed and disseminated to the residents in Navobod using Hand Siren. Then, residents started for the evacuation area on foot. The VHF Handie-Talkies, which the representatives learned how to use the day before, were also utilized for evacuation guidance and situation reporting. The residents took the evacuation route for foot traffic, as same as the 2005 flood.

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Fig. R 8.7.7 Hand Siren



Fig. R 8.7.8 VHF Handie-Talkie



Fig. R 8.7.9 Scene of the Evacuation (Evacuation Route for Foot Traffic)



Fig. R 8.7.10 Vehicle-Available Evacuation Route

c) Evacuation Area

A foreyard with tree cover in a cotton factory, named Grachev Farm, was assigned as an evacuation area because it has been used for the same purposes. At the 2005 flood, this area was also used as a camp site for evacuees at the 2005 flood. The residents gathered under the tree covers in order to keeping the sun off.

The total number of participants at the evacuation area was counted, then, the completion of evacuation was declared by the Representative of Navobod. It took about 40 minutes from the start (08:53) to the completion (09:32) of evacuation.



Fig. R 8.7.11 Evacuation Area (Foreyard with Tree Cover in a Cotton Factory)

5) Evaluation Meeting

The residents and officials held an evaluation meeting immediately after the completion of the field flood-evacuation drill. At the evaluation meeting, people discussed about the following three points:

- What is the problem for the current evacuation plan?
- How to improve the problem?
- Who (Which organization) is responsible to conduct the improvement plan?

a) Temporary Bridge

Firstly, the participants mentioned a temporary bridge crossing the canal as a challenge. The temporary bridge, located on the evacuation route for foot traffic, was built by the local residents after the previous one had been washed away by the 2005 flood.

At the field flood-evacuation drill, about 50 of 210 local residents could not cross the temporary bridge: therefore, they could not reach the evacuation area either. They said that they could not cross the temporary bridge because:

- The bridge wobbles so precariously that some people feel scared.
- Woman carries a baby in her arms.
- Chronic health condition (high blood pressure, clouded vision, difficulty in walking, etc.)
- Too old to cross, etc.



Fig. R 8.7.12 The People remained in front of the Temporary Bridge
(on the slope)

The discussion was continued about the improvement measure for the risk of temporary bridge. The participants indicated that the safer route (the moving along the vehicle-available evacuation route) was the most reasonable countermeasure at this time against the risk of the temporary bridge, especially for the people who need to be supported in flood evacuations. The participants also mentioned that it would be dangerous even for normal adults to cross the temporary bridge during nighttime or at high water level. Besides, crossing the temporary bridge with household goods and livestock animals would be also practically difficult even in daytime. Therefore, it was recognized that the residents should give priority to the safer evacuation route.

Meanwhile, as a long-term solution, the participants reached agreements that:

- An application is prepared by the Head of Tagnob and Head of Navobod, with signature of local residents.
- The Construction Department of the Hukumat of Hamadoni will send an engineer to estimate the cost of the bridge after approving the application.
- Actual construction procedures should be discussed among all stakeholders

(government officials, local residents) after the cost estimation.

- After re-construction of a safer bridge in the future, the evacuation route will be reconsidered.

b) Support for vulnerable people in flood evacuation

Secondly, a lack of transportation ability by vehicles was identified as a problem. There were about twenty cars in Navobod at the present moment. However, only five out of twenty cars were available. The major two reasons of disabilities were:

- Mechanically out of order (lack the money to repair)
- Out of gas (lack the money to purchase)

As a possible improvement measure, the Representative of Navobod would previously consider, in cooperation with local residents, the arrangement of vehicles: how to support the transportation for vulnerable people by the limited number of vehicles.

c) Temporary Bridge between Tagnob and Fayzobod

The thirdly mentioned problem was a temporary bridge located on the north of Tagnob. The local residents also built this temporary bridge after the previous one had been washed away by the 2005 flood. The width of the bridge was available for one car at a maximum. It would become an obstacle to transport external public aid throughout Tagnob including Navobod.

As a reasonable improvement measure, it was identified that another safer route should be used in emergency situations. The participants also expected that the government reconstruct the bridge as public work in the future. It beyond self-endeavors of the local residents because a large amount of cost and skilled construction technology were demanded for a safe bridge crossing a few hundred meters of river width.



Fig. R 8.7.13 Temporary Bridge between Tagnob and Fayzobod

6) Summary of the Field Flood-Evacuation Drill

An actual evacuation activity clarified the warning dissemination procedures between the officials and local residents, as well as evacuation routes, evacuation areas, etc. At the evaluation meeting, the participants discussed several problems and their solutions then, consequently, reached to the consensus for future improvement. Especially the importance of using safer evacuation routes was recognized clearly among the people. Therefore, the drill contributed to raise the disaster management awareness for both the persons in charge of disaster management and the local residents. The methodology of how to implement field flood-evacuation drills were transferred successfully to the responsible persons in

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charge of emergency situations. It was clearly identified that the field flood-evacuation drills were effective, so self-endeavors of the responsible persons to conduct the drills in other areas are important.

8.7.4 Summary of the Flood-Evacuation Drill

Through the two days of the flood-evacuation drill, the following issues are clarified:

Regarding the flood-evacuation map exercise on the first day:

- The key persons in charge of disaster management recognized emergency communication procedures concretely, through the exercise with maps and scenarios.
- The points which need to be improved for the current communication network (“from whom”, “to whom”, and “how” are ambiguous in some part) were identified.

Regarding the field flood-evacuation drill on the second day:

- The participants experienced their evacuation routes and areas actually using an evacuation map.
- As described above in 5) of 8.7.3, several problems were identified by participants. The consensus about the improvement measures and responsibilities for implementations were also agreed among the participants: especially for the importance of using a safer evacuation route.

As observed above, the technical transfer for methodologies of conducting flood-evacuation drills using maps and scenarios was accomplished through actual experiences of the drill. It is expected that the participants, local disaster management persons, will independently motivate themselves to carry out similar drills in other areas in the future.

8.8 VERIFICATION OF POSSIBLE OBSTACLES ON EVACAUTION ROUTES

At the flood-evacuation drill described above, the problems of the existing evacuation route (basically the same ones at the 2005 flood) and the importance of using a safer evacuation route were pointed. For this reason, the verification survey was conducted for the 20 (twenty) evacuation routes recommended on the Master Plan from the view point of necessities for reinforcement / reconstruction of lanes or bridges on the routes.

8.8.1 Evacuation Routes for Flood with up to 15-year Return Period

1) Survey Results

Results of the field survey for 7 (seven) evacuation routes for the simulated flood with up to 15-year return period (the 2005 flood approximately corresponds to a 15-year return period) are as follows:

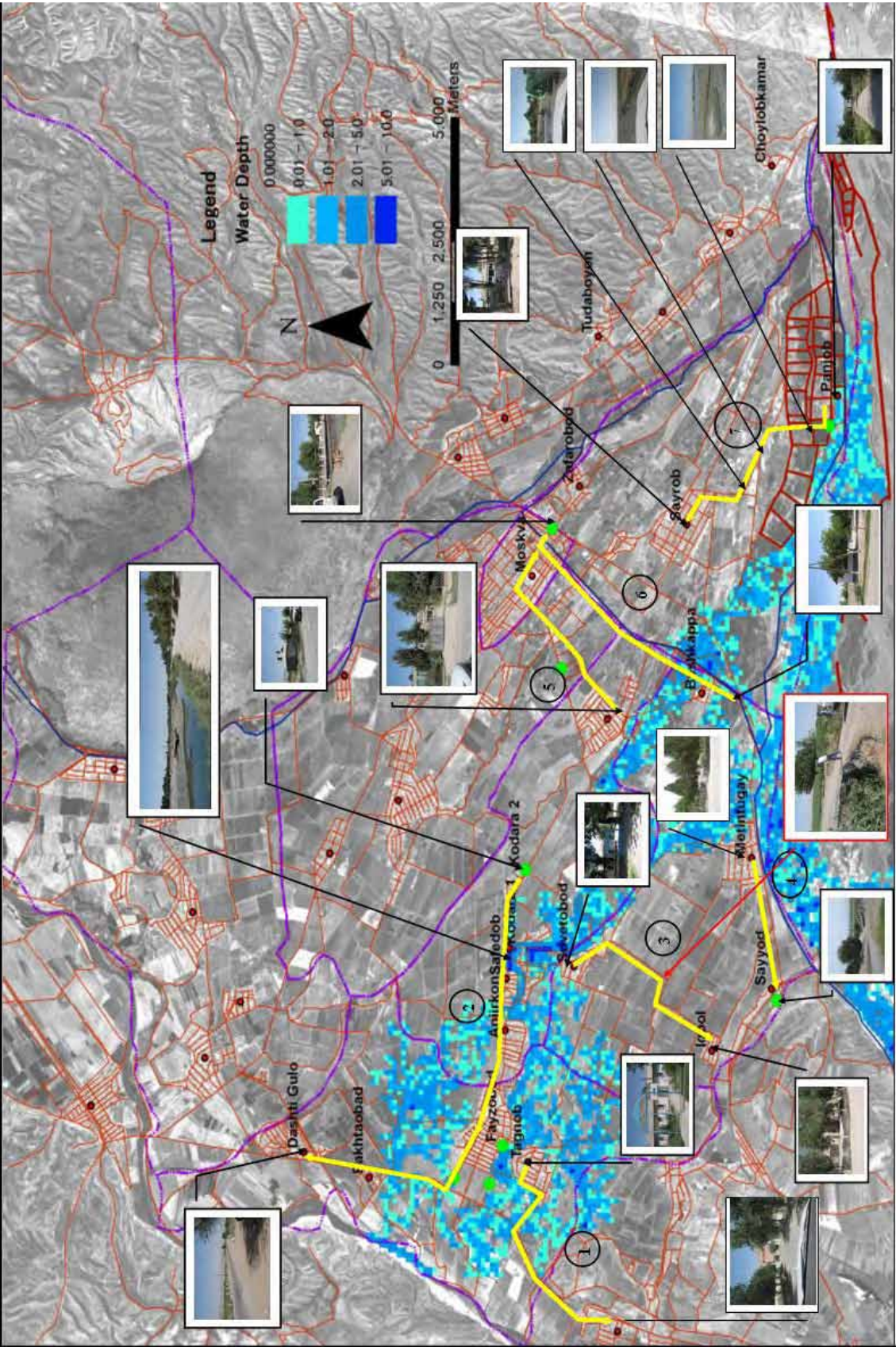


Fig. R 8.8.1 Surveied Sections of the Evacuation Routes for the floods with up to 15-year Return Period (yellow lines)

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Table R 8.8.1 Survey Results of the Evacuation Routes for the floods with up to 15-year Return Period (#1-#3)

#	Start / End	Point	Jamoat	Kishlak	Distance (Km)	Structures Name, Type	Remark
1	Start	1	Dashti Gulo	Tagnob	0.00	Elementary School No.16	There is small pedestrian bridge
					1.3	Mahalla (Navobod)	
					3.3	Bridge, concrete (OK)	from here go down along the channel
	End		Farkhor	Mukhtor	4.7	Cotton Factory	
2	Start	1	Kalinin	Kodara 2	0.00	New housing area	
		2	Kalinin	Kodara 1	1.5		
					1.7	Bridge (damaged by 2005 flood)	Left side of evacuation route
		3	Kalinin	Safedob	2.5	Grocery store	
		4	Kalinin	Anjirkon	3.3	Big cross road	
		5	Dashti Gulo	Fayzobod	5.7	Elementary School	
					7.0	Corner to Farkhor Road	
	End	6	Dashti Gulo	Pakhtaobod	9.9	Bus station	
3	Start	1	Turdiev	Sovetobod	0.00	Elementary School No.27	
					0.7	Bridge -small, OK	
					2.3	Pipe culvert	Need Repair
					2.8	Bridge -small, OK	
					3.2	Pipe culvert -small, OK	
					3.9	Bridge -small, OK	
	End	2	Turdiev	Iqbol	4.1	School	

Table R 8.8.2 Survey Results of the Evacuation Routes for the floods with up to 15-year Return Period (#4-#7)

#	Start / End	Point	Jamoat	Kishlak	Distance (Km)	Structures Name, Type	Remark
4	Start	1	Turdiev	Metintugay	0.00	Jamoat Office	
					1.9	Bridge-OK	
					3.0	Sayyod bridge-OK	Handrail for bridge is necessary
	End	2	Turdiev	Sayyod	3.2	in front of a grave yard	
5	Start	1	Kalinin	Warashiov	0.00	School	
					4.4	Jamoat Office	
	End	2	Moskva	Moskva	5.1	Bridge	
6	Start	1	Turdiev	Beshkappa	0.00	Beshkappa school	
					1.1	Irrigation bridge on the right side	
					3.7	Irrigation bridge on the right side	
	End	2	Moskva	Moskva	4.8	Bridge	along the irrigation channel
7	Start	1	Panjob	Panjob	0.00	Office of fish pond	
					2.5	Water gate	from here no road available for automobile
					2.8	until here bad road	
					3.4	Irrigation channel	
	End	2	Panjob	Sayrob	5.0	Office of Odinahoshim	Sovkhoz

2) The Place which Needs to be Considered for Reinforcement

The field survey identified that a part of the evacuation route #3 (Sovetobod – Iqbol, Jamoat Turdiev) are recommended to consider reinforcement. There is a pipe culvert for canal paved with asphalt, which becomes partially misshapen and results in a narrow road width.



Fig. R 8.8.2 Asphalt Paved Pipe Culvert on the Evacuation Route #3 between Sovetobod and Iqbol in Jamoat Turdiev

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8.8.2 Evacuation Routes for Flood with over 15-year Return Period

1) Survey Results

Results of the field survey for 13 (thirteen) evacuation routes for the simulated flood with over 15-year return period are as follows:

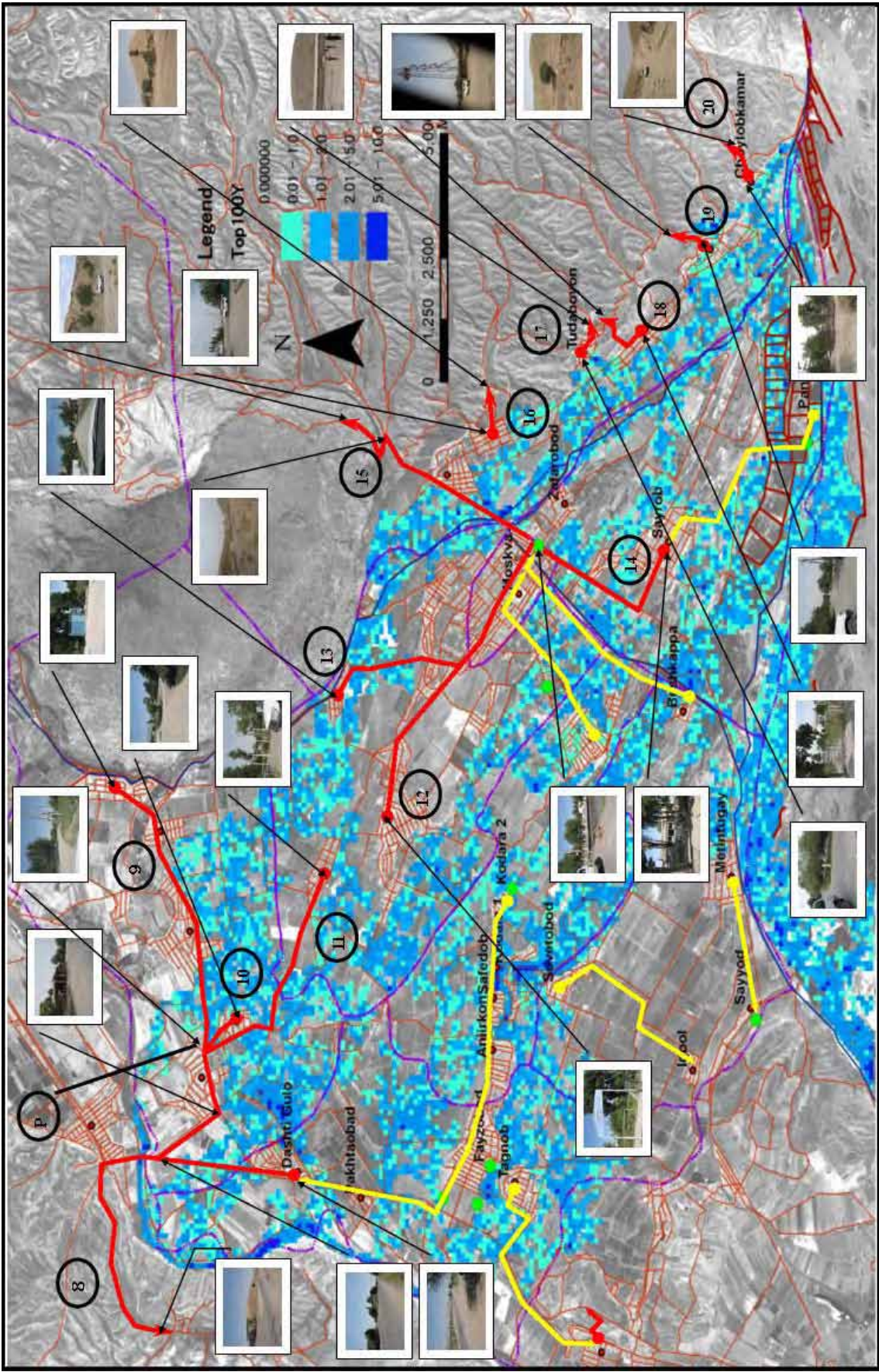


Fig. R 8.8.3 Surveied Sections of the Evacuation Routes for the floods with over 15-year Return Period (red lines)

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Table R 8.8.3 Survey Results of the Evacuation Routes for the floods with over 15-year Return Period (#8-#13)

#	Start / End	Point	Jamoat	Kishlak	Distance (Km)	Structures Name, Type	Remark
8	Start	1	Dashti Gulo	Dashti Gulo	0.00	Bridge on Farkhor Road	
					1.90	Police Check point	
					2.30	Bridge	
					3.10	Intersection	Dangara-Kulyab Road
	End			Olimtoy	7.50	Gasoline Station	
9	Start	1	Mehnatobod	Dzujba	0.00	Elementary School	
		2	Mehnatobod	Guliston	1.00		
		3	Mehnatobod		5.80	Intersection to No.10 and No.11 (Point P on the map)	
		4	Mehnatobod		7.60	Intersection to Hamadoni Road	Chaikhana
	End	5	Mehnatobod	Police Check Point	9.40	Start of interchange point	
10	Start	1	Mehnatobod	Navobod	0.00	center of town	
					0.40	Bridge -small, OK	
	End	2	Mehnatobod		0.80	Intersection	
11	Start	1	Qahramon	Guliston	0.00	School	
					3.00	Bridge	
					3.40	Before bridge turn right	
					3.80	Road along irrigation channel	
					4.60	Bridge-OK	
	End	2	Mehnatobod		5.10	Intersection	
					6.20	Chaikhana	
12	Start	1	Qahramon	Darai Kalot	0.00	School	
					5.20	Jamoat Office	
	End	2	Moskva	Moskva	5.90	Bridge	
13	Start	1	Qahramon	Tagi Namak	0.00	Intersection	
					3.40	Intersection Hamadoni Road	
					5.70	Irrigation bridge on the right side	
	End	2	Moskva	Moskva	6.40	Bridge	

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Table R 8.8.4 Survey Results of the Evacuation Routes for the floods with over 15-year Return Period (#14-#20)

#	Start / End	Point	Jamoat	Kishlak	Distance (Km)	Structures Name, Type	Remark
14	Start	1	Panjob	Sayrob	0.00	Office of Odinahoshim	Sovkhoz
					1.30	Cross-section	
	End	2	Moskva	Moskva	5.00	Bridge	
15	Start	1	Moskva	Moskva	0.00	Bridge	
		2	Chubek	Ittifo	4.00	end of town	
		3			5.40	Dry creek, 15m width	March, April had water
	End	4		Buzakhona	7.10	Bus Station, 4 trees	
16	Start	1	Chubek	Komsomol	0.00	Intersection, shop	
		2			0.30	Pipe culvert, 1.0m x 2 pieces	
		3	Chubek	Kamar	0.80	Brick factory	
	End	4			1.20	End of Kamar, backyard of brick factory	
17	Start	1	Chubek	Tudaboyon	0.00	Shop	
		2			0.30	Bridge-small, 5m-OK	
		3			1.10	turn left to mountain	
	End	4	Chubek		1.40	Cowhouse	
18	Start	1	Chubek	Hoyoti Naw	0.00	Elementary School	
		2			0.50	Steel pipe culvert, 1.0m	
		3			0.80	Concrete bridge, 3.0m	
	End	4	Chubek		1.40	Old oil tower	
19	Start	1	Chubek	Chubek	0.00	Intersection, shop, school	
		2			0.05	Concrete bridge, 5m	
		3			0.70	Pipe culvert, 1.0m	
		4			1.00	Pipe culvert, 1.0m	
		5			2.20	Pipe culvert, 1.0m	
	End	6	Chubek		2.40	3 trees on other side	
20	Start	1	Chubek	Choylobkamar	0.00	School	
		2			0.10	Concrete bridge, 5m, OK	
	End	3	Chubek		0.80	Intersection of road	

2) The Place which Needs to be Considered for Reinforcement / Reconstruction

The field survey results showed that there are no places which need to be considered for reinforcement or reconstruction.

8.8.3 Summary of the Verification

According to the results, the evacuation routes on the Master Plan are basically available for safe evacuation activities, and their current conditions are acceptable without one section.

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8.8.4 Preliminary Survey for Bridges which Damaged at the 2005 Flood

As a reference for reconsideration of evacuation routes in the future, a preliminary condition survey for bridges which has been damaged at the 2005 Flood were conducted. (Please refer the Appendix for details.)

8.9 PUBLIC RELATIONS ACTIVITIES

8.9.1 Newsletters

Newsletters in Tajiki were issued in order to share the necessary procedures and results of the flood-evacuation drills. Each volume was distributed about 130: all household in Navobod (the target area of the field flood-evacuation drill) (60), Jamoat Offices (8), Hukumat of Hamadoni (1), CoES Local Headquarters in Hamadoni (1), etc. The newsletter was printed in an A4 size paper in both sides. The date of issues and contents are as follows:

Vol.1 (24 April 2007)

- Announcement of the conduction of the Evacuation Drill
- Objectives of the local disaster management plan in the draft M/P and the Evacuation Drill
- Evacuation framework in Hamadoni
- Brief overview of the Evacuation Drill

Vol.2 (29 April 2007):

- Explanation about Disaster Simulation Exercise
- Details of how to conduct the Disaster Simulation Exercise and the Field Evacuation Drill

Vol.3 (3 May 2007)

- Time schedule of the Field Evacuation Drill
- Evacuation Map for Mahalla Navobod

Vol.4 (19 May 2007)

- Result of the Evacuation Drill
- Summary of the Seminar on the Draft Master Plan on 17 May
- Indicator of the Maximum Water Level in the 2005 Flood

These newsletters help people become more familiar with:

- the framework of flood information sharing in Hamadoni
- levels, criteria and dissemination procedures of the flood warning and necessary actions
- importance of the completion of evacuation before the roads are covered with water
- importance of recognition of evacuation routes and areas for community on a routine basis
- significance and concrete implement procedures of flood evacuation drills
- importance of consensus building on problems and improvement of disaster management in the area through evaluation meetings
- importance of conduction of flood evacuation drills in other areas
- prevention of needless panic caused by misunderstanding the drill as an actual evacuation



Fig. R 8.9.1 The Newsletter Vol.4 (front page)

8.9.2 Indicator of the Maximum Water Level in the 2005 Flood

Under the cooperation between the Jamoat Office of Dashti Gulo and JICA Study Team, several indicators which show the maximum water level at the flood in summer of 2005 were settled on the street. The sites are an ex-post office near a mosque, market building, store on a main road,

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cotton factory, and restaurant in Jamoat Dashti Gulo. These indicators are expected to raise people's awareness on flood preparedness.



Fig. R 8.9.2 Indicator on the wall of the ex-post office in Dashti Gulo

Similar indicators are recommended to be set up in other flood affected areas in Hamadoni in order to raise people's awareness and transmit the experience to the next generation.

8.9.3 JICA Follow-up Workshop in Kazakhstan on 21-23 June 2007 – along the Action Plan of “Central Asia plus Japan” Dialogue

A representative of the Hukumat of Hamadoni, one of the counterparts in Hamadoni for the Study, was invited to the JICA Follow-Up Seminar in Astana, the capital city of the Republic of Kazakhstan, on 21-23 June 2007. The objectives of the Follow-Up Workshop are:

- Follow-up of the activities and information exchanges of trainees of the seminar “Disaster Prevention Management for Central Asia and Caucasus” conducted in Japan by JICA since 2004, after their return home,
- Review of the seminar in Japan and discuss further improvements
- Consider a framework of preliminary seminar for next trainees in Japan in order to share the background information about the seminar.

The representative of the Hukumat of Hamadoni made a presentation about interim outcomes of the Study and a preliminary action plan on future flood disaster management in Hamadoni, including the results of the flood-evacuation drill. This presentation and discussion contributed to share the outcomes of the Study among the Central Asian countries, along the lines suggested in the Action Plan of “Central Asia plus Japan” Dialogue.



Fig. R 8.9.3 Presentation by the representative of the Hukumat of Hamadoni at the Workshop



Fig. R 8.9.4 Participants and facilitators of the Workshop

REFERENCES

1. Law of the Republic of Tajikistan on Protection and Territories against Natural and Man-made Disasters, Government of the Republic of Tajikistan
2. UNDAC Mission: Disaster Response Preparedness in Tajikistan, United Nations Office for The Coordination of Humanitarian Affairs (UN-OCHA), (<http://www.untj.org>), 2006
3. Disaster Situation Report, Khatlon Oblast and GBAO 24 Jun 2005, United Nations Coordination Unit in Tajikistan, 2005
4. Disaster Situation Report, Khatlon Oblast 29 Jun 2005, United Nations Coordination Unit in Tajikistan, 2005
5. Lake Sarez Risk Mitigation Project - Disaster Management Plan - Moskovsky District, Khatlon Oblast, FOCUS HUMANITARIAN ASSISTANCE, 2002
6. “Central Asia plus Japan” Dialogue –Action Plan-, the Ministry of Foreign Affairs of Japan, 2006
7. List of population and household of Kishlaks in Hamadoni (as of 1 January 2007, Statistical Committee in Hamadoni)

TABLES AT THE BACK OF REPORT

Table 8.1.1 Evacuation Area planned by Jamoat Office (as of October 2006)

Jamoat	Kishlak	Household	Population	Evacuation Area planned by Jamoat Office (as of October 2006)
Moskva Town	-	2794	19965	Khoja Mumin Mountain (6 points)
Subtotal		2794	19965	
Qahramon	Darai Kalot	383	3585	Olimtoy
	Margob	105	914	Karaghoch
	Pakhtakor	94	845	Khoja Mumin Mountain
	Pushkin	474	3927	Olimtoy
	Guliston	205	1840	Olimtoy
	Tagi Namak	174	1484	Khoja Mumin Mountain
	Sadbargo	171	1328	Khoja Mumin Mountain
	Qahramon	100	944	Olimtoy
	Boghi Buz	54	574	Karaghoch
Subtotal		1760	15441	
Mehnatobod	Mehnatobod	636	6301	Olimtoy, Khoja Mumin Mountain
	Gulobod	420	4488	
	Dusti	358	2997	
	Guliston	238	2247	
	Navobod	190	1658	
	Arpatuguldi	110	983	
	Olimtoy	30	185	
Subtotal		1982	18859	
Dashti Gulo	Fayzobod-1	482	4613	Olimtoy, Grachev Farm, Urtabuz Hill, Sayyod Hill
	Fayzobod-2	482	4613	
	Tagnob	414	3301	
	Dashti Gulo	370	2901	
	Pakhtaobod	81	737	
Subtotal		1829	16165	
Kalinin	Anjirkon	353	2475	Olimtoy
	Safedob	270	2255	Olimtoy, Urtabuz Hill
	Kodara 1	91	711	Kiyomchashma
	Kodara 2	85	846	Kiyomchashma
	Safarov Gadoi	577	4820	Kiyomchashma
Subtotal		1376	11107	

Table 8.1.1 Evacuation Area planned by Jamoat Office (as of October 2006) (continued)

Jamoat	Kishlak	Household	Population	Evacuation Area planned by Jamoat Office (as of October 2006)
Turdiev	Metintugay	492	4278	Urtabuz Hill
	Sovetobod	241	2058	Urtabuz Hill
	Sayyod	112	994	Urtabuz Hill
	Iqbol	92	834	Urtabuz Hill
	Beshkappa	72	616	Urtabuz Hill
Subtotal		1009	8780	
Panjob	Sayrob	751	5951	Khoja Mumin Mountain
	Chorbogh	112	895	Khoja Mumin Mountain
	Panjob	32	294	Khoja Mumin Mountain
	Tokiston	17	137	Khoja Mumin Mountain
	Zafarobod	167	1312	Khoja Mumin Mountain
Subtotal		1079	8589	
Chubek	Chapaev	314	2263	hills 0.5 – 1.0km away from residential areas
	Okmazori Bolo	164	1058	hills 0.5 – 1.0km away from residential areas
	Okmazori Miyona	263	2066	hills 0.5 – 1.0km away from residential areas
	Okmazori Poyon	247	1635	hills 0.5 – 1.0km away from residential areas
	Tudaboyon	104	1068	hills 0.5 – 1.0km away from residential areas
	Tugul	111	860	hills 0.5 – 1.0km away from residential areas
	Hayoti Naw	245	1936	hills 0.5 – 1.0km away from residential areas
	Chubek	231	2526	hills 0.5 – 1.0km away from residential areas
	Yangiyul	107	1022	hills 0.5 – 1.0km away from residential areas
	Choylobkamar	55	401	hills 0.5 – 1.0km away from residential areas
	Sarkokul	45	328	No evacuation necessary
	Qaraghoch	79	542	No evacuation necessary
	Buzakkhona	99	530	No evacuation necessary
	Qiyomchashma	60	425	No evacuation necessary
	Chordara	40	319	No evacuation necessary
	Garab	10	106	No evacuation necessary
	Masluk	21	114	No evacuation necessary
	Nugay	7	77	No evacuation necessary
	Tutbulok	8	53	No evacuation necessary
	Dahana	5	28	No evacuation necessary
Marghob	12	61	No evacuation necessary	
Subtotal		2227	17418	
TOTAL		14056	116324	

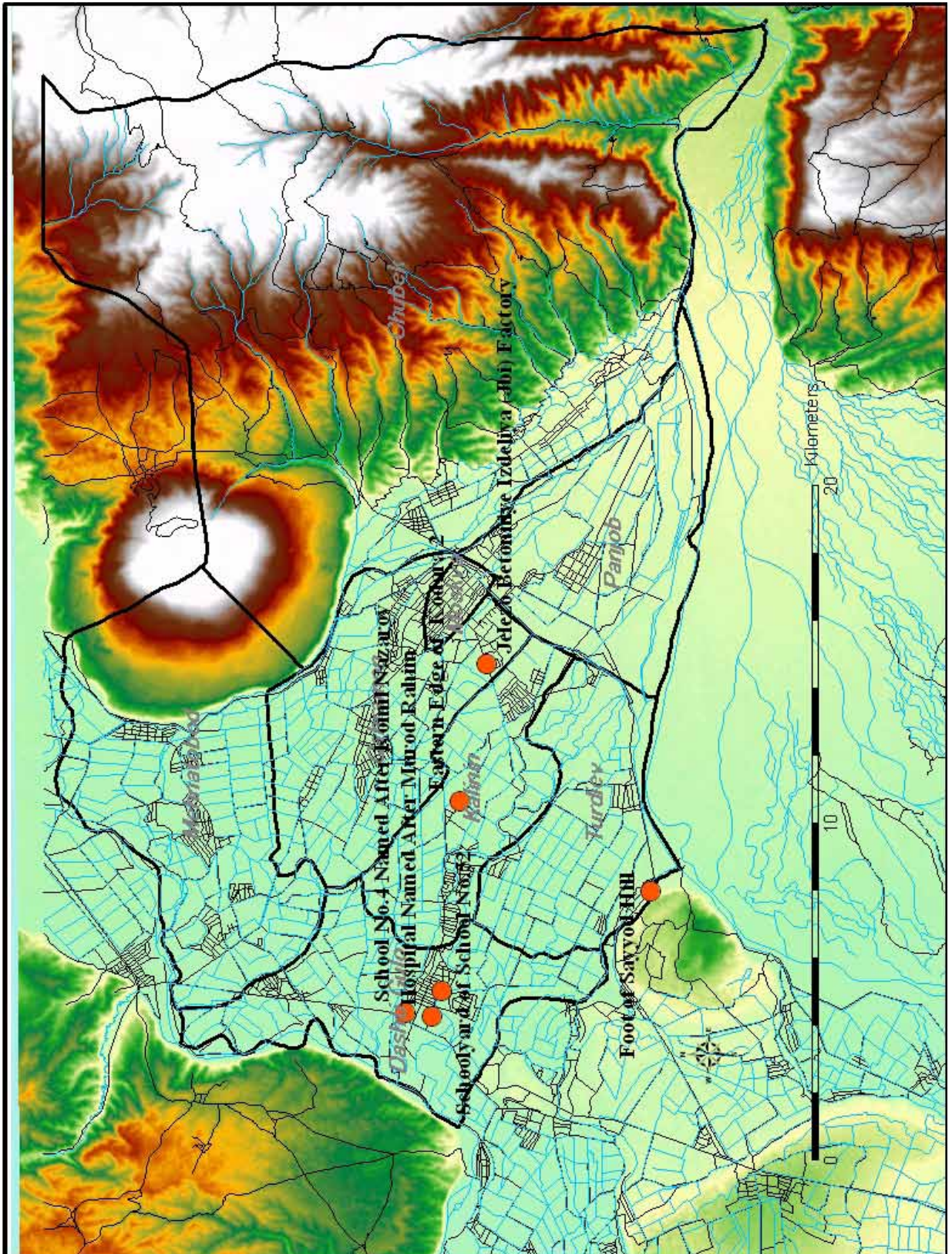
Table 8.4.1 Plan of Number of Hand Sirens

Jamoat	Number of Hand Siren
Panjob	6
Turdiev	8
Dashti Gulo	7
Kalinin	7
Chubek	12
Moskva Town	7
Qahramon	16
Mehnatobod	11
TOTAL	74

Table 8.4.2 Plan of Number of VHF radios

Jamoat and PT	No Repeater System in Hukumat of Hamadoni		A Repeater System in Hukumat of Hamadoni	
	Handie-Talkie	Base	Handie-Talkie	Base
Panjob	1	1		1
Turdiev	1	1		1
Dashti Gulo	1	1		1
Kalinin	1	1		1
Chubek	1		1	
Moskva Town	1		1	
Qahramon	1		1	
Mehnatobod	1		1	
Patrol Team	7	3	11	
TOTAL	15	7	15	4

FIGURES AT THE BACK OF REPORT



THE STUDY ON NATURAL DISASTER PREVENTION IN PYANJ RIVER

CTI INTERNATIONAL ENGINEERING CO., LTD

Fig. 8.1.1 Evacuation areas at the 2005 flood (directly investigated by the JICA Study Team)

***ANNEXES 1
RESULTS OF THE RESIDENTS'
CONSCIOUSNESS SURVEY ON
GENERAL LIVLIHOOD***

(1) The interviewed Jamoats in the Rayon Hamadoni

The survey has been conducted in 5 of 8 Jamoats in Rayon Hamadoni. Moskva, Qahramon and Mehnatobod were eliminated because of relatively infrequent or no flood disaster in past.

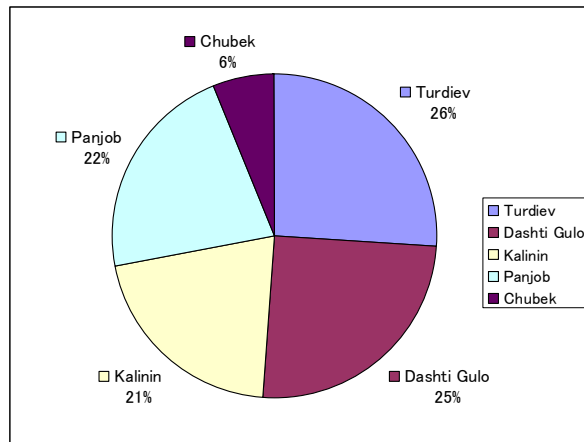


Fig. 1 The interviewed Jamoats in the Rayon Hamadoni

(2) The interviewed villages

The numbers of interviewed villages are 17 totally. 4 of 5 in Turdiev Jamoat, 4 of 5 in Dashti Gulo Jamoat, 4 of 5 in Kalinin Jamoat, 4 of 5 in Panjob Jamoat, 1 of 21 in Chubek Jamoat. The 4 Jamoats (Turdiev, Dashti Gulo, Kalinin and Panjob) affected by the 2005 flood has been targeted mainly.

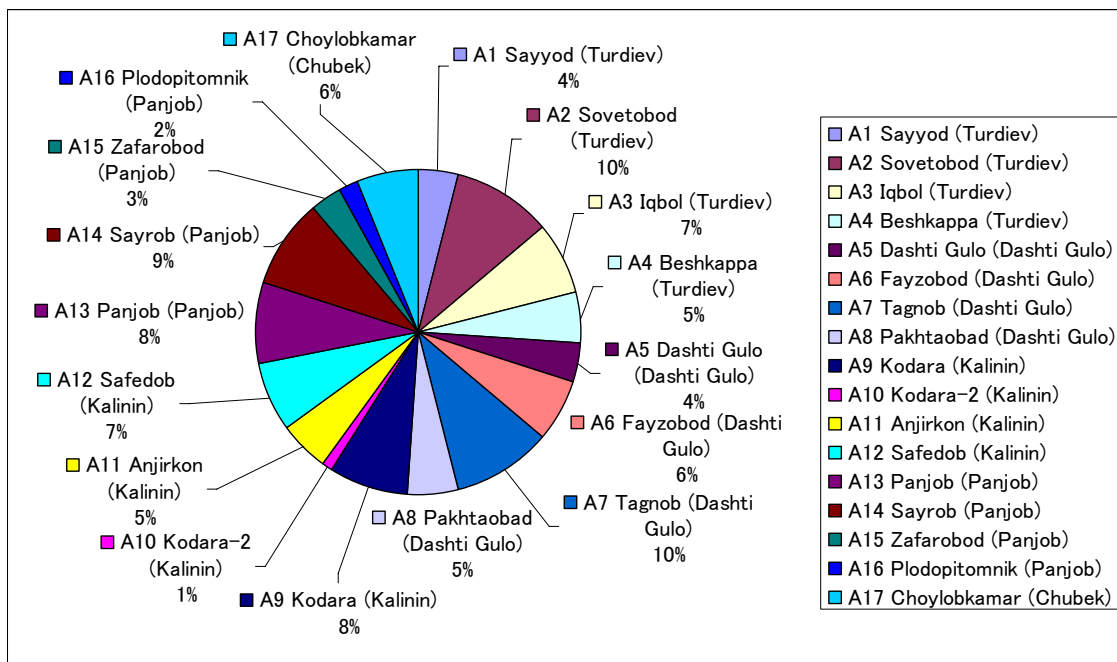


Fig. 2 The interviewed villages

(3) Location of the residential buildings

Almost half (42%) of households live in flat area. The 30% live near the road and 25% are alongside the river.

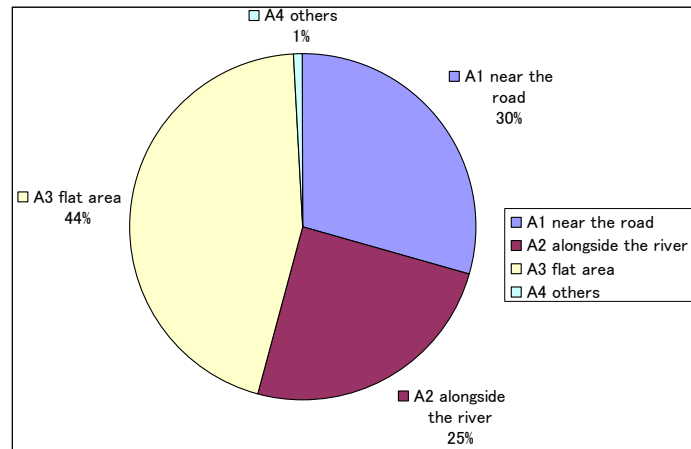


Fig. 3 Location of the residential buildings

(4) Occupations of interviewees

Interviewees are each representatives in the households. Because of one of the custom in the community area, usually elder persons give reply to the interview. That is why 17% of interviewees are pensioners.

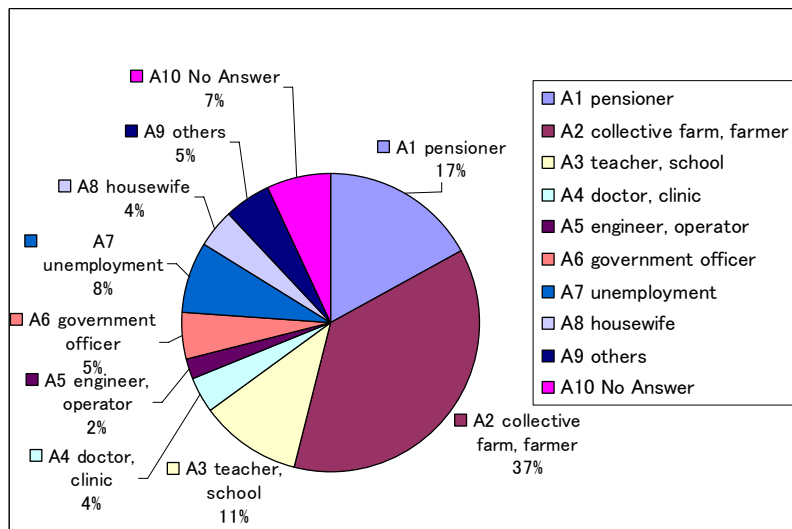


Fig. 4 Occupations

(5) Nationality and Language

Nationalities and languages of local residents are mainly Tajik. Some Uzbek persons are also involved in the community.

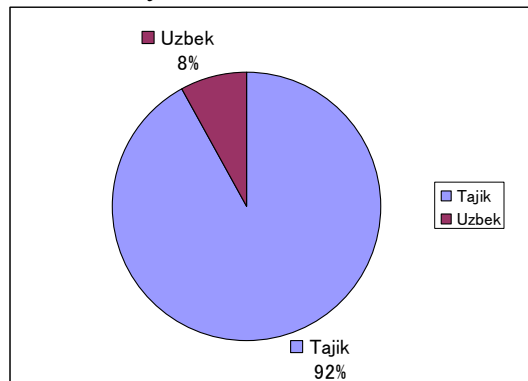


Fig. 5 Nationality

(6) Number of family members living together

Average number of household members is 9.01. The 6 to 10 member household accounts for 58%.

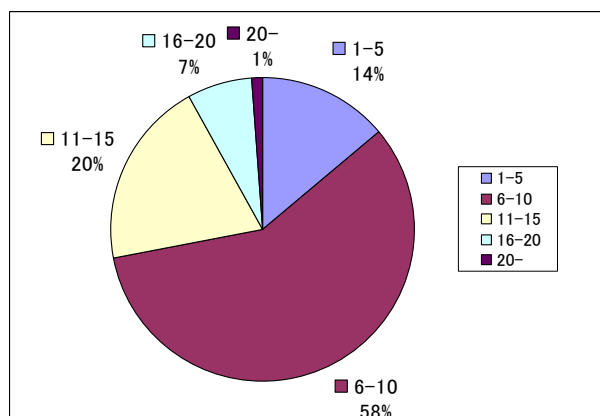


Fig. 6 Number of family members living together

(7) Availability of electrical devices (multiple answers allowed)

Television set is in widespread use almost all households (92%).

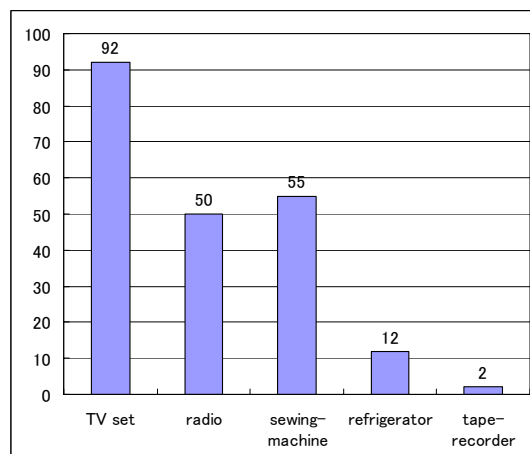


Fig. 7 Availability of electrical devices

(8) Agricultural Product

Potato, tomato, wheat, onion and haricot (bean) are the major agricultural product in the households. The cotton is mainly produced in dehqan farms.

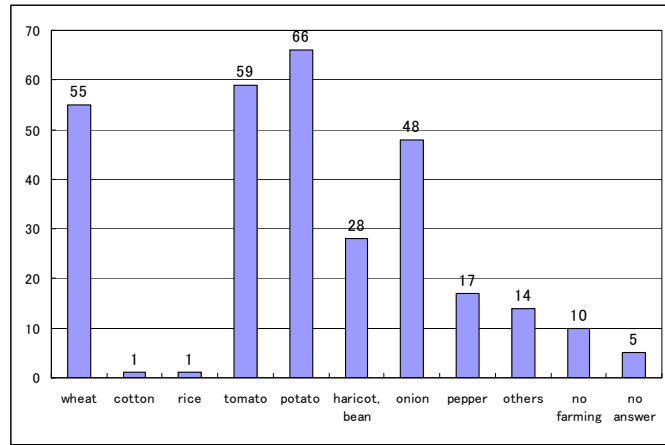


Fig. 8 Agricultural Product

(9) Time of sowing and harvesting of agricultural crops

The farmer's busy season is May to August in common.

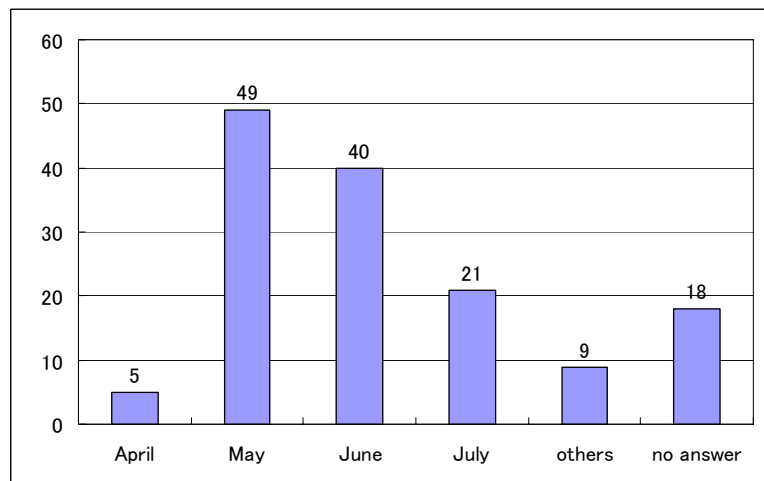


Fig. 9.1 Time of sowing of agricultural crops

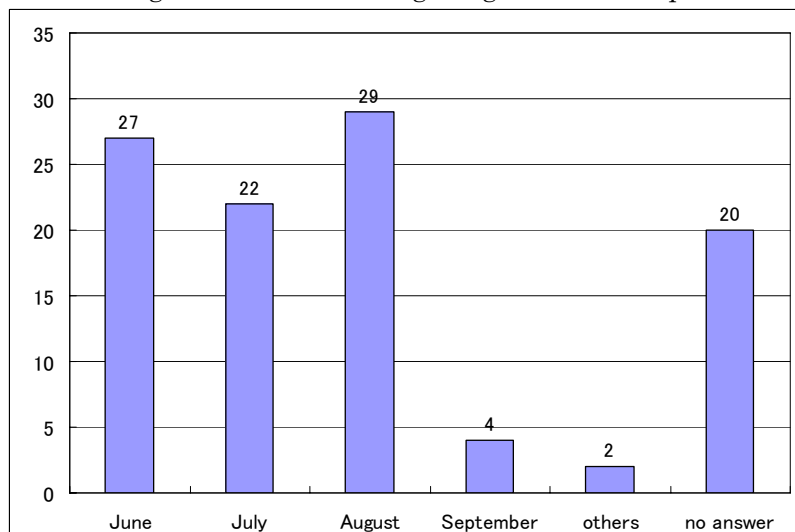


Fig. 9.2 Time of harvesting of agricultural crops

(10) Water supply for daily needs

Because of a hydrologic aspect of alluvial cones, many wells are available as water resource. However 18 of 100 households answer that daily water is not enough. Only 27 households can access the piped water system. 40 households should use river water directly.

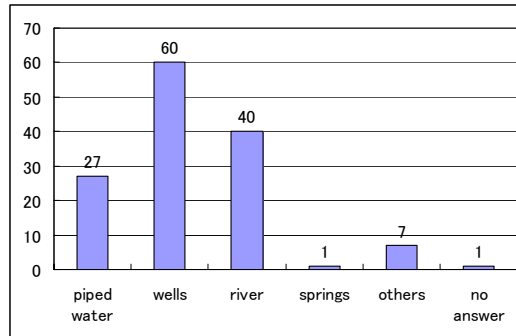


Fig. 10.1 Source of water supply for daily needs

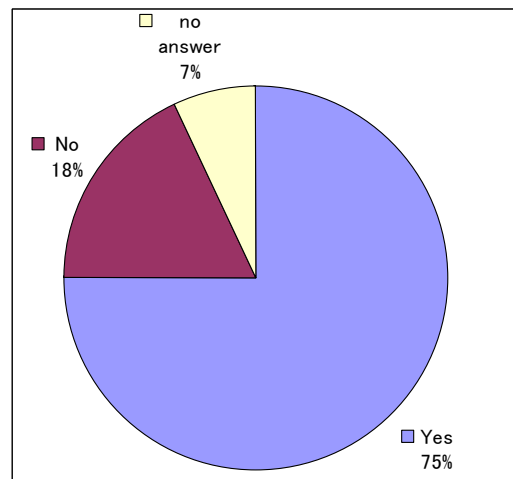


Fig. 10.2 Satisfaction with water supply for daily needs

(11) Water supply for agricultural needs

84 of 100 households depend on the irrigation system for agricultural water. Some of households using only irrigation systems reply that agricultural water is not enough.

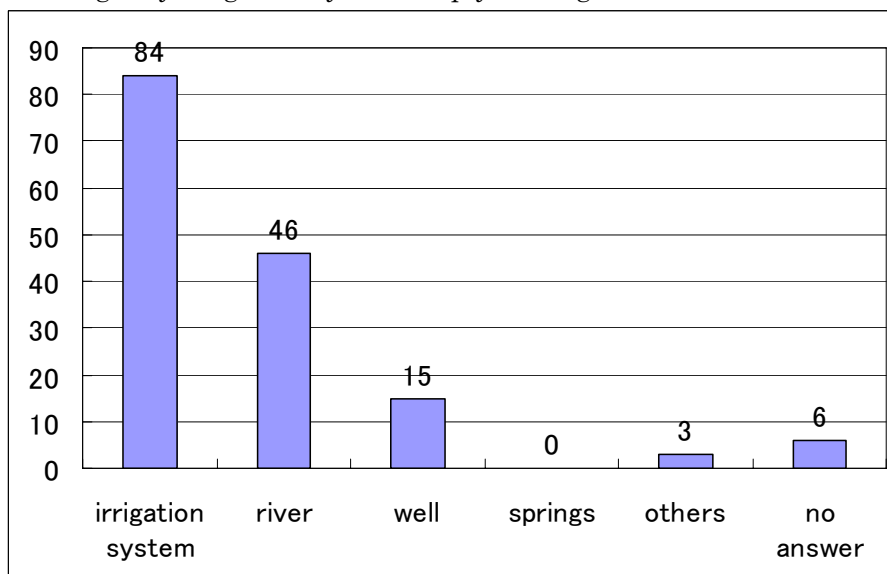


Fig. 11.1 Source of water supply for agricultural needs

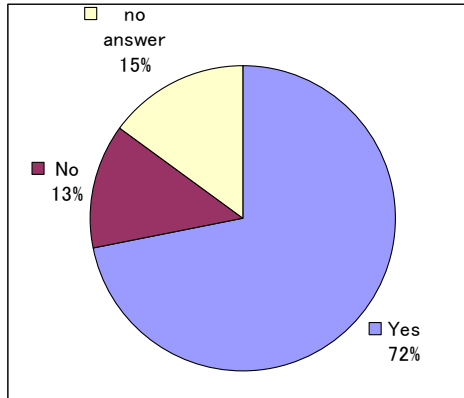


Fig. 11.2 Satisfaction with water supply for agricultural needs

(12) Water supply for livestock

River water, irrigation system, and well are mainly used for livestock.

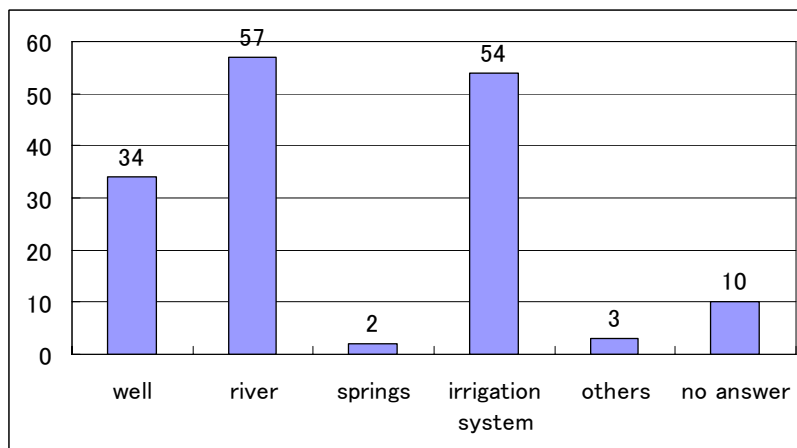


Fig. 12.1 Source of water supply for livestock needs

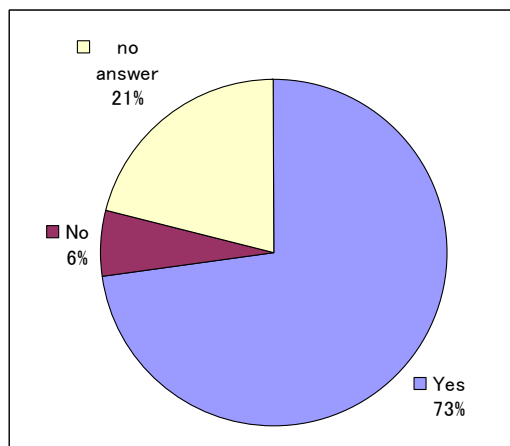


Fig. 12.2 Satisfaction with water supply for livestock needs

(13) Use of wood, brushwood and other alternatives

People obtain wood resource from their own homestead or dehkan farms for heating and cooking mainly. Cow-dung is also important as fuel.

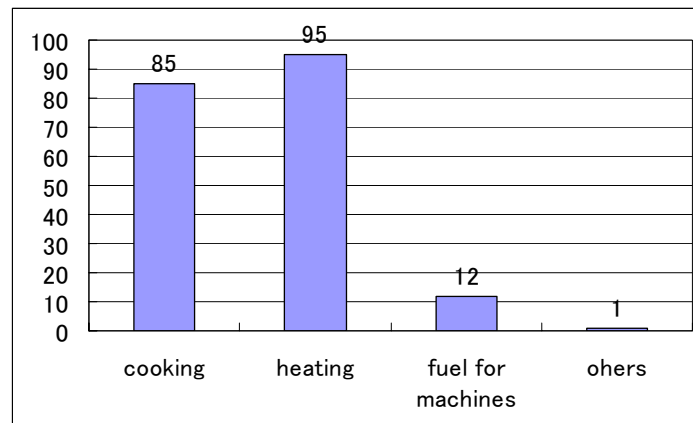


Fig. 13.1 Objectives of using wood, brushwood and other alternatives

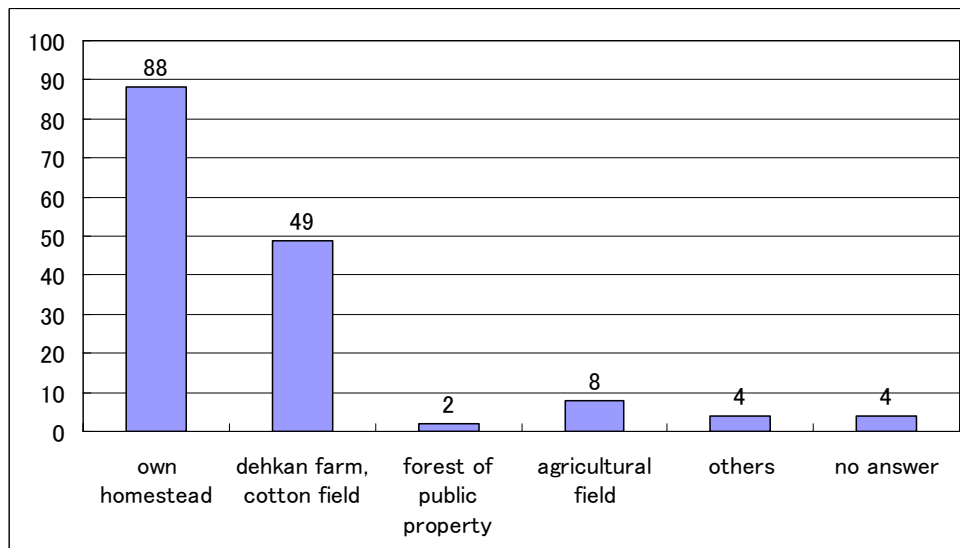


Fig. 13.2 Source of wood and brushwood

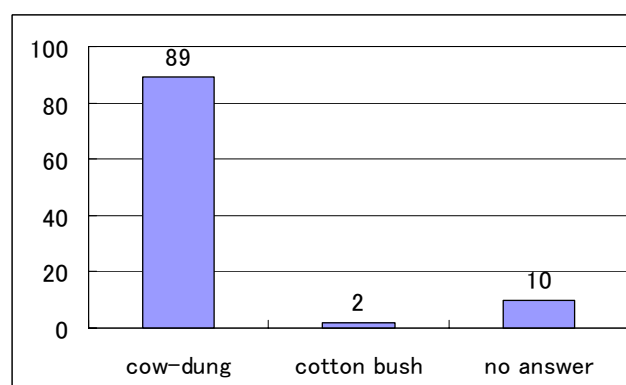


Fig. 13.3 Source of other alternatives

***ANNEXES 2
RESULTS OF THE RESIDENTS'
CONSCIOUSNESS SURVEY ON
FLOOD DAMAGES***

(1) Natural and climatic conditions

Nearly half of local residents think they are living in a safe or not bad area.

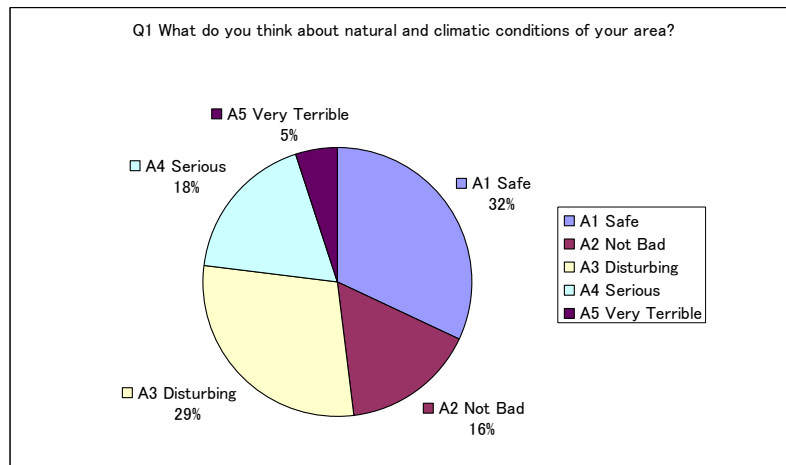


Fig. 1 Natural and climatic conditions in residential areas

(2) Consciousness on flood occurrence

Nearly half of local residents think they are safe from flood or have only small risk of flood.

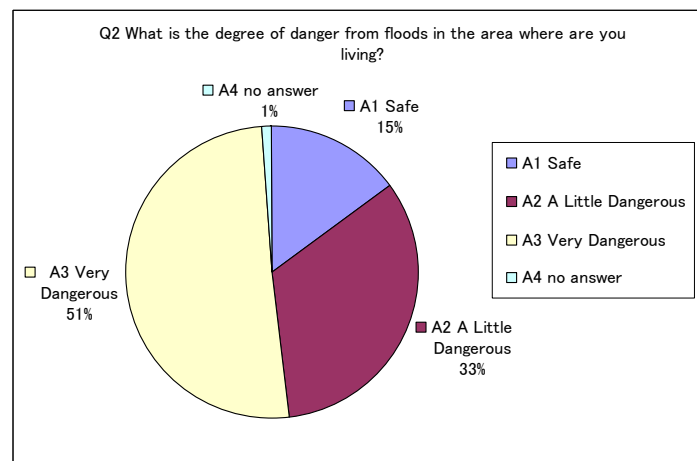


Fig. 2 Degree of danger from flood in residential areas

(3) Recognition on flood risk management

57 out of 100 interviewee reply that flood is impossible to manage. Only 10% answered “possible to manage.” There are 20% of “no concern” people in the community.

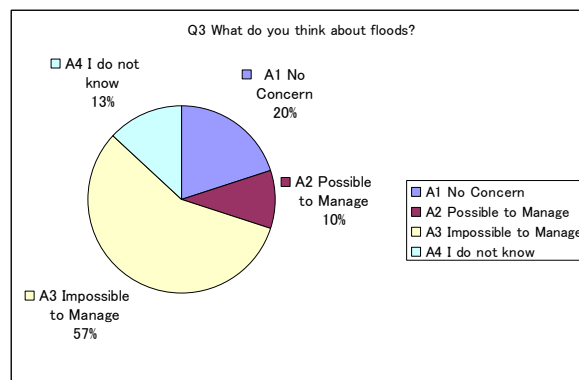


Fig. 3 People’s images of flood

(4) The reason of “Impossible to Manage”

People are afraid of anxieties and damages from flood. Power cut and economic (money) problems are also indicated. However, the conscious on the threat to the people’s lives is not so urgently.

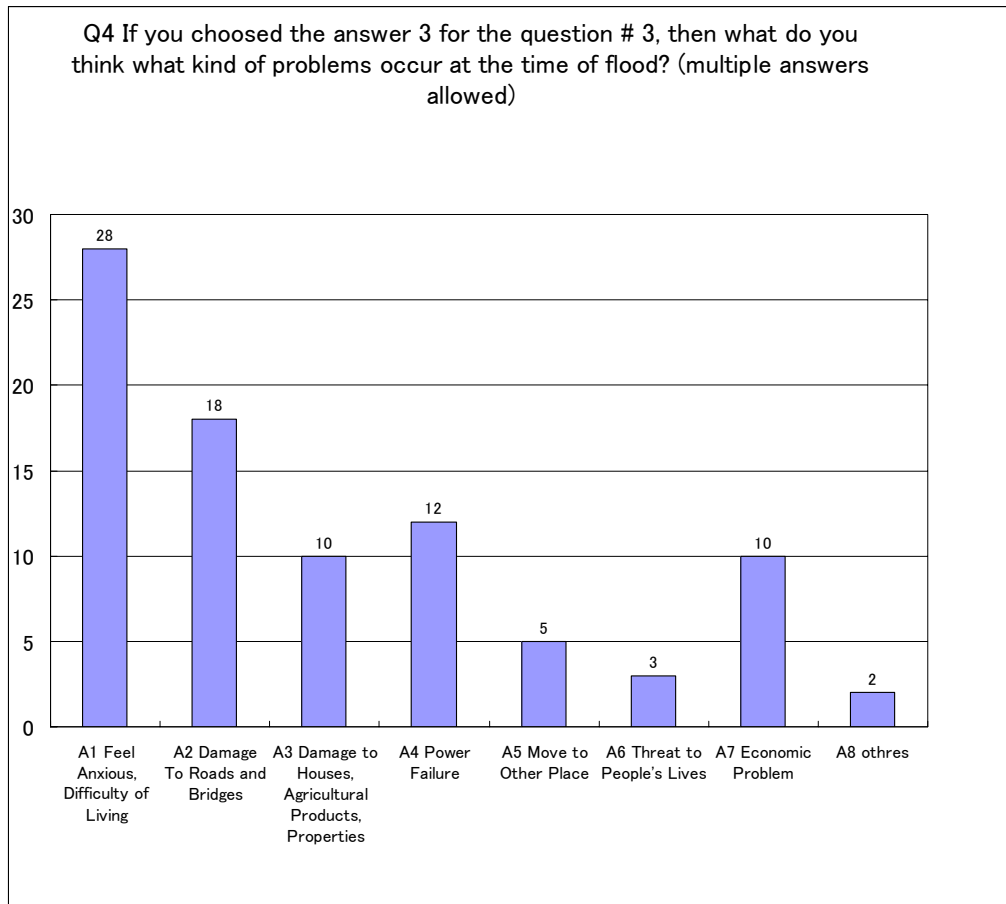


Fig. 4 The reason of “Impossible to Manage”

(5) Past experiences of flood damages

Almost half of interviewees answered that they have damaged from flood in past. Other half is no-damage experience or no answer.

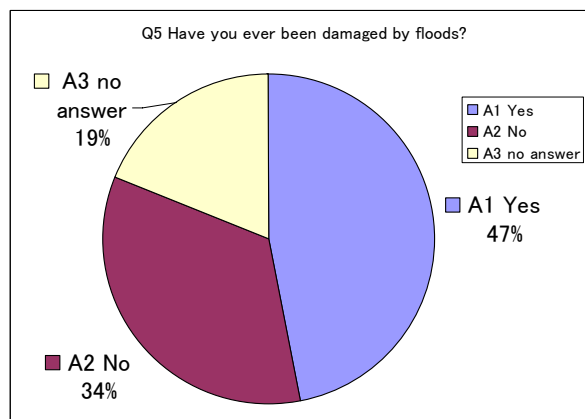


Fig. 5 Past experiences of damages from flood

(6) Total damage amount for each affected household
 61 households answered their damage amount from flood. The maximum and minimum amounts are 50000 and 44 somoni, respectively. The average of 61 is 6448 somoni.

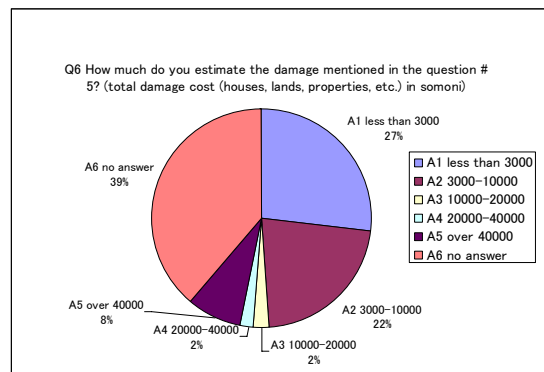


Fig. 6 Total damage amount for each affected household

(7) People's recognitions of the reasons of flood
 The half of interviewees thinks that the reason of flood is an extra high-water level of the river. 23 people mention that the weather conditions such like Pamir's snow-melting by high temperature. 14 and 2 persons mentioned the insufficient work of river bank and canal respectively.

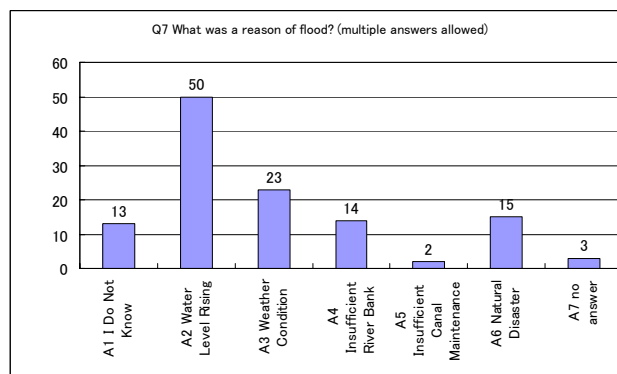


Fig. 7 People's recognitions of the reasons of flood

(8) People's anticipations about damages from flood
 The interviewees express higher concern to damages of agricultural field and livestock rather than human lives or houses.

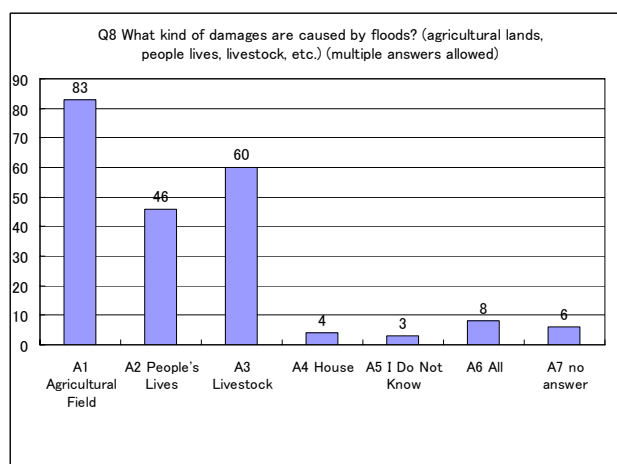


Fig. 8 People’s anticipations about damages from flood

(9) People’s recognitions of the available methods to know about future flood
70 % people reply that they have no idea about how to obtain information on future possible flood.

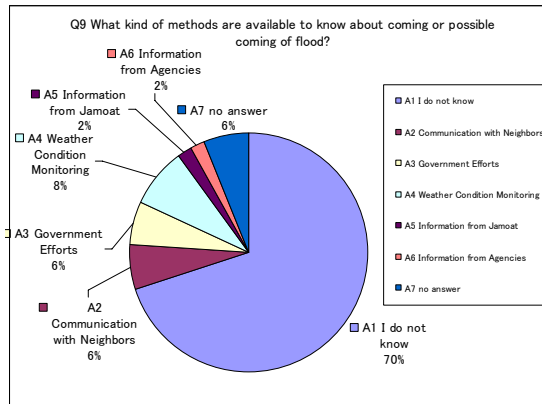


Fig. 9 Available methods to know about future flood

(10) How to obtain flood information (past experience)

People got the flood information from the Jamoat Office, neighbors and mass media including television and radio. However 21 people answered they got no information.

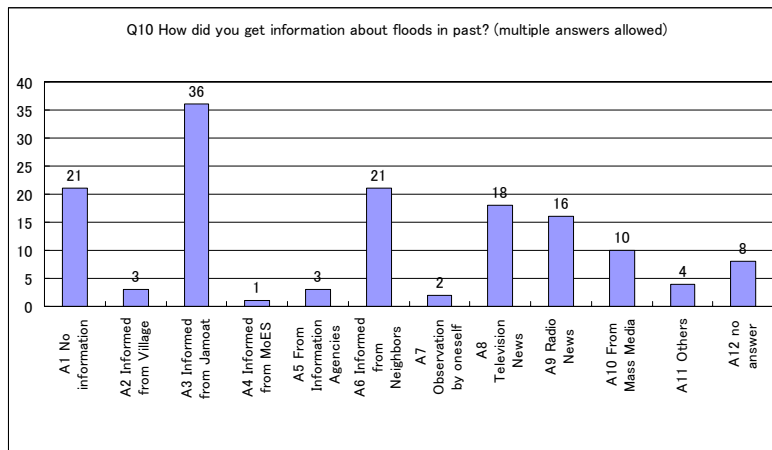


Fig. 10 How to obtain flood information (past experience)

(11) Evacuation area from flood and how to get information in future

Many interviewees said they will move to somewhere safe place like a hill, mountain or others. 8 interviewees answered they did not have any idea about evacuation areas. People expect to get information about flood from Jamoat, neighbors and mass media like television ore radio news in future emergency situations.

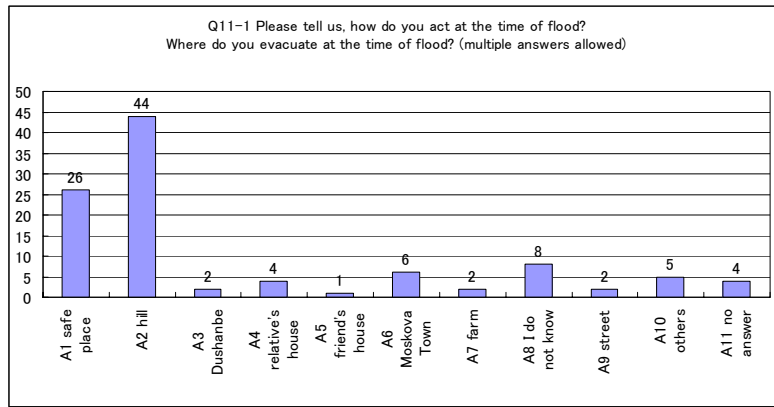


Fig. 11.1 Evacuation area from flood in future

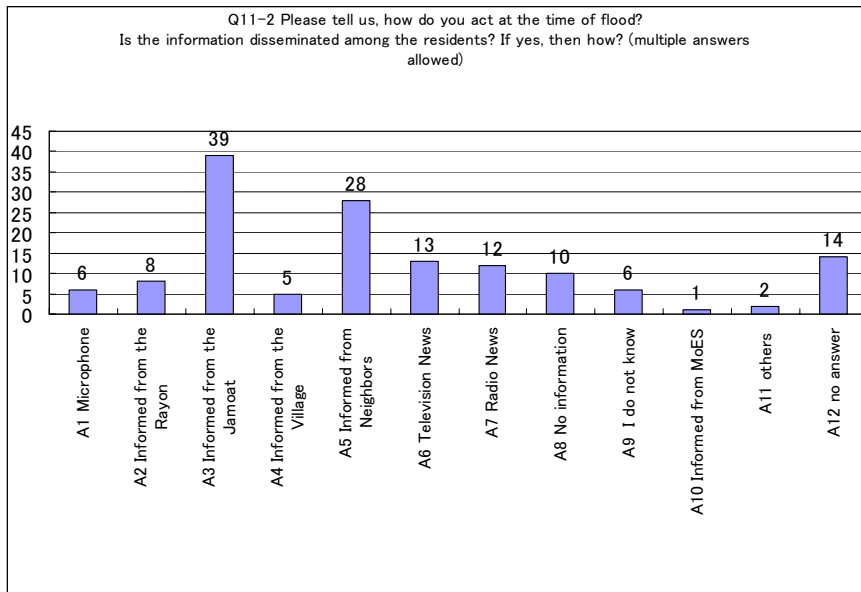


Fig. 11.2 How to get information about flood (future expectation)

(12) Community or individual level effort to avoid damages from flood
65 % of the interviewees answered that the community or individual level efforts to avoid damages from flood have been implemented. Regarding the effectiveness of those measures, over half of the interviewees recognize that those measures are effective.

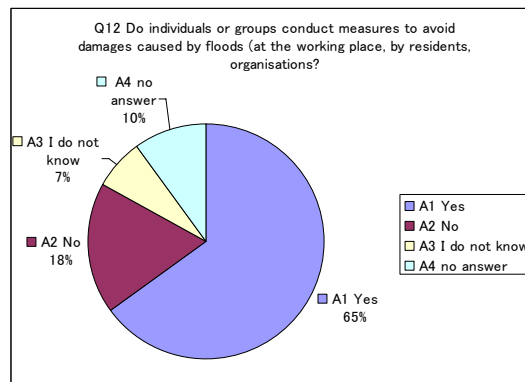


Fig. 12.1 People's recognition of community or individual level effort to avoid damages from flood

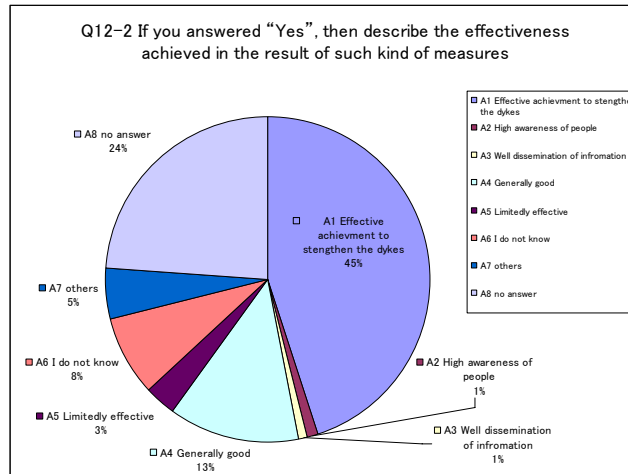


Fig. 12.2 People's evaluation on the effectiveness of measures

(13) Village's measures against flood

Nearly 80 % of the interviewees think that their villages conduct measures against flood, such as the reinforcement or construction of dikes mainly.

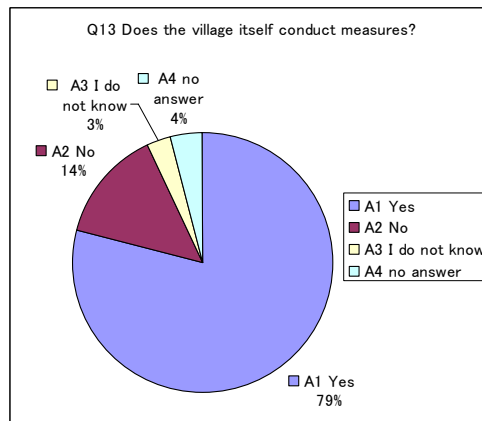


Fig. 13-1 People's recognition of village's measures against flood

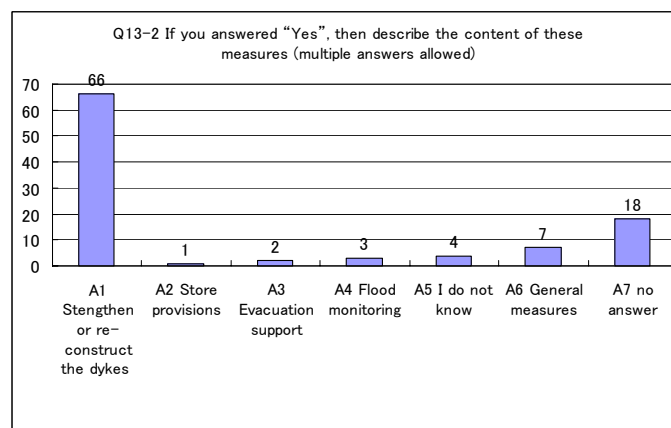


Fig. 13.2 People's recognition of the types of measures against flood by villages

(14) Effectiveness of existing flood prevention structures

50 % of the interviewees think existing flood prevention structures are very effective or effective. 39 % of the interviewees think that their effectiveness is limited. 5% think practically not effective.

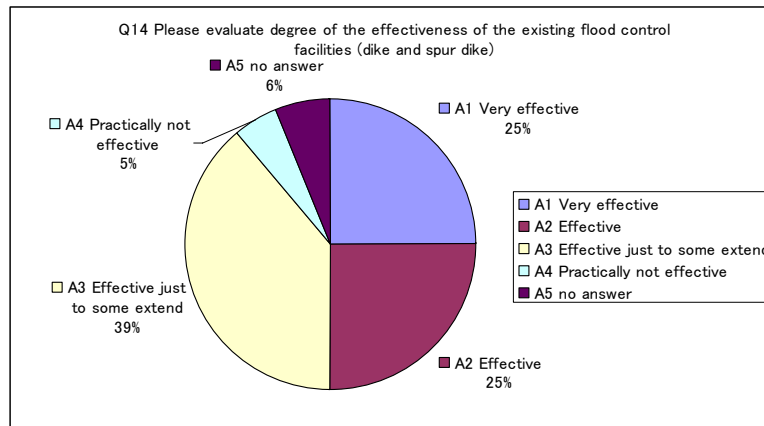


Fig. 14 People’s evaluation on the effectiveness of existing flood prevention structures

(15) People’s recognition on the flood control plan

The flood control plan of the government is not popular among the local residents. Only some people obtain the information through television news or radio rather than Jamoats or villages.

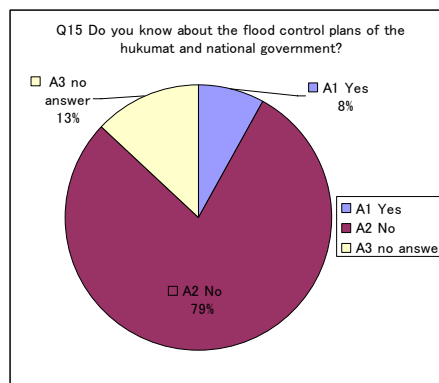


Fig. 15-1 People’s recognition about the flood management plan

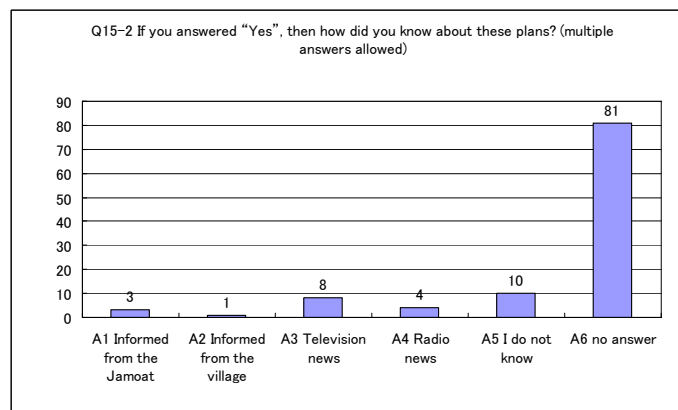


Fig. 15-2 Information sources about contents of the flood management plan

(16) Motivation for moving to another place

Three quarters of the interviewees think they do not want to move to another place. One fifth of the interviewees express their will to move because their houses are located in flood prone area.

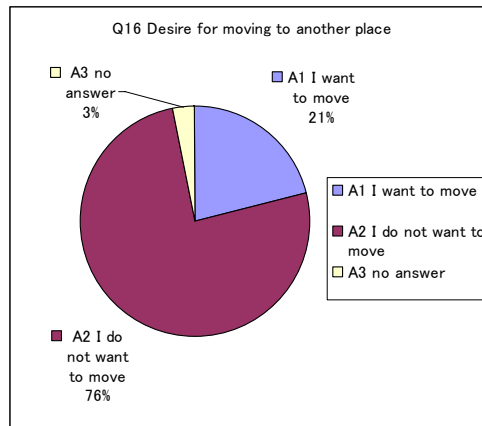


Fig. 16.1 Motivation for moving to another place

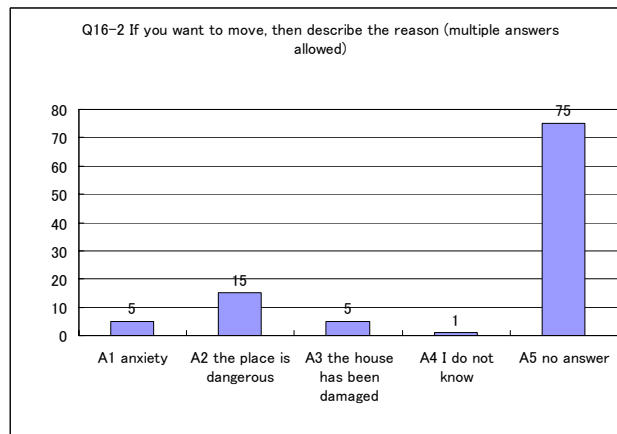


Fig. 16.2 The reasons of will for moving to another place

(17) People's expectation for the measures against flood

Nearly half of the local residents want that the dikes are constructed or reinforced to prevent flood. 35 interviewees show their ambiguous expectations to be better.

Q17 What do you expect for flood control measures in future? (multiple answers allowed)

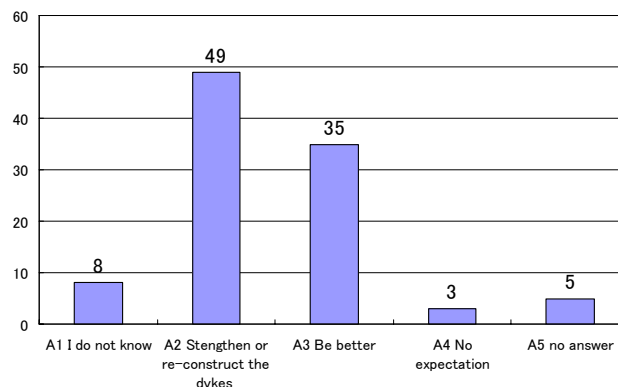


Fig. 17 People's expectation for the measures against flood

(18) People's will to participate in flood prevention activities

About 90 percent of the interviewees express their positive will to participate in flood prevention activities.

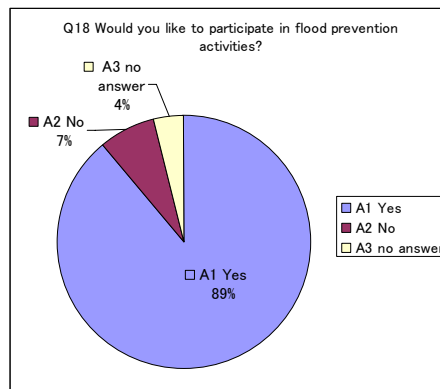


Fig. 18 People’s will to participate in flood prevention activities

(19) Types of activities against flood which residents want to participate in
 The activities they want to participate are water-level monitoring, evacuation training, joining the rescue teams. They have no concern with hazard mapping / risk mapping.

Q19 If you answered “Yes” for Question #18, then in what kind of activities would you like to participate? (multiple answers allowed)

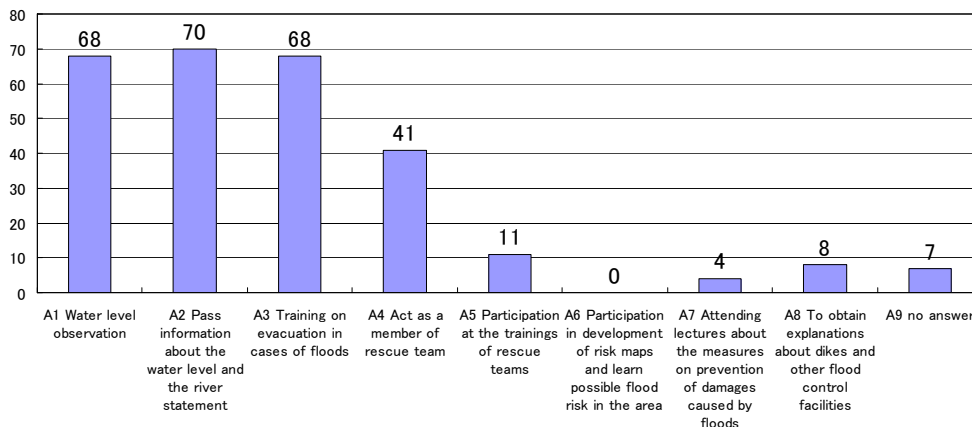


Fig. 19 Type of flood prevention activities which people want to participate in

(20) People’s important properties
 The top five important properties are houses, livestock, belongings, cars and agricultural fields.

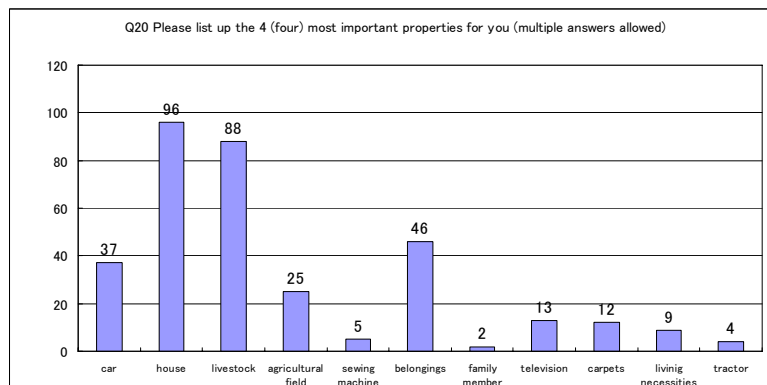


Fig. 20 People’s important properties

***ANNEXES 3
NEWALETTERS ON
FLOOD-EVACUATION DRILL***



Newsletter on the Study on Natural Disaster Prevention in Pyanj River

Vol.1

24 April 2007

On 5-6 May 2007, the CoES and the JICA Study Team will conduct a Flood Evacuation Drill (Disaster Simulation Exercise and Field Evacuation Drill) in Hukumat of Hamadoni and Mahala Navobod, Kishlak Tagnob, Jamoat Dashti Gulo.

1. Objective of the Master Plan

Increase in security and decrease in vulnerability to flooding in Hamadoni, using both structural measures (reinforcement of dikes, etc.) and non-structural measures (evacuation drill, etc.).

2. Objective of the Evacuation Drill

Through a disaster simulation exercise for decision makers to practice their abilities of communication (using VHF radios, etc.) and circumstantial judgment (identification of the flood warning level, etc.) and a field evacuation drill involving local residents with actual evacuations, the non-structural part of the current master plan by “THE STUDY ON NATURAL DISASTER PREVENTION IN PYANJ RIVER” is spread among the all stakeholders and, if needed, the subjects to be improved and the necessary corrective measures would be clarified.

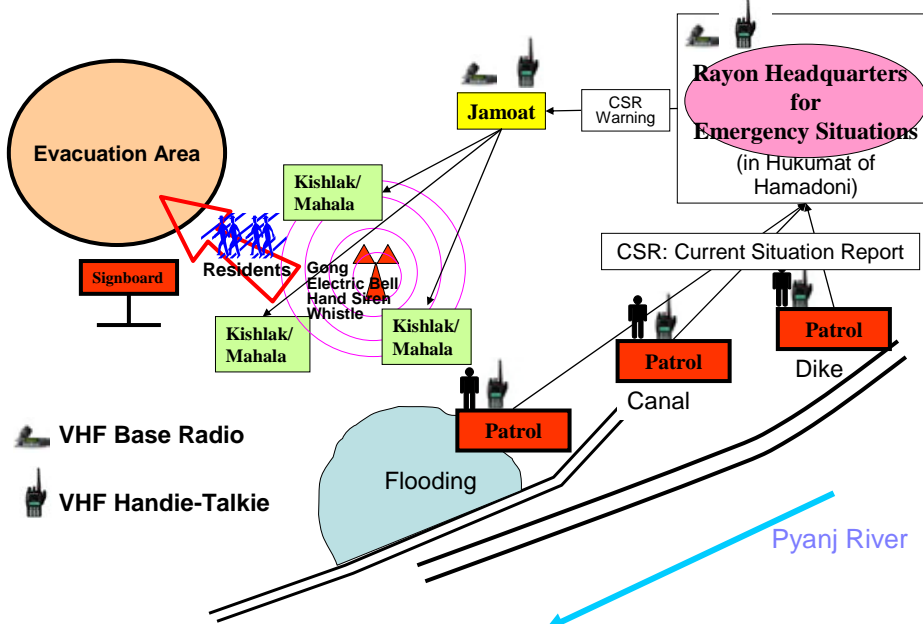
3. Evacuation Framework in Hamadoni

The Rayon Headquarters for Emergency Situations in Hamadoni disseminates 4 levels of flood warning (see the figure on right-hand side) based on the Current Situation Report submitted by the Patrol Team. Representatives of Jamoats, Kishlaks and Mahalas transfer the warnings to local residents (see the figure below).

Flood Warning Level



Evacuation Framework in Hamadoni (Master Plan)



4. Schedule of the Evacuation Drill

A. Disaster Simulation Exercise

- Date: 13:00-17:00, Saturday, 5 May 2007
- Venue: Conference Hall, (2nd floor of the Hukumat of Hamadoni)
- Participants: Disaster Simulation Exercise including a lecture on VHF radios for the representatives in charge of disaster management in CoES, Hukumat of Hamadoni, Patrol Teams, Jamoat Offices, Chiefs of Kishlak and Mahala (without local residents).

B. Field Evacuation Drill and Evaluation Meeting

- Date: 08:00-11:45, 15:00-16:30, Sunday, 6 May 2007
- Venue: Mahala Navobod, Kishlak Tagnob, Jamoat Dashti Gulo
- Participants: Local residents in Mahala Navobod

5. Contents of the Evacuation Drill

A. Disaster Simulation Exercise

- Lecture on how to use VHF radios (Handie Talkie and vehicle-mounted mobile).
- The representatives of Central Government (CoES Headquarters), Hukumat of Hamadoni, Patrol Team, Jamoat Offices, Chiefs of Kishlak and Mahala are gathered in an operation room to practice their roles and procedures of receiving, interpreting and transferring the information.

B. Field Evacuation Drill

- Set up the Rayon Headquarters for Emergency Situations in Hamadoni.
- Organize and dispatch the Patrol Teams with VHF radios to dikes and canals.
- Rayon Headquarters disseminates the flood warning for evacuation based on the Current Situation Report from the Patrol Teams.
- Jamoat Office, Chief of Kishlak or Mahala transfer the evacuation warning to local residents.
- Local residents evacuate to the safe areas.
- The Rayon Headquarters are informed that the evacuation has been completed after the confirmation by Jamoat Chief based on the report from the Chief of Kishlak or Mahala.
- After the Drill, an evaluation meeting will be held to clarify the subjects to be improved and the necessary measures.



Newsletter on the Study on Natural Disaster Prevention in Pyanj River

Vol.2

29 April 2007

The Flood Evacuation Drill on 5-6 May 2007 consists of two separate programs: a Disaster Simulation Exercise on the first day and a Field Evacuation Drill on the second day.

1. What is Disaster Simulation Exercise?

Disaster Simulation Exercise is widely implemented to learn what to do when a disaster occurs. The stakeholders gather in a room to simulate their behaviors along the supposed disaster situation (scenario), using a large size map, color markers, etc. The key persons in charge of disaster management are responsible to consider various kinds of emergency situations well in advance of the disaster occurrence. The Disaster Simulation Exercise is available to train them efficiently for a variety of disasters with relatively low-amount of labor, cost and time because the exercise includes no real action in the field.



Disaster Simulation Exercise in Japan (Ref.: White Paper on Disaster Management, Cabinet Office, Japan, 2006)

2. Contents of the Disaster Simulation Exercise on 5 May 2007

Next Saturday, 5 May 2007, the representatives of concerned organizations will participate in the Disaster Simulation Exercise at the conference hall of the Hukumat of Hamadoni, targeting a snow-melting flood in Pyanj River. The scenario is according to the master plan of the snow-melting flood disaster management in Pyanji River. That is, the flood warning levels are raised from “STAND-BY”(putting flood fighting groups on stand-by) ->”WARNING “ (preparation of evacuation)-> “ALERT” (start of evacuation) -> “CRITICAL” (dykes are facing breaches) in response to the water levels in Pyanj River or canals. The representatives will simulate the procedure on how to get and transfer the information to local residents in response to each flood warning level.

The lecture on VHF radios (VHF Handie-Talkies and Vehicle-Mounted VHF radios) are also planned because the Rayon Headquarters for Emergency Situations in Hamadoni (Hukumat of Hamadoni), the Patrol Teams monitoring the water level and erosion of dikes / canals, and the Jamoat Offices will use VHF radios for real-time communication.

3. Trial of The Field Evacuation Drill on 6 May 2007

Based on the previous afternoon's experience, the representatives will lead the people to conduct a Field Evacuation Drill in Mahala Navobod of Kishlak Tagnob in Jamoat Dashti Gulo on the morning of Sunday, 6 May 2007. The scenario of the Drill will start from the ALERT (start of evacuation) level of the flood warning. (A) Firstly, the Patrol Team will submit the Current Situation Report (CSR) about "Water level at Chubek Intake reaches the Alert Level" to the Rayon Headquarters. (B) Then the Rayon Headquarters will disseminate the ALERT level flood warning for starting evacuations to Jamoat Chiefs by VHF radio (Base or Handie Talkie). (C) The Jamoat Chief of Dashti Gulo transfers the ALERT warning to the representative of Kishlak Tagnob by dispatching a messenger, vehicle mounted loud-speaker, or mobile phone, etc. (D) The representative of Kishlak Tagnob will inform to the representative of Mahala Navobod using a messenger or other means of communication. (E) The Representative of Mahala Navobod will disseminate the ALERT to the all household through the neighboring network, Hand Siren, car horn, whistle, etc. (F) The local residents will move to the evacuation area (Grachev Farm or Zoli Zar Hill in Rayon Farkhor). (G) The representative of the Navobod will report to the Representative of Kishlak Tagnob about the completion of the evacuation after confirming that the local residents arrived at the evacuation area. (H) The Representative of Kishlak Tagnob will inform to the Jamoat Chief of Dashti Gulo or the Rayon Headquarters about the completion of the evacuation.

Through the real action of the Drill, the local residents identify the both good and bad points of present evacuation plan. Their experiences will be discussed at the evaluation meeting on the same evening from the view points of (1) what are the problems of the current evacuation plan?, (2) how can we solve the problems?, and (3) who or which is responsible to implement the countermeasure?

4. Important Reminder:

Basically, the flood warning levels are raised from "STAND-BY" ->"WARNING" -> "ALERT" -> "CRITICAL" in response to the water levels in Pyanj River or canals. However, once an erosion of dikes / canals is identified, the warning level should be raised to "CRITICAL" so as to the people in flood prone areas start to evacuate immediately.

This kind of drill is applicable to other part of Hamadoni for various types of emergency situations. We hope the people in Hamadoni become familiar with the procedure of the Drill and apply it in near future to reduce their own risk.

For a better tomorrow for all.

THE STUDY ON NATURAL DISASTER PREVENTION IN PYANJ RIVER IN THE REPUBLIC OF TAJIKISTAN

JICA Study Team Office in Tajikistan:

734012, Republic of Tajikistan, Dushanbe, Lohuti str., 26, Committee of Emergency Situations and Civil Defense, 3rd Floor

tel: +992-37-227-28-36



Newsletter on the Study on Natural Disaster Prevention in Pyanj River

Vol.3

3 May 2007

The Field Evacuation Drill on 6 May 2007 for the local residents at Mahala Navobod of Kishlak Tagnob in Jamoat Dashti Gulo (the Disaster Simulation Exercise on 5 May 2007 is targeting the representatives only), the people of Navobod evacuate to the safe areas in accordance with the flood warning disseminated by the Rayon Headquarters for Emergency Situations based on the Current Situation Report from the Patrol Teams. After the Drill, an evaluation meeting for improvement will be held. The schedule is as follows:

Time	Contents	Remarks
8:00	Start of the Preparatory Meeting	Outdoor Meeting Space at Navobod, Tagnob
8:00	Opening address	by Hukumat of Hamadoni
8:05	Explanation of the Drill	by JICA Study Team
8:30	End of the Preparatory Meeting	
8:30	Start to get in position	
9:00	Start of the Field Evacuation Drill	
11:45	End of the Field Evacuation Drill	
15:00	Start of the Evaluation Meeting	Outdoor Meeting Space at Navobod, Tagnob
15:00	Briefing on today's results	by JICA Study Team
15:20	Discussion 1. What are the problems of the current evacuation plan? 2. How can we solve the problems? 3. Who or which is responsible to implement the countermeasure?	
16:25	Closing Address	by Hukumat of Hamadoni
16:30	End of the Evaluation Meeting	

This kind of drill is applicable to other part of Hamadoni for various types of emergency situations. We hope the people in Hamadoni become familiar with the procedure of the Drill and apply it in near future to reduce their own risk.

For a better tomorrow for all.

THE STUDY ON NATURAL DISASTER PREVENTION IN PYANJ RIVER IN THE REPUBLIC OF TAJIKISTAN

JICA Study Team Office in Tajikistan:

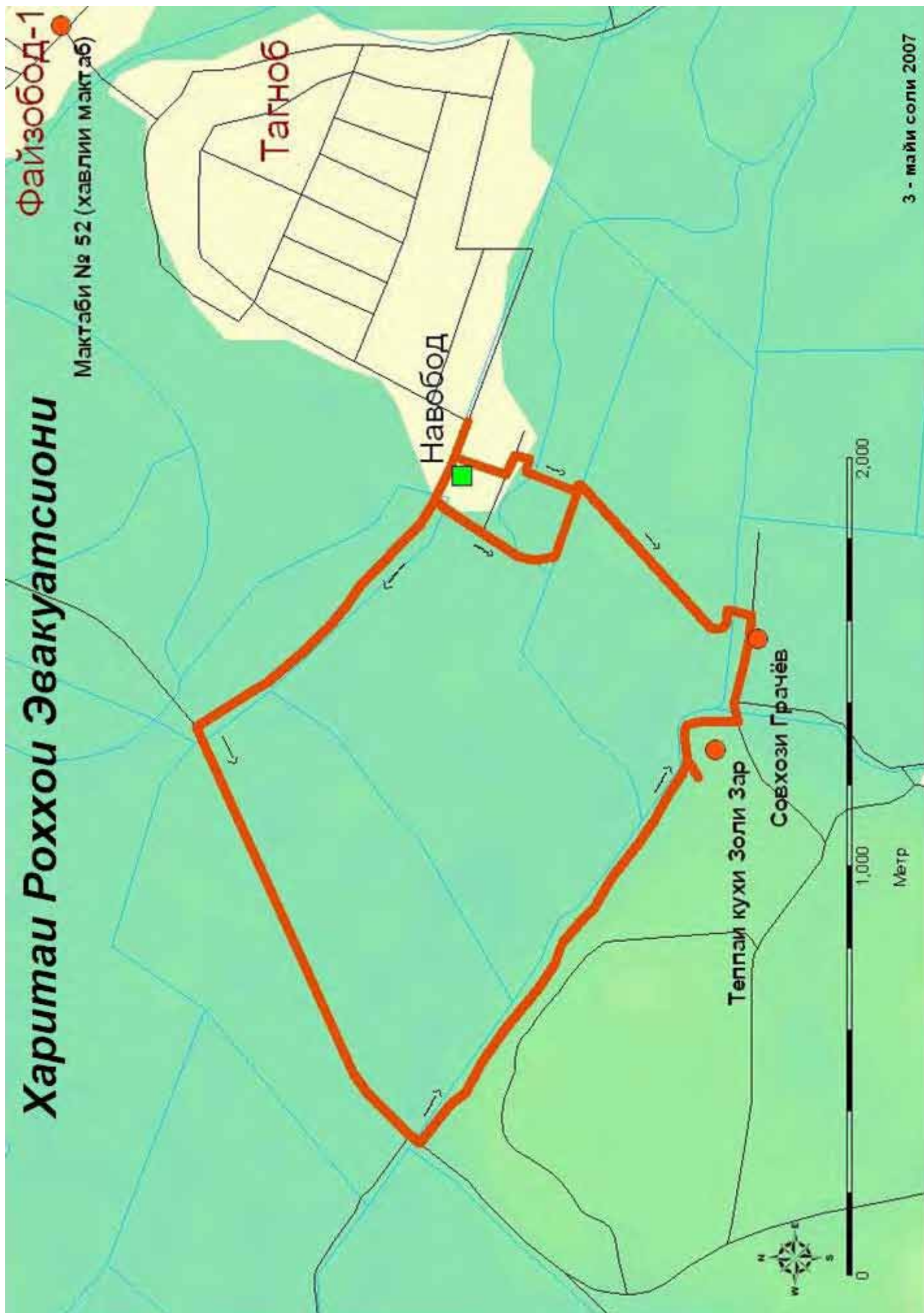
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tel: +992-37-227-28-36

Харитаи Роҳҳои Эвакуатсионӣ

Файзобод-1

Мақтаби № 52 (хавлии мактаб)



3 - майи соли 2007



Newsletter on The Study on Natural Disaster Prevention in Pyanj River



Vol.4, 21 May 2007

Result of the Evacuation Drill on 5-6 May 2007

Day 1: 13:50-16:30, Saturday, 5 May 2007

A Disaster Simulation Exercise was conducted at the Conference Hall of Hukumat of Hamadoni. There were 12 participants from CoES Headquarters of Dushanbe, CoES Local Headquarters in Kulyab, CoES Local Headquarters in Hamadoni, Hukumat of Hamadoni, Jamoat Chiefs / Representatives and Head of Mahala Navobod. Firstly, the participants learned how to use the VHF Handie-Talkie and Mobile (vehicle-mounted type). Then, the Disaster Simulation Exercise was operated along a scenario of flood situation. The emergency communication was simulated and described on a large-size map, using color felt pens and markers. The participants identified an inadequacy of emergency communication network between Jamoat Offices and Kishlaks as well as each Kishlak and Mahalas.



Day 2: 08:00-11:20, Sunday, 6 May 2007

A Field Evacuation Drill involving local residents was implemented at Mahala Navobod (around 60 households, 400 population) of Kishlak Tagnob in Jamoat Dashti Gulo. The total participants are around 220 (around 210 local residents, 10 officials and representatives). They actually examined the evacuation route for walk by themselves.



Just after the Field Evacuation Drill, an Evaluation Meeting was held at the open space in Navobod. The participants (both government officials and local residents) identified an unstable temporal bridge as a major obstacle. That is, around 50 of 210 local residents could not cross the bridge. The reasons are: 1) the bridge wobbles so precariously that some people feel scared, 2) several women carries their babies in their arms, 3) bad health conditions, etc. They also discussed about the countermeasures and responsibility of the implementation. Eventually, they decided that an application would be submitted to the construction department of the Hukumat of Hamadoni for cost estimation on the improvement of the bridge. The application will be prepared by the Head of Kishlak Tagnob in cooperation with Head of Mahala Navobod and representatives of the local residents.



Seminar on the Draft Master Plan on 17 May 2007

The Seminar on the Draft Master Plan on Pyanji River Flood Mitigation has been conducted at Dushanbe on 17 May 2007. The participants are: President Apparatus, CoES, MMWR, Agency on Hydrometeorology, Tojikkoinot, Tajikgeology, Institute of Earthquake Engineering and Seismology, Center of Competence for Disaster Reduction, Dushanbe City Aerospace and Geodesy Enterprise, FOCUS Humanitarian Assistance, ADB, UNDRMP, Embassy of Japan, JICA Tajikistan Office and JICA Study Team. Both structural and non-structural plans were discussed among the delegates. The summary of the Flood Evacuation Drill on 5-6 May 2007 in Hamadoni was also presented by the JICA Study Team, as well as other part of the Master Plan. The representatives of the Central Government Officials were deeply impressed about the Drill's result and current situations of Navobod.



Indicator of the Maximum Water Level in the 2005 Flood

Under the cooperation between the Jamoat Office of Dashti Gulo and JICA Study Team, several indicators which show the maximum water level at the flood in summer of 2005 are settled on the street. The sites are an ex-post office near a mosque, market building, store on a main road, cotton factory, and restaurant in Jamoat Dashti Gulo. These indicators are expected to raise people's awareness on flood preparedness.



For a better tomorrow for all.

THE STUDY ON NATURAL DISASTER PREVENTION IN PYANJ RIVER IN THE REPUBLIC OF TAJIKISTAN

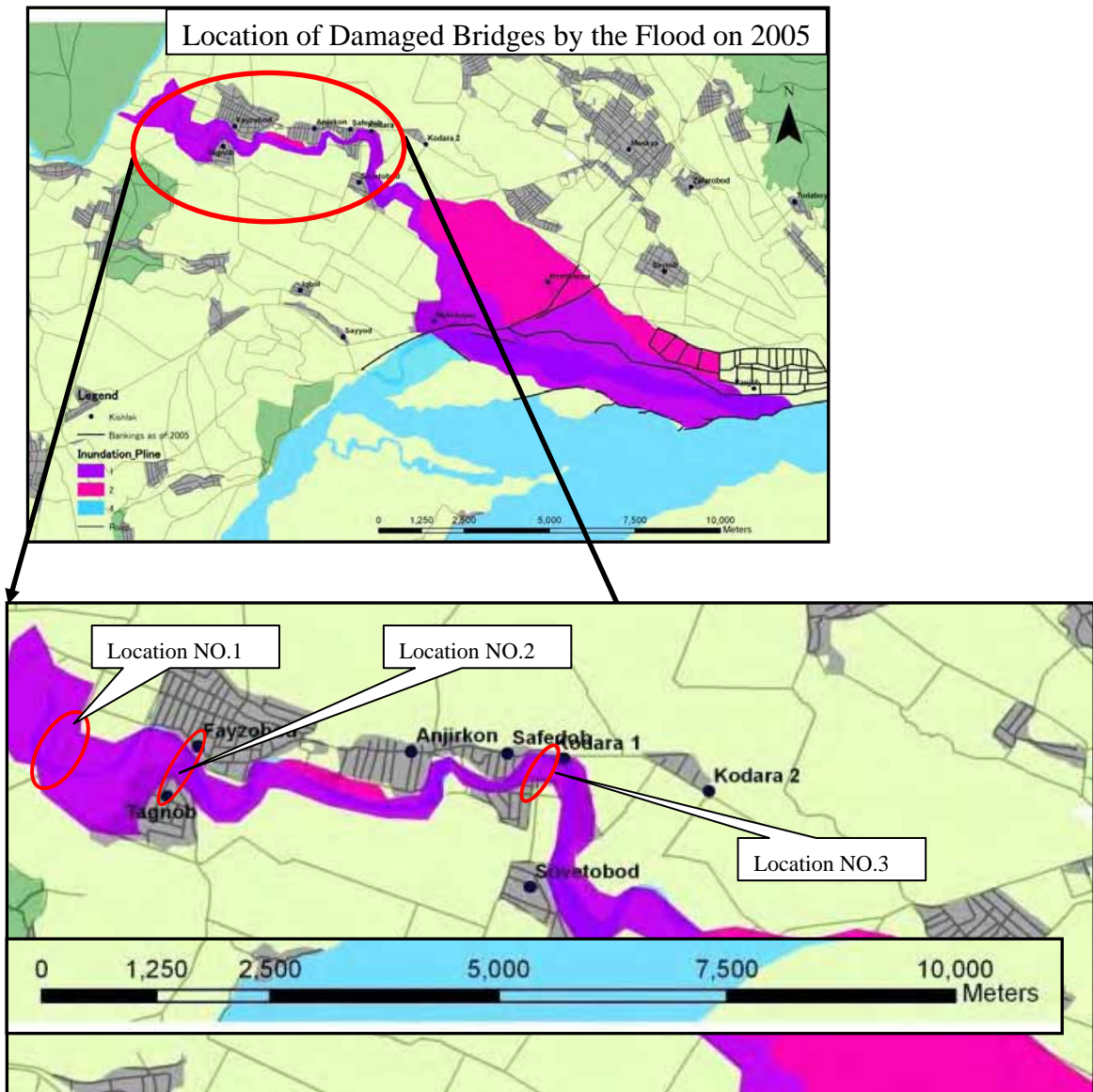
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***ANNEXES 4
BRIDGE DAMAGES BY THE 2005 FLOOD***

Appendix: Bridge Damages by the 2005 Flood



Location No.1

Bridge on Fakhor Road before the Mukhor

During the Flood, the flow were flow over the Bridge and scoring the both side of embankment on approach road.

Since this is the main road, repair work was conducted within six months after the Flood.



Location No.2

Bridge is located between Fayzobod and Tagnob. After the flood on July 2005, rehabilitation works was not planned due to the limitation of budget at the national and local government.



Main body of the Bridge (length 20.0 m, width 8.0 m) was not damaged by Flood



Flood had scouring the embankment materials of both side of the Bridge, width is 474.0 m
People have a car use Farkhor Bridge and student and other people who want to come from Tagnob to Fayzobod use temporary steel bridge at downstream of the Bridge.



Width of River
is 298.0 m.



Location No.3

Bridge is located in Kodara 1, it also not repair since July 2005.



Right Side



Length from car to bridge is 50.0 m and to the river dike is 120.0 m

Left Side



Length from car to pavement portion is 58.0 m and to the edge of the dike is 192.0 m



Face to Left side



Face to Right side



Size of the Bridge is 20.0 m long and 8.0 m wide. Four (4) spans with five (5) lines of five (5) concrete piles (350 mm x 300 mm). Length of concrete pile is 8.0 m (based on the site interview).



Sedimentation along the piles



Damaged concrete piles



Waterway is changed after the flood and bridge is isolated in the middle of river

(Survey on July 20 2007, JICA Study Team)