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REPORT

on the work carried out

National Committee of the Republic of Tajikistan  
for the International Decade on Natural Disaster  
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Chapter I describes aspects of the activity of the State Commission on Emergencies (SCE) of the Council of Ministers of the Republic of Tajikistan. A description is given of the work done by the rescue formations and units that deal with repair and rehabilitation and with precautionary planning. Light is thrown on the problem of resettling people from zones subject to natural calamities and of funding disaster relief measures.

Chapter II deals with the conducting of scientific research and planning work on implementing the special-purpose comprehensive plan developed in Tajikistan under the title of "The Elements". The results are set forth of certain activities designed to improve the management of the national economy after disasters have occurred, to determine the economic consequences of natural calamities and to deal with the problems of planning relief measures.

Chapter III describes the efforts of the Government of Tajikistan to eliminate the sequelae of the natural disasters that occurred in 1993.

SECTION I

Like some other countries in the Commonwealth of Independent States (CIS), the Republic of Tajikistan is subject to practically the whole range of natural disasters; except that they are distinguished here by being more intense and more frequent. Hence the considerable resultant socio-economic damage inflicted on the Republic's national economy by these phenomena.

93% of the national territory is mountainous. The whole country is in the 8-9-degree zone of earthquake intensity and is subject to mudslides, earth creep and avalanches.

Thus in 1993 over a third of the population suffered from natural disasters, 35,000 people were left practically without a roof over their heads and lives were lost. The direct economic damage done by natural disasters is estimated at about 220 billion roubles at the prices ruling in the Republic on 1 April 1993.

It must be noted that a considerable amount of work has been done to eliminate the consequences of natural disasters. Thus the Republic's Flood-Control Commission has been continuously in action and in 1990 it established the State Commission on Emergencies of the Council of Ministers of the Republic of Tajikistan (the SCE of the Republic of Tajikistan).

In its four years of existence the SCE has accomplished a considerable amount of work on all the diverse but closely interconnected aspects of averting disasters or alleviating their consequences.

In view of the need to tackle from many different angles the problems of the stability of the national economy in times of disaster, a specially designed programme was drawn up and approved by the Government under the title of "The Elements". It defines a number of research, planning and design activities and also relief measures designed to anticipate natural disasters and reduce the damage they cause. Specialists have already solved a number of

tasks (the so-called "trigger complex"), making it possible to improve considerably the Government's decision-taking process in the event of disasters. These tasks comprise in the first instance the interconnected problems involved in forecasting the situation that may arise should an emergency situation occur and predicting the socio-economic losses that may result. Work is being done on developing an automated system for managing the national economy of Tajikistan, based on a unified computer network. We should like to mention that work on the problems listed above forms an integral part of the IDNDR research programme. This work has been carried out by a special sub-unit in the research institute of the Ministry for the Economy, which on the instructions of the Republican SCE is implementing the special-purpose comprehensive "Elements" programme. Considerable work has been done on aspects of organizing and efficiently managing accident and rescue, repair and rehabilitation and planning and preventive activities.

With a view to carrying out rescue work in the Republic an accident and rescue service (ARS) of the Republic of Tajikistan has been formed. It comprises:

- a Republican rapid-response rescue division;
- militarized mountain-rescue units;
- a climbers' mountain-rescue service;
- a flight safety service;
- the Central Board for Fire Protection and the Accident and Rescue Service;
- an emergency medical service, etc.

All these formations have operational posts working round the clock, which immediately collect all the necessary data when emergencies have occurred. At the present moment the question is being discussed of creating a unified accident and rescue dispatcher service attached to the Republican SCE,

which will make it possible to solve efficiently all the problems connected with carrying out accident rescue work. In addition, with a view to ensuring the social welfare of workers in the rescue formations and defining their rights and duties, a Republican Bill has been prepared on "the Status of the Rescue Worker". It is confidently expected that this Bill will be adopted and will solve a number of important problems connected with the work of rescue formations in the Republic.

The construction and assembly units of ministries, branches of the administration and organizations in Tajikistan deal with repair and rehabilitation work once the Government has decided what needs to be done.

To carry out planning and preventive work together with protective measures a combined research and production unit has been specially created called "Tajikselezashchita" which designs installations to protect the population against mudslides and carries out bank-strengthening work on watercourses.

There is particular concern in Tajikistan regarding the resettlement of inhabitants of danger zones subject to landslips, avalanches, earth creep and mud slides. At the present time over 5,500 families (about 35,000 persons) need resettling. In view of the lack of available land in their own areas, we are forced to look for danger-free sectors in other areas to settle them in. However people are refusing to move from where they were living because of the expensiveness of building new homes and the absence of infrastructure in the new areas. Thus to resettle people from dangerous areas in new territories it is necessary to build dwellings, to bring in electricity, water and communications, to construct motor roads and teaching and medical establishments, shops, household services, etc. However this calls for huge financial expenditure which the Republic is unable to shoulder at the present moment. However, it is also impossible to leave in dangerous areas about

35,000 people whose lives are constantly under threat. Because of this the Government has drafted a decree which in particular makes provision for assigning to each resettled family a long-term interest-free loan of 500,000 roubles to be repaid over a period of 25 years.

The world community is well aware of the danger that may arise from the Sarez Lake if the Usoisk dam should break and from the advance of the Medvezhiy glacier. However, the SCE of the Republic of Tajikistan is working on these questions also with some success.

The practicability of dealing with all these problems facing the Republican SCE unfortunately depends entirely on a well-thought-out and successfully planned funding programme. Obviously it is not always possible to fund a particular measure or urgent type of work from the State budget, even though human lives depend on their being efficiently carried out. Because of this, after the Gissar earthquake the Republic passed an Act "Fund for meeting emergencies in the Republic of Tajikistan", under which all ministries, branches of the administration, organizations, collective farms and State farms were obliged to allot to the fund amounts equivalent to 2% of the total sums they had earmarked for research, development, and technology, or for similar purposes. In accordance with decisions taken by the SCE of the Republic of Tajikistan the money in the Fund was spent on one-time material assistance to the population affected, the upkeep of the accident and rescue formations, the carrying-out of emergency repairs and rehabilitation work and other purposes. However because of the break-up of the USSR, the rupture of links with suppliers of material resources, constantly increasing inflation and other reasons, the amounts paid into the Fund became markedly inadequate. In this present year we have reconsidered and revised the existing Act, and the new version was adopted by the Supreme Council of the Republic at its thirteenth session at the end of December. In accordance with the new Act,

all ministries, branches of the administration, organizations and other establishments will allot to the Fund 10% of their total amortization provisions.

After this short description of the work done to avert disasters in the Republic of Tajikistan or alleviate their consequences, we should like to mention that most of it was carried out in the period 1990 to 1994, i.e. within the period designated as the International Decade for Natural Disaster Reduction. We consider that the SCE of the Republic of Tajikistan has achieved a great deal considering that the bloody events of 1990 and the civil war of 1992-1993 put the economy of the Republic back 25 years, so that it is now in a parlous state.

We should like to note that the members of the SCE of the Republic of Tajikistan are almost all ministers or top managers in branches of the administration and organizations and that the State Commission itself is headed by a deputy chairman of the Council of Ministers of the Republic. However on the whole all the work done was ensured by a staff group from the SCE of the Republic of Tajikistan consisting of seven persons, acting as a structural subdivision of the Government of the Republic and possessing the authority of a government department. In this connection we consider it advisable that a separate national committee for reducing the risk of natural disasters should be set up and the responsibility for carrying out IDNDR tasks should be assigned to the present SCE of the Republic of Tajikistan, on the basis of a Government decree for the purpose.

SECTION II

The economic exploitation of the territory of Tajikistan, particularly during the last 20 to 30 years, has led to practically complete utilization of the agricultural land and to the urban and rural development of the large river valleys and the intramontane depressions that cover 7% of the area of the Republic. A considerable proportion of the population engaging in livestock raising and mountain agriculture lives and will continue to live in mountainous areas on the alluvial cones deposited by the watercourses and in small areas scattered among the mountains. As a rule they are exposed to geodynamic processes intensified by human activity.

The elemental phenomena that occur in the Republic inflict every year a huge amount of socio-economic damage, burying centres of population under landslides and silting up cultivated land with alluvial deposits. The losses inflicted by natural disasters are estimated at tens of billions of roubles a year and are accompanied by considerable loss of human life.

Historical experience shows that, as a result of demographic processes and the trends in scientific and technical progress, human beings expose themselves to natural hazards and are not only themselves a potential source of technogenic accidents and catastrophes but quite often provoke natural disasters. While it cannot be said that in bringing new areas into exploitation provision has not been made for some measures that may possibly avert the hazards, i.e. ensure safety, it must be acknowledged that in the first place these measures are clearly inadequate, in the second place they are often narrowly specialized and in the third place they are directed most often to averting economic loss without taking into account the interrelationships with the external environment and the long-term sequelae for the population. The sad experience of catastrophes and natural disasters during the last few years confirms this judgement.



It must be admitted that for Tajikistan, as a country of mountains and valleys combining in its small territory a whole range of natural climatic conditions and landscapes ranging from eternal snows to arid zones with fragile ecological biogeocoenoses and limited biotic resources, natural disasters, accidents and catastrophes are not only proving decisive factors in bringing about economic regression but are also having dire consequences for large groups of the population.

The action of man on the natural environment often takes place without adequate scientific preparations and, without taking into account the Environmental Protection Act; the rules for proper construction of engineering communications are not observed and no special installations are built to protect economic assets from natural disasters. This position is due to an attitude that regards resources merely as something to be exploited, to the pursuit of narrow economic interests and at times to wilful carelessness in using natural assets. One of the adverse effects of upsetting the balance between natural and man-made processes is the activation of elemental phenomena and an increase in the number of production accidents and disasters.

All this has made it an urgent necessity to carry out a range of researches on preventing disasters in the national economy, on timely and scientifically sound forecasting of the scale of their consequences and on implementing effective measures to protect the public and workers in industrial enterprises and in the non-productive sphere from the aftermath of natural disasters. The research needed is partly outlined in the special-purpose comprehensive programme adopted by the Council of Ministers of the Republic of Tajikistan under the title of "Study of the possibilities of the occurrence of natural disasters, accidents and catastrophes and the drafting of recommendations and implementation of measures to avert them and reduce the losses therefrom" (the "Elements Programme"). Its development

makes it possible to study the laws governing the occurrence of disasters and the way they interact with each other, using a systems approach. Measures to clear up the effects of disasters, to avert them or to reduce the damage they cause can be designed independently of the branch of the economy concerned or the area involved.

It should be mentioned that the "Elements Programme" reflects numerous activities and tasks which over a period of many years before had been carried out by Union and Republican research, planning and other organizations. Numerous examples showing the scale and significance of the work done could be quoted but these matters have often been discussed in various publications and there is no point in dwelling on them in more detail here. There is nevertheless one sphere in which practically no studies have been done or else only at a very low level. We refer to problems of managing the national economy when emergency situations have arisen, studying the economic consequences of natural disasters, accidents and catastrophes and planning and drafting measures designed to prevent disasters or reduce the damage they cause. Bearing this in mind, the Institute of Economics of the State Planning Commission of the Republic (hereinafter referred to as the Ministry for the Economy) was instructed by the Government, in addition to fulfilling its coordinatory functions, to try to solve the tasks listed above. In the Institute a specialized subdivision - the Department of Economic Research on Situational Processes - is working on the problems concerned.

The work carried out by the Department may be tentatively subdivided into three sections. The first section covers work on questions affecting the system as a whole, the second deals with conceptual and methodological aspects and the third develops and carries out forecasting assignments that help management at any level to take sounder and more effective decisions. The following examples will illustrate this.

In the first section Republican requirements to ensure more stable functioning of the national economy in emergencies were drafted. These are concerned with what is needed to protect the public, prepare the national economy to work in emergency situations and carry out rescue and disaster relief work, enable the population to carry on, take measures to restore the national economy, etc.

"Provisional Regulations of the Republican Territorial System for Prevention and Action in Emergencies" have been drawn up. The system referred to comprises all the executive organs of the Republican Government from the Council of Ministers down to establishments in the national economy and works on a whole range of problems connected with emergencies, ranging from forecasting and preventing accidents, disasters, natural and environmental calamities and epidemics and epizootics to responding to the occurrence of disasters and dealing with their aftermath.

In drawing up the "Elements" programme, research workers came up against a need for more detailed study of geodynamic, hydrometeorological and anthropogenic processes occurring on the territory of Tajikistan and their links with economic problems and aspects of management. It was essential to determine who should carry out the programme, to define the sources and amounts of funding, to set the time limits for implementing the programme's tasks, etc. In view of the need to involve in this work specialists with various qualifications, a "Provisional Think Tank" was formed which drafted "Basic principles of the 'Elements' Programme". The think tank consisted of specialists from the State Planning Commission of the Republic and its Institute, the Academy of Sciences, the Ministry of Hydraulic Resources Management, the production combine "Tadzhikgeologiya", the Tajikistan Hydrological and Meteorological Service and the planning institutes "Tadzhikgiprovodkhoz" and "Tadzhikgiprom".

The work they have carried out represents a systematized exposition of specific information on the characteristics of elemental phenomena, an analysis of the causes of those phenomena, a description of measures that will help avert emergencies and a discussion of the main lines of action and measures proposed to reduce damage and avert accidents and calamities. The basic principles, aims and tasks have been worked out, the volume of funding has been determined, those who will work on the main sections of the "Elements" programme have been designated and a work schedule has been drawn up. An analysis has been made of conditions in the centres of population in the Republic that lie in areas subject to exogenous dynamic processes and the main features of climatic processes have been described. Consideration has been given to the principal medical and biological features of human activities as they interact with the socio-economic and natural climatic conditions ruling in Tajikistan.

The second section is characterized primarily by research on methods of determining the many and various losses to the national economy resulting from natural disasters, accidents and calamities. In considering problems of the economic losses inflicted by natural phenomena, it must be noted that it is only now that a systematic recording of emergencies is being organized in Tajikistan and therefore the available data are of a scattered and at times random nature. Judging from documentary sources only direct economic losses are being taken into account, while the indirect economic and socio-economic damage is not accounted for at all, although its scale is very considerable. This is due on the one hand to the lack of a generally accepted method of evaluating losses inflicted by natural disasters and on the other hand to a reluctance to gather such information. The absence of complete and systematic information on losses distorts the facts and this in its turn makes it impossible to undertake protective measures in good time and on the required

scale for reducing and averting adverse effects from natural phenomena on branches of the national economy, and, most important, makes it difficult to provide economic justification for the protective installations and measures that are being planned.

Taking these circumstances into account, on the instructions of the State Commission on Emergencies of the Council of Ministers of the Republic the Institute's specialists are developing an automated system for the collection, processing and storage of information on natural disasters, accidents and catastrophes that take place in Tajikistan. The system is based essentially on using input from the Executive Committees of Oblast, City and Rayon Councils of People's Deputies to set up data banks on disasters and catastrophes that have occurred. As the need arises, the information is given out to any level of the administration (Supreme Council of the Republic, Council of Ministers, territorial authorities, ministries and branches of the administration). The information may be specific to an actual emergency or may cover particular sectors over particular periods of time. It is proposed initially to run the system on IBM personal computers and later, after the information has been gathered for several years, to feed it into the Common Computer System.

At the present time an automated data bank is being established which includes information on all the centres of population in the Republic that lie in potentially hazardous zones, indicating for each of them all the items of economic interest (housing, industrial and agricultural enterprises, establishments in the non-productive sphere, etc.) and giving information on potentially hazardous zones and establishments.

Although they differ from each other in their nature, features and forms of occurrence, all elemental phenomena have a common trait. They have an adverse effect on society and their consequences can be expressed in terms of

cost. This has made it possible to develop a universal method to calculate the economic losses arising from practically every sort of emergency situation of any kind. The method for complex evaluation of economic loss (direct and indirect) developed by specialists at the Institute provides a theoretical and practical basis for drafting a number of regulatory documents covering a whole set of problems connected with evaluating the consequences of emergencies, ranging from the collection of baseline information to determination of the amount of economic loss. This ensures great efficiency and the selection of the best options when taking decisions after natural disasters, accidents and calamities have occurred.

The third section is concerned with evaluating the situation resulting from the action of destabilizing factors arising from natural and manmade disasters and accidents. This work is of a predictive nature but must at the same time ensure that the necessary calculations are carried out immediately the emergencies occur. One of the problems of this kind - how to determine the effects of possible accidents in which toxic substances are discharged from large establishments presenting chemical hazards - was studied by the Institute's specialists and the results incorporated in the routine practice of the civil defence authorities in the Republic. Essentially what was done was to determine the consequences of accidents at the "Tadzhikkhimprom" production combine and the Vakhsh nitrogenous fertilizer factory resulting in the discharge of highly toxic substances into the atmosphere. After information is received that an accident has occurred, calculations are carried out on the computer to evaluate the situation after a possible leak or discharge of chemically hazardous substances. It is determined which centres of population lie within the affected zone, how many medical staff and hospital beds are needed to provide care for those injured and how much food, water and other necessities of daily living are needed.

In view of the first-class importance for Tajikistan of forecasting the situation that will arise after the occurrence of mud slides, floods, inundations and avalanches, a set of methods and a range of economic-mathematical models have been developed for evaluating the situation that results from such hydrological emergencies and calculating the economic losses caused. As an experimental model the basin of the River Pyandzh was chosen, in which such potentially hazardous establishments and sites as the Sarez Lake and the Medvezhiy Glacier, the advance of which has often caused emergencies, are situated. Regardless of the cause, which may be the rupture of the Sarez Lake dam, the advance of glaciers or the damming-up of rivers by glacier ice or the occurrence of huge mudflows as a result of intensive snow melt or heavy rain, an evaluation is carried out of the situation after the emergency has occurred on the main channel and tributaries of the River Pyandzh. The centres of population are determined which may be inundated and the time is calculated that will elapse before the wave of floods reaches each of them. Calculations are made of possible loss of life and economic damage as a result of the flooding of centres of population and agricultural land. After determination of all the necessary parameters in the situation that has arisen, calculations are made of the manpower and resources needed to carry out rescue and relief work. In addition the vital daily needs of the population are estimated. It should be noted that the set of methods is applicable everywhere, making it possible to carry out similar calculations for the basin of any river in Tajikistan.

As already mentioned, all the problems listed above have been processed on personal computers and may have great practical significance for the members of the Republic's SCE and for branches of the economy and local administrative authorities.

An important element in such tasks is mapping the results of the emergency (it is proposed to draw up computer maps and possibly to print them out). For that reason research has been carried out in the Institute to determine the zones exposed to natural disasters and also to pinpoint the potentially dangerous establishments therein. As a result of this research registers have been compiled of potentially dangerous zones down to administrative unit level, showing the centres of population in those zones and their potentially hazardous establishments, on the basis of their most important characteristics (types and forms of hazard). This material will serve as a basis for further work in that direction.

It should be noted that the economic studies carried out in the Economic Research Institute of the Ministry for the Economy, the methodological and programming apparatus that has been developed and the experience accumulated in carrying out calculations make it possible to begin to implement the Decree of the Council of Ministers of Tajikistan on the development of territorial (oblast, rayon, city) schemes for managing the national economy in emergencies; these schemes must reflect various scenarios of the natural disasters that may occur in the area concerned together with industrial accidents and calamities (their nature, their probable scale and an economic evaluation of their consequences).

As already mentioned, the establishment of a system for managing the national economy of the Republic in times of natural disasters, accidents and calamities presupposes the solution of complex problems connected with setting up data banks and carrying out calculations concerned with the situation, the economic damage, the rehabilitation of the national economy and the optimum distribution of resources necessary for ensuring the vital needs of the population in the zone where the disaster has occurred. The modelling of extreme situations necessary for predictive calculations of their possible



effects requires the application of modern highly efficient computer technology. The work being carried out in this direction in Tajikistan shows that the most rational method is to create a single computerized information network for all organizations concerned with problems connected with emergencies. In this connection the same methodological, data-processing and programming techniques must be applied to all the problems to be solved at all levels of management. An information network of this type will initially cover the Council of Ministers of the Republic, an information and computer centre providing for all levels methodological information and programming software for the tasks concerned, and the oblast, city and rayon Executive Committees of People's Deputies.

### SECTION III

In the spring and summer of 1993 heavy storm rainfall, floods, the rupture of bunds, mudflows and land creep in Tajikistan, completely destroyed 1,764 homes and wrecked 8,274 dwellings, about 100 educational and health establishments, over 1,200 km of motor roads and 180 bridges, over 250 km of river banks and about 290 km of irrigation channels and canals, about 230 km of power lines, about 200 km of telephone lines and many other features of the economy. Immense damage was inflicted on agriculture: over 47,000 hectares of crops were affected, including 30,000 hectares of cotton, and 15,000 head of cattle were killed.

The population of Tajikistan, most of whom live in rural localities, faced a critical situation. Over a third of the population of the Republic suffered from the natural disasters, about 35,000 people were left homeless and over 25,000 people were evacuated from damaged dwellings. There was loss of life.

According to the data available the direct damage inflicted by the disasters in the Republic as a whole was estimated at about 214.6 billion roubles. In the various branches of the economy this amounted to:

agriculture	- 63.7 billion roubles
water resources	- 14.5 billion roubles
roads	- 15.1 billion roubles
education, culture and public health	- 5.1 billion roubles
municipal services	- 3.7 billion roubles
individual dwellings	- 12.8 billion roubles
other branches	- 99.7 billion roubles

The Government of the Republic took all possible disaster relief measures. Simultaneous assistance to the utmost of the possibilities was given to those who had suffered from natural disasters, those who had contracted toxic hepatitis in the Farkhor rayon and the families of those who had been killed in the plane crash at Khorog. About 2.5 million roubles were assigned from the Emergency Relief Fund these purposes.

For the suffering population of the Republic humanitarian aid arrived from Uzbekistan, Russia, Kazakhstan, the United States of America, the Federal Republic of Germany and the United Nations. The following supplies were delivered to the Republic:

tents	- 100
blankets	- over 21,000
flour	- over 120 tonnes
olive oil	- 60 tonnes
childrens' clothing	- 600 sets
mobile homes	- 4
diesel fuel	- 150 tonnes

sugar	- about 10 tonnes
tea	- 840 kg
pasta	- about 5 tonnes
groats	- about 20 tonnes
powdered soup	- about 5 tonnes
children's foods	- about 26 tonnes
dried milk	- 4 tonnes
tinned meat	- 4 tonnes

together with medicaments and other essential goods.

The humanitarian aid received was distributed among the regions which had suffered. In addition, under a decree of the Government of the Russian Federation, adopted at the instance of its President, the Republic of Tajikistan was given a 2-billion rouble interest-free loan for the restoration of the national economy.

Because of the problem that arose in allotting these funds in the Republic and the absence in Tajikistan of the necessary material and technical resources, the Chairman of the Council of Ministers of the Republic of Tajikistan ordered the Ministry of Finance and the Ministry of Commercial Resources to use the money for obtaining material and technical help from the Russian Federation.

The Ministry of Finance of Tajikistan by agreement transferred the 2 billion roubles that had been allotted to the credit of the Ministry of Commercial Resources for obtaining foodstuffs and industrial goods, fuels and other material and technical resources in the Russian Federation for use on the territory of the Republic.

To solve the tasks of rehabilitating the national economy in all the areas that had suffered, measures were taken forthwith to undertake repair and rehabilitation work on roads, power stations and telephone lines and

municipal, social and cultural establishments were restored together with agricultural and other buildings. The resowing of agricultural crops that had suffered from the natural disasters was completed, irrigation systems were restored and as much work as possible was done to strengthen the river banks. To carry out these tasks in the stricken regions, despite the critical situation that had arisen in supplying the national economy of the Republic with materials and technical resources, the following were despatched:

cement	-	4,854 tonnes
sawn wood	-	825 m <sup>3</sup>
slates	-	90 tonnes
roundwood	-	78 m <sup>3</sup>
paints and varnishes	-	109
cables	-	220 km
wire	-	302 tonnes
rod	-	41 tonnes
metal mesh	-	10.8 thousand m <sup>2</sup>
reinforcement	-	33 tonnes
metal pipes	-	10 tonnes
closure fittings	-	20,000
arc-welding		
transformers	-	5
plywood	-	500 m <sup>3</sup>
fibreboard	-	500,000 m <sup>2</sup>
particle board	-	800 m <sup>3</sup>

plus other material and technical resources.

In 1993 the Government of the Republic assigned for their use to ministries, branches of the administration, organizations and oblast, city and rayon Executive Committees funds to pay for repair and rehabilitative work

carried out in 1992 and its completion in 1993. Thus in February a decision was taken by the State Commission on Emergencies concerning urgent bank-protection measures on particularly dangerous reaches on rivers in Tajikistan. In accordance with this decision the Ministry of Water Resources of the Republic was allotted 1 billion roubles to carry out bank-strengthening work. In addition, in January and June 1993 2 billion roubles were allotted to Republican agencies.

With a view to rehabilitating as rapidly as possible establishments in the Khatlon Oblast that had been destroyed as a result of natural calamities, Decree of the Council of Ministers of the Republic of Tajikistan No. 202, dated 7 May 1993, allotted about 4.5 billion roubles to Republican agencies, which were fully utilized.

Decree of the Council of Ministers of the Republic No. 529, dated 18 October 1993, allotted to ministries, branches of the administration and oblast, city and rayon Executive Committees 20.0 billion roubles to pay for the repair and restoration work that had been carried out.

Thus in 1993 the Government of the Republic had allotted a total of more than 27.6 billion roubles to disaster relief. According to communications from ministries, branches of the administration and oblast, city and rayon Executive Committees, as of 1 January 1994 repair and restorative work had been completed to a total value of over 27 billion roubles. Thus in the Republic as a whole the Ministry of Water Resources had restored 48 km of levees, mud channels and canals and brought three pumping stations back into operation. The Ministry of Agriculture had restored and brought into use in the Khatlon Oblast 267 m<sup>2</sup> of housing and a kindergarden, a cotton factory, two sheep farms, a farm with 200 head of cattle, field camps and other establishments. The Ministry for Roads had prepared blacktop surfacing for 550 km of motor roads and restored 220 km of motor roads and three large

bridges. The Ministry of Health of the Republic had restored six central rayon hospitals and undertaken a complete refit of three rayon hospitals and polyclinics. The Ministry of Construction had restored a 20-apartment residential block, a spare-parts unit and the mechanization centre in Kulyab and brought into use 1,390 m<sup>2</sup> of administrative buildings for the building combine in Kulyab. Tadzhiksel'khozvodoprovodstroy had restored about 7 km of water channels. The Ministry of Rural Construction had restored in the Khatlon oblast 5,400 m<sup>2</sup> of housing, 20 schools, seven kindergartens and two hospitals. The Ministry of Communications had restored 1.5 km of telephone cable and intercity telephone lines from Dzhilikul to Grarauty and from Kumsangir to Nizhniy Pyandzh. The "Barki Tochik" company had brought into operation over 3.5 km of OH-04 KV electricity supply lines, over 20 km of OH-6-10 KV lines, over 3 km of OH-35 KV and over 2 km of OH-110 KV. Other Republican agencies had restored and brought into operation many other features of the national economy.

Work to restore establishments damaged by natural disasters is being carried out in all regions of the Republic but not to the extent that is needed. The lack of the necessary funds, material and technical resources, finished building materials, equipment, mechanisms, qualified staff and working capital among the contractors is slowing down considerably the rate of fulfilment of the work.

In Tajikistan extensive resettlement work is being done and 5,539 families need to be moved out of geodynamically dangerous zones. As of 1 January 1994 a total of 464 households have been resettled.

In 1993 alone it was necessary to resettle 840 households in Tajik villages - Shang, Badgakh, Ruzi-Obnok, Kosatarosh, Mazar, Ven, Panchrud, Bashangton, Ravandin, Tagobikhalk, Gizhdariva, Artuch, Obi-Borik and Surkhob in the Pendzhikent Rayon, 289 households from Zosun, Pokhu-Fatmev, Pukhtin,

Zindakon, Marzich, Takfon, Iskodar, Khushekat, Ayni, Zerobad, Ispanch, Ravad and Makhshevat in the Ayni Rayon, 15 households in the village of Tol in the Khodzhent Rayon, three households from the villages of Nilu and Obi-Garm in the Gissar Rayon, 20 households from the villages of Fatkhabad, Gultepp, Elok and Kashkarokh in the Faizabad Rayon, 79 households from the villages of Kiblan and Gulvista in the Leninsk Rayon, two households from Kushvo in the Kofarinkhonsk Rayon and one household from the village of Sakhro in the Shakhrinavsk Rayon.

A certain amount of work has been done on improving the environmental situation and bringing natural resources back into use. Thus decrees of the Government have been adopted on the protection of nature, the conservation of valuable landscape complexes, rare and disappearing species of plants and animals and unique ecological systems, the preservation of natural features and monuments of culture and history, the development and restoration of tourism, the exchange of meteorological information with neighbouring countries, the rational utilization of the resources of medicinal plants growing in the wild by protecting them from disappearance, the conducting of research and educational work, the replacement of losses in the natural environment, compensation for damage and other aspects of nature conservation.

A decree has been adopted by the Council of Ministers setting aside a month for planting greenery and improving amenities in the Republic. As a result the following have been planted:

trees - total 3.14 million  
comprising:  
fruit trees - 1.28 million  
wild trees - 1.86 million

shrubs - total 1.18 million

including:

decorative shrubs - 1.01 million

parks, flower gardens, lawns and the whitewashing of trees and

buildings - 4.33 million m<sup>2</sup>

rubbish collection - 1.78 million tonnes

the establishment of walkers' paths and the cleaning of

irrigation canals - 714 km

With a view to averting any deterioration of water quality, improving the sanitary condition of watercourses and restoring traditions of careful utilization of water, information has been published on how to save water and a contribution has been made towards solving the ecological problems of the Aral Sea. A Clean Water Month has been celebrated. During the Month units of the Ministry of Natural Resources checked 391 watercourses, issued 1,160 orders, fined 173 persons a total sum of 4,192,000 roubles and closed down enterprises that were polluting watercourses. A four-hour television marathon was held, as a result of which 5,330,000 roubles were paid into the special account of the Ministry of Natural Resources for the Clean Water Fund. This money was used for restoration and repair of damaged water purification installations in the Khatlon and Leninabad Oblasts and in the Gissar Rayon. With a view to reducing air pollution in cities and other centres of population in Tajikistan and scaling down pollutant discharges, the Ministry of Environmental Protection together with the Ministry of Internal Affairs of Tajikistan carried out a clean air operation from 10 to 30 September 1993. As a result of this operation, 7,209 motor vehicles were checked, of which 1,646 were found to be infringing the State standards, 720 vehicles were banned from the roads and 1,403 managers and drivers were fined a total sum of



388.7 thousand roubles. In Dushanbe alone in six motor transport enterprises the damage done by air pollution was costed at 1,885,000 roubles.

In dealing with these matters certain problems were encountered, as in:

(a) the immediate implementation of protective measures on rivers and canals necessary for letting through flood waters in the spring and summer of 1994;

(b) the resettlement of people from the geodynamically hazardous zones;

(c) the completion according to plan in 1994 of repair and restoration work to eliminate the consequences of national disasters, work that had begun in 1993.

As is known, in 1993 the main damage to the national economy was inflicted by the rupture and destruction of levees and the breaking out of flood waters. With a view to averting any repetition of these natural disasters a special commission was formed which determined the reaches on the rivers and canals that were under greatest threat. A survey established that about 260 km of levees needed repair or replacement. This calls for huge funds - about 30 billion roubles - which the Republic does not have at the present time. For that reason it was decided to prepare the necessary reserves of stone and to concentrate human resources on bank-strengthening work in centres of population by the "khashar" method (with the participation of the people). At the present time bank-strengthening work is being carried out but the lack of fuel, lubricants and wire for making the gabions is seriously holding up implementation of the work planned.

The main reasons for inadequate compliance with Government decisions on resettling people from geodynamically dangerous zones is the lack of land on the spot and the lack of financial resources and building materials. The bulk of the households designated for resettlement are in centres of population situated in mountain and hilly regions. Unfortunately at the moment it is

practically impossible to find safe places in the regions where these people are living and they categorically refuse to move to other regions in the valleys. As a result they themselves are building dwellings in other sectors, as a rule in the flood plains of rivers and streams, i.e. in sectors that are just as dangerous. But even if the search for the necessary safe areas of land is successful, the refugees refuse to go there since under Council of Ministers Decree No. 361 of 25 September 1992 long-term loans of 30,000 roubles are granted for the construction of dwellings and this is markedly insufficient at present prices for building materials.

Certain measures have been taken by the Government of the Republic to solve this problem.

The State Commission on Emergencies has adopted a decision "Further measures to ensure the completion of bank-strengthening and mudslide prevention work in the Republic of Tajikistan", which instructs ministries, branches of the administration, companies, trusts and other organizations in the Republic of Tajikistan to set aside a portion of their own funds every year in order to carry out this type of work for the protection of their own establishments. The Ministry of Commercial Resources of the Republic of Tajikistan, the Naftrason Company and the Madad combine are instructed to provide every year beginning in 1994 material and technical resources to meet the orders of the Ministry of Water Resources of Tajikistan for carrying out bank-strengthening work and measures to avert mudslides.

The staff of the SCE of the Council of Ministers of the Republic has prepared a draft Council of Ministers decree "The granting of loans to households to be resettled from centres of population subject to landslides, avalanches, and mudslides" which envisages increasing the amount of the long-term interest-free loan to 500,000 roubles.

Oblast, city and rayon Executive Committees together with the Ministry of Labour of the Republic, in agreement with Tadzhikglavgeologiya and the State Planning Commission of the Republic of Tajikistan, have been instructed to provide in good time areas of land on which resettled people can build houses and a categorical prohibition has been placed on arbitrary construction of housing in potentially dangerous sectors.

A great deal of work has been done in collaboration with the representatives of foreign countries and international organizations.

In 1993 the SCE staff invited a number of diplomats and representatives of international organizations to take part in a survey of the areas of the Republic that had suffered from natural disasters. They came from the United States of America, the United Nations, international organizations, Medecins sans frontiere, Japan, the International Committee of the Red Cross, Caritas International, the Federal Republic of Germany and the International Bank for Reconstruction and Development.

An analysis of the damage caused by the disasters showed that in the main it had affected the national economy of the Republic in the spring as a result of a rise in water levels in the rivers and the breakdown of levees. The scale of destruction was too great for the Ministry of Water Resources on its own to be able to ensure the carrying-out of bank-strengthening work throughout the Republic.

The spring floods of 1994 are expected to be catastrophic as a result of the huge amounts of snow banked up in the mountains. The damaged portions of the levees on the rivers Pyandzh, Kzyl-Su, Yakh-Su, Vakhsh, Kafirnigan, Khanaka, Varzob and Il'yak have still not been repaired. For that reason the oblast, city and rayon Executive Committees, ministries and branches of the administration have been instructed to concentrate on this work all their available human resources using the "khashar" system in the period when flow

in the rivers is at its lowest, to use the machines and other resources of collective farms, State farms and other enterprises and organizations situated on their territory to carry out bank-strengthening work and to assign specific sectors to these organizations.

The Madad combine and the Ministry of Commercial Resources have been instructed to allot for the bank-strengthening work the necessary quantity of wire for constructing gabions and to provide spare parts to ensure normal operation of the machines and equipment used in this work.

The Naftrason Company has been instructed to ensure the assignment of the necessary amounts of fuel and lubricants for normal working of the machinery and vehicles used in carrying out bank-strengthening work. If coordination measures are not adopted forthwith to implement this work, the results in spring 1994 will be unpredictable.

Decree of the Council of Ministers of the Republic of Tajikistan No. 529, dated 18 October 1993 envisages the completion in 1994 of all the repair and restoration work. In particular it gives instructions:

1. to ministries, branches of the administration and oblast, city and rayon Executive Committees to ensure strict and specific utilization of the funds set aside for natural disaster relief;

2. to the Ministry of the Economy of the Republic of Tajikistan and the Finance Ministry of the Republic jointly with ministries, branches of the administration, organizations and oblast, city and rayon Executive Committees, when forecasting how the economy will function in 1994, to arrange to complete the work of restoring establishments that suffered from natural disasters in 1993, in view of the lack of other resources in the Republic for these purposes.

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