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Debris Flow Disaster Prevention and Protection Operation Plan

Part I General Principles

The Council of Agriculture (hereinafter, the COA) is the central competent authority for debris flow disaster prevention and protection operations under [Article 3, Subparagraph 3 of the Disaster Prevention and Protection Act](#). The COA is responsible for directing, supervising, and coordinating with all levels of relevant administrative agencies and utility enterprises in implementing all kinds of tasks such as debris flow mitigation and preparedness before disaster, emergency response action during disaster, and recovery after disaster. The COA, having drafted the Debris Flow Disaster Prevention and Protection Operation Plan (hereinafter, the Operation Plan) in accordance with [Article 19, Paragraph 2 of the Disaster Prevention and Protection Act](#), and relevant details of the Disaster Prevention and Protection Basic Plan (hereinafter, the Basic Plan). The Operation Plan was approved on January 16, 2002 in the third meeting of the National Disaster Prevention and Protection Council and announced by the National Disasters Prevention and Protection Commission (NDPPC), the Executive Yuan, bearing reference number Tzai-Fang-Jian-Tzu No. 0919970038. The COA promulgated the Operation Plan on February 22, 2002, bearing reference number Nung-Lin –Tzu No. 0910030038.

The first amendment to the Operation Plan was approved by the National Disaster Prevention and Protection Council on June 16, 2004; P and promulgated for implementation by the COA on August 13, 2004, bearing reference number Nung-Shou-Suei-Bau-Tzu No. 0931842783.

The second amendment to the Operation Plan was approved by the National Disaster Prevention and Protection Council on November 15, 2006; P and promulgated for implementation by the COA on May 25, 2009, bearing reference number Nung-Shou-Suei-Bau-Tzu No. 0981853178.

Other relevant central or local authorities for debris flow disaster prevention and protection efforts are as follows: the Ministry of the Interior (MOI), Ministry of Economic Affairs (MOEA), Ministry of Transportation and Communications (MOTC), Ministry of National Defense (MOND), Ministry of Education (MOE) Ministry of Foreign Affairs (MOFA), Ministry of Justice (MOJ), Ministry of Finance (MOF), Environmental Protection Administration (EPA), Department of Health (DOH), Public Construction Commission (PCC), Government Information Office (GIO), Financial Supervisory Commission, Executive Yuan (FSC), Directorate-General of Budget, Accounting and Statistics (DGBAS), National Communications Commission (NCC), Council of Indigenous Peoples (COIP), National Disasters Prevention and Protection Commission (NDPPC), National Science Council (NSC), and local governments (including governments of municipalities under the direct jurisdiction of the Executive Yuan, counties, cities, villages, and townships).

Disaster Prevention and Protection Act

1. This Act was promulgated in accordance with the President's Decree dated July 19, 2000 and bearing reference number Hua-Tsung-(I)-Yi-Tzu No. 8900178710. The Act has been incorporated for the development and improvement of a disaster prevention and response system of functions to protect the safety of the people's life and properties and conservation of the homeland.
2. Addition of Article 39-1, published under Presidential Order Hua-Tsung-(I)-Yi-Tzu No.09100108310, May 29, 2002.

Article 3, Subparagraph 3 of the Disaster Prevention and Protection Act

Depending on the type of the disaster, the following agencies shall be the central regulating authorities for the Disaster Prevention and Response in charge of command, supervision and coordination among administrative agencies and civil utilities to carry out Disaster Prevention and Response operation:

3. Frost, debris flow:
Commission for Agricultural Affairs,
Executive Yuan

Article 19, Paragraph 2 of the Disaster Prevention and Protection Act

The central Disaster Prevention and Response operation regulating authorities shall based on the Disaster Prevention and Response basic plan develop within its jurisdiction of the Disaster Prevention and Response operation plan to seek the approval for action from the National Disaster Prevention and Response Council.

slopelands
Under Article 3, Paragraph 3 of the Soil and Water Conservation Act, slopeland refer to national forest area, forest land for experimentation, protection forest land and public and private land conforming to either of the following which the central or municipal competent authority identifies in accordance with the natural terrain, requirements of the administrative regions, and requirement for conservation and utilization, and which are approved and publicly announced by the Executive Yuan upon application of the central or municipal competent authority: (1) with an elevation of more than 100 m; (2) with an elevation less than 100 m, however, average gradient greater than 5%.

1. Operation Plan Descriptions

(1) Objectives

The Operation Plan aims to develop effective debris flow disaster prevention and protection system, strengthen programs for debris flow disaster recovery and reconstruction, implement debris flow disaster prevention education and training plans, enhance government at each level the ability in debris flow disaster prevention, preparedness, and mitigate disaster losses. Additionally, the Operation Plan also serves as the basis for Regional Disaster Prevention and Protection Plans.

(2) Constituents and contents

The Operation Plan consists of five parts, including General Principles, Disaster Prevention; Disaster Emergency Response; Post-disaster Recovery and Reconstruction, Operation Plan Implementation, Control and Evaluation; and Appendixes.

(3) Relationship with other plans

The Operation Plan is formulated based on the Basic Plan and will become effective after being approved by the National Disaster Prevention and Protection Council. The Operation Plan is by nature a subordinate plan of the Basic Plan and a complementary plan for all kinds of Disaster Prevention and Protection Operation Plans formulated by the MOI, MOEA, MOTC, EPA, DOH, and Atomic Energy Council (AEC). The Operation Plan is a superior and guiding plan for Regional Disaster Prevention and Protection Plans formulated by all levels of local governments. The matters set forth in the Operation Plan that required to be handled by relevant agencies should also be included in the debris flow section of regional disaster prevention and protection plans prepared by local governments for implementation by corresponding agencies (units) to ensure a sound mechanism for overall debris flow disaster prevention and protection.

2. Characteristics and recognition of debris flow disasters

(1) Natural conditions for formation of debris flow disasters

Located in the Pacific-Rim Seismic Zone, Taiwan has a fragile geology with numerous faults, steep [slopelands](#) and shallow soils. Geographically located in the path of rainy fronts and West Pacific typhoons, Taiwan is frequented by typhoons and storms, which bring abundant rainfall coupled with natural environmental factors such as earthquakes. All these are likely to cause debris flows in susceptible areas.

A debris flow is a mixture of mud, sand, gravel, boulder and water that created by the action of gravity and carries the following characteristics:

- i. The unit weight of a debris flow in motion is 1,400 - 2,300 kg/m^3 .
- ii. A gravel type debris flow travels at a velocity of 3 - 10 m/sec, and a mud type at 2 - 20 m/sec.
- iii. Debris flows typically occur on 15 - 30° slopes and are deposited slopes with inclines of 3 - 6°.
- iv. Debris flows often form alluvial deposits on relatively flat areas at valley outlets.
- v. The front section of a moving debris flow is wave-shaped and generally characterized by a high concentration of boulders.

Debris flows are natural phenomena with triggering conditions, including abundant deposits, sufficient water and steep slope. The development process of a debris flow consists of the source area (generation section), transportation section (flowing section) and deposition area (deposition section). The source area is often located on relatively steep areas upstream of valleys. Water flows sharply erode riverbed and side banks, causing [landslide](#) and accumulate a large amount of debris. When water flows mix with debris to a certain concentration typical debris flow, a certain flow velocity and riverbed washing energy will be created at appropriate grades. In addition, the sediments and woody debris travelling at the front end can also cause certain damage. A debris flow at this stage is known as a transportation section. When the debris flow reaches relatively wide or moderately inclined areas at downstream riverbeds, it slows down and becomes gradually dehydrated, with gradually deposition of sediment. Alluvial deposit is formed at the opening of a valley or river mouth and is known as the deposition area.

(2) Social conditions

In the past, debris flows were regarded as natural phenomena as they generally occurred in sparsely populated areas. However, rapid economic development has caused an increase in the populations and industries in mountainous areas. As a result, debris flows now threaten, settlements, farms, and public facilities, and the definition of debris flows as natural disasters has increased in popularity.

(3) Case studies and analyses

When a debris flow disaster occurs, all levels of governments should

landslide

Under Article 160 of the Technical Regulations of Soil and Water Conservation, a landslide refers to the falling or sliding of rock and soil on slopes and consists primarily of falls, slumps and slides.

investigation and analyses of major historical debris flow disaster cases

See Appendix A

scenario simulation

Quantified simulations and loss assessments on potential debris flow disasters are conducted, including situation simulations and assessments on conditions such as potential casualties, damage to buildings and the environment and social and economic losses.

Concrete Execution Plans for Resolution of Debris Flow Disasters

It was decided during the 2768th Session of the Executive Yuan on January 9, 2002 that relevant authorities are required to prepare concrete plans for implementation in accordance with the Debris Flow Resolution Program.

Table on Relevant Responsibilities and Division of Work Items

See Appendix B

commit necessary manpower and resources in collecting, investigating, analyzing, exploring, and compiling information about the status and causes of a disaster and submitting such information to the COA for inclusion into the [Investigation and Analyses of Major Historical Debris Flow Disaster Cases](#) (Appendix A), which serve as future reference for the formulation of disaster prevention strategies.

(4) Recognition of debris flow disasters

A debris flow disaster is recognized on the basis of the above-mentioned characteristics and the Technical Regulations of Soil and Water Conservation. In doubtful cases, the determination is made by the COA.

3. [Scenario simulation](#) of disasters

All levels of governments should appraise each disaster potential area before formulating any policies. Such appraisals should include:

- (1) Scenario simulation of debris flow disasters, determination of the disaster area and estimation of disaster-incurred losses.
- (2) Preparation of hazard maps and databases for debris flow disasters that codify as disaster prevention information.

4. Division of work items and responsibilities

All agencies (units) and all levels of governments should in addition to handling the matters set forth in the Operation Plan, should plan comprehensively and execute debris flow disaster prevention and protection operations by following the division of work items and responsibilities for each unit as set forth in the [National Land Security Plan – Concrete Execution Plans for Resolution of Debris Flow Disasters](#) approved by the Executive Yuan. If necessary, the COA can coordinate with all units for review and revision. (See Appendix B for the [Table on Relevant Responsibilities and Division of Work Items](#)).

5. The Operation Plan formulation procedure

The Operation Plan is prepared and reviewed by the COA, which considers comments and opinions from relevant agencies (units) solicited by the COA, and is subsequently submitted to the National Disaster Prevention and Protection Council for approval prior to its implementation (the COA is authorized to approve amendments to the Operation Plan Appendices). All relevant agencies (units) are required to thoroughly follow the Operation Plan.

6. Schedule and timing for the Operation Plan amendment and review

Under Article 8 of the Enforcement Rules of the Disaster Prevention and Protection Act, the COA should, based on the Basic Plan, review the Operation Plan and amend it in every two year's, if necessary, by conducting inspection and evaluations based on outcomes of relevant scientific research, disasters circumstances and coping strategies. The COA can amend it when needed within the two-year period.

7. Operating procedure for debris flow disaster prevention and protection

The COA prepares the [Operating Procedures Related to Debris Flow Disaster Prevention and Protection](#) (Appendix C). All units can prepare relevant operating manuals on their own based on such operating procedures.

Operating
Procedures
Related to Debris
Flow Disaster
Prevention and
Protection

See Appendix C

8. Index

To facilitate effective reviews and quick searching of all kinds of debris flow prevention and protection information by relevant personnel, an index is compiled for the Operation Plan.

Part II Disaster Prevention

Disaster prevention encompasses disaster prevention and protection measures such as disaster mitigation in normal times and pre-disaster preparation with an aim to reduce natural disasters and man-made damage to national land and prepare disaster emergency plans beforehand to improve the emergency response capability when coping with disasters.

Chapter 1 Disaster Mitigation in Normal Times

Section 1 Preparedness of Security Facilities for National Land

1. Strengthen slopeland conservation and management

- (1) Forestation should be enhanced in the upstream areas of [watersheds](#) (COA).
- (2) Conservation and management of [reservoir watersheds](#) should be strengthened to improve water quality and ensure sustainable utilization of soil and water resources (MOEA and COA).
- (3) Emergency soil and water maintenance and treatment at the sources of debris flows and landslides should be implemented to reduce source materials of debris flows, minimize landslides, and debris flow disasters (COA).
- (4) Programs related to mountain management and disaster prevention should be strengthened with each watershed as a basic unit (COA).

2. Strengthen disaster prevention management on slopelands

- (1) The [overuse](#) of slopelands should be dealt with to reduce sediment related disasters caused by overuse (COA and local governments).
- (2) Programs for investigation, reporting and crackdown on over-development and construction on slopelands should be reinforced, and overuse investigation should be conducted (COA and local governments).
- (3) Review, supervision and management of slopeland development should be strengthened to reduce disasters caused by man-made development of slopelands (COA, MOI, and local governments).
- (4) Disaster prevention planning for rural village on slopelands should be enhanced, and soil and water conservation facilities for rural villages and settlements on slopelands should be improved (COA and local governments).

[watershed](#)

Under Article 3, Paragraph 4 of the Soil and Water Conservation Act, area above a given point of stream or river where the natural drainage converges.

[reservoir watershed](#)

Under Article 3, Paragraph 6 of the Soil and Water Conservation Act, a “reservoir watershed” refers to the area within the whole basin of a watershed or dam (including the intake of an off-channel reservoir).

[overuse](#)

Pursuant to the interpretation set forth in Article 26 of the Enforcement Rules of the Soil and Water Conservation Act, the overuse of slopelands refers to agricultural, fishing and stock-breeding development, plantation, operation or use within areas designated as those suitable for forest land or lands requiring intensive treatment under the Statute for Slopeland Conservation and Use.

- (5) Workshops and seminars on laws, regulations, and techniques regarding slopeland management should be organized to cultivate slopeland management professionals and enhance the law enforcement capability of slopeland managing personnel (COA).
- (6) A [geographic information database](#) for slopelands and a search system should be established, and the National Geographic Information Task Force under the Ministry of the Interior should integrate existing geographic information databases from various units to rapidly and effectively search and plan relevant disaster prevention measures (MOI, COA, and MOEA).
- (7) The authorities and responsibilities of various existing slopeland management agencies, as well as operations relating to conservation and mitigation work and investigation of illegal uses, should be integrated to thoroughly implement slopeland safety and maintenance projects (COA and MOI).
- (8) Continuous efforts should be made to study appropriate amendments to slopeland administration acts and regulations to cater social and environmental changes (COA).
- (9) Research projects related to debris flow disaster prevention should be carried out on a continuous basis to strengthen the research and applications of debris flow disaster prevention technologies and strategies (COA, NSC, PCC, MOEA, MOI, and MOTC).

Section 2 Assurance of Disaster Prevention Construction and Facilities

1. Safety inspection and review

A database regarding the current status and safety inspection of [erosion and sediment control engineering](#) structures and soil and water conservation measures should be set up. The localities and the geological characteristics of damaged structures should be identified. In addition, statistics can be employed to analyze the primary triggers for the damage or destruction, and the functions and performance of existing disaster prevention construction and facilities can be reviewed to help strengthen existing disaster prevention projects and the planning and design of subsequent disaster prevention structures (COA and local governments).

2. Assurance of construction quality

All emergency agencies of competent authority should enforce the supervision and inspection of the quality of engineering construction according to the Article 70 of the Government Procurement Act. All

geographic information database

An integrated geographic information database incorporating graphic, image and attribute data.

erosion and sediment control engineering

These refer to projects relating to sediment and flood control, collapse treatment and environmental conservation undertaken or subsidized by relevant authorities such as the Forestry Bureau and Soil and Water Conservation Bureau under the COA.

potential debris flow torrent

The potential debris flow torrent is the nature hazard estimation which exceed the resilient ability of protect objects within the affected areas.

Designated Soil and Water Conservation Area

Under Article 3, Paragraph 5 of the Soil and Water Conservation Act, such area refer to area designated by the central or municipal competent authority where the handling and maintenance of soil and water conservation must be strengthened., including the following items: (1) reservoir watersheds, (2) watersheds of major streams and rivers that are subject to special protection, (3) coasts, the riparian zones of lakes and reservoirs, or banks of waterways that are subject to special protection, (4)sand dunes, sand beaches etc. that are under serious wind erosion, (5) steep slopeland that is likely to jeopardize public safety, (6) other areas with a great impact on soil and water conservation.

treatment and maintenance of soil and water conservation

Under Article 3, Paragraph 1 of the Soil and Water Conservation Act, the application of engineering, agronomic or vegetative measures to protect soil and water resources, maintain natural ecology and landscape, and prevent soil erosion, collapse, landslide, debris-flow, and other disasters.

subordinate should be supervised to prescribe three-level engineering quality management and assure the construction disaster prevention in advance, according to the Quality Management Systems for Public Construction Projects. (COA, local governments, and PCC).

Section 3 Investigation and Mapping of Potential Torrents

1. Survey on potential debris flow torrents

The COA and local governments shall continue conduct surveys on [potential debris flow torrents](#) and set up an inquiry system and, at the same time, follow the survey and assessment outcome to enhance the maps of [Designated Soil and Water Conservation Areas](#), debris flow prevention, and sediment control works, or the posting of warning signs (COA and local governments).

2. Delimitation of Designated Soil and Water Conservation Areas

Pursuant to the Regulation of Delimitation and Abolishment of Designated Soil and Water Conservation Areas, active efforts should be made to partition soil and water conservation areas. Administrative authorities for designated soil and water conservation areas should enhance [treatment and maintenance of soil and water conservation](#) by stages and areas and exercise strict control over developments in restricted areas so as to conserve soil and water resources, mitigate natural disasters and maintain public safety on slopelands (COA, local governments, MOEA, and MOI).

3. Installation and maintenance of warning signs for potential debris flow torrent

Continuous efforts should be made to post and maintain warning signs for potential debris flow torrent (local governments and COA).

Section 4 Disaster Evacuation Planning

1. With regard to debris flow evacuation planning, local governments should plan debris flow evacuation routes and shelters in consideration of local characteristics. The COA will provide a demonstration plan to offer examples and standards (local governments and COA).

2. County (city), village (township and city) governments should formulate Debris Flow Disaster Prevention and Evacuation Program based on the outcome of debris flow evacuation planning (local governments and COA)

3. The COA should prescribe the [Operating Procedures for Debris Flow Disaster Evacuation](#) (Appendix C.1), which serves as the basis for debris flow evacuation drills by local governments (COA and local governments).

Operating Procedures for Debris Flow Disaster Evacuation
See Appendix C.1

Chapter 2 Pre-disaster Preparedness

Section 1 Establishment of Emergency Response Mechanism

1. Local governments and relevant utility enterprises should formulate emergency mobilization plans to specify the emergency contact methods, assembly methods, gathering locations, mission assignment, operating procedures and matters to be noted for people responsible for disaster emergency response implementation and conduct regular drills by simulating various disaster scenarios (local governments, MOI, MOEA, MOTC, and COA).
2. Each local government should formulate Debris Flow Disaster Prevention and Evacuation Program for potential debris flow torrent in advance. If necessary, the COA should provide active guidance and assistance to local governments in generating these plans (local governments and COA).
3. Each local government should set up a rescue organization to provide support for the rescue of residents (local governments).
4. Each local government and the military should follow the relevant requirements in executing a mutual support agreement which provides for the dispatch procedure and methods and windows of contact, and enhance mutual communications and conduct joint drills in regular times (local governments and MOND).
5. Local governments and relevant public utility enterprises should strengthen the facilities and equipment of disaster emergency response centers (emergency action term) and debris flow disaster prevention and control measures. They should also consider allocation mechanisms in times of difficulties with the supply of food and drinking water and ensure that such mechanisms can operate normally upon power outage (local governments, MOI, MOEA, MOTC, and COA).
6. The MOTC should supervise the Civil Aeronautic Administration with respect to coordination with aviation operators and local governments to jointly maintain the safety of landing sites for rescue missions of helicopters to facilitate support operations (MOTC and local governments).
7. All levels of governments should maintain contact with the civil defense mobilization preparation system to handle the preparation for disaster

rescue, responses and conscription of reservists (local governments and MOND).

Section 2 Collection, Reporting, Analysis and Application of Disaster Information

1. Establishment of a disaster information collection and reporting system

- (1) The COA shall formulate the [Operating Procedures for Collection and Reporting of Debris Flow Disaster Information](#) (Appendix C.2) to establish an emergency reporting system for debris flow disasters (COA).
- (2) Each local government is required to set up a communication list related to disaster rescue based on such information provided by the central competent authority or set up by such local government as the emergency contact persons, [protected objects](#), evacuation routes, emergency shelters, first-aid stations and disaster rescue resources for potential debris flow torrent. Such communication list should be verified on a regular basis (local governments, COA, MOI, and COIP).
- (3) The MOTC shall provide and maintain equipment and reporting facilities for monitoring and forecasting typhoons, torrential rainfall, heavy rainfall and other severe weather events; the MOEA should provide and maintain equipment for real-time monitoring of landslides; the COA shall provide and maintain facilities for real-time monitoring of and warning for landslides (MOTC, MOEA, COA).
- (4) All levels of governments and relevant public utility enterprises shall establish multiple channels for disaster notification, to establish a communication system for the collection and notification of disaster information among enterprises, a standardized platform for information on disaster prevention and, at the same time, to set up their respective accountability and division of work (local governments, MOI, COA, MOEA, MOTC, COIP).

2. Assurance of communications facilities

- (1) All levels of governments and relevant public utility enterprises should develop alternative plans for power outages or damage to communications systems to ensure communication availability during disasters, and plan for communication link digitization and diversification, underground CATV installation, the transmissions via phone line, wireless, and satellite, and so on (local governments, MOI, MOEA, MOTC, COA, and COIP).

Operating Procedures for Collection and Reporting of Debris Flow Disaster Information

See Appendix C.2

[protected objects](#)

These refer to information about the residents and public facilities within debris flow-affected areas

- (2) All levels of governments should regularly inspect or test communications facilities or conduct operating training for such facilities and simulate emergency scenarios involving communications breakdown or massive communications usage (local governments, MOI, MOEA, MOTC, COA, and COIP)
- (3) All levels of governments should establish a disaster rescue communications network to ensure that on-site disaster data can be transmitted to all levels of disaster emergency operation centers and relevant disaster prevention agencies (local governments, MOI, MOEA, MOTC, COA, and COIP).
- (4) All levels of governments should setup the operating modes of the citizens' mobile phones and radio systems in times of disasters (local governments, MOI, MOEA, MOTC, COA, and COIP).

3. Analysis and application of disaster data

All levels of governments should regularly collect and analyze information related to debris flow disaster prevention and list such information on the Internet and other delivery channels for citizen review (local governments and COA).

Section 3 Preparedness for Rescue and Emergency Medical Care

1. All levels of governments should regularly prepare equipment, apparatuses, and resources required for debris flow disaster rescue and emergency medical care and enhance the training of rescue and emergency medical professionals. As for relevant equipment, including excavation machinery, rescue equipment, and life detection equipment should be prepared, in addition to common equipment and apparatuses for all kinds of disasters, and rescue dogs should be prepared and trained. Private sectors may be subsidized to facilitate such efforts (local governments, MOI, and COA).
2. All levels of governments should prepare an emergency medical care system for debris flow disasters, prescribe the reporting procedure between the medical care command and medical institutions and among medical institutions, regulate the division of work items among medical staff in dealing with a large number of patients, and conduct regular exercises (local governments, DOH, and MOND).
3. The MOI and local governments should prepare an emergency medical care system for debris flow disasters, prescribe reporting protocols, and regulate the division of work within the rescue system, and conduct regular drills (MOI, local governments).

Section 4 Preparedness for Emergency Transportation

1. For emergency transportation as an emergency response measure during debris flow disasters, local governments should identify appropriate transportation facilities (roads, airports, and helicopter landing sites), transportation locations (stations, markets, and school playgrounds.) and relevant alternative proposals. The safety of a transportation system with respect to disaster prevention should be considered (local governments, MOTC, MOI, and MOND).
2. Local governments should negotiate with relevant agencies to plan reserve sites for helicopters in advance to serve as part of an emergency transportation network and should announce such sites (local governments, MOTC, and MOI).
3. Traffic control agencies should plan traffic control measures for land transportation during disasters and ensure the safety of road facilities such as traffic signals and information bulletin boards during disasters (local governments, MOTC, and MOI).
4. All levels of governments and relevant public utility enterprises should identify the manpower, tools and equipment required for the removal of road barriers and emergency repair in the wake of a disaster and generate support agreements with construction and maintenance operators (local governments, MOTC, and MOI).
5. All levels of governments and public utility enterprises should enter into agreements with transportation operators in advance to facilitate emergency transportation. (local governments, MOTC, and MOI).

Section 5 Preparedness of Evacuation Shelters

1. Local governments should plan the evacuation routes beforehand and select appropriate locations as the evacuation shelters for residents by considering the type and scale of disasters, population distribution and topographic conditions, communicate such information to the residents, and regularly mobilize the residents to participate in disaster prevention drills. Assistance should be provided to disadvantaged groups such as senior citizens, foreign nationals, infants and children, pregnant women, lying-in women, and mentally and physically handicapped people (local governments, COA, and MOI).
2. Local governments should set up water storage tanks, temporary toilets and telecommunications facilities for delivery of information and for contact at evacuation shelters or in their vicinity and plan the preparation and storage of food, drinking water, medical supply, and cooking utensils, and provide facilities for senior citizens, mentally and physically handicapped people, pregnant women and others (local governments).

3. Local governments should inspect facilities and goods stored at shelters on regularly. Administrative rules should be developed for the shelters use and these rules mustly be communicates to citizens (local governments).
4. All levels of governments should investigate and evaluate lands available for temporary shelter and set up a system for resources allocation and provision in accordance with land use, topography map, transportation route, population, and historical records on disaster and other information (local governments, MOI).

Section 6 Preparedness for Allocation and Provision of Food, Drinking Water and Necessities of Living

1. Local governments should regularly identify regional population statistics, transportation routes and information on suppliers for essential goods to estimate the kinds and quantity of food, drinking water and necessities of living in times of a large-scale debris flow disaster and set the allocation and provision plans, in which the appropriateness of storage locations, comprehensiveness of storage methods and safety of storage buildings should be considered (local governments).
2. All levels of governments should prepare for the storage and allocation of food, drinking water, medical supply, necessities of living and telecommunications facilities (local governments, MOI, COA, DOH, MOTC, and COIP).

Section 7 Preparedness for Emergency Recovery of Facilities and Equipment.

1. All levels of governments and relevant public utility enterprises should estimate potential disaster damage to the facilities, equipment and [lifelines](#) under their management, prepare for emergency recovery and provision measures beforehand, and execute support agreements with relevant operators (local governments, MOI, MOEA, and MOTC).
2. Local governments should regularly inspect various disaster prevention and debris flow control engineering within their jurisdictions and intensify such inspection during [flooding control seasons](#). Any damage found during the inspection should be reported immediately for maintenance to ensure that disaster prevention functions of all projects can be carried out (local governments, MOI, MOEA, MOTC, and COA).
3. The NCC shall oversee telecommunication enterprises in matters of repairing damaged telecommunication network (NCC)

[lifelines](#)

Basic energy pipelines that support the lives of disaster-struck residents, including electricity, water, gas, etc.

[flooding control seasons](#)

Under Article 18 of the River Management Regulation, flood defence season covers from May 1 to November 30electricity, water, gas, etc.

Section 8 Preparedness of Disaster Information for Citizens

1. All levels of governments should provide comprehensive information regarding the process of disasters handling and deployment and enhancement of information delivery facilities to disaster-struck residents (local governments, MOI, MOEA, MOTC, COA, GIO, and COIP).
2. All levels of governments and relevant public utility enterprises should strengthen and maintain their information delivery system and communications facilities and equipment to speedily deliver relevant disaster information and provide living information to disaster-struck residents. At the same time the government should take into consideration of those foreign nationals, mentally and physically disadvantaged people, and those who are likely to become disaster-struck people in isolated regions or people who will be unlikely to return home and thus have difficulty obtain information when maintaining the information delivery system (local governments, GIO, MOI, MOEA, MOTC, COA, and COIP).
3. All levels of governments and public utility enterprises should plan disaster prevention consultation services in advance to cope with the citizens' needs (local governments, MOI, MOEA, MOTC, COA and COIP).

Section 9 Preparedness for Prevention of Repeated Disasters

1. The COA should prescribe the [Operating Procedures for Prevention of Repeated Debris Flow Disasters and for Recovery and Reconstruction](#) (Appendix C.5) (COA).
2. All levels of governments should enrich and maintain necessary equipment, facilities and disaster detection devices to prevent repeated debris flow disasters (local governments, MOI, MOEA, MOTC, and COA).

Section 10 Preparedness for Acceptance of International Support

1. The central government should prescribe relevant operating guidelines for accepting international support, survey international support organizations and catalog such organizations in advance.
2. The operating guidelines set forth in the preceding paragraph should be set by the MOI with the assistance of the COA and MOFA (MOI, MOFA, and COA).

Section 11 Drills and Training for Relevant Disaster Prevention and Protection Agencies

1. Local governments should enhance debris flow disaster emergency treatment for villages and townships prone to potential debris flow torrent (local governments, COA and COIP).
2. All levels of governments should plan cross-county and city training of disaster emergency preparedness (local governments, MOI, MOEA, MOTC, COA, and COIP).
3. Local governments and public utility enterprises should maintain close contact with the military, community disaster prevention and protection organizations, private disaster prevention and protection volunteer organizations and companies and conduct drills (local governments, MOI, MOEA, MOTC, and MOND).
4. When conducting [disaster prevention and protection drills](#), all levels of governments and public utility enterprises should simulate all kinds of debris flow disaster scenarios to strengthen emergency response handling capability and coordination and communication mechanisms between various agencies. Evaluation should be conducted following such drills for reference of disaster prevention and protection (local governments, MOI, MOEA, MOTC, and COA).

disaster prevention and protection drills

To simulate potential disasters, the following measures can be taken to enhance the contingency-copying capability and the preparedness of the citizens participating in the simulation and training: issuance of pre-disaster warnings, preventive measures, promotion of disaster prevention, organization of communication self-protection groups, establishment of a command center, announcement of evacuation route for residents, post-disaster reporting, and disaster rescues.

Section 12 Cataloging Reconstruction Facilities and Equipment

1. All levels of governments and relevant public utility enterprise should prepare all kinds of information (such as cadasters, buildings, rights relationship, facilities, objects buried underground, and real estate registration, financial information and maintenance and support systems for information such as surveying drawings and information drawings) in advance to smoothly perform recovery and reconstruction (local governments, MOI, MOEA, and MOTC).
2. Public facility management agencies should prepare relevant information in advance such as the construction drawings, bases and foundations of major facilities under management and make copies for separate storage to facilitate post disaster restoration (local governments, MOI, MOEA, and MOTC).

Chapter 3 Disaster Prevention Education, Training and Publicity for Citizens

Section 1 Promotion of Disaster Prevention Awareness

1. Debris flow disaster prevention education and publicity should be

continued by all levels of governments (local governments and COA).

2. The COA should establish the [Implementation Guidelines for Debris Flow Disaster Prevention Education and Publicity](#) (Appendix C.3) to strengthen disaster prevention education and training, promote the disaster prevention awareness of all citizens, and impart all kinds of disaster prevention knowledge and self-help methods to the citizens so that the citizens will stay away from dangerous areas for their own safety (local governments, COA, MOI, and COIP).

Section 2 Dissemination of Disaster Prevention Knowledge

1. All levels of governments should conduct analysis and investigation regarding debris flow disaster potentials, degrees of danger and scenario simulation. Local governments should educate and provide timely notice to the citizens to prepare emergency living supplies and carry-ons and disseminate disaster prevention knowledge regarding emergency response actions and evacuations that should be initiated during disasters (local governments, COA, MOI, and COIP).
2. The MOE and local governments should promote education regarding the conservation of national land, soil and water conservation and prevention of debris flow disasters (MOE and local governments).
3. The COA should regularly organize domestic and international practical workshops, academic conference and training for debris flow disaster prevention and protection to improve Taiwan's capability in debris flow disaster prevention and protection (COA).

Section 3 Implementation of Disaster Prevention Training

1. All levels of governments and relevant public utility enterprises should conduct debris flow disaster prevention training through activities such as disaster prevention weeks (local governments, MOI, MOEA, MOTC, COA, and COIP).
2. Local governments may simulate scenarios of debris flow disasters and disaster response measures beforehand by regularly inviting personnel of relevant agencies, residents, organizations, and companies to jointly participate in training and exercises. For disadvantaged groups in times of disaster evacuation such as senior citizens, foreign nationals, infants and young children, pregnant women, and mentally and physically handicapped people, special disaster prevention training should be planned and implemented (local governments).

Section 4 Promotion of Disaster Prevention for Companies

Companies located on slopelands should consider their social responsibilities by participating and facilitating debris flow disaster prevention drills in their areas (local governments, MOI, MOEA, and COA).

Section 5 Promotion of Self-Sufficient Disaster Prevention for Community

Communities should actively promote the concept of disaster prevention, and establish disaster prevention systems based on residents saving themselves and others; all levels of governments should assist communities in promoting self-sufficient disaster prevention (local governments, MOI, COA, COIP).

Chapter 4 Research on and Observations of Debris Flow Disaster Countermeasures

Section 1 Research on Debris Flow Disaster Countermeasures

1. The COA and NSC should promote the technology and research relating to debris flow disaster prevention and protection from the perspective of disaster prevention, and should cooperate with relevant research institutions in order to effectively apply research outcome (COA and NSC).
2. The COA and NSC should work with academic institutions and other professional organizations to promote relevant disaster prevention research (COA and NSC).

Section 2 Observations of Debris Flow Disasters

1. The MOTC should upgrade meteorological observation facilities to improve the capability of typhoon path forecasting, heavy rainfall monitoring and forecasting. The MOEA should provide and maintain equipment for real-time monitoring and promote the forecasting on landslides. The COA should upgrade relevant hydrological observation and transmission facilities to promote the capability of the debris flow warning system and various debris flow prevention and protection facilities (MOTC and COA).
2. The COA should set debris flow observation station and collecting the hydrological and geographic information are necessary to serve as reference for establish [rainfall threshold value for debris flow warning](#) in the future (COA).
3. Local governments may set up debris flow monitoring or observation systems on their own, depending on their actual needs and incorporate

rainfall threshold value for debris flow warning

Local precipitation records and debris flow indicators will serve as the basis for reference, and precipitation and debris flow benchmarks will be established based on local geological environments and circumstances.

such systems into local disaster prevention systems. The COA should provide consultation, if necessary (local governments and COA).

4. The COA should integrate MOTC, MOEA and other agencies with universities, research institutes, and other professional organizations regarding information related to debris flow monitoring, establish and expand information platform to accumulate knowledge on debris flow disaster prevention and protection (COA, MOTC, MOEA, NSC, MOE).

Section 3 Collection and Analysis of Debris Flow Disaster Cases

1. The COA and local governments should analyzes the causes of disasters and review current practices based on past cases of debris flow disasters and relevant information collected (COA and local governments).
2. The COA should broadly collect debris flow cases and measures, acts and regulations related to disaster prevention and protection operation in other countries and conduct regular exchanges of experience or send officials overseas for training (COA).

Part III Disaster Emergency Response

Chapter 1 [Debris Flow Disaster Forecasting and Warning](#)

Section 1 Releasing Debris Flow Disaster Alert Information

1. In accordance with the [Operating Procedures for Forecasting and Warning of Debris Flow Disasters](#) (Appendix C.4).
2. The COA is responsible for system establishment and professional assistance and, when determining the likelihood of debris flows, should provide information directly to municipalities, counties (city) and townships, city governments as soon as possible such that warnings can be issued or relevant measures taken (COA, local governments, and MOI).

Section 2 Evacuation Education for Citizens

1. Local governments should prescribe emergency response measures for debris flows according to weather forecast, and should take safe precautions in debris flow and landslide disaster areas. When a disaster is likely to occur, the local governments should enforce evacuation procedures, and use helicopters and other transportation vehicles when necessary (local governments).
2. If a disaster is likely to occur, local governments should set up shelters that meet actual needs and communicate shelter information to the residents (local governments).
3. In areas where a disaster is likely to occur, local governments should persuade senior citizens, foreign nationals, infants and young children, pregnant women, lay-in women, and mentally and physically disadvantaged people to evacuate (local governments).

Chapter 2 Collection, Reporting and Dissemination of Debris Flow Disaster Information

Section 1 Collection and Reporting of Debris Flow Disaster Information

1. When a debris flow disaster occurs, local governments should report disaster and damage information to their superior governments according to reporting procedures (in accordance with the [Measures for Multiple Intelligence Setup for Disaster Investigation and Reporting](#) (Appendix D.13) and the [Operating Procedures for Collection and Reporting of Debris Flow Disaster Information](#) (Appendix C.2) so that the COA's Disaster Emergency Action Team

Debris Flow disaster forecasting and warning

When it is determined that a debris flow is likely in a debris flow prone area pursuant to the rainfall data released by the Central Weather Bureau and alert values for different alert areas, information should be provided to direct municipality and county (city), village (township, city, district) governments to issue warnings or take relevant coping measures.

[Operating Procedures for Forecasting and Warning of Debris Flow Disasters](#)

See Appendix C.4

[Measures for Multiple Intelligence Setup for Disaster Investigation and Reporting](#)

Directive dated March 28, 2001 and bearing reference number (2001) Nei-Hsiao-Tzu No. 9086327, and revised by the COA (reference number Nei-Shou-Shiao-Tzu No.0920093079) on May 29, 2003. See Appendix D.13

[Operating Procedures for Collection and Reporting of Debris Flow Disaster Information](#)

See Appendix C.2

Central Disaster Emergency Operation Center

Article 13 of the Disaster Prevention and Response Act stipulates that the head of the central competent authority for disaster prevention and rescue shall report to the organizer of the National Disaster Prevention and Response Council if any major disaster has happened or is likely to happen. The organizer may set up a Central Disaster Emergency Operation Center based on the scale and nature of disasters and designate a commander.

or the [Central Emergency Operation Center](#) (CEOC) can quickly assess, analyze and identify the scale and conditions of each disaster (local governments, MOI, and COA)

2. Local governments should report on the establishment and operating status of disaster emergency operation centers and their emergency response performance to relevant superior authorities (local governments).

Section 2 Assurance of Communication

1. All levels of government should, when a disaster is likely, examine communication facilities and send personnel to fix malfunctions to maintain the functionality of communication equipments (MOI, MOEA, MOTC, MOND, COA, DOH, COIP, local governments).
2. During a disaster, all levels of governments should under take effective communication control measures and properly allocate limited communication resources (MOI, MOEA, MOTC, MOND, COA, DOH, COIP, local governments) ; when necessary, the NCC shall supervise private enterprises undertake communication control measures.

Section 3 Identification and Dissemination Information of Debris Flow Disaster

Citizens are typically frightened during a disaster. The CEOC (or the COA if the CEOC is not set up) should address rumors and hearsays using facts and scientific evidence and provide accurate information to the citizens (MOI, COA, and GIO) ; when necessary, the NCC shall determine any misconduct afterwards.

Chapter 3 Emergency Mobilization

Section 1 Establishment of disaster emergency operation organizations

1. During a debris flow disaster or a likely occurrence, all levels of governments should deploy appropriate organizations to deal with such disasters in accordance with the relevant requirements in the Disaster Prevention and Protection Act (local governments, COA, and MOI).
2. If a disaster is likely to occur, local governments should set up a disaster emergency operation center or activate emergency response teams. Local disaster prevention and protection units should mobilize disaster rescue manpower and keep equipment on standby (local governments).

Section 2 Cross-county and city support

When necessary, local governments should request support from neighboring local governments based on applicable mutual support agreements, depending on the scale of debris flow disasters (local governments).

Section 3 Dispatch of Technical Inspection Personnel to Disaster Areas

1. The COA should send professionals and specialists to disaster areas, base on the scale of a disaster or requests by local governments, to ascertain the status of a disaster such that appropriate emergency response measures can be implemented (COA).
2. The COA should handle relevant disaster inspections in accordance with the [Assistant Items and Procedures Requirements for COA's Support to Local Governments in Handling Debris Flow Disasters](#) (Appendix D.6) (COA).
3. When a disaster occurs, local disaster prevention and protection units should mobilize disaster rescue manpower and equipment immediately to initiate rescue operations related to debris flow disasters. The central competent authority or (county) city governments should provide necessary support and keep track of the status of emergent treatment (local governments, COA, MOI and MOND).
4. Local governments should request military support, if necessary, in accordance with the order of CEOC Commander or the [Measures to Application for Military Support in Handling Disasters](#) for assistance in Disaster Rescue Actions (Appendix D.14).

Assistance Items
and Procedural
Requirements for
COA's Support to
Local
Governments in
Handling Debris
Flow Disasters

See Appendix D.6

Measures to
Application for
Military Support
in Handling
Disasters

See Appendix D.14

Section 4 Disaster Emergency Response Equipment, Machinery-Control and Conscripting

Local governments should maintain information about the current quantity of disaster emergency equipment as well as the status of machinery allocation and fully understand methods of conscripting (local governments, and MOI).

Section 5 Mobilization of Professionals and Specialists to Support Disaster Inspection and Rescue

1. The COA should establish a list of experts and scholars for debris flow disaster handling and rescue, and provide such list to all levels of governments for reference. If necessary, such list may be published on the Internet. The PCC may provide assistance as the competent authority for kinds of professional engineers (COA and PCC).

2. If necessary, the support of disaster rescue equipment, tools, rescue manpower and rescue dogs may be requested from other countries (COA, MOFA, MOI, MOTC, GIO, and local governments).

Chapter 4 Prevention of Repeated Disasters

Section 1 Safety Measures for Debris Flow Disaster

To prevent debris flow disasters, all levels of governments should allocate or assist in the allocation of professional technicians to debris flow disaster zones to conduct monitoring, and report to all levels of relevant disaster prevention and protection authorities and local residents during times of danger. All relevant agencies should take appropriate evacuation measures after receive the notice (COA, MOI, PCC, COIP, local governments).

Section 2 Rescue and Reparation

Rescue and reparation in debris flow disaster should be conducted by local governments in a prompt manner. The local disaster reserve fund with priority may be accessed. When an area suffers severe destruction by disaster and requires the assistance from the COA, local governments can follow the “[Assistance Items and Procedural Requirements for COA’s Support to Local Governments in Handling Debris Flow Disasters](#)” (Appendix D.6) (local governments, COA).

Chapter 5 Rescue and Emergency Medical Care

Section 1 Rescue

1. Community disaster prevention and protection organizations and private disaster prevention and protection volunteer organizations can assist relevant authorities in the rescue of disaster residents and emergency care (local governments).
2. The [National Rescue Command Center of the Executive Yuan](#), CEOC or forward command posts should voluntarily or upon request engage in integrated coordination, depending on the scale of a disaster, to ensure effective implementation of rescue and emergency care (MOI).
3. The equipment and tools needed by all levels of governments for rescue operations should basically be prepared by the agencies in charge of such operations. Manpower and rescue equipment may be conscripted from the private sector, if necessary, to facilitate rescue operations (local governments and MOI).
4. The rescue of residents stranded during debris flow disaster should be handled by local governments. In case of a lack of capability or of

Assistance Items
and Procedural
Requirements for
COA’s Support to
Local
Governments in
Handling Debris
Flow Disasters

See Appendix D.6

National Rescue
Command Center
of the Executive
Yuan

To establish a unified national disaster prevention and rescue structure and command system, the Executive Yuan set up the National Rescue Command Center by upgrading the Rescue Coordination Center for Armed Forces on July 24, 2001.

necessity, a support application may be filed with the National Rescue Command Center, and the Debris Flow Disaster Emergency Action Team of the Council of Agriculture should be reported (local governments, MOI, and COA).

Section 2 Emergency Medical Care of Local Governments

1. Local governments should activate emergency medical systems and notify medical institutions within their jurisdictions to get ready for accepting and treating patients.
2. Public medical institutions within disaster areas should conduct emergency repair of their buildings and medical equipment. If necessary, the assistance of relevant operators can be requested (local governments).
3. Disaster emergency operation centers in disaster areas may integrate and coordinate medical operations within disaster areas (local governments).

Section 3 Emergency Medical When Local Governments Resources are Inadequate

1. The central competent authority for medical services, disaster prevention and protection agencies and local governments outside disaster areas should accurately manage emergency medical care personnel being organized. If necessary, medical institutions may be asked to send emergency medical care personnel to provide assistance (DOH and local governments).
2. Local governments should integrate and coordinate emergency medical care personnel in disaster areas with the support of neighboring local governments, and set up medical posts (DOH and local governments).
3. When necessary, local governments can request that medical institutions under the jurisdiction of other local governments in nondisaster areas facilitate transportation and treatment of injured and sick residents and, when necessary, request that the central government serve as a liaison between local governments (DOH and local governments).
4. Local governments should administer medical care immediately and report online when activating the emergency medical care system (DOH and local governments).

Chapter 6 Emergency Transportation

Section 1 Guidelines for Emergency Transportation

1. The targets of debris flow emergency transportation are primarily injured

citizens in disaster areas, necessities of living for stranded citizens in disaster areas and emergency rescue and restoration manpower and equipment. Local governments should consider factors such as the scale, degree of emergency and importance of a disaster in implementing local or regional traffic control measures (local governments).

2. During debris flow disasters, local governments should consider emergency transportation for matters related to emergency measures such as the rescue of people, medical treatment, sanitation and health care and environmental maintenance (local governments).

3. Determination of transportation objects

(1) Stage 1

- i. Manpower and materials required for the rescue and support of human lives during rescue and medical care.
- ii. Manpower and materials required for fire fighting and rescue operations to prevent the escalation of disasters.
- iii. Emergency response manpower required for various disaster prevention and protection agencies, manpower required for maintaining telecommunications, electricity, gas and water facilities, fuel and manpower and materials required for initial response measures.
- iv. Transportation of patients and civilians who must be evacuated urgently to safe areas.

(2) Stage 2

- i. Work set forth in Stage 1 should continue.
- ii. Life supporting materials such as food and drinking water.

(3) Stage 3

- i. Work set forth in Stage 2 should continue.
- ii. Manpower and materials required for post-disaster restoration.
- iii. Necessities of life.

4. Transportation Guidelines

- (1) To safeguard life.
- (2) To prevent disaster escalation.
- (3) To not hinder the disaster emergency operation.

Section 2 Execution of Emergency Transportation

1. Local governments should handle emergency transportation on their own and, if necessary, request the COA (or CEOC) to coordinate with traffic and transportation agencies to facilitate emergency transportation (local governments, MOI, COA, and MOTC).
2. The COA (or CEOC) may, at the request of local governments, integrate, command, coordinate and dispatch emergency transportation via land, maritime and air transportation facilities. If necessary, helicopters, vehicles and vessels may be conscripted to facilitate emergency transportation (local governments, MOI, COA and MOTC).
3. The COA, MOTC, MOI, MOND, local governments or other relevant public and private agencies should supervise, coordinate and utilize existing aircraft, vehicles and vessels to implement emergency transportation pursuant to the CEOC's instructions.
4. If necessary, the COA may request the MOTC (or the CEOC will command) to coordinate with air, land and maritime transportation operators to facilitate emergency transportation (local governments, MOI, COA, and MOTC).

Section 3 Assurance of Smooth Traffic and Transportation

1. Traffic control

To ensure the emergency transportation of injured citizens in disaster areas, necessities of living for stranded citizens in such areas, and manpower and machinery for emergency rescue and repair, the transportation and police offices of local governments may plan traffic control for transportation routes and communicate such measure to the citizens prior to its implementation.

(1) Control of road traffic

- i. The local police authorities or transport authorities should, in addition to collecting information such as traffic conditions and disasters at disaster areas, use all kinds of traffic monitor or video taping equipment to quickly identify the road or traffic conditions required for flood defense and emergency rescue (local governments).
- ii. To ensure emergency transportation, local police authorities should implement traffic control measures and prohibit access of general vehicles and, with the assistance of police authorities or volunteer traffic police in

neighboring areas outside of disaster areas, to implement comprehensive traffic control (local governments).

- iii. Local police authorities should notify residents of traffic control measures being implemented (local governments).
- iv. To ensure emergency transportation, local police authorities may tow vehicles that obstruct the transportation or use police cars to lead the transportation (local governments).

(2) Air traffic control

The MOTC, MOND and relevant transportation units should give priority to the takeoff and landing of emergency aircraft, depending on the condition of a debris flow disaster (or the number of injured or stranded residents), or restrict the takeoff and landing of general aircraft (MOTC, MOI, and MOND).

2. Emergency repair of roads

- (1) All road authorities should identify road damages under their administration, remove road barriers and give priority to the emergency route repair for emergency transportation or to delineate alternate routes. When bridges required for emergency rescue and transportation are damaged, local governments and traffic authorities should set up makeshift bridges to enable emergency transportation access. In case of a lack of such capability, they can request or coordinate with the military to facilitate the construction of makeshift bridges (such as MGB bridges) to restore transportation (local governments, MOTC, and MOND).
- (2) Local governments, police authorities and the military may, depending on the conditions of disasters, take necessary measures to help remove road barriers (local governments, MOI, MOTC, and MOND).
- (3) All levels of governments and relevant public utility enterprises should report road damages and status of their restoration to disaster emergency operation centers (local governments, MOTC, and MOI).

Chapter 7 Evacuation and Sheltering

Section 1 Evacuation Persuasion or Instructions to Disaster-struck Residents

If a debris flow disaster occurs or is likely to occur, local governments should give priority to the consideration of human lives, implement persuaded or instructed evacuation of local residents based on the Debris

Flow Disaster Prevention and Evacuation Program, which is formulated in advance, and provide information such as shelters, evacuation routes, dangerous zones, disaster status and other information needed for evacuation (local governments).

Section 2 Shelters

1. When a disaster occurs or likely to occur, local governments should set up shelters depending on actual needs and communicate such information to the residents. If necessary, additional shelters may be set up (local governments).
2. Local governments should manage shelters appropriately and plan the delivery of shelter information, supply and distribution of food and drinking water, and environmental cleanup, and should seek support from volunteers such as disaster-stricken residents, local residents or community disaster prevention and protection organizations. If necessary, the support of neighboring local governments can be requested (local governments).
3. Local governments should keep track of information relating to the mental and physical status of evacuees at shelters and maintain good living environments and order of shelters (local governments).

Section 3 Temporary Shelters

1. When local governments deem it is necessary to set up temporary shelters, they should consult relevant government authorities immediately before such shelters are set up. When such shelters are set up, repeated disasters should be avoided, and assistance should be provided to help disaster-stricken residents move into such shelters (local governments).
2. When equipment or tools needed by local governments in setting up temporary shelters are inadequate and allocations are thus required, authorities for equipment or tools needed by temporary shelters may be requested directly or through the CEOC to allocate or provide such tools and equipment (local governments, MOI, MOEA, MOND, and MOE).
3. When receiving a request, the CEOC should instruct relevant agencies to allocate equipment and tools. When receiving such an instruction, the relevant agencies should take appropriate measures or coordinate with relevant organizations or companies to supply the equipment and tools and report to local governments (local governments, MOI, MOND, and MOE).

Section 4 Cross-County and City Evacuation Shelters

1. When a local government determines that cross-county or city shelters outside of disaster areas based on the evacuation and sheltering conditions of disaster-struck residents, shelter-related authorities may be requested directly or via the CEOC to provide support (local governments, MOI, MOND and MOE).
2. When receiving a request, the CEOC, shelter-related authorities and local governments of nondisaster areas should implement cross-county and city shelters from a humanitarian perspective (local governments and MOE).

Section 5 Protection and Care of Specific Disadvantaged Group

1. Local governments should adequately care for the living environments and health conditions of seniors and mentally and physically handicapped citizens and the socially disadvantaged such as young children and pregnant women, give priority to such people if they wish to move into temporary shelters, and set up temporary shelters for senior and mentally and physically handicapped citizens. Helpless senior citizens or young children should be placed in social welfare institutions such as asylums for senior citizens or young children (local governments and MOI).
2. Local governments should immediately arrange the students in disaster areas to neighboring schools, set up temporary classrooms or offer at-home tutoring and provide psychological counseling to calm the residents (local governments and MOE).
3. When preparing and implementing debris flow disaster prevention, rescue and evacuation programs and measures, all levels of governments should, to the greatest extent, use the mobility rate (mobilization capability) of socially disadvantaged groups as the basis for their fundamental planning (local governments, MOI, COA, and COIP).

Chapter 8 Allocation and Provision of Food, Drinking Water and Necessities of Living

Section 1 Coordination for Allocation and Provision

All levels of emergency disaster operation centers should coordinate the allocation of food, drinking water, pharmaceutical and medical supply, and necessities in accordance with the scale of disaster (local governments, MOI, MOEA, DOH, COA, COIP).

Section 2 Assistance for Allocation and Provision

Local governments and relevant central authorities should request relevant agencies or the central disaster emergency operation center for allocation assistance when face inadequate supply of goods and in need of allocation (MOI, MOEA, DOH, COA, COIP, local governments).

Section 3 Assistance from Private Enterprises

The central or local governments should coordinate or requisition food, drinking water, pharmaceutical and medical supply, and necessities of living from private enterprises in times of needs (MOI, MOEA, DOH, COA, COIP, and local governments).

Chapter 9 Sanitation, Health Care, Disease Prevention and Treatment of Victim Bodies

Section 1 Sanitation and Health Care

1. The DOH should keep track of pharmaceutical and medical supply needs from time to time to ensure adequate supply (DOH)
2. To prevent the mental and physical health of disaster-struck residents from being affected by drastic changes in living condition, local governments should maintain a good healthy environment in a disaster area, keep track of the health status of the victims and consider the option of setting up medical relief stations (local governments).
3. Local governments should plan and allocate medical staffs of their affiliated health organizations (offices) or hospitals responsible for first aid to provide itinerant health care services in disaster areas and to implement sanitation and health care operations in disaster areas (local governments).
4. To ensure the sanitation of living environments, local governments should set up mobile toilets, depending on actual needs, and take necessary measures to dispose of excrements, garbage and wastes in order to maintain the sanitation and tidiness of disaster areas (local governments).

Section 2 Disinfection and Disease Prevention

Local governments should take indoor and outdoor disinfection and disease prevention measures to prevent an outbreak of diseases. The DOH may request the central governing authority to coordinate with other local

governments for assistance with respect to the dispatch of disease prevention personnel or the provision of disease prevention pharmaceuticals, or requests the MOND for assistance (local governments, DOH, and MOND).

Section 3 Treatment of Victim Bodies

Local governments should promptly coordinate with local prosecutors' offices to inspect victims' remains as soon as possible, handle the belongings of the deceased, allocate coffins, ice chests ensure the safe delivery of bodies and the maintenance of sanitation, and collect information relating to the burials and storage of the bodies to ensure proper handling of the bodies. If necessary, the assistance of neighboring local governments may be requested (local governments, MOJ, and MOI).

Chapter 10 Maintenance of Social Order

1. Local police authorities should take emergency response measures such as patrol in disaster areas and their neighboring areas, joint defense, vigilance and maintenance of social order, which may be carried out by volunteering police, civil defense, and community patrol teams and others (local governments and MOI).
2. Local governments should patrol and monitor disaster areas to ensure the normality and safety of the residents' lives and the supply of their necessities of life (local governments and MOI).

Chapter 11 Emergency Restoration of Facilities and Equipment

In times of debris flow disasters, local governments should immediately mobilize or send for professional technicians to conduct emergency inspection of disaster prevention facilities and equipment under management and take emergency response measures for lifelines, basic living facilities and public facilities and equipment to ensure the livelihood of citizens (local governments)

Chapter 12 Provision of Disaster Information to Disaster-stricken Residents

Section 1 Delivery of Disaster Information to Disaster-stricken Residents

All levels of governments should identify the needs of disaster-struck residents and, from time to time, deliver information such as meteorological conditions, water supply status, operating and management status of lifelines and public facilities and strategies adopted by relevant government agencies to

disaster-stricken residents through the assistance of mass media (local governments, MOTC, MOI, MOEA, COA, GIO, and COIP)

Section 2 Inquiries about Disaster Information

To provide disaster-related information for citizens, local governments may set up dedicated lines, single contact windows and information websites for citizens' inquiries and for announcement of such information (local governments).

Chapter 13 Acceptance of Support and Assistance

Section 1 Establishment of Volunteer Assistance System

All levels of governments should keep track of community disaster prevention and protection organizations, private disaster prevention and protection volunteering organizations, reservist organizations and civil defense organizations at all times, set up communication channels, and establish a system for accepting volunteers' assistance (local governments, MOI, COA, MOND and COIP).

Section 2 Materials Support from Citizens and Companies

With respect to materials support from citizens and companies, local governments should consider the types, quantity, designated delivery locations, and gathering locations of materials urgently needed by disaster-struck residents in all disaster areas and communicate such information to citizens through mass media (local governments).

Section 3 International Disaster Rescue Support

The central government should review matters related to acceptance of international disaster rescue support by considering the types, scale, estimated time of arrival and locations of such support (MOI and MOFA).

Section 4 Handling of Donations

When accepting monetary donations from local and foreign agencies, organizations, companies and individuals, all levels of governments should respect the donor's opinion and apply special funds to special areas as stipulated, to offer relief assistance to the affected people. The fund may not be used toward administrative and operating costs, and the balance should be made public (COA, local governments, MOI, and MOFA)

Part IV Post-disaster Recovery and Reconstruction

Chapter 1 Fundamental of Recovery and Reconstruction for Disaster Areas

Section 1 Formulation of Restoration and Reconstruction Plans

Local governments should conduct prompt review and aim at rapid restoration of original functions by considering local characteristics, status of damage in disaster areas, authorities and responsibilities of agencies having jurisdiction over relevant public facilities and visions of residents and, at the same time, formulate restoration and reconstruction plans focusing on mid-term and long-term reconstruction planning in cities and villages where debris flows can be avoided or circumvented (local governments).

Section 2 Implementation of Recovery and Reconstruction Plans

Local governments should plan the restoration and reconstruction of disaster areas by respecting the opinions of disaster-struck residents, and may request the central government for support when necessary (local governments, MOI, MOEA, MOTC, COA, and COIP).

Section 3 Fiscal and Financial Support

If substantial funding is required by the local government of a disaster area to execute disaster emergency preparedness measures for disasters and post disaster restoration and reconstruction, the central governments should negotiate with the local government for appropriate sharing of responsibility and render support through fiscal and financial measures (local governments, MOF, and DGBAS).

Section 4 Central Government Support

The central government may, at the request of a local government, send relevant professional technicians, allocate equipment and tools or assist in other matters (MOI, MOEA, MOTC, COA, EPA, DOH, MOND, COIP, and PCC).

Chapter 2 Emergency Restoration

Section 1 Rapid Repair of Damaged Facilities

All levels of governments should promptly repair or strengthen damaged facilities by implementing allocation and provision programs for materials, equipment and tools and support programs for professional technicians, which have been formulated beforehand and in accordance with relevant regulations

(MOI, MOEA, MOTC, COA, EPA, DOH, MOND, COIP, PCC, and local governments).

Section 2 Simplifying Operating Procedures

To promptly repair and support lifelines and transportation facilities of vital importance to the residents' livelihood in disaster areas, all levels of governments should, to the greatest extent, simplify operating procedures and formalities relating to the repair (MOI, MOEA, MOTC, NCC, COA, COIP, PCC, and local governments).

Section 3 Principles of Emergency Restoration

All levels of governments should execute rapid repair of damaged facilities with the restoration of original functions as the basic consideration and implement renovative repair or strengthening from the perspective of preventing further disasters (MOI, MOEA, MOTC, NCC, COA, and local governments).

Section 4 Cleaning in Disaster Areas

Local governments should establish methods for the disposal of wastes, garbage and debris by setting up temporary storage sites and final disposal sites for progressive collection, transportation and disposal to rapidly clean up disaster areas and avoid environmental pollution. In addition, other appropriate measures should be taken to maintain the health of the residents and operators (local governments, MOI, and EPA).

Chapter 3 Planning and Programming of Recovery and Reconstruction

Section 1 Development of System for Implementing Reconstruction Programs

Local governments should develop the system for implementing reconstruction programs. If necessary, the central government should also set up the system of a reconstruction organization to support local governments (local governments and MOI).

Section 2 Reconstruction of Cities and Villages from Debris Flows Disasters

1. A local government engaging in reconstruction should aim at a safe and comfortable environment. The reconstruction strategies should be formulated to prevent debris flow disasters, strengthen the safety of buildings, roads, bridges and lifelines in potential disaster areas and plan

open space and disaster prevention locations such as parks and lawns (local governments and MOI).

2. The span of a bridge which is reconstructed after being destroyed by a debris flow should be increased, and the number of piers should be reduced to the greatest extent possible. The amount of a debris flow should be included in hydraulic calculations (MOI, MOEA, MOTC, COA, COIP, and local governments).

Section 3 Consolidation of Reconstruction Directions

A local government engaging in reconstruction should negotiate and communicate with local residents to understand their expectation of the new township so as to consolidate reconstruction directions and form objectives and consensus. Proper participation of the residents should be considered so that they can understand reconstruction status such as the steps, stages, and progress of a reconstruction program (local governments).

Chapter 4 Support for Livelihood Reconstruction for Disaster-struck Residents

Section 1 Issuance of Disaster Damage Certificates

Local governments should, if necessary, after a debris flow disaster, send relevant professional technicians immediately to inspect and assess the status of the disaster and establish a system for issuing disaster damage certificates as soon as possible to issue such certificate to disaster victims. If there are no sufficient professional technicians, the assistance of relevant central government agencies may be requested, or coordination may be made for the assistance and support of relevant professional associations (local governments, MOI, COA, and PCC).

Section 2 Provision of Life Support Funds

All levels of governments should investigate and register the status of each resident in disaster areas and provide all kinds of necessary funds for the livelihood of disaster-struck residents such as disaster consolation money and living support allowances pursuant to relevant acts and regulations to help restore their livelihood. A disaster relief budget should be prepared, and disaster relief funds be distributed in accordance with the [Regulations of Kind and Standard for Debris Flow Disaster Relief](#) (Appendix D.7) (local governments).

Section 3 Tax Exemption, Reduction or Grace Periods

The MOF should consult relevant agencies after a disaster and prescribe tax

exemption, reduction or tax grace periods for disasters pursuant to applicable laws (NDPPC, MOF, and local governments).

Section 4 Minimization of Burdens for Disaster-struck Residents

All levels of governments may, depending on the circumstances, coordinate with insurance companies to take measures such as postponing payment of premiums, preferential premiums and subsidies for medical and health care cost for disaster areas to reduce the burdens of disaster-struck residents. For working people in disaster areas, their employment may be maintained or job intermediary services may be provided (MOF, DOH, MOI, COA, and local governments).

Section 5 Low-interest Loans to Disaster-struck Residents

Financial institutions shall provide reconstruction funds in the forms of low-interest loans to residents in disaster areas; interest rate subsidy shall be allotted in accordance with MOI's Integrated Housing Subsidy Policy and local government's budgets. All levels of government shall coordinate with financial institutions for the extension of principal and interests (MOI, local governments).

Section 6 Household Maintenance for Disaster Areas

Local governments should help disaster-struck residents maintain their household living during reconstruction periods by building temporary residential units or providing public housing units (local governments, MOI, and COIP).

Section 7 Fund-raising for Post Disaster Reconstruction

Local governments should raise funds by addressing prioritized areas in accordance with [Article 43 of the Disaster Prevention and Protection Act](#) and its enforcement rules in order to effectively promote the integrate recovery and reconstruction of disaster areas (local governments).

Section 8 Publicity of Post Disaster Reconstruction Strategies

All levels of governments should disseminate relevant measures such as post disaster reconstruction strategies implemented in disaster areas to disaster-struck residents. If necessary, a general consultation window may be set up (local governments, MOI, MOEA, MOTC, COA, COIP, and GIO).

Chapter 5 Reconstruction of Industrial Economy

Section 1 Low-Interest Rate Financing for Corporates

Article 43 of the Disaster Prevention and Protection Act

Expenditures needed to carry out disaster prevention and rescue under the Act shall be duly prepared with the budgets by the government at each level according to those things and matters to be undertaken as provided by the Act.

Receipts and payments of then current fiscal year may be adjusted as applicable without being subject to Articles 62 and 63 of Budget Act when such adjustment is required in the event that the budget prepared for the expenditures of Disaster Prevention and Response is insufficient to pay the costs of the emergency action during the disaster, and the restoration and reconstruction after the disaster.

All Disaster Prevention and Protection agencies should, when necessary, provide low-interest reconstruction loans in accordance with Low-Interest Reconstruction Loans quota and regulation, under the consideration of funding sources, damage degree, and the financial situation of all levels of government, to invite all relevant agencies to outline loan application and choose which bank to execute. The subsidy for interests shall be allotted from the budgets of all levels of government (COA, MOI, MOEA, local governments).

Section 2 Corporate Loans

If necessary, all levels of governments should offer corporate loans via various disaster reconstruction loan programs in order to assist the enterprises with circulating capital (COA, MOI, MOEA, and local governments).

Section 3 Financing for the Agriculture, Forestry , Fishery, Husbandry Industries

Agriculture authority may negotiate with financial institutions to offer capitals and financing for the reconstruction and maintenance of agriculture enterprises (COA, and local governments).

Chapter 6 Post-disaster Reconstruction Projects

Section 1 Inspection and Consolidation of Disaster Information

During the debris flow disaster restoration and reconstruction stage, the COA and other relevant central agencies and direct municipality, county (city) governments should pay continuous attention to the development and handling of disasters, inspect and assess damaged facilities and report all kinds of debris flow disaster statistics to the COA (local governments, COA, and MOI).

Section 2 Recovery and Reconstruction Projects

In the face of various facilities damaged by debris flow disasters, the COA and all relevant authorities in the central government, as well as direct municipality, county (city) governments, should promptly start emergency repair and recovery of transportation infrastructure and restoration of original facades by considering priorities assigned to disasters as established based on areas requiring emergent treatment, considerations to prevent disaster escalation, areas prone to repeated disasters and areas requiring medium and long-term planning and treatment. Safety, aesthetics and economics, as well as restoration of all kinds of ecosystems, should be considered in planning relevant treatment and reconstruction projects (local governments, COA, and MOI).

Section 3 Land Use in Disaster Areas

If a debris flow in a disaster area is escalating, or if the landslide condition in the disaster area is a natural evolution process, land use in such area should be restricted when post-disaster recovery and reconstruction are planned to prevent any recurrence of such disaster in order to minimize damages and losses caused by the disaster (local government, COA, and MOI).

Section 4 Cause Assessment of Disasters

After a disaster, scientific methods should be employed, or an assessment committee should be organized to assess the causes of such disaster. Human factors for such disaster should be forcibly eliminated prior to the commencement of post disaster recovery and reconstruction (local governments, COA, and MOI).

Chapter 7 Recovery and Reconstruction Funding

Section 1 Preparation of Budgets

Reconstruction after a disaster should be funded by the disaster prevention and protection budgets prepared annually by all agencies, direct municipality and county (city) governments and by adjustment of relevant annual budgets in accordance with Article 43 of the Disaster Prevention and Protection Act and should not be subject to the limitations set forth in [Articles 62 and 63 of the Budget Act](#) (local governments, MOEA, MOTC, COA, and DGBAS).

Section 2 Subsidies

In the event of insufficient funding after a local government has taken measures mentioned in the preceding section, the [Operating Guidelines for Budget Review of Post Disaster Reconstruction Projects](#) (Appendix D.12) should be followed to obtain funding for the recovery and reconstruction of public facilities (local governments, MOEA, MOTC, COA, COIP, DGBAS, and PCC).

Articles 62 of the Budget Act

Funding for various agencies, political matters, projects or operating items within the general budget may not be used interchangeably, provided that this restriction shall not apply to items collectively funded by the Executive Yuan and the first reserve fund.

Articles 63 of the Budget Act

If the funding for a particular item among items of various purposes within a project or operating item is deficient while the other items have funding surplus as a result of budget distribution by all agencies, the funding for other items shall be used pursuant to the requirements of the central budget authority, provided that such funding shall not be used as personnel expenditure.

Operating Guidelines for Budget Review of Post Disaster Reconstruction Projects

See Appendix D.12

Part V Operation Plan Implementation, Control and Evaluation

Chapter 1 Major Tasks of All Stages of Disaster Prevention and Protection Operations

1. To effectively carry out disaster prevention and protection efforts, all relevant authorities should designate personnel with exclusive responsibility for handling disaster prevention and protection work and for the readiness of disaster prevention and protection organizations.
2. All relevant authorities should establish standard operating procedures for disaster prevention and protection missions and mechanisms such as the standardization of formats for disaster reports and enhance their coordination and communication with other agencies so that the following matters can be thoroughly implemented:
 - (1) All relevant authorities should consider the work items that should be implemented for various stages such as disaster prevention, emergency response, and recovery and reconstruction for debris flow disasters as set forth in Appendix E and actively implement measures currently planned and those to be implemented in the future (within two years) based on their implementation schedules and the division of work items between and among the principal (supporting) agencies.
 - (2) To help local governments enhance their Regional Disaster Prevention and Protection Plans, the relevant authorities under the Operation Plan should promote relevant research and studies, extensively collect disaster prevention and protection information and actively provide information and guidance so as to facilitate the implementation of disaster prevention and protection plans.

Chapter 2 Control and Evaluation

1. All major tasks set forth in the Operation Plan should be actively and thoroughly carried out by all principal (supporting) agencies, which should also set their performance evaluation indicators for regular reviews.
2. Regarding the implementation status and achievement of each work item under the Operation Plan, focused items will be selected by the COA in conjunction with all relevant principal (supporting) agencies for annual review. The rest of the work items will be controlled and managed by all principal (supporting) agencies.
3. The performance of each agency in carrying out disaster prevention and protection tasks will be included as major reference for evaluating the performance of such agency. The personnel-in-charge and their supervisors will be rewarded or penalized based on such performance.

Chapter 3 Budgets

The budgets required for implementing tasks of the Operation Plan shall be provided by all relevant principal (supporting) agencies through preparation of relevant budgets.

Appendixes

- Appendix A Investigation and Analyses of Major Historical Debris Flow Disaster Cases
- Appendix B Table on Relevant Responsibilities and Authorities of All levels of Governments in Debris Flow Disaster Prevention and Protection and the Table on Division of Work Items among Various Agencies with respect to the Debris Flow Disaster Mitigation Program approved by the Executive Yuan
- Appendix C Operating Procedures Related to Debris Flow Disaster Prevention and Protection
 - C.1 Operating Procedures for Debris Flow Disaster Evacuation.
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- Appendix D Requirements Relating to Emergency Reporting, Response and Reconstruction for Disasters
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 - D.9 Operating Guidelines for Debris Flow Disaster Emergency Action Term, COA
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