

**SOCIALIST REPUBLIC OF VIETNAM**

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**NATIONAL STRATEGY FOR  
NATURAL DISASTER  
PREVENTION, RESPONSE AND  
MITIGATION  
TO 2020**

**HANOI - NOVEMBER 2007**

**PRIME MINISTER**

**SOCIALIST REPUBLIC OF VIETNAM**  
**Independence – Freedom – Happiness**

No: 172/2007/QĐ-TTg

*Hanoi, 16 November 2007*

**DECISION**

**TO APPROVE THE NATIONAL STRATEGY FOR NATURAL DISASTER  
PREVENTION, RESPONSE AND MITIGATION TO 2020**

**THE PRIME MINISTER**

Pursuant to the Law on Organization of Government dated 25<sup>th</sup> December 2001;

Pursuant to the Law on Water Resource dated 20<sup>th</sup> May 1998;

Pursuant to the Law on Dyke dated 29<sup>th</sup> November 2006;

Pursuant to Ordinance on Flood and Storm Control dated 20<sup>th</sup> March 1993 and the amended and revised Ordinance on Flood and Storm Control dated 24<sup>th</sup> August 2000;

Pursuant to Decree 86/2003/NĐ-CP dated 18<sup>th</sup> July 2003 of the Government stipulating functions, duties, authority and organizational structure of the Ministry of Agriculture and Rural Development;

Considering the request of Minister of Ministry of Agriculture and Rural Development cum Chairman of Central Committee for Flood and Storm Control,

**DECIDES**

**Article 1.** To approve the National Strategy for natural disaster prevention, response and mitigation to 2020 with the main contents as follow:

**I. GENERAL PERSPECTIVE**

1. Disaster management includes preparedness, response to and recovery of consequences caused by disasters in order to ensure the sustainable socio-economic development and national security and defense.

2. Government agencies, social organizations, economic organizations, armed forces, citizens, and foreign organizations and individuals living in the territory of Vietnam all are duty-bound to disaster prevention, response and mitigation.

3. Disaster prevention, response and mitigation are joint actions of Government and citizens that effectively utilize state resources as well as take

advantage of all possible resources of the community, national and international organizations and individuals.

4. Disaster prevention, response and mitigation shall be integrated into socio-economic development master planning and plans of every region, sector, and nation-wide.

5. Disaster prevention, response and mitigation shall be giving priority to disaster preparedness, keeping studying on impacts of the global climate change, storm surge and other extreme climate phenomena for appropriate response actions.

6. Disaster prevention, response and mitigation shall be succeeding and unleashing traditional experience, learnt lessons and combining them with modern knowledge and technologies through international cooperation..

## **II. GUIDING PRINCIPLES**

1. Government consolidates the State management on disaster prevention, response and mitigation nationwide; Ministry of Agriculture and Rural Development is the standing agency and to cooperate with relevant agencies to support Government in executing the state management in the field of DM.

2. Ensure to follow the directions of the ruling Party and the policies, and legislation of the State. Improve the effectiveness and efficiency of the state management and increase the responsibility of every organization and individual for disaster prevention, response and mitigation. Step by step complete institutions and organizational mechanisms from central to local levels Raise awareness and disseminate experience on disaster prevention, response and mitigation, especially at commune, village, and hamlet level.

3. The National Strategy for disaster prevention, response and mitigation must be implemented in synchronous, period-based and priorities-based manners, responsive to both intermediate and long-term purposes. The principles used for disaster prevention, response and mitigation in Vietnam is the “four-on-the-spot” (command on the spot, man-power on the spot, materials on the spot and logistics on the spot) and proactive prevention, timely response, quick and effective recovery. Disaster recovery should be combined with reconstruction and upgrading to ensure sustainable development of each area and sector.

4. Investment for disaster prevention, response and mitigation is critical to ensure a sustainable development. Government shall ensure the availability of necessary resources and mobilize the contribution of community and the whole society for disaster prevention, response and mitigation. Investment for disaster prevention, response and mitigation must combine both structural and non-structural measures, for multipurpose, and be harmonized with the nature, and environment.

5. Ensure the implementation of international commitments in the field of disaster prevention, response and mitigation.

### **III. GOALS**

#### **1. General goal:**

Mobilize all resources to effectively implement disaster prevention, response and mitigation from now up to 2020 in order to minimize the losses of human life and properties, the damage of natural resources and cultural heritages, and the degradation of environment, contributing significantly to ensure the country sustainable development, national defense and security.

#### **2. Specific objectives:**

a) Enhance the capacities of forecasting flood, storm, drought, seawater intrusion, of informing earthquake, of warning tsunami and extreme hydro-meteorology phenomena, of which the focus is given to increase the early warning of storm and tropical depression to 72 hours in advance.

b) Ensure that the development planning and building codes of socio-economic structures and residential areas in places frequently affected by disaster suit to regional standards for flood and storm control; and socio-economic development plans and sectoral plans are integrated with the strategy and plans of disaster prevention, response and mitigation for a sustainable development.

c) Ensure 100% of local staffs who directly work in the field of disaster prevention, response and mitigation at all levels to be trained and strengthened of capacities for disaster prevention, response and mitigation; ensure more than 70% of population living in disaster prone areas to be disseminated of knowledge on disaster mitigation.

d) Complete the relocation, arrangement and stabilization of the life for people in disaster prone areas according to the planning approved by authorized government agencies. Up to 2010, manage to relocate all population from flash flood and land slide high-risk areas and dangerous areas to safety places.

đ) Direct the collaboration and cooperation among forces of search and rescue to take initiative in responding to emergency situations; ensure adequate investment for construction of technical infrastructure and facilities, for procurement of equipment and for human resource development to deal with disaster search and rescue in line with the Master Planning for Search and Rescue to 2015, with vision up to 2020 approved by Prime Minister on Decision 46/2006/QĐ-TTg on 28<sup>th</sup> February 2006.

e) Ensure safety for the dyke systems at provinces from Ha Tinh province up to the North of the country; improve the flood-resistant capacity of embankment systems in the Coastal Central region, Central Highlands and the Eastern South; complete the consolidation and upgrading of seadyke systems all over the country to protect population, develop the sea economy, and ensure national security and defense in coastal areas.

g) Ensure safety for reservoirs, especially the large reservoirs and the ones related to crowded residential areas, to politically, economically, culturally sensitive areas, and to important structures of national security and defense downstream.

h) Complete 100% of construction of storm shelters for boats and ships according to the planning approved by authorized agencies.

i) Complete the fishery communication system; ensure that 100% of offshore fishing boats and ships have sufficient communication equipment; sign treaties on sea rescue with other nations and territories in the region.

#### **IV. RESPONSIBILITIES AND SOLUTIONS**

##### **1. General responsibilities and solutions**

###### ***a) Consolidate the system of laws, policies and mechanisms***

- Go forward to formulate the Law on natural disaster prevention and response based on the existing Ordinance on Flood and Storm Control, suiting the national socio-economic development. Promulgate policies on disaster relief and recovery for each region: living with flood, flood diversion and retention, flash-flood and landslide vulnerable areas etc.

- Integrate natural disaster prevention, response and mitigation into social-economic development planning and plans

- Stipulate policies encouraging research activities, investment attraction, international cooperation, and resources mobilization ... for disaster management.

- Produce plannings, plans, zonings and conduct disaster risks assessments to formulate suitable policies for each region, locality, and critical zone, and to found bases for a proactive disaster preparedness; stipulate criteria and technical instructions of construction in disaster prone areas; revise and supplement standards and regulations on disaster forecast and warning.

###### ***b) Consolidate organizational structure***

- Continue to strengthen the leading bodies of disaster management at ministries and sectors, and at both central and local levels.

- Review and complement to improve the functions, duties of and cooperation mechanisms among the Committees for Flood and Storm Control, Committees for Search and Rescue at central, ministerial and local levels.

- Professionalize the staffing for disaster prevention, response and mitigation. Upgrade working places for steering agencies/bodies in the field of disaster prevention, response and mitigation at all levels with appropriate equipments and technologies.

- Encourage the establishment of organizations supporting disaster management, of coaching and training centers, and public service organizations for disaster prevention, response and mitigation.

***c) Human resources development and social mobilization***

- Adopt socialization policies in disaster prevention, response and mitigation in which favorable conditions are created for the participation of local residents in formulating legislation, plans and programs, in managing and monitoring the implementation of local programmes and projects.

- Promote community awareness raising and information dissemination. Build the resilience to disaster and promote the tradition of mutual support in disaster situation. Organize self-response forces in communities for active emergency search and rescue. Promote the role of social organizations and associations in disaster response and recovery. Develop volunteer networks for disaster propaganda, advocacy, recovery and production rehabilitation... Encourage national and international organizations and individuals to develop diverse and efficient ways of support for disaster affected people and areas.

- Increase the training of the human resource to meet requirements for disaster prevention, response and mitigation, especially human resources for relevant advisory and administration agencies.

***d) Financial resources***

- The State budget ensures the investment for natural disaster prevention, response and mitigation projects and the contingency for disaster relief and recovery. The reserved state budget can be used for disaster prevention, response and mitigation if necessary. Take advantage of ODA and FDI for disaster prevention and mitigation projects, giving priority of non-refundable ODA utilization for capacities strengthening and technological and management experience transfer.

- The State decentralizes to People's Committees of provinces and districts in investment and mobilization of legitimate resources for disaster prevention, response and mitigation.

- Gradually increase the annual budget for strengthening the management capacities, implementing new construction projects, upgrading and maintaining structures; and for projects of planning, of improving equipment and facilities for disaster forecast, warning, rescue, relief, recovery and production rehabilitation.

- The State has policies to provide preferences and to protect legitimate interests of organizations and individuals investing in disaster prevention, response and mitigation, to encourage national and international organizations and individuals to invest in researching and applying science and modern technologies in the combination with traditional methods.

- Encourage national and international organizations and individuals to finance activities of disaster prevention, response and mitigation and conduct humanitarian and charity activities for disaster affected localities. Conduct studies to establish disaster insurance regimes and disaster self-financing funds.

***d) Community awareness raising***

- Promote activities for information dissemination, education, awareness and disaster response capacity raising for communities. Include basic knowledge about natural disaster prevention, response and mitigation into school curriculum to help children know how to respond to and support their family and community in disaster situations;

- Provide training for those who are directly involved in disaster prevention and mitigation, especially for decision-makers, managers, planners, practitioners, and local officers;

***e) Develop science and technologies related to natural disaster prevention, response and mitigation.***

- Promote basic investigation and investment for scientific research and new technology application in disaster prevention, response and mitigation.

- Modernize early warning systems from Central, regional to local levels, focusing on efficient communication methods especially for mountainous areas, territorial water and remote areas.

- The State encourages the application of advanced scientific and technological achievements to improve capacities of disaster forecast, prediction, warning, and communication; to improve research capacities to observe the Earth's variability and natural changes in the region and territory; encourages the application of advanced technology and new materials for disaster prevention, response and mitigation

- Step by step develop scientific sectors related to disaster: emergencies, disaster management, sustainable development, health care, post-disaster environmental and production recovery.

***g) Ensure safety for dyke, reservoir and dam systems***

- Build, strengthen and upgrade river and sea dyke systems to meet the design standards, and to be suitably used for multi-purposes of social-economic development.

Focus on enhancing quality of dykes, preventing dyke degradation, and reducing the number of weak sections on dyke foundation and sluices underneath the dykes; Complete designed dyke cross-sections, and harden of dyke surface to serve for rural traffic.

Increase investment for dyke protection replantation; consider the tending and protection of dyke protection trees as permanent duties in the dyke protection

- Review plannings, and invest to increase flood drainability of flood retention and divergence structures approved by authorized state agencies.

- Regularly inspect and evaluate the situation of the existing reservoirs, repair, upgrade and newly build emergency spillways to ensure safety for reservoirs; complete the reservoirs' operation procedures for multi-usability, particularly in cases of large reservoirs involving to regulate water levels in flood and dry seasons for downstream areas.

***h) Enhance the search and rescue capacities:***

Enhance the search and rescue capacities of specialized and semi-specialized forces and local people; regularly organize exercises of disaster prevention, response and mitigation at all levels and localities. Enhance disaster emergency information and communication; improve on-site response capacities for local organizations, individuals, and communities especially those in mountainous, remote and border regions, in islands and water areas.

***i) Promote international cooperation and integration***

Boost regional and international cooperation in disaster warning, forecast, in education, training and technology transfer, in sharing of information, experience and practical lessons to build up agreements, and conventions for disaster prevention, response and mitigation, especially for emergency search and rescue; Cooperate with international organizations to implement the UN Convention for Climate Change, the Kyoto Protocol, Hyogo Framework for Action and other programmes; Work in collaboration with countries in the region on water resources exploitation, protection and management.

**2. Natural disaster prevention, response and mitigation responsibilities and solutions for each region**

***a) The Red River Delta and the North Central***

The approach applied for the areas is to radically prevent floods, and to take initiatives in prevent and respond to storm, drought and storm surge, for which the following solutions must be taken in places in the same time:

- Enhance flood-prevention capacity for river dyke systems, conduct in a synchronous manner solutions including making flood control plannings for river systems, reviewing and adjusting dyke system plannings as bases for activities of dyke construction, upgrading, protection, and management; strengthening of under-dyke structures; treatment of weak dyke foundation; and hardening of dyke surface for rural traffic.



- Continue constructing new reservoirs and establish operation procedures of the existing large reservoirs to regulate water levels for the downstream areas, preventing flood, drought and salt intrusion; reforest to protect upstream watersheds.

- Improve the flood discharge capacity for river channels through removal of obstructions on the river plain and river bed; dredging channels and completing flood divergence projects.

- Implement programs to restore and upgrading sea dykes, to plant mangrove and protection forests, to plant grass to prevent dyke erosion, and to build bank protection structures in coastal provinces.

### ***b) The Central Coast, the Eastern South and Islands***

The approach applied for the areas is "Proactiveness in disaster prevention, and adaptation for development", for which following solutions are considered as priorities:

- Establish plannings of residential, industrial and tourism areas; plan and construct disaster prevention and mitigation structures, and transportation infrastructures ensuring a flood resilience and flood drainability.

- Transform crops and animal husbandry structures to suit the regional disaster characteristics and make full use of favorable natural conditions for development; prevent the invasion of sand dunes to plain areas and the desertification.

- Strengthen dykes, take advantage of and preserve natural sand dunes for prevention of tsunami, sea water rise, and salinity intrusion; build reservoirs, increase forestation, conduct solutions to increase run-off and underground water in dry season, build structures to control drought and inundation; build bank protection structures, dredge river channels; build storm shelters for boats and ships; establish and upgrade coastal communication stations for typhoon, sea rise and tsunami warning.

- Promote research to find out solutions to prevent river mouth deposition, to dredge river channels for enhancing flood discharge and waterway transportation.

### ***c) The Mekong River Delta***

The approach of natural disaster prevention, response and mitigation applied for the Mekong river delta is "living with flood", ensuring safety for a sustainable development; and taking initiatives to prevent storm, thunderstorm, whirlwind, salinity intrusion, drought at the same time, for which the following solutions are to be focused:

- Establish plannings of flood control, to be proactive in flood prevention, reasonably use land and forest resources and favorable natural conditions of the region.

- Specific measures for flood and salination control include: Construction of residential clusters and infrastructure above flood level, improvement of flood discharge for rivers and canals, construction of sea dykes, estuary dykes, embankments, reservoirs, and other structures for salinity prevention and fresh water preservation.

- Proactively take advantages of flooding; research and invest to explore the flooding environment: alluvium, reduced acidity and salinity, aquaculture, fisheries, ecotourism, water transport, cultural and sports activities which are typical for the flooding region.

- Enhance international cooperation with countries in the Mekong river basin to reasonably use and protect water resources. Continue researching, coordinating with upstream countries to find out solutions for flood control in rainy season, run-off maintaining in dry season to prevent saline intrusion; and for response to the sea level rise.

#### ***d) Mountainous areas and Central Highlands***

The approach applied for the areas is to "proactively prevent natural disasters", for which following solutions are focused:

- Define and map areas highly prone to flash floods, landslides, geological hazards; make residential planning, evacuate population in dangerous areas, make land use planning, restructure crops, manage mineral exploitation to prevent harmful impacts on the environment and landslide risks, properly plant and exploit forests.

- Establish warning and communication systems down to commune and village levels; build structures to prevent landslides and flash floods; expand flood discharge openings of sluices and bridges on traffic roads to ensure flood drainability; build reservoir system for both flood and drought control.

- Strengthen the cooperation with bordering countries in disaster forecasting, warning, search and rescue.

#### ***d. Sea areas***

The approach applied for disaster prevention, response and mitigation in sea areas is "proactive prevention and response," to ensure the safety for human life and activities, and take advantages of resources to develop the sea economy, for which the following solutions are focused:

- Establish a management system of vehicles and boats operating at sea, giving priorities for management of fisherfolk before and during disaster.

- Establish communication systems in combination with delivery of disaster forecasts and warnings to vehicles and structures operating at sea. Establish professional search and rescue forces, enhance rescue capacities for semi-specialized forces among fishermen on ships and boats.

- Strengthen the cooperation with other countries and territories in disaster forecasting, warning, communication, search and rescue, storm shelter provision and reasonable exploitation of natural resources at sea.

## **V. ACTION PLAN**

Focus to implement the following target programs up to 2020:

### **1. Non-structural measures**

#### ***a) The program on improvement of legislation and policies***

- Promulgate the Law on disaster prevention, response and mitigation.
- Review, amend, supplement related legal documents.
- Promulgate disaster relief and recover policies, preventing speculation and price increase, and supporting the environment and production rehabilitation after disaster.
- Promulgate assistance policies for disaster prone areas.
- Establish financially self-reliant fund for disaster prevention, response and mitigation.
- Implement disaster risk insurance in some sectors

#### ***b) The program on consolidation of organizational structures***

- Annually, consolidate the steering mechanism for disaster prevention, response and mitigation at all levels.
- Provide training courses to enhance capacities for staff working in the field of disaster prevention, response and mitigation.
- Establish organizations supporting disaster management.

#### ***c) The programme to make and review plannings***

- Define and map areas highly prone to flash floods, river and sea erosion, storm, earthquake, sea level rise, tsunami. Map out the flood areas to assess risks of flood and drought.
- Review and amend the flood prevention and control plannings of the Red River and Thai Binh River systems, of the Mekong River Delta, of rivers in the Central region, from Khanh Hoa to Thanh Hoa provinces, rivers in the South Central and the Eastern South of Viet Nam.
- Review and amend river and sea dyke system plannings
- Review and amend the residential plannings in flash flood and landslide-prone mountainous areas and in erosion prone areas along riverbank, river mouth and coastal areas.

- Review and amend the land use plannings to link with disaster prevention and control.
- Review and amend plannings to protect and develop mangrove forests for sea dyke systems and in coastal areas.
- Review and amend the construction plannings in disaster prone areas.
- Review and amend the integrated exploitation and management plannings of river basins.

***d) The programs on strengthening of disaster warning and forecast capacities***

- Strengthen flood warning and forecast capacities for the Red River Delta, Mekong River Delta, rivers in the Central region, Central Highlands and the Eastern South of Viet Nam.
- Strengthen capacities to forecast and warn storm, flood, earthquake, drought, salty intrusion, and to warn tsunami.
- Strengthening flash flood warning and forecast capacities for mountainous provinces

***e) The programs on community awareness raising***

- Include disaster knowledge into school programmes
- Conduct trainings for and disseminate information/knowledge/experience on disaster prevention, response and mitigation to communities living in disaster prone areas.
- Disseminate information and propagandize on natural disaster issues via mass media.

***f) The programs on forestation and protection of upstream forests:***

- Establish, manage, protect, develop and sustainably use 16.24 million ha of forestry land; increase the area of forest coverage to 42-43% by 2010 and to 47% by 2020.
- Pay attention to develop and explore non-wood forestry products in the areas of protection forests to make forests protection beneficial to local people.
- Plant trees to protect dyke systems.

***g) The program on strengthening of disaster management capacities and science and technology application***

- Strengthen capacities for disaster management agencies from the central to local level, and for search and rescue forces.
- Review and amend/supplement building codes in line with natural disaster characteristics in each region.

- Apply scientific and technological advances as well as new techniques and materials for natural disaster prevention, response and mitigation.
- Improve information and communication systems and management of boats and ships at sea
- Establish procedures to ensure safety for children, old and disabled people in disaster prone areas:
  - Establish volunteer networks for natural disaster prevention, response and mitigation

## **2. Structural measures**

- The programme to review, upgrade and newly build natural disaster prevention, response and mitigation structures matching the designed standards and each region's disaster characteristics.
- The programme to construct reservoirs and establish operation procedures of reservoirs to effectively explore water resources and regulate water levels for downstream areas to respond to flood and drought.
  - The programme to expand flood discharge openings of bridges and sluices along road and railroad systems.
  - The programme to construct erosion prevention structures
  - The programme to enhance dyke systems, to upgrade sluices underneath the dykes, and to harden surface of dykes of grade 3 upward.
  - The programme to construct storm shelters for boats and ships.
  - The programme to construct residential clusters for flood and storm avoidance.

The list of programs and projects, of implementing organizations, collaborating organizations and durations are stipulated in Annex I attached to this Decision.

## **VI. EVALUATION OF THE STRATEGY IMPLEMENTATION**

Criteria to evaluate the strategy implementation include:

- The legal documents, mechanism, policies related to disaster prevention, response and mitigation.
- The disaster forecast and warning capacities.
- The organizational mechanism for disaster prevention, response and mitigation at all levels (4 levels).
- The search and rescue capacities of specialized and community forces
- The integration of natural disaster prevention, response and mitigation into overall planning as well as specific projects and programmes for socio-economic development in ministries, sectors and localities.

- Activities for education, information dissemination, community awareness raising on disaster prevention, response and mitigation.
- The community participation in formulating legal documents, in planning, managing and monitoring the implementation of programs, projects at local level.
- The self-preparedness, and response to disaster.
- The efficiency of constructed disaster prevention and control structures.
- The sustainable development of each region, locality under disaster impacts.
- The efficiency of investments for disaster prevention and response.
- The science and technology application in disaster prevention and response.
- International cooperations in the field of disaster prevention, response and mitigation.

**Article 2.** Organization for the strategy implementation

1. Ministry of Agriculture and Rural Development and the Central Committee for Flood and Storm Control will preside over the implementation of the National Strategy for natural disaster prevention, response and mitigation to 2020:

- Guide, inspect and urge the implementation of the Strategy in ministries, sectors, localities; and act as the national focal point with international communities in the field.

- Base on the attached annex of the list of programs and projects, establish specific programs and action plans, identify priorities, and assign the implementation responsibilities for ministries, sectors, and localities.

- Inspect, examine and assess the Strategy implementation of ministries, sectors, and localities. Conduct review of the Strategy implementation every year and every five years to draw out experience, and recommend to Prime Minister suitable adjustments to the contents, and solutions of the Strategy.

2. According to their own functions and duties, ministries, sectors and localities are responsible for effectively implementing relevant contents, objectives, duties and solutions stated in the Strategy.

3. Ministry of Planning and Investment takes lead and works in collaboration with Ministry of Finance, Ministry of Agriculture and Rural Development, Central Committee for Flood and Storm Control, National Committee for Search and Rescue and other relevant ministries and sectors to balance and arrange annual investment resources in accordance with the Law on State Budget and other funding resources to effectively implement the Strategy.

4. People's Committees, Committees for Flood&Storm Control and Search&Rescue at provincial and city levels steer its departments to implement the National Strategy, in which priorities are given to strengthen and newly build disaster mitigation, prevention and response structures, to organize disaster prevention, response and mitigation forces, to set plans protecting human life; at the same time, disaster prevention, response and mitigation is integrated into local socio-economic development planning; and report the implementation results to Ministry of Agriculture and Rural Development and Central Committee for Flood and Storm Control on annual basis.

**Article 3.** This Decision takes effect 15 days after its publication on the Official Gazette.

**Article 4.** Ministers, heads of ministry-level agencies, directors of Government departments, and chairmen of People's Committees of provinces and central cities are responsible for executing this decision./.

**CC.**

- Central Party Secretariat;
- Prime Minister, Deputy Prime Ministers;
- Central ministries, ministry-level agencies, Government agencies;
- Office of Central Committee for Corruption prevention;
- People's Councils, People's Committees of provinces and central cities;
- Central Government Office and Party Committees;
- President Office;
- Ethnic Council and National Assembly Committees;
- National Assembly Office;
- People's Supreme Court;
- People's Supreme Procuracy;
- State Audit;
- The Viet Nam Fatherland Front Central Committee
- Central agency of mass organizations;
- Government office: Chairman, Deputy chairmen, Government website, Prime Minister spokesman, Departments, affiliated units , Official Gazette;
- Filing: NN (5b) A.

**PRIME MINISTER**

**(Signed)**

**Nguyễn Tấn Dũng**

**Annex I**  
**List of programs promulgated as attachment to the**  
**National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020**  
*(Promulgated as attachment to the DECISION No. 172/2007/QĐ-TTg*  
*on 16 November 2007 of Prime Minister)*

<b>Order</b>	<b>Content of program/project</b>	<b>Leading organisation</b>	<b>Cooperated organisation</b>	<b>Time frame</b>	<b>Remarks</b>
<b>I.</b>	<b>COMPLETE THE SYSTEM OF LEGAL DOCUMENTS</b>				
1.	Natural Disaster Prevention, Response and Mitigation Law	Ministry of Agriculture and Rural Development (MARD)	Relevant ministries, industries and locals	2010-2012	
2	Review, amend and supplement relevant legal documents	MARD	Relevant ministries, industries and locals	frequent, annual	
3	Promulgate polices on disaster relief and recovery after the disaster	Ministry of Labour, Invalids and Social Affairs (MOLISA)	MARD and relevant Ministries, industries and locals	frequent, annual	
4	Promulgate assistance policies for disaster prone areas	MOLISA	MARD and relevant ministries, industries and locals	frequent, annual	
5	Establish Financial self-reliant Fund for natural disaster prevention, response and mitigation	Ministry of Finance (MOF)	MARD and relevant ministries, industries and locals	2007-2020	
6	Implement disaster risk insurance in some sectors	MOF	MARD and relevant ministries, industries and locals	2007-2020	
<b>II</b>	<b>STRENGTHEN ORGANISATIONAL MECHANISM</b>				
1	Strengthen the steering mechanism for natural disaster prevention, response and mitigation at all levels	Central Committee for Flood and Storm Control (CCFSC)	Relevant ministries, industries and locals	frequent, annual	



<b>Order</b>	<b>Content of program/project</b>	<b>Leading organisation</b>	<b>Cooperated organisation</b>	<b>Time frame</b>	<b>Remarks</b>
2	Provide training courses to improve the capacity of staff in charge of natural disaster prevention, response and mitigation	MARD	Relevant ministries, industries and locals	frequent, annual	
3	Establish organisations supporting natural disaster management	Ministry of Home Affairs (MOHA)	MARD and relevant ministries, industries and locals	frequent, annual	
<b>III.</b>	<b>NON-STRUCTURAL MEASURES</b>				
	<b>Program of establishing and reviewing plans</b>				
1	Create a zoning map of flash-flood risk	Ministry of Natural Resources and Environment (MONRE)	Relevant ministries, industries and locals	2007-2010	
2	Create a flood zoning map to assess risks caused by flood	MARD	Relevant ministries, industries and locals	2007-2010	
3	Create a zoning map of evaluating risks caused by drought	MONRE	Relevant ministries, industries and locals	2007-2012	
4	Create a map of identifying risks of earthquake and tsunami	Vietnamese Academy of Science and Technology	Relevant ministries, industries and locals	2007-2015	
5	Create a map of identifying risks of storm and storm surge	MONRE	Relevant ministries, industries and locals	2007-2010	
6	Create a map of identifying risks of erosion in river bank or seaside	MARD	Relevant ministries, industries and locals	2007-2010	
7	Review, complement plans of flood preparedness in Mekong River Delta	MARD, locals	Relevant ministries, industries and locals	once every 5 years	
8	Review, complement plans of flood preparedness in rivers of Central regions, from Thanh Hoa to Khanh Hoa provinces	MARD, locals	Relevant ministries, industries and locals	once every 5 years	

<b>Order</b>	<b>Content of program/project</b>	<b>Leading organisation</b>	<b>Cooperated organisation</b>	<b>Time frame</b>	<b>Remarks</b>
9	Review, complement plans of flood preparedness in rivers of South Central and East South regions	MARD, locals	Relevant ministries, industries and locals	once every 5 years	
10	Review, complement plans of river and sea dyke systems	MARD, locals	Relevant ministries, industries and locals	once every 5 years	
11	Review, complement plans of protecting and maintaining protective forests on the sea-shore and the coastal areas	MARD, locals	Relevant ministries, industries and locals	once every 5 years	
12	Review, complement residential plans of flash-flood and landslide-prone mountainous areas	People's Committee of mountainous provinces	MONRE, MARD, Vietnamese Academy of Science and Technology	once every 5 years	
13	Review, complement residential plans of erosion-prone areas on rivers bank, river mouths and coastal region	People's Committee of provinces	MONRE, MARD, Ministry of Science and Technology (MOST)	once every 5 years	
14	Review, complement plans of land use, linking with disaster preparedness	MONRE, locals	Relevant ministries, industries and locals	once every 5 years	
15	Review, complement construction plans in disaster-prone areas	Ministry of Construction (MOC)	Relevant ministries, industries and locals	once every 5 years	
16	Review, complement plans of integrated management and exploitation river basins	MONRE	Relevant ministries, industries and locals	once every 5 years	
<b>Program of enhancing forecast and warning capacity</b>					
17	Strengthen capacity of storm forecast and warning	MONRE	Relevant ministries, industries and locals	frequent, annual	
18	Strengthen capacity of flood forecast and warning in Red River Delta	MONRE	Relevant ministries, industries and locals	frequent, annual	

<b>Order</b>	<b>Content of program/project</b>	<b>Leading organisation</b>	<b>Cooperated organisation</b>	<b>Time frame</b>	<b>Remarks</b>
19	Strengthen capacity of flood forecast and warning in Mekong River Delta	MONRE	Relevant ministries, industries and locals	frequent, annual	
20	Strengthen capacity of flood forecast and warning in rivers of Central and Central Highlands, East South regions	MONRE	Relevant ministries, industries and locals	frequent, annual	
21	Strengthen capacity of flash-flood forecast and warning in mountainous provinces	MONRE	Relevant ministries, industries and locals	frequent, annual	
22	Strengthen capacity of earthquake, tsunami informing	MONRE, Vietnamese Academy of Science and Technology	Relevant ministries, industries and locals	frequent, annual	
<b>Program of improving the community awareness</b>					
23	Include knowledge related to natural disasters into curriculums of secondary schools	Ministry of Education and Training (MOET)	Relevant ministries, industries and locals	2007 - 2020	
24	Conduct training on natural disasters for communities living in disaster-prone areas	CCFSC, Committee for Flood and Storm Control in all levels	National and international organizations and individuals	frequent, annual	
25	Propagandize and disseminate information on natural disaster via mass media	Ministry of Information and Communications (MIC), Radio, Television	Relevant ministries, industries and locals	frequent, annual	
<b>Program of planting and preserving protective forest</b>					
26	Plant and preserve upstream forests	MARD, locals	Relevant ministries, industries and locals	2007-2020	
27	Plant trees against sea waves to protect dyke systems	MARD, locals	Relevant Ministries, industries and locals	2007-2020	

<b>Order</b>	<b>Content of program/project</b>	<b>Leading organisation</b>	<b>Cooperated organisation</b>	<b>Time frame</b>	<b>Remarks</b>
<b>Program of enhancing disaster management and science and technology application capacity</b>					
28	Strengthen capacities of disaster management agencies from central to local levels	MARD	Relevant ministries, industries and locals	2007-2020	
29	Strengthen capacities of the rescue and search forces	Ministry of Defense	Relevant ministries, industries and locals	2007-2020	
30	Review, complement building codes in line with natural disasters characteristics in each region	MOC	Relevant ministries, industries and locals	2007-2010	
31	Apply advanced technology, science and technique as well as use new materials for natural disaster prevention, response and mitigation	MOST	Relevant ministries, industries and locals	2007-2020	
32	Complete communication system and manage ships/boats operating on the sea	MARD	Relevant ministries, industries and locals	2007-2010	
33	Establish programs to ensure safety for children, the old and the disabled in disaster-prone areas	Locals	National and international organizations and individuals	frequent, annual	
34	Establish volunteer networks for natural disaster prevention, response and mitigation	Ho Chi Minh Communist Youth Union	National and international organizations and individuals	frequent, annual	

<b>Order</b>	<b>Content of program/project</b>	<b>Leading organisation</b>	<b>Cooperated organisation</b>	<b>Time frame</b>	<b>Remarks</b>
<b>IV</b>	<b>STRUCTURAL MEASURES</b>				
1.	The program to review, upgrade and build structures for natural disaster prevention, response and mitigation in line with designed standards and natural disaster characteristics of each region, each local	MARD	Relevant ministries, industries and locals	frequent, annual	
2	The program to build erosion prevention structures	People's Committee of provinces	Relevant ministries, industries	Frequent, annual	
3	The program to strengthen and upgrade sea dyke systems	People's Committee of coastal provinces and cities	Relevant ministries, industries	2007-2015	
4	The program to establish systems of structures prevent salt but preserve fresh water	MARD	Relevant ministries, industries and locals	2007-2020	
5	The program to build systems of storm shelters for boats, ships	MARD	Relevant ministries, industries and locals	2007-2015	
6	The program to upgrade dyke systems of Red river and Thai Binh river	MARD	Relevant ministries, industries and locals	2007-2015	
7	The program expand flood discharge openings of bridges and sluices along road and railroad systems	Ministry of Transportation	Relevant ministries, industries and locals	2007-2020	
8.	Continue to build reservoirs for water flow adjustment and flood drainage	MOC, MARD	Relevant ministries, industries and locals	2007-2020	

**ANNEX II**  
**NATURAL DISASTER**  
**AND DISASTER PREVENTION, RESPONSE AND MITIGATION**  
**IN VIETNAM**

*(Promulgated as attachment to the DECISION No. 172/2007/QĐ-TTg  
on 16 November 2007 of the Prime Minister)*

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**I. NATURAL DISASTER IN VIETNAM**

**1. General context**

In recent decades, natural disasters have increasingly happened in terms of severity over the world, causing serious consequences to human life, especially to the poor. Disasters are natural phenomena, however their magnitude and consequences have been exacerbated due to human activities during the process of socio-economic development, with technologies, urbanization, population boom, and natural resources and environmental degradation. In the past 2 decades, more than 200 million people on average directly suffered from the consequences of natural disasters every year.

Vietnam is located in the tropical monsoon area, one of the five storm-prone areas of the Asia Pacific region. Therefore the country often faces natural disasters of various types. In recent years, disasters have continually occurred all over the country, causing vast losses in human life, property, socio-economic and cultural infrastructure as well as environmental degradation. In the recent decade (1997-2006), natural disasters such as typhoons, floods and droughts have caused significant losses, including 7500 missing and dead people, and asset damage equivalent to 1.5% of GDP. Natural disasters in Vietnam have been increasingly severe in terms of magnitude, frequency and volatility.

**2. Geographical and socio-economic background of Vietnam**

*a. Geographical location and topography*

The territory of Vietnam stretches across 15 north latitude degrees (from 8°30' to 23°20') and 7 east longitude degrees (from 102° 10' to 109° 20'), bordering China in the North, Laos and Cambodia in the West, and facing the East Sea in the East and the South.

With the total territory area of 329,241 km<sup>2</sup> and a coastal line of 3,260 km, every 100 km<sup>2</sup> of land has 1 km of coastline averagely. Its width is about 600 km at the widest part and 50 km at the narrowest point.

Viet Nam has a relatively diverse topography. The country's territory is made up of mountains, highlands, deltas, rivers, coastline, islands and peninsulas. Hills and mountains cover 3/4 of land area. Mountain ranges tend to have North-West to

South-East direction and perpendicular to the direction of the North East - South West tropical monsoon. Parallel mountains separate the country and make up North West – South East direction rivers. Most of rivers flow into the East Sea. High, steep and separated mountains scattered all over the country, and blended with dense river networks.

Plains account for  $\frac{1}{4}$  of the territorial area, consisting of the Red River delta, the central coastal plains, the Southeast plains and the Mekong River delta.

The territory is divided into seven economic and sub-climate zones, namely the Northern Mountains, the Red River Delta, the North Central Coast, the South Central Coast, the Central Highlands, the Eastern South and the Mekong River delta.

With the above mentioned features, Vietnam frequently suffers from storms, floods, and other types of natural disasters.

### ***b. Soil conditions and vegetation cover***

**The North** region has the most complicated geological structure compared with other regions in the country. One third of the northern mountains consist of rock with a thin weathered layer, which is infertile and poorly water-absorption. Black soil is often distributed in calcareous areas which are rich in calcium and magnesium. Mountains and hills occupy 80% of the regional land area. The forest coverage in this region is lowest in the country. The northern mountains and highlands still have much bare land and hills. Alluvial land area in the Red River delta only accounts for 14% of the total area of the North. The ancient alluvial soil in this region is often characterized by the yellow and brown color, small amount of clay, poor in water absorption, and prone to drought and erosion.

**The North Central Coast** has a large proportion of mountains and hills, small and narrow plains with unfertile soil and limited alluvial land area. The most common types of soil in this region are light yellow soil in high mountains, red soil, brown-red soil, yellow-red soil, depleted grey soil, erosion prone soil. The forest coverage in the region is 28%. Bare land and hills account for 3.4% of the natural land area.

**The South Central Coast** has a complex and diverse geological structure with various types of soil including alluvial soil, coastal sandy soil, and exhausted soil, etc. The forest coverage is relatively high (34.5%).

The geological structure in **the Central Highlands** is made of 2 covering layers: a soft covering layer and a weathered layer. Alluvial soil in the region only accounts for 2.8% of the natural land area, black soil accounts for 1.86%, and depleted grey soil 10%. The yellow red soil accounts for a large proportion of 68.2%. The forest coverage in the region is considerably high at about 60%.

**The Eastern South** has a relatively similar geological structure as the Central Highlands with two major types of soil, namely grey soil and red soil. The forest coverage is about 19.5%.

**The Mekong river delta** has a homogeneously geological structure. Alluvial soil makes up 31.4% of the natural land area, acid soil 41.1%, saline soil 19.1% and grey soil 3.5%...

In general, the geological structure in Vietnam is relatively stable with many high mountain ranges scattered in every regions; the territory is separated by dense river systems. Earthquake occurs in the Western North region though it is at low frequency and magnitude. Additionally, high and steep mountain ranges make the region very vulnerable to landslides and flash floods.

### *c. Climate*

There is a great difference in **temperatures** amongst regions, seasons and between day and night in each region. The North has 4 distinct seasons, whereas the South has only the dry season and rainy season, and the Central is affected by the South West monsoon.

**Evaporation** is relatively high and different amongst the regions, of those the South East and the Mekong River Delta have the highest evaporating level.

**Humidity** is also high and fluctuated between the regions and seasons. The South is often less humid than other regions in the country.

**Rainfall:** Vietnam is located at the edge of South East Asia where is bordered by the Pacific and the Indian Oceans. It is also influenced by various continental and ocean air blocks. Therefore, the rainfall is high but fluctuated and varied throughout the country. The average annual rainfall is approximately 2,000 mm. The Middle Central Part of VN is often observing the highest average annual rainfall, while the South Central Part has the lowest rainfall.

#### *1.2.4. Hydrology*

As its territory is separated by mountain ranges, Vietnam has dense river networks. There are 2,360 rivers of 10 km and above length. 13 river systems have the basin area of 3000 km<sup>2</sup> and above, in which 9 river systems have the basin area of more than 10,000 km<sup>2</sup>, namely Mekong river, Red river, Ca river, Ma river, Thai Binh river, Dong Nai river, Ba river, Bang Giang – Ky Cung river and Thu Bon river.

The catchments area of Vietnam river systems is 1.167 million km<sup>2</sup>, of which 835,000 km<sup>2</sup> outside its territory (71.5%). The average flow is 835 billion m<sup>3</sup> for years, of which 313 billion m<sup>3</sup> (37.5%) is originated in Vietnam territory

#### *1.2.5. Socio-economic conditions*

Rapid population growth and urbanization have caused serious pressure, causing the natural resources and environment degraded. The total population in the country has reached more than 85 million people now. In the near future, the population of Vietnam will be about 100 million people (as reported at APEC 2006). The rapid



population growth in the areas of potential productiveness has led to land shortages, for both residential and cultivation purposes. The human being has encroached the river channels, river estuaries, coastline, river and stream sides; exploited natural resources and minerals in an uncontrollable manner, as well as cut down and burnt forests, and increased the amount of wastes.... These are the factors that constraint the water flow, impoverish the land, silt reservoirs, cause landslides in the mountainous and hilly areas, as well as mud and rock floods. As a result, natural disaster risks have risen.

The average economic growth was beyond 7%/year in the 1990s and will be even higher in the next 2 decades. If there is no integration of natural disaster prevention, response and mitigation in the development process, this growth may cause more environmental pollution and break the ecological balance, resulting in increased disaster risks and an unsustainable development.

### **3. Typical natural disasters in Vietnam**

#### ***a. Typhoon***

Vietnam is located in the northwest of the Pacific Ocean, one of the storm-prone areas with a vast and violent number typhoons and an increasing trend especially in the recent 3 decades. Typhoon is one of the major and dangerous types of natural disasters in Vietnam. In more than 50 years (1954-2006), there were totally 380 typhoons and tropical depressions in Vietnam, of which 31% hit the North, 36% to the Northern Central and Middle Central Part and 33% to the South Central and the South. Typhoon's landfalls usually accompany with high tide and heavy rain, thus resulting in heavy and long rains and floods. It is estimated that up to 80-90% of the Vietnam's population are affected by typhoons.

#### ***b. Floods***

##### ***Floods in Northern river systems***

The basin areas of the Red River-Thai Binh River are 164,300 km<sup>2</sup>, in which 87,400 km<sup>2</sup> are on the territory of Vietnam, crossing 23 provinces and cities and accounting for 75.7% of the natural land area of the North.

Flood season in the Red river and Thai Binh river system normally occurs from May to September, earlier than that in other regions. On average, there are about 3 to 5 floods within the region annually, each of them may last from 8 to 15 days, depending on its scale and strength. Major floods in the Red river are often generated from 3 rivers of Da, Thao and Lo, of which the Da River plays a decisive role contributing 37%-69% of the flood flow in Son Tay (49.2% on average), while the Lo river contributes 17%-41.5% (28% on average) and the Thao river contributes the lowest proportion – 13%-30% (19% on average). Floods in the Thai Binh River are often generated from 3 rivers of Cau, Thuong and Luc Nam and partly from the Red river through the Duong river.

Flood amplitude is high on the Red river system, above 10m in Hanoi. Whereas that of the Thai Binh river is above 6m in Pha Lai.

### ***Floods on rivers in the Central***

The flood season on the rivers from Thanh Hoa to Ha Tinh is from June to October every year. Floods on these rivers generally occur on main streams thanks to the dyke systems preventing the overflow. Flood amplitude is above 7m on the Ma river system and above 9m on the Ca river system.

On the rivers from Quang Binh to Binh Thuan, the flood season is from September to December. This region is characterized by short and steep river systems with rapid flows. Dyke systems in this region are relatively low or uncompleted. Therefore, floods not only occur on the mainstreams but also spread across the floodplains with the amplitude of above 8m.

### ***Floods on rivers in the Central Highlands***

There is no major river system in the region, and annual precipitation is low. The influenced area of floods in this region is narrow and characterized by mountainous and flash floods. Flood amplitude at Dabla bridge on the Dabla river is 10m.

### ***Floods in the Eastern South rivers***

Since rainfall is not very high plus a thick and diverse vegetation cover forests, floods in the Dong Nai river are not strong but long-lasting. Nevertheless, historical floods were seen such as in October 1952, the flood discharge crest in Bien Hoa was 12,500 m<sup>3</sup>/s.

### **Floods in the Mekong River Delta**

The flooding level in the Mekong river delta is generated from upstream floods and also directly influenced by tides and water reserving capacity of Tonle Sap. The progress of floods in the Mekong river delta is slow and floods last for a long period of 4 to 5 months annually, causing inundation in almost areas of the Mekong river delta.

### ***c. Flash floods and mud floods***

Flash and mud floods are often found in mountainous and hilly areas where are characterized by steep slopes, heavy rains and disadvantaged drainage conditions. Flash floods also may occur due to the failures of small reservoirs or landslides blocking up flows, etc. Flash floods have occurred and threatened in all 33 mountainous provinces of the 4 regions, namely the Northern Mountains, the Central, the Central Highlands and the Eastern South of VN. Due to climate changes in recent years, flash floods have become more frequent in Vietnam with 2 to 4 flash floods on average happen every year during the flood season. In many cases, flash floods happen frequently at a same location. The occurrence of flash floods is usually sudden and within a small area, but very severe and often causes tremendous human and asset

losses. Some typical flash floods are the one happened in Son La town on 27 July 1991, in Muong Lay and Lai Chau in 1994, in Ha Tinh on 20 September 2002, in Yen Bai in 2005, etc. Currently flash floods are unpredictable but can be proactively prevented by zoning high risk areas and establishing warning systems.

#### ***d. Inundation***

Inundation in Vietnam is usually caused by heavy rains and it last for long time in some areas. Although resulting in limited human loss, it causes remarkably negative impacts on agricultural production and the ecological environment.

#### ***d. Droughts and desertification***

Drought is a common type of disaster in Vietnam, which causes the 3<sup>rd</sup> greatest losses, following typhoons and floods. In recent years, drought continuously happens throughout the country. In some particular years, droughts reduced 20-30% of the food productivity, thus severely threatening people's livelihoods and daily life. Drought control is difficult due to water shortage and depleted upstream reservoirs. Prolonged droughts result in desertification risks in several regions, especially the South Central, sandy coastal areas and slope lands in the highlands and mountain areas.

#### ***e. Salinity intrusion***

The coastline of Vietnam is 3,260 km long with many river estuaries, therefore salinity intrusion is found along the entire coastline at different rates. Three zones at higher risks of salinity intrusion are the South West coastal provinces, Central coastal provinces and the downstream part of the Dong Nai River. The South West coastal region is the most severely affected by salinity intrusion with 1.77 million ha of salinity land, accounting for 45% of the total area. Salinity intrusion prevention and fresh water reservation in this area are usually very costly.

#### ***g. Whirlwind and cyclone***

**Whirlwind** is a phenomenon of accidental strong wind within a narrow extent generated by extremely strong developing thunderclouds. A whirlwind may have sudden change of direction, and the wind velocity is from Grade 8 or more. Accompanying whirlwinds are usually showers, or even hails in some cases.

**Cyclone**, also called tornado is a whirlwind in a narrow area but has a very powerful strength (equivalent to a strong windstorm), formed by a strong and specially structured thundercloud. A thundercloud may form two or three tornado at the same time, which are then combined into a cyclone. A cyclone often goes with showers, rainstorm or hails with dusts and sand ...

**Both whirlwind and cyclone** are violent types of natural disaster. They happen suddenly and are not yet forecasted, therefore they cause vast and unpredictable consequences but that of cyclone is considerably more serious. Whirlwinds are often accompanied by strong winds that pull down trees and houses, destroy communication

and power systems, as well as sink small boats and ships ... Cyclones, due to stronger winds, high velocity and frequent directional changes, often cause violent damages. Whirlwinds and cyclones are common phenomena in Vietnam, and their frequency has increased in recent years.

#### ***h. Landslide and erosion***

Landslide is a common type of disasters in Vietnam, consisting of river bank erosion, coastline erosion, and landslides on mountain slopes, land subsidence, etc. Landslides are usually caused by external factors (water), internal factors (geological changes) and human activities (unplanned mineral exploitation or construction), etc.

***River bank erosion*** is very common throughout the country. It causes remarkable losses of residential and cultivated land area and destroys many villages along riverbanks.

***Coastline erosion*** happens due to waves, tides, seawater rise and sea currents. Coastline erosion has led to sea intrusion, causing lost land and destroyed environment, etc.

***Landslides in hill and mountain slopes*** are usually caused by heavily concentrated rains combining with weak geological structure and human impacts like mountain destruction for roads, forest destruction, etc. Landslides often come with mud floods and cause serious damage to the human life and assets.

#### ***i. Earthquake and tsunami***

***Earthquake*** is the phenomenon of ground surface vibration, caused by the sudden movements of geological blocks in the earth's womb, volcanic eruptions, landslides, cave collapses, etc. Earthquakes have happened in Vietnam though in a limited strength.

***Tsunami*** is the phenomenon of long circle ocean waves at a high-propagated speed. When reaching the coastline, depending on the depth of the sea and the topography of the coastal area, these waves can be tens of meters high and travel deeply into the land, causing vast catastrophes. Tsunami is the result of earthquakes in the ocean bed. Though tsunami has not yet happened in Vietnam, many coastal areas of Vietnam may be affected by tsunami due to earthquake potentials in some neighboring countries.

#### ***k) Sea surge***

***Sea surge*** is the phenomenon of annual average of sea level in recent years higher than the multi-year average of sea level, resulted from the effects of global climate change.

#### **4. Consequences of natural disasters to socio-economic development**

##### a) Socio-economic consequences

Natural disaster in Vietnam is the direct impediment to the economic development, sustainable development and poverty reduction; the huge obstacle to the process of striving for the Millennium Development Goals.. Vietnam has more than 80% of its population living at risk of direct impacts of natural disasters.

Natural disaster has taken away many achievements of the national socio-economic development. In the last 5 years (2002-2006), natural disaster has killed 1,700 people and caused losses of estimated VND75,000 billion of assess.

Natural disaster intensifies the division in residents' living standard; hinders and lowers the hunger eradication and poverty alleviation, especially in areas frequently at risk of disaster. On average, millions of people are in need of assistance due to natural disasters every year. Many of them, who have just escaped from poverty, are re-impooverished due to the disasters.

Natural disaster affects educational development, destroys educational infrastructure and interrupts school time, especially in mountainous areas and the Mekong River Delta.

Natural disaster also causes negative impacts on vulnerable groups such as the old, the disabled, women, and children.

##### b) Environmental consequences

- Natural disaster destroys, degrades and pollutes environment and negatively affects production and community's life.

- Consequences of natural disaster result in water pollution, disease generation.

##### c) Consequences of natural disasters to national defence and public security

- Destroy constructions for defence and security

- Reduce the national reserve

- Cause social instability

- Cause chaotic in social security and order

## **II. NATURAL DISASTER PREVENTION, RESPONSE AND MITIGATION IN VIETNAM**

Throughout the course of development, natural disaster prevention, response and mitigation in Vietnam have always been considered as a struggle for life and closely

linked with the founding and defence of the country. Disaster prevention, respond and mitigation in Vietnam have made great progress throughout the history.

## **1. Course of development**

Since last thousands of years, Vietnamese ancestors have seen natural disasters as one of the “4 biggest dangers to mankind”: water (floods), fire, robbers, and invaders.

Dyke constructions for flood prevention were implemented many centuries ago. By 1248, the Red river dyke system had formed. At present, the system of river and sea dykes of the nation is thousands of kilometres long.

No sooner had the Democratic Republic of Vietnam been established than President Ho Chi Minh signed Order No. 70/SL on 22 May 1946 to establish a Central Committee for Dyke Maintenance, the predecessor of the current Central Committee for Flood and Storm Control.

*During the period of 1945-1954*, Vietnamese people had both to fight against invaders and to prepare for and respond to natural disasters. Northern provinces built nearly 7 million m<sup>3</sup> of dykes to strengthen critical dyke sections.

*During the period of 1955-1975*, flood and storm control got new further development step with the establishment of the Ministry of Water Resources, the promulgation of the Regulation on Dyke Protection and many other directives and resolutions in order to improve the capacity of flood and storm control... In this period, Northern provinces built millions of cubic meters of dykes, hundred thousands of cubic meters of stone embankments; built flood retarding zones, renovated flood diversion systems, and planted trees for wave resistance.... During this period, the North suffered many heavy floods that broke dykes in some areas. However, production and social stability were soon restored thanks to prompt recovery activities.

*During the period of 1976-present*, flood and storm prevention and response have been regarded as one of the particular important measures for socio-economic development. The State has promulgated these following legal documents: the Ordinance on Dykes (1989) and Ordinance on Flood and Storm Control (1993), amendments to these two ordinances (2000), the Strategy for Water Disasters (1994), the Law on Dykes (2006) and decrees to guide the implementation of these laws and ordinances. Policies on natural disaster prevention, response and mitigation have been promulgated such as policies for the ‘living with floods’ areas (Mekong River Delta), flood diversion and retarding areas (Northern region) and “avoidance and adaptation” areas (Central region). Many structural solutions have been carried out such as reservoir building, dyke upgrading, boat and ship shelter building, etc. Non-structural solutions have included forest rehabilitation, communication systems renovation, forecast, warning, international cooperation, community awareness raising, step-by-step consolidation of organizational mechanism for flood, storm control and search and rescue...

## 2. Achievements and limitations

### a) Remarkable achievements

- ***Step-by-step accomplish legal documents;*** create a legal corridor for natural disaster prevention, response and mitigation. In recent years, Vietnam has developed and promulgated relevant legal documents, such as Law on Dyke, Water Resources Law, Law on Forest Protection and Development, Law on Environment Protection, Land Law, Law on Natural Resources and Minerals, Law on Fisheries, etc., Ordinance on Flood and Storm Control, Ordinance on Exploitation and Protection of Water Resources Structures, Ordinance on Exploitation and Protection of Hydro-meteorological Structures, etc. Promulgate decrees to guide the implementation of laws and ordinances.

- ***Step-by-step strengthen the organizational mechanism; enhance the capacities, equipment and physical infrastructures*** for the direction of flood and storm control, natural disaster mitigation as well as search and rescue activities from the central to local levels.

- ***Develop and implement socio-economic development programs related to flood and storm control and natural disaster mitigation*** such as Plantation of upstream forests, protective forests, mangrove forests program; reservoirs for flood drainage and drought resistance program; “living with floods” program, safety for fishing boats and ships program, dyke reinforcement and renovation program, etc.

- ***Research and apply science and technology for flood and storm control as well as natural disaster prevention, response and mitigation, such as:***

- + Research on prevention and control of river bank and coastline erosion;
- + Research on extreme flood preparedness for the Red River Delta;
- + Research on 12 types of natural disasters;
- + Research on the establishment of self-help financial funds;
- + Models of safe-in-disaster houses;
- + Methodology for damage and disaster relief assessment;
- + Research on flood zoning in Central provinces;
- + Research on flash flood prevention planning;
- + Apply new technologies to disaster forecast, warning and management;
- + Apply new materials and technologies to construction of several disaster prevention and mitigation structures.

***- International cooperation***

+ Participate in international and regional organizations for natural disaster mitigation, for example Asian Disaster Reduction Center (ADRC), Asian Disaster Preparedness Center (ADPC), ASEAN Committee on Disaster Management (ACDM), World Meteorological Organization (WMO), Typhoon Committee (TC), Natural Disaster Mitigation Partnership (NDM-P), International Strategy for Disaster Reduction (ISDR), etc.

+Cooperate with international organizations, nations and non-government organizations in disaster mitigation such as UNDP, UNESCAP, WB, ADB, etc.,

***- Search and Rescue:*** Establish the National Committee for Search and Rescue, strengthen the organization mechanism from central to local levels; enhance facilities and equipment for search and rescue activities; develop a master plan for search and rescue up to 2015.

***- Relief and recovery activities:*** The State annually allocates a certain proportion of budget and reserves some essential commodities for emergency relief and prompt damage recovery. When disasters occur, political and social organizations such as the Vietnam Fatherland Front, Trade Union, Youth and Women Associations, etc. have taken the initiative to organize donation activities, supporting affected areas for quick stability. Relief and recovery efforts have also come from on-site sources, taking advantage of the mutual support tradition.

***- Training, propagandizing and awareness raising:*** Thanks to the mass media, activities of training, propagandizing and awareness raising have been improved. Training in communities have been provided at grass-root level as well as to officers related to disaster mitigation in ministries, sectors and localities. As a result, the awareness of authorities and the residents have increased. Poor families in coastal areas have been supplied with equipment to be able to obtain information and prepare for natural disasters proactively.

***- Resources for natural disaster prevention, response and mitigation***

+ Every year, the government has given preference and gradually increased budget for natural disaster prevention, response and mitigation; given prior investment in specific programs and projects: The forest plantation programs, dyke upgrade programs, reservoir programs, landslide prevention programs, “living with floods” program, safety for boats and ships program.

+ Provinces have mobilized the on-site resources, taken advantage of the contributions of the people, social and political organizations, and international organizations in natural disaster prevention and damage recovery.

+ Annual Official Development Assistance (ODA) has been supplemented



## b) Limitations

In recent years, we have made considerable efforts; physical and technical infrastructures for disaster preparedness have been improved; the leadership and coordination in response to natural disasters from central to local levels have made substantial progress. However, with regards to the consequences of natural disasters and the socio-economic development goals in the near future, the following shortcomings and limitations need to be addressed:

- Disaster prevention, response and mitigation activities are passive and mainly focus on addressing specific problems;
- The response to disasters is slow due to objective and subjective reasons;
- Unstable production system, inappropriate production structure;
- Infrastructure is poor and vulnerable to disaster;
- Forecast and warning systems do not meet the requirements, particularly with regards to disasters like flash floods, landslides, whirlwinds, etc;
- Emergency relief, damage recovery and rehabilitation are limited, sometimes disconcerted and lack of cooperation;
- Search and rescue activities are limited due to lack of equipments and facilities, unprofessional operations and not bringing the combined strengths of all forces and communities into full play.

## c) Reasons

- Awareness
  - + Inadequate awareness of natural disasters and sustainable development, especially the approach of living in harmony with the nature is insufficiently implemented;
  - + Dependent and inactive attitude; disregard of and inexperience in natural disasters preparedness;
  - + Disseminating, training and raising community awareness of disaster prevention, response and mitigation are infrequent and unsystematic, mostly implemented throughout the mass media and training programs of natural disaster preparedness have not been included in school curriculum.
- Planning
  - + Lack of synchronous planning and short of coordination among ministries, sectors and localities. Lack of due attention to the integration of natural disaster

prevention, response and mitigation into local and sector's socio-economic development programs;

- + In construction planning, lack of due attention to safety and flood and storm avoidance, particularly in industrial zones, tourism areas, urban areas of coastal regions, mountainous areas, residential areas and transportation roads;

- + The encroachment on sea and rivers for construction or setting construction projects in areas highly prone to floods, flash floods, storms, sea surge and landslides make structures always at risks, resulting in costly for protection and maintenance;

- + Development planning has not been linked with environment and landscape protection and preservation. For example, natural sand dunes on the sea shore, upstream protective forests and mangrove forests have been destroyed for aquaculture.

- Policy and mechanism

- + Lack of penalties for failure to obey legal regulations, and the orders of relevant authorities;

- + Overlaps of functions and duties and lack of clear responsibilities;

- + Lack of policies to encourage disaster-related insurance purchases;

- + Lack of policies to encourage individuals and organizations volunteering and participating in search, rescue and response activities to natural disasters.

- Lack of regulations for organizations on the appeal, collection, receipt and distribution of disaster relief in good and cash.

- Lack of timely adjustment in policies on the mobilization of resources for disaster prevention and mitigation.

- Investment

- + Investment in natural disaster prevention, response and mitigation has been non-synchronous and not met the requirements and the given situation of disaster;

- + Investment in the maintenance, management and utilization of existing structures is not correspondent to the new construction investment;

- + Financial allocation to some critical, approved projects such as reservoirs, shelters of boats and ships, dyke system, etc. is slow and does not meet current requirements.

- Direction and management

- +The directions and orders in response to natural disasters have not yet been seriously executed; the implementation is slow; dependence on leaders still exists;

+The inspection and direction of four “on-the-spot” principles are not determinedly;

+There have been wrong directions of economic development without linking with natural disaster prevention, response and mitigation. For instance, coastal protective forests were destroyed for aquaculture while watershed protective forests were cleared for crop productions.

+ The lax management and protection of watershed forests, coastal and riverside protective forests have led to the degradation of forest coverage in some areas, restraining the effectiveness of flood, storm and drought control and causing unexpected dangers;

+ The lax management of sand exploitation on rives and other activities on river banks have resulted in harmful impacts on flood discharge and caused erosion;

+ The shortcomings of vehicle management on rivers and at sea, particularly pelagic fishing boats have resulted in damages when disasters occur;

+ The quality control in some particular structures was insufficient, hence, damaged structures even in case of low intensity disaster. Some structures have even hindered flood discharge or made flood more serious.

+ Management of implementing progress and operation of disbursement’s procedures are still slow, especially ODA;

+ The management and utilization of resources for disaster recovery are sometimes lax, lack of transparency or for inappropriate purposes.

### **3. Tendency of natural disaster changes and challenges**

All over the world, natural disasters are forecasted to happen more regularly in terms of types and frequency, more complex in terms of developments and more serious in terms of consequences. Global warming, climate changes, El Nino, La Nina phenomena and increase of typhoon and drought, etc., occurring recently in the world and in the region, have caused direct impacts on the climate and natural disasters in Vietnam.

The territory of Vietnam extends over 15 latitudes with 3,200 km coastline and locates in the area of humid tropical monsoon, complex topography and dense river network. These leads to many different sub-climate zones, ecologies and various types of natural disasters including typhoons, floods, flash floods, droughts, landslides, etc. Affected directly by the Pacific Ocean typhoon centre, Vietnam is hit by about 6-7 typhoons and tropical depressions every year.

Moreover, on the subjective side, the rapid industrialization and modernization in the country have resulted in comprehensive development, but at the same time, led to the increase of disaster risks. Because of human’s activities with an aim at socio-

economic development such as not disobeying natural norms or loosing environmental and natural resource management in combination with population pressure, it is recognized that there were inappropriate behaviors such as mountain destruction for roads, encroachment on sea and rivers, leveling hills and mountains for construction, forest destruction, etc. These resulted in increased unsafe in case of disaster and negative impact on the economic development and destroyed environment.

Obviously, natural disasters have been making vast effects on the human's life and the sustainable development of the country.

*Every effort has been made to provide a complete and accurate translation of this document; however, in all cases, the original Vietnamese language document is the official statement*