the boadcasting enterprises to activity handle the disaster broadcasting

o The Electricity Utilities Industry Law

Law for making management of electricity utilities industry. proper and reasonable, and for regulating works, maintenance and operation of electric articles

Including providing an inspection before use or an access inspection to be made of the electric articles in order to prevent danger and hazards involved in the works, maintenance and operation

o The Gas Utility Industry Law

Law for adjusting management of gas Utility Industry and for regulating works, maintenance and operation of gas structures and production and sale of gas supplies

Including that the gas enterprises are under obligation to have the installed gas structures comply with the technical standards, report the work schedules and conduct inspections before use and periodically, and as required, reporting and access indpections may be made in order to prevent danger and hazards

(6) Emergency Measures against Disaster

o Disaster Relief Law

Law for securing protection of the victims and preservation of social order in the event of a disaster, with Government extending necessary relief urgently under cooperation of the local governments, Japanese Red Cross Association, other organizations and people

o Flood Fighting Act

Law for maintaining public safety by means of warning and prevention of water disasters and reduction of the damage by it in the event of flood and storm surge

o Fire Srevice Law

Law for maintaining peace and order and for promoting public welfare by means of preventing, warning and extinguishing fire, protecting life and limb of the sitizens and their property from fires and reducing damage by disasters such as fire and earthquake

o Self-Defence Forces Law

Law providing matters concerning Self-Defence Forces including its duties

Including the provision which, upon request following to the provisions of the Large-Scale Earthquake Countermeasures Act, enables the dispatch of troops may be for support

(7) Rehabilitation of Disaster

o Act Concerning Special Financial Support to Deal with the Designated Disaster of Extreme Severity

Law providing special fiscal support to local governments and special assistances for the damaged persons in the event

of extreme severe disaster

- o Act on National Burden for Natural Disaster Rehabiltation Works of Public Utilities

  Law providing the government liabilities for disaster recovery projects of public work facilities to comply with the financial capacities of local governments

- o Act on Extraodinary Measures for Fiscal Support to Disaster Recovery Projects of Facilities of Agriculture, Forestry and Fisheries

  Law providing fiscal support to disaster recovery projects of agricultural land, facilities of agriculture, forestry, fishery and common use

- o Act on Government Liability for Disaster Recovery of Facilities of Public Schools

  Law providing the government liabilities for disaster recovery projects of facilities of public schools

(8) Assistance for the Damaged Persons

- o Act concerning Payments of Disaster Condolence Money

  Law providing payments to bereaved families and the heavily handicapped by disasters, representing a system of individual remendies made by municipalities for damages by natural disasters

- o Act on Extraodinary Measures Concerning Finance to Damaged Enterprises and Persons Engaged in Agriculture, Forestry and Fisheries by Natural Disasters

  Law for promoting stability of management of damaged persons engaged in agriculture, forestry and fisheries or damaged organizations consist of them by natural disasters such as rainstorm, heavy rain, earthquake, storm and big wave, storm surge, heavy snow, heavy frost, low temperature and hailstorm by means of smoothly financing necessary funds to manage agriculture, forestry and fisheries

- o Act Concerning Earthquake Insurance

  Law for promoting spread of earthquake insurance by means that Government reinsure the responsibilities of insurance companies concerning earthquake insurance

- o Act on Special Measures Concerning Tax to Damaged Persons Including Reduction of, Exemption from, Postponement of Collection of Taxes

  Law providing special measures concerning reduction of, exemption from, a method of calculation of or postponement of collection of national taxes payed by damaged persons by disasters such as earthquake, storm and flood, falling of thunderbolt and fire, and concerning collection of or return of national taxes about damaged goods

(9) Reconstruction from Disaster

- o Law providing Temporary Measures concerning Leased Land and Buildings in the Cities Damaged by War

Law for promoting reconstruction of damaged cities by arranging legal relation as to leasehold on damaged land, applicable mutatis mutandis to the cases where there are buildings destroyed by disasters such as fire, earthquake, and so forth

o Act concerning the Special Fiscal Measures for the Promotion of Collective Relocation for Disaster Prevention

Law for protecting the life and limb of citizens and their property from disasters by means of promoting collective relocation of houses in the area accepted improper to live within the damaged region by a natural disaster such as heavy rain, flood, storm surge or within the hazardous area

4. **Disaster mitigation activities completed or underway:**

a) **Identification of hazard zones: hazard assessment (assessment on natural disasters)**

Title of project:

(1) Development of coast hazard maps.

(2) Implementation of coastal zone basic survey.

(3) Implementation of land condition survey.

(4) Other (survey of hazard sites).

Status:

(1) The coast hazard maps comprising disaster prevention data required for relief activities in the event of a disaster occurring on a remote island or in a peninsular zone, 6 maps have been developed until fiscal 1993 for Higashi-Izu and Northern part of the Sagami Bay.

(2) For the purpose of obtaining fundamental data required for prevention of disasters and conservation of environment in the coastal areas, topographic maps and land condition maps of the coastal areas have been prepared as basic maps of coastal areas comprising sea and land areas. Presently, for the sea area of about 33,600 km^2 of a water depth of 50m or less where various plans of use are undertaken among the gulfs, bays and inland sea in Japan, the survey has been completed for 13,151km^2 until 1993, and 69 topographic maps and 68 maps land condition of the coastal areas have been published.

(3) Of the planned 120,000km^2, 40,871km^2 has been completed (progress rate, 34.1%).

(4) Hazard sites are checked every year for correction, as required, and filing.

Participating institutions in the country and/or on international level:

(1)-(4) —— .

Costs of project:

(1) 9 million yen for FY1993; 27 million yen for FY1991-FY1993.

(2) 69 million yen for FY1993; 2,286 million yen for FY1972-FY1993.

(3) 17 million yen for FY1993; 195 million yen for FY1961-FY1993.

(4) —— .

Sources of funding:

(1)-(3) Central Government: 100%.

(4) Prefectural governments: 100%.

Implementing agencies:

(1) Maritime Safety Agency, Ministry of Transport.

(2)-(3) Geographical Survey Institute, Ministry of Construction.

(4) Prefectural Police.

Address (trelephone and fax-number) of the agency in charge:

(1) Hydrographic Department, Maritime Safety Agency, Ministry of Transport
5-3-1, Tsukiji, Chuo-ku, Tokyo 104

Tel 03-3541-3811; Fax 03-3542-7174.

(2)-(3) Geographic Department, Geographical Survey Institute, Ministry of Construction

1, Kitasato, Tsukuba-shi, Ibaraki 305

Tel 0298-64-1111; Fax 0298-64-1658.

(4) National Police Agency

2-1-2, Kasumigaseki, Chiyoda-ku, Tokyo 100

Tel 03-3581-0141; Fax 03-3581-0559.

a) **Identification of hazard zones: hazard assessment (assessment on wind and flood disasters)**

Title of project:

(1) Promotion of the study on meaures against wind and flood damage (study on disasters occurring frequently with global warm-up).

(2) Implementation of comprehensive flood control measures (isclosure of prospected inundation areas and inundation records).

Status:

(1) Investigation and research were made for identifying dangerous sites of potential landslides and risk, and examination made of the form of occurrenece of landslide block and of the stability considered from the micro-topographic elements of landslide sites.

(2) The map of the prosected areas of inundation of 4 rivers (as of August 31, 1993) was prepared and published, and the map of inundations is of 476 rivers (as of December 31, 1992).

Participating institutions in the country and/or on the international level:

(1)-(2) —— .

Costs of project:

(1) 5 million yen for FY1993.

(2) —— .

Sources of funding:

(1) Central Government: 100%.

(2) —— .

Implementing agencies:

(1) Public Works Research Institute, Ministry of Construction.

(2) Regional Construction Bureaus and Prefectures.

Address (telephone and fax-number) of the agency in charge:

(1) Landslide Division, Public Works Research Institute, Ministry of Construction

1, Asahi, Tsukuba-shi, Ibaraki 305

Tel 0298-64-2211; Fax 0298-64-2840.

(2) River Planning Division, River Bureau, Ministry of Construction

2-1-3, Kasumigaseki, Chiyoda-ku, Tokyo 100

Tel 03-3580-4311; Fax 03-5251-1942.

a) Identification of hazard zones: hazard assessment (assessment on earthquake disasters)

Title of project:

(1) Promotion of the study of measures for earthquake disaster prevention (tests and investigation concerning design earthquake ground motion for slopes and determination method of slope aseismaticity).

(2) Formulation of liquefaction map preparation manual (completed).

(3) Other (Research on local characteristics of long period ground motions)

Status:

(1) For the purpose of developing a method for reasonable and simple assessment of the risk of slope failure at an earthquake, factors of slope failure in earthquake were extracted, and using the fuzzy theory, a possibility linear regression model was established.

(2) A general method of preparation of a map for approximate prediction of the possibility of occurrenece of liquefaction was shown.

(3) Developing a method of assessment of the risk of long period ground motions upon slothing of oil tanks, and applying the seismic data in Tokyo, it was shown that the danger by an earthquake at about Izu would be high at a period of about 8 seconds.

Participating institutions in the country and/or on the international level:

(1)-(3) —— .

Costs of project:

(1) 4 million yen for FY1993.

(2) —— .

(3) 15 million yen for FY1993.

Sources of funding:

(1)-(3) Central Government: 100%.

Implementing agencies:

(1) Public Works Research Institute, Ministry of Construction.

(2) National Land Agency and Ministry of Construction.

(3) Fire Research Institute, Fire-Defence Agency, Ministry of Home Affairs.

Address (telephone and fax-number) of the agency in charge:

(1) Slope Failure Division, Public Works Research Institute, Ministry of Construction

1, Asahi, Tsukuba-shi, Ibaraki 305

Tel 0298-64-2211; Fax 0298-64-0930.

(2) Earthquake Disaster Countermeasures Division, Disaster Prevention Bureau, National Land Agency

1-2-2, Kasumigaseki, Chiyoda-ku, Tokyo 100

Tel 03-3501-5693; Fax 03-3503-5690.

(3) Fire Research Institute, Fire-Defence Agency, Ministry of Home Affairs
3-14-1, Nakahara, Mitaka-shi, Tokyo 181
Tel 0422-44-8331; Fax 0422-42-7719.

a) **Identification of hazard zones: hazard assessment (assessment on volcanic disasters)**

Title of project:

(1) Comprehensive measures for active volcanos (formulation of the guideline for preparation of volcanic eruption hazard maps [completed]).

(2) Execution of the survey of volcanic land conditions.

(3) Preparation of volcanic hazard maps for eruption of Mt. Unzen.

(4) Others (study on sediment disaster prevention in volcanic areas, and development of a disaster prevention system for sediment disasters).

Status:

(1) There was formulated a guideline for assessing the risk of areas from volcanic disasters and preparing volcani hazard maps.

(2) The survey was completed of 4 volcanos among the planned 33 volcanos (progress rate, 12.1%).

(3) While the volcanic hazard maps were prepared for Mt. Unzen have been prepared, measures for monitoring sediment runoffs for warning and evacuation are promoted.

(4) 1) Study on sediment disaster prevention in volcanic areas.

Methods of determining the dangerous areas from rundown and flooding of volcanic mud flow, lava flow and pyroclastic flow have been developed, and at the same time, countermeasure works to prevent or mitigate these disasters have also been developed to some extent.

2) Development of a disaster prevention system for sediment disasters.

As countermeasures for pyroclastic flow, development of temporary countermeasures works method which realizes safe and swift works without workers in no-trespassing area is explored, and technologies for predicting pyroclastic flow and for specifying disasterous areas by measuring the behavior of lava dome are being developed.

Participating institutions in the country and/or on the international level:

(1)-(4) —— .

Costs of project:

(1) —— .

(2) 2 million yen for FY1993; 10 million yen for FY1988-FY1993.

(3) —— .

(4) 1) 30 million yen for FY1993; 568 million yen for FY1975-FY1993.

2) 68 million yen for FY1993; 122 million yen for FY1992-FY1993.

Sources of funding:

(1)-(4) Central Government: 100%.

Implementing agencies:

(1) Disaster Prevention Bureau, National Land Agency.

(2) Geographical Survey Institute, Ministry of Construction.

(3) Sediment Control Department, River Bureau, Ministry of Construction.

(4) 1) Public Works Research Institute, Ministry of Construction.

2) Public Works Research Institute, Ministry of Construction; Geographical Survey Institute, same as above.

Address (telephone and fax-number) of the agency in charge:

(1) Earthquake Disaster Countermeasures Division, Disaster Prevention Bureau, National Land Agency

1-2-2, Kasumigaseki, Chiyoda-ku, Tokyo 100

Tel 03-3501-5693; Fax 03-3503-5690.

(2) Geographic Department, Geographical Survey Institute

1, Kitasato, Tsukuba-shi, Ibaraki 305

Tel 0298-64-1111; Fax 0298-64-1658.

(3) Sediment Control Division, Sediment Control Department, River Bureau, Ministry of Construction

2-1-3, Kasumigaseki, Chiyoda-ku, Tokyo 100

Tel 03-3580-4311; Fax 03-5251-1947.

(4) 1) Erosion Control Division, Erosion Control Department, Public Works Research Institute, Ministry of Construction

1, Asahi, Tsukuba-shi, Ibaraki 305

Tel 0298-64-2211; Fax 0298-64-0903.

2) Engineering Affairs Management Section, Minister's Secretariat, Ministry of Construction

2-1-3, Kasumigaseki, Chiyoda-ku, Tokyo 100

Tel 03-3580-4311; Fax 03-5251-1925.

a) Identification of hazard zones: hazard assessment (assessment on snow disasters)

Title of project:

(1) Promotion of the study on countermeasures to snow disasters (survey on the method of assessment of the risk of reach of surface avalanche).

Status:

(1) Developed a system of preparing avlanche hazard maps using numerical data of national land. Also, for analysis of the movements of avalanche, examination is made of the field application of the equations of motion.

Participating institutions in the country and/or on the international level:

(1) —— .

Costs of project:

(1) 7 million yen for FY1993.

Sources of funding:

(1) Central Government: 100%.

Implementing agencies:

(1) Public Works Research Institute, Ministry of Construction.

Address (telephone and fax-number) of the agency in charge:

(1) Niigata Experimental Laboratory, Public Works Research Institute, Ministry of Construction
2-6-8, Nishiki-cho, Arai-shi, Niigata 944
Tel 0255-72-4131; Fax 0255-72-9629;
Public Works Research Institute, Ministry of Construction
1, Asahi, Tsukuba-shi, Ibaraki 305
Tel 0298-64-2211; Fax 0298-64-0903.

a) **Identification of hazard zones: hazard assessment (study on natural disasters)**

Title of project:

(1) Study on natural disasters.

(2) Study on erosion control, shore disasters and disaster prevention materials.

Status:

(1) For contribution to establishment of the natural disasters preventing and mitigating measures, basic studies are carried out for study subjects.

(2) Studies on the erosion control, shore and offshore disasters and disaster prevention materials are carried out at the research institutes attached to national universities under the independency of the researchers.

Participating institutions in the country and/or on the international level:

(1) Universities and research institutions.

(2) Research institutes attached to national universities.

Costs of project:

(1) 479 million yen for FY1992.

(2) 113 million yen for FY1993.

Sources of funding:

(1) Central Government: fixed amount.

(2) Central Government: 100%.

Implementing agencies:

(1) Universities and research institutions.

(2) Disaster Prevention Research Institute, Kyoto University; Institute of Low Temperature Science, Hokkaido University; etc.

Address (telephone and fax-number) of the agency in charge:

(1) Research Aid Division, Science and International Affairs Bureau, Ministry of Education, Science and Culture
3-2-2, Kasumigaseki, Chiyoda-ku, Tokyo 100
Tel 03-3581-4211(ext 2581); Fax 03-3507-9946.

(2) Research Institutes Division, Science and International Affairs Bureau, Ministry of Education, Science and Culture
3-2-2, Kasumigaseki, Chiyoda-ku, Tokyo 100
Tel 03-3581-4211(ext 2570); Fax 03-3581-7354.

a) **Identification of hazard zones: hazard assessment (study on wind and flood disasters)**

Title of project:

(1) Promotion of the studies concerning prevention of rainfall disasters (studies on the meteorological disaster generation mechanism and assessment of the effects, and development of large rainfall experimental facilities).

(2) Hydrological studies.

(3) Promotion of the studies concerning measures against wind and flood disasters (heavy rain type landslide survey, and studies on the mechanism of sedimentation of debris derived from slope failure).

Status:

(1) 1) Studies on meteorological disaster generation mechanism and assessment.

Clarification of the mechanism of generation of sediment disasters and prediction.

o Heavy rain generation mechanism and prediction.

o Forecasting technology of flood runoff, inundation and damage.

o Prediction of the sites of occurrence of slope failure.

The foregoing studies will be respectively summed up in fiscal 1993.

2) Development of large rainfall experimental facilities.

For investigation of the natural disasters by rainfall from the phenomenal aspect, development and maintenance of large rainfall experimental facilities are promoted so as to allow multi-faceted experiments in use of their universal applicability.

(2) Studies on hydrology are carried out at the research institutes attached to national universities under the independency of the researchers.

(3) 1) Heavy rain type landslide survey.

Studies on the mechanism of generation of heavy rain type landslides and nethods of investigation are being summed up.

2) Studies on the mechanism of sedimentation of debris derived from slope failure.

Based on the experiments of the dynamics and sedimentation of failed soil and actual cases of failure, the simulation method is being examined.

Participating institutions in the country and/or on the international level:

(1) —— .

(2) Research institutes attached to national universities.

(3) —— .

Costs of project:

(1) 1) 13 million yen for FY1993.

2) 29 million yen for FY1993.

(2) 37 million yen for FY1993.

(3) 1) 11 million yen for FY1993.

2) 4 million yen for FY1993.

Sources of funding:

(1)-(3) Central Government: 100%.

Implementing agencies:

(1) National Research Institute for Earth Science and Disaster Prevention, Science and Technology Agency.

(2) Disaster Prevention Research Institute, Kyoto University, etc.

(3) Public Works Research Institute, Ministry of Construction.

Address (telephone and fax-number) of the agency in charge:

(1) National Research Institute for Earth Science and Disaster Prevention, Science and Technology Agency

3-1, Tennodai, Tsukuba-shi, Ibaraki 305

Tel 0298-51-1611; Fax 0298-51-1622.

(2) Research Institutes Division, Science and International Affairs Bureau, Ministry of Education,Science and Culture.

3-2-2, Kasumigaseki, Chiyoda-ku, Tokyo 100

Tel 03-3581-4211(ext 2570); Fax 03-3581-7354.

(3) 1) Landslide Division, Public Works Research Institute, Ministry of Construction

1, Asahi, Tshukuba-shi, Ibaraki 305

Tel 0298-64-2211; Fax 0298-64-2840.

2) Slope Failure Division, Public Works Research Institute, Ministry of Construction

1, Asahi, Tsukuba-shi, Ibaraki 305

Tel 0298-64-2211; Fax 0298-64-0903.

a) **Identification of hazard zones: hazard assessment (study on snow disasters)**

Title of project:

(1) Study for advanced snow fall and cover countermeasure technologies (completed).

(2) Study on countermeasures to snow disasters (study on clarification of the mechanism of generation of blowing snow and development of disaster prevention technologies [completed]).

(3) Study on growth of wet snow particles (completed).

(4) Studies on snow avalanche.

Status:

(1) The initial condition of generation of clouds was made clear. Also, upon the finding obtained by observation, a snow cloud regulating model was developed.(2) Taking the Shonan and Tsugaru District, usually assaulted by blowing snow, as a model area, a study to clarify the mechanism of blowing snow and develop a technology of preventing disasters by blowing snow was carried out.

(3) Efforts were made for clarification of the state of growth of snow particles which would determine the reflectivity of snow surface and moisture retention of snow causing great influence onto occurrence of snow flood.

(4) Studies on the snow avalanche are carried out at the research institutes attached to national universities under the independency of the researchers.

Participating institutions in the country and/or on the international level :

(1)-(3) —— .

(4) Research institutes attached to national universities.

Costs of project:

(1) 91 million yen for FY1992; 545 million yen for FY1988-FY1992.

(2) 29 million yen for FY1992.

(3) 5 million yen for FY1991 (total cost).

(4) 32 million yen for FY1993.

Sources of funding:

(1)-(4) Central Government: 100%.

Implementing agencies:

(1) Meteorological Research Institute, Meteorological Agency, Ministry of Transport; Research and Development Bureau, Science and Technology Agency; National Research Institute for Earth Science and Disaster Prevention, same as above; etc.

(2)-(3) National Research Institute for Earth Science and Disaster Prevention, Science and Technology Agency.

(4) Institute of Low Temperature Science, Hokkaido University, etc.

Address (telephone and fax-number) of the agency in charge:

(1) Meteorological Research Institute, Meteorological Agency, Ministry of Transport
1-1, Nagamine, Tsukuba-shi, Ibaraki 305
Tel 0298-53-8535; Fax 0298-53-8545.

(2)-(3) National Research Institute for Earth Science and Disaster Prevention, Science and Technology Agency
3-1, Tennodai, Tsukuba-shi, Ibaraki 305
Tel 0298-51-1611; Fax 0298-51-1622.

(4) Research Institutes Division, Science and International Affairs Bureau, Ministry of Education,Science and Culture
3-2-2, Kasumigaseki, Chiyoda-ku, Tokyo 100
Tel 03-3581-4211(ext 2570); Fax 03-3581-7354.

b) Monitoring, prediction and warning (observation of natural disasters)

Title of project:

(1) Maintenance of meteorological observation facilities (maintenance of geostational meteorological satellite services and meteorological observation facilities installed on the ground).

Status:

(1) 1) Maintenance of geostational meteorological satellite services.

Since launching of a geostational meteorological satellite (GMS) in July 1977, GMSs have been successively launched to continue the geostational meteorological satellite observation, and presently GMS-4 launched in September 1989 is operated. Also, GMS-5 is being developed as a successor of GMS-4, and it will be launched in winter of fiscal 1994.

2) Maintenance of meteorological observation facilities installed on the ground.

At the 162 meteorological stations in Japan, observations are carried out with the atmospheric pressure, temperature, humidity, wind direction, wind velocity, precipitation snow, snowfall, cloud, visibility and weather. Also, with automated meteorogical observation facilities installed at about 1,300 places (including the meteorological stations), the precipitation, temperature, wind direction, wind velocity and intensity of sunshine (some stations precipitation only) are observed. With the snow cover depth meters installed at about 200 places in the areas of high snowfall, the depth of snow cover is automatically observed. Further, with meteorological radars installed at 20 places (19 places from FY1993), the area, intensity, etc. of the rainfall at the time of a typhoon or heavy rainfall are observed, and at the 18 stations. A balloon carrying meteorologicai observation instruments is raised 2-4 times a day to observe the atmospheric pressure, temperature, humidity, wind direction and wind velocity from surface to the height of about 30km.

Participating institutions in the country and/or on the international level:

(1) 1) Science and Technology Agency, and National Space Development Agency.

2) —— .

Costs of project:

(1) 1) 6,767 million yen for FY1993.

2) 3,985 million yen for FY1993.

Sources of funding:

(1) Central Government: 100%.

Implementing agencies:

(1) Meteorological Agency, Ministry of Transport.

Address (telephone and fax-number) of the agency in charge:

(1) 1) Meteorological Agency, Ministry of Transport

1-3-4, Otemachi, Chiyoda-ku, Tokyo 100

Tel 03-3212-8341; Fax 03-3211-2032.

2) Meteorological Agency, Ministry of Transport

1-3-4, Otemachi, Chiyoda-ku, Tokyo 100

Tel 03-3212-8341; Fax 03-3212-2453.

b) Monitoring, prediction and warning (observation of earthquakes)

Title of project:

(1) Maintenance of earthquake observation facilities.

(2) Promotion of the studies of geodetic survey technology for long-term prediction (Western Pacific VLBI(Very Long Baseline Interferometer) experiment).

(3) Implementation of the survey of crustal movements by geodetic method.

(4) Promotion of the studies on earthquake countermeasures (strong-motion earthquake observation project).

Status:

(1) With a view to exactly knowing the activities of major, medium and minor earthquakes and thus implementing the earthquake prediction, observations are constantly made with seismographs installed at 117 meteorological offices in the country, and changes in crustal strain, which are assumed as precursors of a large-scale earthquake, are constantly monitored at 31 points in the Tokai and South Kanto districts. A system for quick issue of tsunami forecast through earthquake detector network and emergency information satellite transmitting system will be established. Also, for improvement of the accuracy of earthquake prediction information and for prevention of earthquake disasters, seismic wave- forms transmitted from the seismographs upon occurrence of an earthquake are immediately processed and analyzed for issue of earthquake information on tsunami warning.

(2) Using VLBI (Very Long Baseline Interferometer) systems on each of four plates in the vicinity of Japan (North American plate, Pacific plate, Philippine Sea plate and Eurasian plate) and observing the lengths of the baselines between these four stations, CRL(Communications Research Laboratory), Ministry of Posts and Telecommunications make precise measurement of the movements of the plates around Japan. In 1989, CRL installed a 10m antenna on the remote island, the observations were started. Also, requesting for observation to the Shanghai Astronomical Observatory, China, simultaneous observations with the CRL were implemented. Movements of the stations (several centimeters/year) are detected at an accuracy in the order of mm, and thus exact analysis of the plate movements in the vicinity of Japan is becoming possible.

(3) For the Japanese Islands precise geodetic network survey, the second observation of the primary reference points and the eighth national revision measurement of the levels and gravities are under way. For the astronomical survey, revision of survey points is carried out of average 6 points a year. For the gravity survey, the second revision of measurement is carried out. For the geomagnetic survey, a revision of measurement is carried out at a rate

of 2-5 years. For the VLBI survey, observation has been performed in Sagara-cho, Shizuoka, and international observation has been started jointly with NASA in 1992. For improvement of the precision to detect crustal movements, tracking of the global positioning system (GPS) satellite is performed, and a precise orbit is determined.

(4) Each project implementing agency has collected, arranged and analyzed the records of observation of strong earthquakes in the country and offered the data on strong motions domestically and abroad to serve for studies on seismology and earthquake engineering and for improvement of earthquake disaster countermeasures.

Participating institutions in the country and/or on the international level:

(1) —— .

(2) Shanghai Astronomical Observatory, Science Agency, China.

(3)-(4) —— .

Costs of project:

(1) —— .

(2) 3 million yen for FY1993.

(3) 1,590 million yen for FY1993.

(4) 23 million yen for FY1993.

Sources of funding:

(1) Central Government: 100%.

(2) For observations in the country, Central Government: 100%.

(3)-(4) Central Government: 100%.

Implementing agencies:

(1) Meteorological Agency, Ministry of Transport.

(2) Communications Research Laboratory, Ministry of Posts and Telecommunications.

(3) Geographical Survey Institute, Ministry of Construction.

(4) National Research Institute for Earth Science and Disaster Prevention, Science and Technology Agency; Regional Construction Bureaus, Ministry of Construction; Public Works Research Institute, Ministry of Construction; Building Research Institute, Ministry of Construction; Hokkaido Development Bureau; Okinawa General Bureau; and local autonomous bodies.

Address (telephone and fax-number) of the agency in charge:

(1) Meteorological Agency, Ministry of Transport
1-3-4, Otemachi, Chiyoda-ku, Tokyo 100
Tel 03-3212-8341; Fax 03-3211-2032.

(2) Communications Research Laboratory, Ministry of Posts and Telecommunications
893-1, Hirai, Kashima-cho, Kashima-gun, Ibaraki 314
Tel 0299-84-4123; Fax 0299-84-4128.

(3) Geographical Survey Institute, Ministry of Construction

1, Kitasato, Tsukuba-shi, Ibaraki 305
Tel 0298-64-1111; Fax 0298-64-1658.
(4) National Research Institute for Earth Science and Disaster Prevention, Science and Technology Agency
3-1, Tennodai, Tsukuba-shi, Ibaraki 305
Tel 0298-51-1611; Fax 0298-51-1622;
Public Works Research Institute, Ministry of Construction
1, Asahi, Tsukuba-shi, Ibaraki 305
Tel 0298-64-2211; Fax 0298-64-2840;
Building Engineering Division, International Institute of Seismology and Earthquake Engineering, Building Research Institute, Ministry of Construction.
1, Tatehara, Tsukuba-shi, Ibaraki 305
Tel 0298-64-2151; Fax 0298-64-2989.

b) Monitoring, prediction and warning (observation of volcanic eruptions)

Title of project:

(1) Development and improvement of volcanos observation facilities.

(2) Other (maintenance of the mountainous block movement observation system for Mayuyama with eruption of Unzen-Dake).

Status:

(1) For the particularly active 19 volcanos, observation of earthquakes is regularly carried out, and for the other active volcanos, circuit observation by a volcano mobile observation team is made, with observation equipment installed as required in an emergency for detailed observation.

(2) The Mayuyama (height 818m) in the east of the Unzen-Dake in Nagasaki had a great collapse induced with great eruption of the Unzen-Dake in 1792 and caused serious damage to the local inhabitants. With intensification of the eruptive activities of the Unzen-Dake since November, 1990, sector collapse of the Mayuyama has been apprehended this time, and so a mountainous block movement observation system has been maintained for the Mayuyama since August 1991.

Observation has been made continuously since August 1991, with no anomalous result of observation leading to movement of the mountain block noted to data.

But, the eruptive activities of the Unzen-Dake are not yet ended, and so the observation will be continued.

Participating institutions in the country and/or on the international level:

(1) —— .

(2) Nagasaki Prefecture, etc.

Costs of project:

(1) 292 million yen for FY1993.

(2) 17 million yen for FY1993; 127 million yen for FY1991-FY1993.

Sources of funding:

(1)-(2) Central Government: 100%.

Implementing agencies:

(1) Meteorological Agency, Ministry of Transport.

(2) Nagasaki District Forest Office, Kumamoto Regional Forest Office, Forestry Agency, Ministry of Agriculture, Forestry and Fisheries.

Address (telephone and fax-number) of the agency in charge:

(1) Meteorological Agency, Ministry of Transport

1-3-4, Otemachi, Chiyoda-ku, Tokyo 100

Tel 03-3212-8341; Fax 03-3211-2032

(2) First Management Division, Forestry Agency, Ministry of Agriculture, Forestry and Fisheries

1-2-1, Kasumigaseki, Chiyoda-ku, Tokyo 100

Tel 03-3502-8111; Fax 03-3592-6259.

b) Monitoring, prediction and warning (observation of snow falls)

Title of project:

(1) Promotion of R&D of snow fall intensity measurement method (completed).

Status:

(1) R&D was made of the method of high accuracy snow fall intensity measurement in use of snow particle counter.

Participating institutions in the country and/or on the international level:

(1) —— .

Costs of project:

(1) 4 million yen for FY1991 (total cost).

Sources of funding:

(1) Central Government: 100%.

Implementing agencies:

(1) National Research Institute for Earth Science and Disaster Prevention, Science and Technology Agency.

Address (telephone and fax-number) of the agency in charge:

(1) National Research Institute for Earth Science and Disaster Prevention, Science and Technology Agency
3-1, Tennodai, Tsukuba-shi, Ibaraki 305
Tel 0298-51-1611; Fax 0298-51-1622.

b) Monitoring, prediction and warning (prediction of storm and heavy rains)

Title of project:

(1) Promotion of the studies of the countermeasures to wind and flood damage in Hokkaido (study on landslides, and study on sediment flow and riverbed fluctuation in rapid rivers [completed]).

(2) Promotion of the studies concerning the prevention measures of wind and flood damage (study on prevention of debris flow disasters, testing and investigation concerning the method of predicting occurrence of slope failures, survey on failure characteristic on erosion control area and investigation concerning the prediction of occurrence of steep slope failures with the soil characteristics).

(3) Others (application of typhoon model, and development of basic technology for advancing remote sensing technology by use of microwave sensor data).

Status:

(1) 1) Study on landslides.

A study of model simulation of failures was made through measurement and analysis of the behaviours of steep bedrock slopes and field testing of a disaster prediction system.

2) Study on sediment flow and riverbed fluctuation in rapid rivers.

A study for development of a prediction method was made through observation of the sediment transportation by floods and riverbed fluctuation caused by sediment transportation by floods arrangement of data and theoretical analysis and movable bed model experiments.

(2) 1) Study on prevention of debris flow disasters.

There were developed a method of investigation of rapids subject to danger of debris flow, method of setting dangerous areas of debris flow, method of reference point surveying for prediction of debris flow, and debris flow flooding simulation method. Also, a new work method for slit dams was developed.

2) Testing and investigation concerning the method of predicting occurrence of slope failure.

Now, with the system for observation of the behaviors of rain water in slope prepared, observation data are being accumulated.

3) Survey on failure characteristic on erosion control area.

Tropographic prediction method of the location and scale of occurrence of failure has been developed, it is now tested if it is applicable to prediction of the location of occurrence of failure.

4) Investigation concerning the prediction of occurrence of steep slope failures with the soil characteristics .

Soil dynamic procedures related to prediction of steep slope failures were