

THE STATE COMMISSION OF KYRGHYZ REPUBLIC ON EMERGENCIES AND
CIVIL DEFENCE

NATIONAL REPORT OF KYRGHYZ REPUBLIC

Prepared for the IDNDR Mid-Term Review and the 1994 World

Conference on Natural Disaster Reduction

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I. OVERVIEW OF PROBLEM AND EXECUTIVE SUMMARY

All the countries are responsible for protection own people, public facilities and other national property from influence of the disasters. This is fundamental principle of the International Decade for Natural Disaster Reduction is mentioned in the International Framework.

Kyrgyz Republic pays much attention to increase the stability of territorial complex of population and economy against influence of the hazardous processes.

On 1 July 1991 the Cabinet of Ministers of Republic Kyrgyzstan (when it was part of the former Soviet Union) took decision to create a State Commission on Emergencies as a permanent body of the Cabinet.

On 27 May 1993 according to President's Decree it was changed into The State Commission of the Kyrgyz Republic on Emergencis and Civil Defense (SCKRE and CD, or shorter: SCE and CD).

According to Kyrgyz Government's Decree (N 536, 4 November 1993) SCE and CD is a state institution which coordinates executive bodies in the sphere of civil defence, prevention and abolition effects of disasters.

SCE and CD is responsible for elaboration and working out measures directed for prevention emergencies, protection people and national property, for increasing the stability of economical objects in case of disaster.

Thus, the creation of the SCE and CD, it's functions and tasks are entirely in accordance with aims declared by International Decade for Natural Disaster Reduction and they are identical with aims and tasks of National IDNDR Committee.

In the second chapter features of Kyrgyz nature and caused by them disasters are presented.

About 70 types of the hazards are spread in the world. More than 20 of them occurs in the territory of Kyrgyzstan. They are: debris-flows; flash-floods; landslides; snow avalanches;

rockfalls, firn and ice avalanches; squall winds; heavy rainfalls; ice crust; hail; frosts; draughts; floods; thermokarst, solifluction; pulsations and surges of glaciers, courumes, land collapses and salting; arising underground water level; djut and etc.

Dissemination, repeatedness, caused damage of these events change from year by year, but nevertheless, it is possible to say, that in a long-term period the following hazards are the most dangerous for people and economy of Kyrghyzstan:

- earthquakes;
- debris-flows and flash floods;
- rockfalls and landslides;
- spring frosts and snowfalls;
- snow avalanches.

In 1993 produced national income of Kyrghyz Republic has come to 4650 millions soms (Kyrghyz currency) or 422 millions USD. The sum of direct property's losses caused by disasters has come about 40 millions soms or 3, 6 millions USD.

In the third chapter the measures are undertaken by SCE and CD directed to prevention and abolition effect of disasters are described. Analysis shows, that financially priority belongs to measures connected with abolition consequences of disasters, moreover the direct financial aid for people stands first among other measures.

This correlation is enforced. It is explained by the extreme low standards of living (in 1993 the per-capita income was about 42 USD) so the Government through the SCE and CD suffers for direct payments to affected people.

According to General Combined Scheme of Engineering Protection Territory of Kyrghyz Republic from dangerous physical-geological events and processes, the expenses of protectional measures against debris-flow, rockfalls, snow avalanches in two regions (Osh and Jalal-Abad regions) come to 1,96 milliard USD (recent rates). These expenditures are exhausting for Kyrghyz Republic.

High extent of frequency of disasters and low economic level of development condemn to allocate primely funds for abolition effects of disaster, although economy expediency (even without considering prevention of deaths) of prevention works is

beyond all manner of doubts.

For example, effectiveness of works on forced throw of snow avalanches in 1985-1999 in the 6 road passes has come to about 200 thousand USD per year (recent rates).

In the fourth chapter information about existing Systems for Observing, Forecasting and Warning is given.

Two departments: Institute of Seismology of National Academy of Sciences and Agency on Hydrometeorology have the most developed network for observing dangerous natural events and condition of environment.

The activities of Institute of Seismology are directed to seismic zoning and forecasting strong earthquake. The institute, being Academician institution carries out function of the State Seismological Service and takes part directly in works connected with mitigation natural disasters. The Institute and the methodic seismological expedition together have developed network consisting of 32 seismological, 10 geophysical, 6 hydrogeochemical and 6 hydrogeodynamic station, which allow to conduct continuous measurements and to analyze dates in forecasting commissions in order to evaluate seismic conditions.

The network of the Agency on Hydrometeorology accounts 123 hydrological sites, 6 lake sites, 39 meteorological stations including 4 snow avalanche's station, 1 lake observatory, 1 water balance station, 15 agrometeorological sites, 5 aviameteorological stations, 1 hydrometeorological station, 15 control sites for air pollution. All meteorological stations carries out continuous observations for atmospheric events and 8 times a day for meteorological elements. All branches of the Agency work out observations for dangerous hydrometeorological events and transfer information to determined addresses.

Operative hydrometeorological and agrometeorological information is disseminated to the institutions and population by the all available means of connection: by TV and radio, with help of telex and telephone connection, weather panels by post and special delivery.

The Ministry of Geology, Using and Preservation Bowels is undertaking observations for landslides begins from the middle 1950-ies. System for observing landslides includes air visible and field investigation, setting control points for seeing

landslide movement, measurements in drills for underground water. More than 2500 landslides has been registered by air visible observations in the Osh and Jalal-Abad regions. 1184 landslides has been examined by field observations.

There were permanent regular observations on 23 landslides. Now, because of the lack of funds most of the works has been stopped. SCE and CD and local administrations are informed in case of landslide activity.

The system for warning and notification about emergencies is based on the former civil defence system.

Operating duty officer notificates head quarter, civil defence regiment and regional capitals.

Big enterprises and institution in each city have sirens for notification. Besides this, regional and district centers can be notificated by the radio.

The use TV and broadcast is possible in order to notificate about extreme situation in some cases.

In the fifth chapter information about established international connections in the field of prevention and abolition effects natural disasters is presented.

Kyrghyz Republic realizes international cooperation in several directions:

- multilateral cooperation;
- bilateral cooperation;
- cooperation with international institutions.

Multilateral cooperation is realized in the frames of two treaties with CIS-countries. At first, this is the agreement about Interstate Council on Emergencies of Natural and Technogenic Character. Azerbaijan, Armenia, Byelorussia, Kazakhstan, Kyrghyzstan, Turkmenistan, Uzbekistan are the participants of the Council.

Kyrghyz Republic is also the participant of the agreement between countries of the Central Asia (Kazakhstan, Kyrghyzstan, Tadjikistan, Turkmenistan, Uzbekistan) about cooperation on problem of Aral Sea.

Bilateral cooperation is the most effectively developing with Russian Federation. In spite of absence the agreement (draft agreement between the Government of Russian Federation and Government of Kyrghyz Republic about cooperation in the sphere of

prevention industrial accidents, natural disasters and abolition their consequences is being on final stage of editing) in 1992 Russian Federation has rendered sufficient material and financial aid for liquidation consequences of the disastrous earthquake.

Contacts have established with German IDNDR Committee. Exchange of delegation took place in the frames of the this contacts. The concrete directions of the cooperation has been determined as a result of the exchange.

Cooperation with international institutions is being on the stage of establishment contacts. Contacts has been established with: International Federation of Red Cross and Red Crescent Societies; Economic and Social Commission for Asia and the Pacific (United Nations); Department of humanitarian Affairs Relief Co-ordination Branch (United Nations); United Nations Center for Urgent Environmental Assistance; United Nations Development Program.

Naturally, the most developed links have been established with IDNDR-Secretariat. The experience of common work has been appeared, information exchange has been organized.

Russian Federation and Kyrghyz Republic cooperate in rendering aid for Tadjikistan. Specifically, Kyrghyzstan ensures function of the road Osh-Khorogh. The Gorny Badahshan region is supplied by this road. Kyrghyz Republic has rendered humanitarian aid to people of Abkhazia suffered from war.

The possibilities in rendering material and financial aid for other countries are limited. Technical assist assistance taking into consideration the skill of our experts, can be rendered in hazards mapping, seismic resistance designing, designing hydrotechnical protective constructions, rescue works in high mountains, industrial mountaineering.

II. HAZARDS IN THE TERRITORY OF KYRGHYZ REPUBLIC

The territory of Kyrghyz Republic (198,5 thousand square km) and population (about 4,5 million) is exposure to active influence of hazards, which cause disasters in populated places.

Mountain relief is the main special feature among natural conditions of the republic. 94,2 % of the territory lies higher than 1000 m above sea level and 40,8 % of the territory is higher

3000 m above sea level. Mean altitude of the territory is 2750 m above sea level. The highest point (Victory Peak) - 7439 m.

Climate is continental and accompanied by big contrasts connected with altitudinal climatic zonality. The maximum of daily air temperature is 44 plus degrees of Celsius (Chy valley) and the minimum - 55 minus degrees of Celsius (Ak-Sai valley).

The maximum of precipitation (1090 mm in year) falls in the western slope of Fergana Ridge and the minimum (144 mm in year) falls on western side of Issik-Kul basin. High altitudes have predetermined wide development of glaciation. There are 8208 glaciers with total area of 8100 square km in the republic. There are about 30 000 rivers with the length more than 10 km, 1923 lakes among them about 100 lakes have area more than 20 hectares.

Mountain character of territory defines very uneven distribution of the population. There is a high density (90 persons in 1 square km) of the population in the settled intermountaine depressions and valleys and in the same time, highmountain regions are settled rare (2-3 persons per 1 square km). Average population's density is 20 persons per 1 square km. North of the republic is the most developed part. Districts of Chu valley produces 70 % of industrial production, 40 % of milk, 30 % of meat in total. Oasis system of settlement, placing industry, farm available lands have predetermined comparatively dense network of communications (roads, irrigation constructions, electricity power lines). For example, length of the roads comes to more than 23 400 km.

About 70 types of the hazards are spread in the world. More than 20 of them occurs in the territory of Kyrghyzstan. They are: debris-flows; flash-floods; landslides; snow avalanches; rockfalls, firn and ice avalanches; squall winds; heavy rainfalls; ice crust; hail; frosts; draughts; floods; thermokarst, solifluction; pulsations and surges of glaciers, courums, land collapses and salting; arising underground water level; djut and etc.

Earthquakes, by their destructive strength and heavy effects are the most dangerous natural hazards in the Kyrghyzstan. Fortunately, the recurrence of the disastrous earthquakes is not so frequent and is uncompareable with frequency of the other natural hazards.

Debris flows and flash floods are on the first place taking into consideration inflicted total damage (direct, indirect material and social damage) because of their exceptional prevalence and frequency. As a rule, settlements are drawn to flood-plains and alluvial cones because of the absence other flatted surfaces available for irrigated land-use and living. Especially it is typical for southern part of the republic, where lands have been limited.

Snow avalanches inflict insignificant direct material damage, but their indirect effects are very heavy since important vital communications are destroyed: electric power lines, roads. During 1950-1990 72 254 snow avalanches has been registered. Each fiftieth has inflicted damage. The main danger of snow avalanches is in annual human sacrifices caused by them. For the last 10 years (without 1994) snow avalanches have killed more people than other hazards put together, including earthquakes.

Rock falls and landslides are mainly being in the south of the Republic, where in some places, density of landslides is more than 30 per 1 square km.

About 2500 landslides have been registered in the south of the republic. Mining towns Mailyy-Suu, Sulukta, Ming-Kush and roads undergo the main damage from landslides.

In March and April 1994 106 persons died under the deposits of landslides in the south of the republic.

Outbursts of highmountain lakes can be attributed to separate type of the hazards. In 1993 3 events like these were registered.

There was not any examples of heavy industrial katastrofes involving serious social and ecological effects in the republic yet. Evidently, it is a matter of time only. The waste-deposits of mining enterprises are very dangerous. Most of them are toxic and radioactive. Outbursts of the dams of the waste-deposits have occurred.

In table 1 information about the most heavy natural disasters in the territory of Kyrghyz Republic occurred during 1985-1993 is presented.

Table 1

Information about the most heavy natural disaster in the territory of the Kyrghyz Republic occurred during 1985-1993

Year	Type of hazard caused disaster	Point of disasters (regions of the republic)	Material losses in million			Quantity of victims
			Kyrghyz soms	Russian roubles	USD	
1	2	3	4	5	6	7
1985	Snow avalanche	Jalal-Abad	no date	22,0	no date	without deaths
1986	Heavy rain, hail, debris flow	Osh, Jalal-abad		0,5		-//-
1987	heavy rain, falls, frosts, snowfalls	Osh		2,3		-//-
1988	Heavy rain, falls, debris flows, landslides	Osh		53,0		-//-
-//-	Earthquake (5-6 of Richter Scale)	Jalal-Abad, Chu, Naryn		3,0		-//-
-//-	Firn-ice avalanche	Osh		no data		38 men died
1989	Heavy rain, fall, snowfalls, frosts	Osh		4,0		without deaths
1990	Earthquake (6-7 of Richter Scale)	Issik-Kul		20,0		-//-
-//-	Flash flood	Issik-Kul		13,0		-//-

Continuation of table 1

1	2	3	4	5	6	7
	od					
1991	Debris flow	Chu		28,0	1,0	-//-
1992	Heavy rain falls, debris flow, landslides	Osh, Jalal-Abad		4300,0	21,5	-//-
-//-	Earthquake (9-10 of Richter Scale)	Jalal-Abad, Chy, Talas, Naryn		15000	75,0	53 men died, about 60 000 homeless
1993	Frosts, snowfalls	Chu, Osh, Talas	105	21000	26	without deaths
-//-	Debrisflow	Jalal-Abad	7,8	3,2	1,6	386 homeless
1994	Landslides	Osh, Jalal-Abad	420		35	106 men died, 3150 homeless

By origin, hazards can be divided into 4 groups. They are:

- atmospheric (heavy rainfall, wind, hail, frost, draught, snow, thunderstorm, lightning, dust storm);
- hydrospheric (debris flows, snow avalanches, flash floods, floods; arising of underground water, ice jams);
- lithospheric (landslides, rockfalls, earthquakes);
- mixed origin (flash flood caused by heavy rainfall or landslide caused by erosion and etc.

Quantity of fixed hazards's repeatedness change from year by year and within a year. For example, in 1987 109 cases were fixed, but in 1989 - 61 only. The main quantity of the occasions comes to the period from May to August (about 80 % of total). May and July are distinguished by maximum of the occasions.

In Table 2 the total quantity of fixed hazards's occurrences and their correlation are presented.

Table 2

The total quantity of fixed hazard's occurrences (without earthquake) and inflicted direct material damage (in rate 1984-1990) in the territory of Kyrghyz Republic during 1986-1990.

Quantity of fixed hazard's occurrences (by types of origin)								T O T A L	
Atmosphe- ric ha- zards		Hydrosphe- ric ha- zards		Litosphe- ric ha- zards		Mixed ha- zards		Quantity of occu- rencies	Damage (million roubles)
277	73,6	90	28,7	5	0,6	40	24,7	412	127,7
67%	58%	22%	22%	1%	1%	10%	19,7%	100%	100%

The most part of the losses (58 %) is inflicted by atmospheric hazards, but average sum of losses per single occurrence of mixed hazards is bigger than atmospheric ones (10 % of total quantity and 19% of total losses). In order to receive imagination about distribution of the losses and repeatedness of hazards on the territory, the losses have been arranged within administrative districts limits at interval of 5 million roubles. The repeatedness, within districts limits also has been arranged at following intervals: more than 1 time in year; 1 time in year; 1 time 2-4 year; 1 time in 5 year, less than 1 time in 5 year.

Thus, each administrative district was characterized by two indicators in the same time: value of losses and repeatedness of hazards for 5 year. It has been possible to select the administrative districts, with have been mostly suffered of hazards: Nookat district in Osh region, Nooken district in Jalal-Abad region, Ak-Suu district in Issik-Kul region, Jail district in Chu region.

In 1993 produced national income of Kyrghyz Republic has come to 4650 millions soms (Kyrghyz currency) or 422 millions USD. The sum of direct property's losses caused by disasters has come about 40 millions soms or 3, 6 millions USD.

III. MITIGATION ACTIVITIES.

Now there is no the united longterm state program, confirmed by the government in the republic. But it does not mean absence of policy and concrete measures for disaster reduction. In particular, two scientific-technical programs planned to 2000 existing now: academician program "Complex investigation of the natural and natural-technogenic catastrophes" and interdepartmental program "Sactoo" devoted to seismic safety.

All the mitigation activities can be bring together in following directions:

I. Planning

Annually SCE and CD makes a plan of activities for future year consisting of next subdivisions:

- repairing and restoring works at objects and protective constructions suffered by hazards;
- building engineering protective constructions;
- building engineering constructions, public facilities, homes in the district, where people must be replaced;
- designing and prospecting works for building protective constructions or for other protective and preventive measures;
- research works to evaluate exposure of the territory, objects to hazards and, in addition, forecasting and monitoring;
- researching and designing works for creation or improvement existing means for rescue and searching, elaboration methods of protective measures and constructions;
- equipping bodies of the SCE and CD by mechanisms, equipment, outfit, means of connections, material resources necessary for SCE and CD's activities.

In principle the process of taking decisions does not have notifying character.

For example, definition of the list and contain of repairing and restoring works, first of all, depends on strength and location of disaster, that is difficult to forecast. Thus, planning of repairing and restoring works means selection objects and order of priority.

Planning of building protective constructions can not be named notifying also. As a rule, this building begins after fixing a hazard.

First of all, this situation has been caused by lack of funds.

The General Combined Scheme of Engineering Protection Territory Kyrghyz Republic from dangerous physical-geological events and processes (debris flows, snow avalanches, landslides, rockfalls and screes) was finished in 1989 for Jalal-Abad and Osh regions. The purpose of the Scheme is a decisions several questions at once:

- revealing hazards;
- revealing approximate parameters of hazards and parameters their acting;
- determining potential losses from hazards;
- elaboration engineering protective measures for prevention or reduction potential disastrous influence of hazards;
- necessary investments for building protective constructions and suggestions on organization of building;
- economical effectiveness of protective works and order of priority of building.

According to General Combined Scheme of Engineering Protection Territory of Kyrghyz Republic from dangerous physical-geological events and processes, the expenses of protectional measures against debris-flow, rockfalls, snow avalanches in two regions (Osh and Jalal-Abad regions) come to 1,96 milliard USD (recent rates). These expenditures are exhausting for Kyrghyz Republic.

The same General Complex Schemes were made for Chu and Issik-Kul regions.

If it was sufficient funds, realization of protective and preventive measures could be made accordingly the Scheme. But, extremely limited funds have to refuse from longterm activities and to plan urgent measures only.

2. Legislation.

The Regulation on the State Commission of Kyrghyz Republic

on Emergencies and Civil Defence, confirmed by Government's Decree N 536, 4 November, 1993 is basic document determining the strategy of measurement on disaster reduction. The Regulation determines:

- responsibility of the SCE and CD for elaborating and working out measures directed to prevent emergencies, to protect people and national property, to increase the stability of economy objects in case of disaster;

- tasks of the SCE and CD, it's territorial commissions;

- contain of state supervision on working out measures for civil defence, prevention emergencies and preparedness;

- the rights of the SCE and CD and of the Chairman;

- aims and goals of SCE and CD's Board and Expert Council;

- order of financing SCE and CD's activities.

Besides this, there are a lot of laws, decrees, regulations, standards, rules, instructions, touching anyhow upon the problem of disaster reduction in Kyrghyz Republic. First of all these are Practices, specifically BC and P N 2.01.15-90 "Engineering protection of territory, buildings and constructions from dangerous geological processes"; following regulations about departments and their standards:

- The Regulation about Ministry of Water Management and Melioration;

- The Regulation about the State Committee of Geology, Using and Preservation Bowels;

- The Regulation about the State Committee on Nature Protection;

- The Regulation about the State Committee on Architecture and Technical Controlling in Building;

- The Regulation about the State Agency on Hydrometeorology; - The Regulation about the State Inspection on Supervision

for Safe Conducting Works in the Industry and Mining;

- The Regulation about State Forestry inspection;

- departmental instruction of Fire Protection Service Sanitary-Epidemic Service, Service of Radiation Control, Rescue Teams in mountaineering camps.

Kyrghyz Republic has more than enough laws and codes. There are no possibilities to keep codes and standards because of lack

of funds, that is question.

Now the bill about State insurance, which includes several chapters devoted to natural risk insurance is being on stage of consideration.

3. Financing.

The determination of priority in financing is one of the problems of SCE and CD's activity. It is true, that to allocate funds for prevention disaster is more effectively than to abolish consequences, especially in longterm planning.

SCE and CD is financing accordingly by the Regulation on Order of Assignations, Accounting and Using Funds for Prevention and Abolition Emergencies in Kyrghyz Republic, confirmed by Government's Decision (N 35 of 27 January 1993).

The priorities in financing are presented in table 3.

Table 3

Information about financing SCE and CD's activities on preventing and abolishing effects of emergencies in Kyrghyz Republic during 1993.

N/N	Type of activity	Allocated funds, thousand soms	Percentage of total sum
1	2	3	4
	Abolition of the effects of disaster	29 718	71,27
1	a) evaluation of caused damage	9	0,02
2	b) searching und rescue works	16	0,04
3	c) clearing roads from obstruction, clearing canals, rivers and other objects from deposits of debris flows, snow avalanches, rockfalls and etc.	1 543	3,7
4	d) restoring of:	9 188	22,00

Continuation of table 3

1	2	3	4
	- vitally important facilities (watersources; waterpipelines; electricity and power supplying, sewerage)	1 028	
	- communication (roads, bridges and tie-links)	5 343	
	- irrigation network (water drills and other watersources for irrigation, canals)	1 028	
	- protective constructions (dams and dikes, debris flows drainage canals, backing out walls, river banks)	732	
	- public facilities (schools, hospitals and others)	1 458	
5	e) building new objects instead of destroyed, and new building connected with replacing from dangerous sites also:	7 843	18,79
	- vitally important facilities (watersources, waterpipelines; electricity and power supplying, sewerage)	486	
	- communication (roads, bridges and tie-links)	2 421	
	- public facilities (schools, hospitals and others)	4 282	
	- inhabited places	654	
6	f) designing and prospecting works, connected with measures on abolition of disaster effect	197	0,47
7	g) aid for population:	11 865	28,43
	- free aid for families lost houses	73	
	- allocating funds (free) to	1 366	

Continuation of table 3

1	2	3	4
	poor families for building houses		
	- favourable (profits free) credits to population for building and restoring houses	10 201	
	- bying and delivering humanitarian aid (food, clothings, tents and etc.)	225	
	ACTIVE MEASURES ON LIQUIDA - TION OF DISASTER CONSEQUENCES:	3 524	8,44
8	a) sanitary-epidemiologic measures connected with cases of cholera	500	1,20
9	b) transportation of coal to the regions where was lack of coal because of hard frosts	2 522	6,0
10	c) engineering measures on lowering of underground water-level in settlements	357	0,86
11	d) forced throwing of snow avalanches(mortar fire of the slopes)	2	0,001
12	e) designing-surveying works on abolition of threat of rock falls, landslides and outbursts highmountainous lakes.	143	0,34
	PASSIVE PROTECTIVE MEASURES ON PREVENTION EMERGENCY SITUATIONS AND MITIGATION THEIR CONSEQUEN- CES:	4 893	11,72

Continuation of table 3

1	2	3	4
13	a) protective measures:	4 185	10,03
	- designing-prospecting works	297	
	on protective measures and con- structions		
	- building engineering cons - structions f or protection set	3 068	
	tlements		
	- building engineering cons - truction for protection pub-	468	
	lic facilities		
	- building engineering cons - truction for protection farm	252	
	lands and irrigative canals		
14	b) strengthening of seismic re- sistance of public facilities	708	1,69
	(schools, hospitals, houses of fire-stations)		
	MEASURES INCREASING PREPARED - NESS FOR EMERGENCY SITUATIONS:	3 224	7,72
15	a) bying material resources	2 467	5,91
16	b) building regional boards on building and exploitation of	652	1,56
	protective engineering construc- tions and rescue-team stations		
17	c) extraction quarry of blasted stones for dices	105	6,25
	EVALUATION OF THE LIABLENESS TERRITORY AND OBJECTS TO NATU- RAL & TECHNOGENIC DISASTERS:	172	0,41
18	a) making cadastres of risk si- tes exposed to the natural ha-	84	0,20

Continuation of table 3

1	2	3	4
	zards (debris flows, snow avalanches, flash floods, rock falls, screes)		
19	b) evaluation of radioactive conditions in the mining places	39	0,09
20	c) making passports of the building accordingly to their seismic resistance	9	0,02
21	a) seismic microzoning	40	0,09
	MONITORING OF THE NATURAL AND TECHNOGENIC HAZARDS	95	0,22
22	a) observing for regime and conditions of highmountain lakes	65	0,16
23	b) observing for height of snow cover and its distribution	2	
24	c) observation for regime and conditions of landslides	28	0,06
	PREDICTION OF THE EMERGENCY SITUATIONS ORIGIN	111	0,27
25	longterm prediction of sites, time and energy of strong earthquakes	111	
	T O T A L	41 737	100,00

The priority in financing is given to the measures connected with abolishing of disaster effects, moreover the direct financial aid for population standing first, as be shown in table 3.

This correlation is enforced. It is explained by the extreme low standards of living (in 1993 the per-capita income was about

42 USD) so the Government through the SCE and CD suffers for direct payments to affected people.

Indirect reason of this correlation lies in that: Agency on Hydrometeorology, National Academy of Sciences, Ministry of Geology and others carrying mostly out works on monitoring, prediction and evaluating of the liableness territory to the natural hazards.

These departments have own funds and receive money through budget of the republic directly.

Nevertheless, it is difficult to wait principal change in the correlation in nearest future, even taking into account mentioned circumstance.

High extent of frequency of disasters and low economic level of development condemn to allocate primely funds for abolition effects of disaster, although economy expediency (even without considering prevention of deaths) of preventional works is beyond all manner of doubts.

For example, effectiveness of works on forced throw of snow avalanches in 1985-1989 in the 6 road passes has come to about 200 thousand USD per year (recent rates).

IV. SYSTEMS FOR OBSERVING, PREDICTING AND WARNING

1. Systems for observing

Two Departments: Institute of Seismology of National Academy of Sciences and Agency on Hydrometeorology have the most developed network for observing dangerous natural events and condition of environment.

The activities of the Institute of Seismology are directed to Seismic zoning and forecasting strong earthquake. The institute, being Academician institution carries out function of the State Seismological Service and takes part directly in works connected with mitigation natural disasters.

The Institute and the Methodic Seismological Expedition together have developed network consisting of 32 seismological, 10 geophysical, 6 hydrogeochemical and 6 hydrogeodynamic station, which allow to conduct continuous measurements and to analyze dates in forecasting commissions in order to evaluate seismic

conditions.

The materials are handed over to the Sitting of the Expert Council for Seismicresistance Building and Earthquake Prediction on SCE and CD in the case of predicting signals.

The Institute of Seismology has made two combined programs to the period 1990-2000 "Saktoo" and "Prediction" in order to coordinate activities on protection of population from earthquakes.

The program "Saktoo" includes investigations of the Institute of Seismology, design and scientific research institutes on building and protection houses and constructions from seismic action in the frame of longterm prediction.

The main task of the program "Saktoo" is elaboration the scientific bases of methods for following: preparation of the event, the location, the site, the strength and time of the future earthquake in the frame of short - and longterm prediction.

The "Scheme of the Longterm Prediction of the Strong Earthquake in the territory Kyrghyz Republic" (Scale 1:1000000) is specific contribution of the Institute of Seismology in the practice of protecting measures. The are local areas are selected where strong earth quakes will can be occurred in the near 6-10 years, and what settlements lies in the zone of influence of the probable epicenters site in the Scheme.

In these days, the Institute of Seismology carrying out works closely with SCE and CD.

In order to increase the effectiveness and organization of the activities on reducing losses from earthquake it is necessary, by the experience of developed abroad countries, to reequipping all the stations by the modern digital automatic seismic station with radiotelemetric connection and creation of the National Seismological Service.

The network of the Agency on Hydrometeorology accounts 123 hydrological sites, 6 lake sites, 39 meterological stations including 4 snow avalanche's station, 1 lake observatory, 1 waterbalance station, 15 agrometeorological sites, 5 aviameteorological stations, 1 hydrometeorological station, 15 control sites for air pollution. All meteorological stations carries out continuous observations for atmospheric events and 8

times a day for meteorological elements. All branches of the Agency work out observations for dangerous hydrometeorological events and transfer information to determined addresses.

The State Agency on Hydrometeorology gives following types of information:

- monthly predictions for far and highmountain pastures;
- short-term weather predictions (daily, for 3 day, for period);
- long and short-term hydrological predictions in the basins of the rivers of Kyrgyzstan;
- specialized weather predictions for forestry, agriculture, public facilities, water management, for auto, air, rail road transport, the Issik-Kul steamship line, for energy and connections boards, tourist camps and resorts;
- agrometeorological predictions;
- warnings on dangerous and particular dangerous hydrometeorological events;
- specialized information and consultations about hydrometeorological regime.

Operative hydrometeorological and agrometeorological information is disseminated to the institutions and population by the all available means of connection: by TV and radio, with help of telex and telephone connection, weather panels by post and special delivery.

Information about the conditions of the highmountain lakes takes special place.

The lakes with unstable natural dams, keeping the threat of outburst have been revealed. Annually, if the hydrometeorological conditions become bad, highmountain lakes is observed in operative regime first.

Information about the conditions of the highmountain lakes is given to SCE and CD and local administrations, recommendations about draining or strengthening their dams is given also.

The snow avalanche stations of the Agency on Hydrometeorology have to ensure snow avalanche safety of traffic on the roads Bishkek-Osh, Karakol-Inylchek, Kochkor-Ming-Kush, Alabuka-Janibazar by notification about probable snow avalanches drift and their forced throws.

The map of snow avalanches risk has been made for whole

territory of Kyrgyz Republic. The map is being used very effectively not only in designing-prospecting works, but also in building protective constructions for roads and objects which has been built earlier without consideration of snow avalanche risk. The territory of Kyrgyz Republic has been divided into four large classes by the level of snow avalanche risk. Preventive measures, including forced throw are made where real snow avalanches risk is existing, if it is necessary population is evacuated also.

In spring, special attention is pay to predict run-off of melted snow water and possibility of flooding settlements and public facilities. In summer short-term predictions - consultation are made for disastrous flashfloods and debris flows caused by heavy rain-falls.

The map of debris-flows risk made by the Agency on Hydrometeorology divides territory of Kyrgyz Republic into four classes, maximum discharge and volume of debris flows's torrents were serviced as the criterious. Debris flows beds of different types and areas of primary distribution of either types have been selected on this map. In addition, the Catalogue of debris flow risk rivers have been made.

The Ministry of Geology, Using and Preservation Bowels is undertaking observations for landslides begins from the middle 1950-ies. System for observing landslides includes airvisible and field investigation, setting control points for seeing landslide movement, measurements in drills for underground water. More than 2500 landslides has been registered by airvisible observations in the Osh and Jalal-Abad regions. 1184 landslides has been examined by field observations.

There were permanent regular observations on 23 landslides. Now, because of the lack of funds most of the works has been stopped. SCE and CD and local administrations are informed in case of landslide activity.

2. The system for warning, notification and connection.

The system for warning and notification about emergencies is based on the former civil defence system.

Operating duty officer notificates head quarter, civil

defence regiment and regional capitals.

Big enterprises and institution in each city have sirens for notification. Besides this, regional and district centers can be notified by the radio.

The use TV and broadcast is possible in order to notify about extreme situation in some cases.

Dispatch of rescue-team with portable radio stations in the area of potential danger is used in order to warn early.

SCE and CD has bought 6 movable radio stations on cars and 20 portable radiostations "Angara-1". Movable radio stations handed over to regional boards of SCE and CD for connecting with Central Office of SCE and CD in Bishkek. Portable radio stations "Angara-1" are used for connection in the disaster areas and by the rescue-team. Telephone connection is ensured between Central Office of the SCE and CD and its regional boards, Ministries and Departments through channel of Ministry of Connection.

The Central Office of the SCE and CD has facsimile connection ensuring exchange of operative information with foreign countries and regional boards. The office cars of the Chairman of SCE and CD and his deputies are equipped by radiophones "Altai".

V. INTERNATIONAL COOPERATION.

Kyrgyz Republic realizes international cooperation in several directions:

- multilateral cooperation;
- bilateral cooperation;
- cooperation with international institutions.

Multilateral cooperation is realized in the frames of two treaties with CIS-countries. At first, this is the agreement about Interstate Council on Emergencies of Natural and Technogenic Character. Azerbaijan, Armenia, Byelorussia, Kazakhstan, Kyrgyzstan, Turkmenistan, Uzbekistan are the participants of the Council.

The goals of the Interstate Council are directed to conducting coordinated policy in the sphere of prevention and abolition emergency situations, bringing together legislations in this sphere, coordination of actions in the international

institutions and joint participation in the international programs, assistance in elaboration and realization of interstate scientific-technical programs, mutual assistance in of environment and predicting emergencies, creation mutual notification and solution other problems corresponding to frames of IDNDR.

The participants of the Interstate Council have concluded the Agreement about cooperation and interaction in the sphere of researching earthquakes and predicting seismic risk.

Kyrgyz Republic is also the participant of the agreement between countries of the Central Asia (Kazakhstan, Kyrgyzstan, Tadjikistan, Turkmenistan, Uzbekistan) about cooperation on problem of Aral Sea.

The ecologic disaster in region of Aral Sea concerns directly Kyrgyz Republic. The upper waters of Syr-Daria lies in the territory of Kyrgyzstan and there is a problem of potential salt pollution of the glaciers and accelerating their melting because wind drift from former bottom of Aral Sea.

Bilateral cooperation is the most effectively developing with Russian Federation. In spite of absence the agreement (draft agreement between the Government of Russian Federation and Government of Kyrgyz Republic about cooperation in the sphere of prevention industrial accidents, natural disasters and abolition their consequences is being on final stage of editing) in 1992 Russian Federation has rendered sufficient material and financial aid for liquidation consequences of the disastrous earthquake.

Contacts have established with German IPNDR Committee. Exchange of delegation has taken place in the frames of the this contacts. The concrete directions of the cooperation has been determined as a result of the exchanges:

- scientific-technical (seismology, engineering geology, evaluation of risk and risk mapping);
- technical (exchange of experience in rescue works and using technical means in searching);
- increasing of qualification of the experts by taking part in existing and new seminars;
- education of population (mutual coproduction educating-methodic manuals).

Developing these directions the agreement about

coproduction film on earthquake and seminar on rescue and searching work have been achieved.

Mutual works on project of Global Positioning System is carrying now.

Naturally, the most developed links have been established with IDNDR-Secretariat. The experience of common work has been appeared (Regional workshop on disaster reduction in the territory of the CIS countries. 13-18 December 1993, Bishkek, Kyrgyzstan. Visit to Switzerland) information exchange has been organized.

Russian Federation and Kyrgyz Republic cooperate in rendering aid for Tadjikistan. Specifically, Kyrgyzstan ensures function of the road Osh-Khorogh. The Gorny Badahshan region is supplied by this road. Kyrgyz Republic has rendered humanitarian aid to people of Abkhazia suffered from war.

Kyrgyz Republic has allocated cement (130 tons), window glasses (4,5 thousand square meters, electricity lamps (15 000), cereals (5 tons). The cost of humanitarian aid including transportation was equal 29 000 soms.

The possibilities in rendering material and financial aid for other countries are limited. Technical assistance taking into consideration the skill of our experts, can be rendered in hazards mapping, seismic resistance designing, designing hydrotechnical protective constructions, rescue works in high mountains, industrial mountaineering.