ASIA-PACIFIC NETWORK FOR GLOBAL CHANGE RESEARCH

Project Reference Number: CAF2014-CD02NMY-Nhat
Capacity Building for National, Provincial Stakeholders and Remote Communities on Loss and Damage Related to Disaster Risk Reduction and Climate Adaptation

WORKSHOP PROCEEDINGS

Climate Change Adaptation and Disaster Risk Reduction in the context of Loss and Damage

SUPPORTED BY
ASIA-PACIFIC NETWORK FOR GLOBAL CHANGE RESEARCH (APN)

ORGANIZED BY
DEPARTMENT OF METEOROLOGY, HYDROLOGY AND CLIMATE CHANGE (DDMHCC)
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT OF VIET NAM (MONRE)

15 May 2015, Ha Noi, Viet Nam

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PREFACE

Vietnam suffers significantly increasing climate extremes in recent years with complicated occurrences of typhoons, floods and other extreme events. Although Vietnam has been active in implementing Climate Change Adaptation (CCA) and Disaster Risk Reduction (DRR) initiatives at all levels, Loss and Damage (L+D) still occur and severely affect vulnerable communities, especially remote communities. Recognizing the risk of dealing with unavoidable L+D, the Department of metrology, hydrology and climate change (DMHCC) collaborates with Hue Economic University to develop a series of capacity building activities, including a national workshop, with an aim to establishing a comprehensive linkage between national agencies and local communities in a response to immediate impacts of disasters while ensuring a sustainable foundation of knowledge and knowledge transfer to effectively reduce long-term impacts of climate change.

The national workshop for designated agencies on climate change at central levels in Vietnam was organized with participation of leaders of line departments under governmental ministries and Provincial People's Committees who directly involve in policy-making processes on climate change under supervision and coordination of Vietnam NTP and disaster reduction coordinated by the Central Committee for Flood and Storm Control (CCFSC).

The objective of the workshop was to seek strategic ways to improve coordination role of Vietnam NTP in directing and ensuring the effectiveness of disaster risk reduction and climate change adaptation activities by line ministries and related provinces will include (i) enhancing the knowledge-base of CCA-DRR-L+D including colloquially understanding of Loss and Damage and linkages between DDR and CCA, (ii) Successful practices of local, experiential and indigenous knowledge; and (iii) discussing potential integration of DRR and CCA to address L+D for sustainable development and how to establish linkages between DDR and CCA strategies to formulate a better protocol.

The presentations received attentions and appreciation as well as the fruitful comments of the experts and representatives from line ministries and related agencies. Based on the comments raised at the Workshop, Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment will, in collaboration with the experts, finalize the report and

training documentation. The workshop was successfully organized on 15th May 2015 in Ha Noi, Viet Nam.

Taking this opportunity, I would like to express sincere thanks to APN for their generous supports and to all participants for their active and constructive comments to the workshop.

Dr. Le Minh Nhat - Project Leader
Director Climate Change Adaptation Division(CCA)
Department of Meteorology, Hydrology and Climate Change (DMHCC)
Ministry of Natural Resources and Environment, Viet Nam (MONRE)

Project Reference Number: CAF2014-CD02NMY-Nhat

Capacity Building for National, Provincial Stakeholders and Remote Communities on Loss and Damage Related to Disaster Risk Reduction and Climate Adaptation

ABBREVIATION

APN	Asia-Pacific Network for Global Change Research
CCA	Climate Change Adaptation
COP	Conference of Parties
DRR	Disaster Risk Reduction
DMHCC	Department of Meteorology, Hydrology and Climate Change
IMHEN	Institute of Meteorology, Hydrology and Environment
LD	Loss and Damage
MARD	Ministry of Agriculture and Rural Development
MPI	Ministry of Planning and Investment
MOF	Ministry of Finance
MOIT	Ministry of Industry and Trade
MONRE	Ministry of Natural Resources and Environment
MRV	Measurement, Reporting and Verification
UNFCCC	United Nations Framework Convention on Climate Change

PHOTOGRAPHS FROM THE WORKSHOP

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Capacity Building for National, Provincial Stakeholders and Remote Communities on Loss and Damage Related to Disaster Risk Reduction and Climate Adaptation

1- Opening session	
	
Mr. Truong Duc Tri, Deputy Director General, DMHCC, MONRE, makes the welcome speech	Professor, Dr. Truong Quang Hoc, Member of Vietnam Panel Climate Change, Co-Chair
2-Presentations at Workshop	
	
Dr. Le Minh Nhat, Director Division of Climate Change Adaptation, DMHCC, MONRE, presents *Relationship between CCA and DRR in the context of Loss and Damage*	Mr. Tran Huu Tuan, Hue Economic University presents*Sharing experience on implementing activities of capacity building on Loss and Damage at provincial level*
	
Dr. Bui QuangHuy, Vice Director of Disaster Mitigation Centre, presents *Disaster risk management: Opportunities and challenges in reducing loss and* damage	MsHuong, Department of Disaster Prevention, Directorate of Water Resource, MARD. *Introduction of the guidance on disaster damage inventory and evaluation*

	
Assistant Professor Dinh Vu Thanh, MARD presents *Loss and Damage by climate change impacts in agricultural sector: Difficulties and Challenges*	Ms. Nguyen Thanh Van, MOLISA presents.*Difficulties and challenges in developing supporting mechanism of loss and damage by climate change and disaster in Viet Nam*
	
Mr Huynh ThanhDien, Office of NTPRCC, Ben Tre province presents*Experience on implementing climate change adaptation and disaster risk reduction*	Ms Le Dinh Van Khanh, Office of Can Tho's PC presents*Experience on implementing climate change adaptation and disaster risk reduction*
3. Discussion at the Workshop	
	
Mr , Climate change expert makes some questions and comments	Dr Le Minh Nhat answers a question

ORGANIZATION OF THE WORKSHOP

Objective

(i) Sharing the knowledge-base of CCA-DRR-L+D including colloquially understanding of Loss and Damage and linkages between DDR and CCA,

(ii) Sharing the successful practices of local, experiential and indigenous knowledge; and

(iii) Discussing potential integration of DRR and CCA to address L+D for sustainable development and how to establish linkages between DDR and CCA strategies to formulate a better protocol.

Date of Workshop

15th may 2015

Venue

Bao Son Hotel,

No.50 Nguyen Tri Thanh,Dong Da District, HaNoi, Viet Nam.

Organizer

Department of Meteorology, Hydrology and Climate change (DMHCC), Ministry of Natural Resources and Environment (MONRE).

Supported by

Asia-Pacific Network for global Change Research (APN)

PART 1.

REPORT OF THE WORKSHOP

Summary Report on
Workshop "Climate Change Adaptation and Disaster Risk Reduction
In the context of Loss and Damage"
Ha Noi, 15May 2015

I. Introduction

A national workshop for designated agencies on climate change at central level in Vietnam for leaders of line departments under governmental ministries and Provincial People's Committees who directly involve in policy-making process on climate change under supervision and coordination of Vietnam NTP and disaster reduction coordinated by the Central Committee for Flood and Storm Control (CCFSC), was held at the Bao Son Hotel in Hanoi on 15th April 2015. It was organized by the Department of Meteorology, Hydrology and Climate Change (DMHCC) of MONRE in collaboration with related agencies

II. Objectives of the workshop

The general objective of the workshop was to improve the coordination role of Vietnam NTP in directing and ensuring the effectiveness of disaster risk reduction and climate change adaptation activities by line ministries and provinces.

The specific objectives of the meeting were to:

(iv) Sharethe knowledge-base of CCA-DRR-L+D including colloquially understanding of Loss and Damage and linkages between DDR and CCA,

(v) Sharethe successful practices of local, experiential and indigenous knowledge; and

(vi) Discuss potential integration of DRR and CCA to address L+D for sustainable development and how to establish linkages between DDR and CCA strategies to formulate a better protocol.

III. Workshop Chairpersons and Participants

The workshop was co-chaired by Mr. Truong Duc Tri, Deputy General Director of DMHCC, MONRE, Professor Dr. Truong Quang Hoc, a member of Vietnam's Advisory Committee of Climate Change (Decision 43/QD-TTg) and Dr. Le Minh Nhat, Project leader, Director of Climate Change Adaptation Division, DMHCC,MONRE.

The workshop was attended by 102 participants, including representatives from related line ministries: Ministry of Agriculture and Rural Development (MARD), Ministry of Industry and Trade (MOIT), Ministry of Natural Resources and Environment (MONRE), Ministry of Transport (MOT), Ministry of Science and Technology (MOST), Ministry of Construction (MOC); Ministry of Finance (MOF); as well as academics; Non-Governmental Organizations and journalists.

IV. Conduct of the Workshop

The workshop was opened by Mr. Truong Duc Tri, Deputy General Director of DMHCC, MONRE. He warmly welcomed all participants to the workshop and provided some background information on the preparation of the APN project proposal. He introduced the objectives of the workshop and invited comments and inputs from the participants.

A total of eight presentations were made, four in the morning session and fourin the afternoon session, as follows.

Morning session:

1) Dr.Le Minh Nhat, Project leader, Director of Climate Change Adaptation, DMHCC provided an overview on the development of the project proposal. He covered the objectives, procedures and work plan, as well as tentative institutional arrangement for the preparation of this project. He also provided some information on the project budget and fund allocation. Hispresentation give a briefdefinition of loss and damage and aintroduction about loss and damage in Vietnam. He pointed out that the idea of insurance pool was raised by Alliance of Small Island States (AOSIS) in 1991. However, “loss and damage” only appeared for the first time in a UNFCCC document in 2007. Then in 2010, in Cancun, a work programme was created and by 2013 the Warsaw International Mechanism (WIM) on loss and damage was set up. However, there hasnot been anyagreement, finalized until now. The gaps and challenges in integrating an approach of climate change adaptation into disaster risk reduction in order to addressloss and damage issues were also discussed.

2) Dr.Tran Huu Tuan of the Hue Economic University gave a presentation on sharing experiences in implementing the capacity building activities for loss and damage at the provincial level. His presentation was divided into three parts including enhancing capacity activities about loss and damage at the provincial level, best practices of climate change adaptation and disaster risk

reduction in the context of loss and damage and case study: properties damaged assessment caused by flood in 2007 in Quang Nam. In explaining the first part, Dr. Tran Huu Tuan introduced the main activities about enhancing capacity for regional climate change experts including reviewing legal documents related to disaster risk reduction and climate change adaptation in context of loss and damage at the provincial level and a communal training at Nam Dong commune. Dr Tuan then went to explain the best practices on disaster risk reduction and climate change adaptation.

3) Dr. Dinh Vu Thanh of MARD gave a presentation on Losses and damages under the impact of climate change in the agricultural sector: difficulties and challenges. There is no doubt that agricultural sector is one of the most vulnerable in Vietnam. Dr. Vu DinhThanh - Deputy Director of Department of Science and Technology who has about 30 years in this sector, were the main speaker of the workshop. His presentation started with very detail information about the agricultural in Vietnam. He indicated that loss and damage in agricultural sector now remainedchallenging issues. Dr. Vu Dinh Thanh recommended that Vietnam's government and the ministries should rapidly develop mechanisms and policies to support equitable and fair compensation for the areas adversely damagedby natural disasters along with building forecasting models, early warning of the natural disasters. Besides that, local governments, especially in districts and communes drastically displaced, damage prevention, damage. It is very important to raise awareness for the community toproactively be prepared and respond to the natural disasters. Finally, the government should integrate economic development activities in social development planning in the medium to the long term in the context of climate change scenarios.

4) Dr. Bui Quang Huy, Deputy Director of Disaster Management Center (DMC), Ministry of Agriculture and Rural Development (MARD) presented the Disaster risk management: Opportunities and challenges in reducing loss and damage in Viet Nam. He provided an overview on previous and existing DRR activities, policies and action plan, as well as major gaps in Loss and Damage reduction actions. He also proposed some activities, includingimplementation plan and major of Loss and Damage Assessment on the 31QD/PCLBTW dated 24/2/2012 and the gaps and challenges in loss and damage reduction. To end up, he outlined both opportunities and challenges for loss and damage assessment system.

Afternoon session:

5) Mrs. Nguyen Thu Huong, Deputy Director of Disaster Prevention Division,MARD introduced an overview on previous and existing assessment of loss and damage activities including definition, purpose and significance. Mrs. Huongthen described in detailed methodology of the damage assessment. At request from the participants, she particularly explainedindicator system which contributed a vital part in methodology of damage assessment. She also outlined all kind of reports as long as their pros and cons. At the end of her presentation, she brought out a new project on development of a circular on statistical and assessment damages caused by the natural disasters.

6) Mrs. Nguyen Thanh Van from Institute of Labor Science and Social Affairs presented challenges in developing a support mechanism of loss and damage due to climate change. Mrs. Van started her presentation with the key objects of the support mechanism of loss and damage. After that, she clarified the existing supporting policies for loss and damage in Vietnam with detail beneficiary for each case. She also stated the support mechanism for resources outside of the national budget. According to Mrs. Van, difficulties in implementing policies still remained as an unsolvable trouble. She also dissected the challenges in developing support mechanism of loss and damage due to climate change. She summed up with recommendations to solve the problems.

7) The next presentation in this workshop was aimed to share experience in implementing adaptation activities and disaster risk reduction at provincial level. Mr. Le Huynh DuyAnh from Ben Tre province gave a short summary of the disaster situation in the province. He mentioned that coordination of the operation unit in response to climate change, disaster preparedness and reduction wascomprehensive, providing advices for the provincial People's Committee in implementing institutions and organizations management and administration are in time and highly accurate. Mr. DuyAnhraised difficulties and limitations in implementing adaptation activities. He also figured out the deployment of response to climate change activities in Ben Tre, which included direction, administration and organization. At the end of his presentation, he showedresults and shortcomings of the response to climate change activities in Ben Tre along with recommendations.

8) Mrs. Le Dinh Van Anhdelivered the final presentation of this workshop, on behalf of Can ThoProvincial People’s committee. Firstly, some background

information of Can Tho city including social and economic situation of Can Tho city and natural disaster situation in Can Tho.Mrs. Le Dinh Van Anh also presented the activities of climate change adaptation and disaster risk reduction undertaken in Can Tho City. She then introduced the province's direction and orientation on climate change adaptation and disaster risk reduction in the future. Implementation solution was the last part of her presentation.

V. Questions & Answers and Discussion

The participants were given opportunities for discussionat the end of workshop:

- Participant Le HuuThuan, raised a question on the definition of loss and damage and difference between loss and damage.
- Dr. Le Minh Nhat, Director of Climate change adaptation division, explained that the difference between loss and damage could be demonstrated throughout recovery functions. The damage can be recovered while loss cannot. He also mentioned that climate change might come along with slow-on-set affect, which is very difficult to identify and measure.
- On behalf of the Ministry of Transportation, Mr. Nguyen Trung Thanh strongly agreed with Dr. Le Minh Nhat about the slow-on-set effects. He gave an example of a damaged freeway; which not only affected transportation between provinces, but also devastated livelihood of nearby citizens and tradingactivities between the areas.
- Mr. Nguyen Trung Thanh on behalf of the Ministry of transportation gave a question about assessmenttool for loss and damage. His question was aimed to clarify the existing tool to assess loss and damage.
- Professor Truong Quang Hoc mentioned two available tools in order to answer his question,including legislation for damage assessment and statistical tool. He emphasized that these tools should be coordinated applied by different organizations so as to give more accurate and more efficientassessment.
- Mr Tran Anh Duong raised a question about specific criteria of determination and collection of the data and assessment of loss and damage; post-disaster needs; and reconstruction. What will Vietnam's government do to solve this problem?

- Dr. Le Minh Nhat said that after reviewing legislation documents and regulations about loss and damage, the workgroup found outidentified a major legal gap that there was lack of no specific criteria to clarify the loss and damage conditions after disaster. Assessing the effects of loss and damage was completely qualitative. However, a new circular on statistical and assessment of the damages caused by the natural disaster is being built by MARD in order to solve the problems.

Mr. Truong Duc Tri concluded the morning session by highlighting that DMHCC would closely cooperate with relevant agencies at the central, local and international organizations to develop mechanisms and policies related to the loss and damage. He also pointed out that loss and damage is now considered as a newissue, some definition remained unclear, therefore, officialsat all level need to enhancetheir awareness about this topic.

In the afternoon, questions were raised for the issues presented in the last four presentations.

- Dang HuongGiang from Institute of Energy, Ministry of Industry and Trade agreed with Dr. Tran Huu Tuan on the best practice at local level. She asked for more information about this practice at local level and how this model should be expanded.

- He stated that the four spots model which had been implemented in Loc Tri commune, ThuaThien Hue provincehad gained a successful result. Besides that, two other well-known adaptation practices also had been stated such as Mangrove reforestation program and early warning systems people-centered in Hai Lang district, Quang Tri province. Dr. Tran Huu Tuan recommended that policies to eradicate hunger and reduce poverty, improve living standards for local people will contribute to reducing vulnerability status due to the natural disasters. Moreover, to minimize the physical damage caused by the natural disasters including floods, local governments need to take measures to create additional off-farm employment, diversification of livelihoods for the local people. As new disaster risks increase day by day, the local communities have almost no experience to cope with the new risks, the local governments and local communities should take new initiatives and innovative measures in order to respond it more effectively.

- Mrs.Doan Le UyenGiang from National committee of climate change had a question about the difficulties in implementing the supporting mechanism on loss and damage.

- Dr. Le Minh Nhat responded that it was obvious that the legislative documents for supporting on loss and damage had already existed. The problems came from limitedresources, loose coordination between stakeholders and identification objects.
- Professor Truong Quang Hoc added that some external factors might lead to insufficency in implementing the support mechanism such as low awareness of the related officials, trust between stakeholders.
- Mr Le Van Chinh from The Ministry of Science and Technology questioned aboutany gaps encountered during the assessment of loss and damage.
- Ms Dang Huong responded that missing some indicators of damage to perennial crops, forests, agricultural land encroachment, mangrove and erosion is an example of the gaps in construction of new circular on assessment of the loss and damage in the context of natural disasters. Determiningprice ranges for some kinds of damages during quick reporting and preparing consolidated reports still remained a big gap. They lied on estimation and quantization.
- Mrs. Nguyen Thi Xuan Thang from Ministry of industry and Trade had a question about the insurancefor the natural disasters relatedloss and damage. She wondered that who would pay for this kind of insurance, the government or the private sector.
- Mr Truong Duc Tri responded that the insurance still had a lot of limitations and needed to be reviewed widely. A coordination mechanism between the government and the private sector should be established in order to create regulations on thisinsurance. At the moment, ADB is working closely with Ministry of Transportation to launcha new pilot project of insurance for the natural disaster related loss and damage in Can Tho province.

Question and discussion summary:

The discussion session started with group discussion.. In Vietnam, loss and damage remainsa new topic so that the definitions of this topic isquite strange to the participants. Ms. Thuy from the Ministry of Transportation raised a question about the difference between loss and damage. Dr. Le Minh Nhat demonstrated the slow on set effects of the damage concept in order to distinguish between loss and damage.This discussion linked to the other question about how Vietnam government measures the slow on set effect, social and economic effects. On

behalf of the Ministry of Transportation, Mr Nguyen gave an example about economic and social damage, which was triggered by the natural disaster. He explained that when a road was damaged by a storm, it might be unable to be used temporarily and resulted in disruption of transportation between areas. However, it also resulted in social economic loss such as trading, communication and livelihood. He recognized that measuring the above mentioned effects is very difficult and needs new mechanisms. The participants also shared their experience on related sector in the context of the loss and damage. Mrs.LE raised a question about insurance for disaster-prone areas. Some participants wondered that the government or the private sectors should pay this kind of insurance. On behalf of the Ministry of Finance, Mr. Truong Duc Tri answered that the insurance still had a lot of limitations and need to be reviewed widely. At the moment, ADB isworking closely with Ministryof Transportation to launch a new pilot project of insurance for the loss and damage related to the natural disasters in Can Tho.

VI. Conclusion of the workshop

Finally, Mr. Truong Duc Tri briefly summarized what had been discussed during the workshop, and thanked all participants for their participation, especially those who contributed to the presentations and discussions. He concluded that:

One of the recommendations fora national support mechanism of the natural disasters related losses and damages is to strengthen the linkage between climate change adaptation and disaster risk reduction based on the solution of losses and damages.

The mechanism for compensation for losses and damages is a new concept which requires knowledge exchange and experiences sharing of specific activities undertaken by local people as well as discussing challenges in establishing mechanisms for compensation for losses and damages in Vietnam, therefore, identifying most suitable solutions to reduce losses and damages in Vietnam.

To adapt to climate change and disaster risk reduction,it is necessary to have a fundamental transition in the development and implementation of policies by each of the relevant stakeholderstowardcomprehensive, multidisciplinarycoordinating approaches.

Some specific recommendations were given such as creating a network of stakeholders active in the area of climate change adaptation and disaster risk reduction at national and local level; seeking funding from organizations for the implementation of climate change activities, building joint programs for the planning and implementation of climate change adaptation and disaster risk reduction in collaboration with different stakeholders in the community; developing a forum to share experience onplanning and developing of climate change adaptation and disaster risk reduction amongstakeholders at all levels.

With the responsibility as anorganization of state management on climate change, Department of Hydrometeorology & Climate Change, Ministry of Natural Resources and Environment will continue to coordinate and consult with relevant agencies at the central, local levels and with international organizations during development of the mechanisms and policies related to the loss and damage in consistent with the country's development as well as global trends.

PART 2.

PRESENTATIONS AT THE WORKSHOP

BỘ TÀI NGUYÊN VÀ MÔI TRƯỜNG
CỤC KHÍ TƯỢNG THỦY VĂN VÀ BIẾN ĐỔI KHÍ HẬU

RELATIONSHIP BETWEEN CLIMATE CHANGE ADAPTATION RISKS AND DISASTER MITIGATION IN CONTEXT OF LOSS AND DAMAGE

DR. Lê Minh Nhật

CỤC KHÍ TƯỢNG THỦY VĂN VÀ BIẾN ĐỔI KHÍ HẬU — *Hà nội 15-5-2015* — APN ASIA-PACIFIC NETWORK FOR GLOBAL CHANGE RESEARCH

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DEFINITION OF LOSS AND DAMAGE

- **Loss**: Impacts of climate change that cannot be recovered
- **Damage**: Impacts of climate change that can be recovered
- **Loss and damage**: The **impacts of climate change that people cannot cope with or adapt to** (Warner and van der Geest, 2013)

INTERNATIONAL MECHANISM ON L - D

- **1991**: Alliance of Small Island States (AOSIS) proposes **insurance pool** in new climate change Convention
- **2007**: 'Loss and damage' appears for the first time in a UNFCCC text
- **2010**: **Work programme on loss and damage** created under Cancun Adaptation Framework
- **2013**: **Warsaw international mechanism on loss and damage** established (also under CAF)

INTERNATIONAL MECHANISM ON L - D

- At COP16 in Cancun, An agreement has emphasized minimizing losses and damages caused by climate change through enhanced international cooperation and capacity building.
  - (1) Risk assessment of damages for damage caused by the impact of climate change and the understanding of loss and damage;
  - (2) Identify approaches to address loss damage caused by climate change, including the impacts of extreme weather events and the slow start (slow on-set), and consider the impact at all levels;
  - (3) Define the role of the Climate Convention in supporting the resolution of issues related to loss and damage.

1.Cơ chế quốc tế về Tổn Thất và Thiệt hại

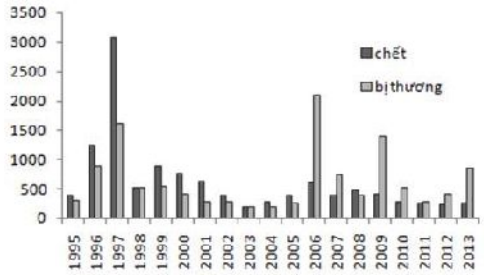
- COP18 in Doha, countries has come to an agreement to build an international mechanism to solve the problem of loss and damage.
- COP19 in Warsaw, the Parties have agreed to develop international mechanisms to solve the problem of loss and damage.
  - Commission of operating mechanism about loss and damage was established
  - General guidance resolve loss and damage to the countries affected by climate change.
  - Each country should develop a mechanism for resolving personal losses and damages.

CỤC KHÍ TƯỢNG THỦY VĂN VÀ BIẾN ĐỔI KHÍ HẬU
APN ASIA-PACIFIC NETWORK FOR GLOBAL CHANGE RESEARCH

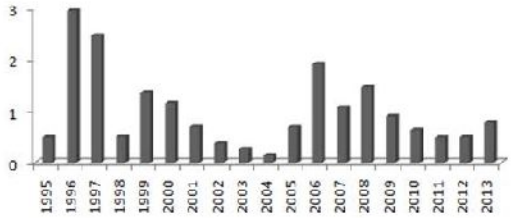
Cơ chế quốc tế Warsaw về tổn thất và thiệt hại

- **Highlights from the work plan** of the Executive Committee of the Warsaw international mechanism:
  - Identify tools, technologies, lessons learned and best practices to **facilitate comprehensive risk management**
  - Assess and develop recommendations to **enhance knowledge and capacity to address slow onset processes**
  - Invite relevant risk management and humanitarian organizations to **develop country specific analyses of the risk of loss and damage** and develop institutional arrangements to prevent and manage loss and damage
  - Establish an expert group to **develop recommendations for reducing the risk of and addressing non-economic losses**
  - Need to enhance understanding of: how loss and damage impacts **vulnerable people and countries, slow onset processes** and approaches to address them, **human mobility** and **non-economic losses**

2. Damage due to climate change and disaster



Hình 1: Tổn thất về người năm 1995 đến 2013



Hình 2: Tổn thất Thiệt hại từ năm 1995 đến năm 2013 so sánh với GDP (%)

- Under the impact of climate change, the frequency and intensity of disasters caused damage
- People : 11.743,
  - Property Damage estimate: more than 22 trillion GDP accounting for 1.5% / year

CỤC KHÍ TƯỢNG THỦY VĂN VÀ BIẾN ĐỔI KHÍ HẬU
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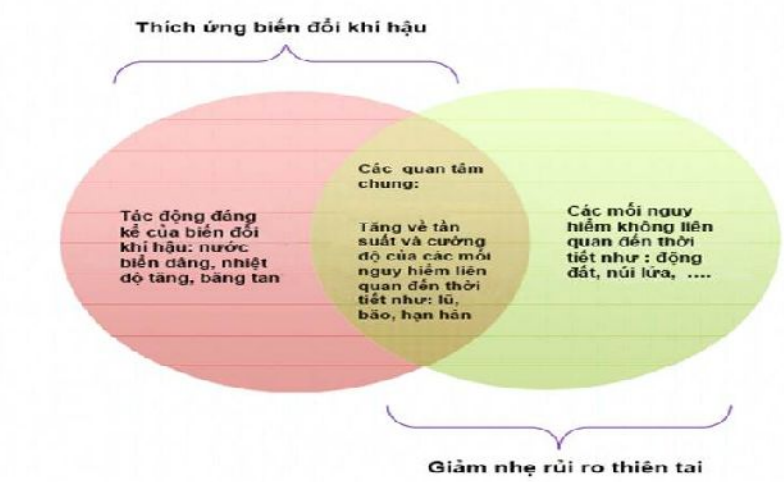
3. Settlement Mechanism on loss and damage

- **Settlement Mechanism on loss and damage**:
  - Strengthening the link between climate change adaptation and disaster risk reduction.
  - Both of DRR and CCA mentioned above aim to reduce losses damages.
- Following discussion:
  - (1) Disaster risk reduction and climate change adaptation in context of loss and damage ;
  - (2) Integrated approaches of disaster risk reduction and climate change adaptation to address loss and damage;
  - (3) Limitations and challenges.

CỤC KHÍ TƯỢNG THỦY VĂN VÀ BIẾN ĐỔI KHÍ HẬU

APN ASIA-PACIFIC NETWORK FOR GLOBAL CHANGE RESEARCH

Climate change adaptation and disaster risk reduction



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4.Thích ứng biến đổi khí hậu và giảm thiểu rủi ro thiên tai

Đặc điểm		Direction
Disaster risk reduction (DRR)	Climate change adaptation (CCA)	
Related to all type of risk	Related to climate risk	Awareness about loss and damage
Derived from the humanitarian aid operations after disaster	Based on scientific theory	Recruitment of climate change adaptation experts from the fields of engineering, water and sanitation, agriculture, health and disaster risk reduction
Focus on solving the existing risk	Focus solve the risks that may happen in the future	Focus on disaster risk reduction in the future; climate oscillations are the basis for implementing climate change adaptation
Historical perspective	Future perspectives	Long-term strategy to address loss and damage
Indigenous knowledge and traditions at the community level is the foundation for resilience	Indigenous knowledge and traditions at the community level may not be sufficient for resilience to the type and scale of disaster risk has not occurred	Integration of scientific knowledge and indigenous disaster risk reduction creates learning opportunities

Climate change adaptation and disaster risk reduction

Feature		Development direction
Disaster risk reduction (DRR)	Climate change adaptation (CCA)	
Structural measures are designed with safety levels based on existing models and historical evidence	Structural measures are designed in safety levels based on existing models, historical evidence and the changes are predicted	Knowledge of structural measures needed to resolve loss and damage in context of climate change adaptation and disaster risk reduction
Focusing on risk reduction and preparation	Focus on adaptation measures to address the vulnerable	Long term focus on extreme weather and slow on set
The process relies on community based on experience	The process relies on community base on policy	The successful experience of the approach based on community
Practical applications locally	Apply theory at local level	Adapting to climate change gain experience through practical applications locally
Full of implementation tools	Lack of implementation tools	Deeply understand about loss and damage
Based on old foundation	New topic	Develop knowledge and expertise on damage losses
Less attention from politicals	Received strong political interest	Disasters related to climate were analyzed and compared with climate change
Small budget	Steady increase in budget	Disaster risk reduction participate financial mechanisms of climate change adaptation

5. Related regulations and mechanism about climate change adaptation and disaster risk reduction

Disaster risk reduction	Climate change adaptation
Hyogo framework (2005)	UNFCCC (1992)
	First National Communication of Vietnam
National Report on Disaster Risk Reduction in Vietnam- Kobe (2005)	First report on technology needs assessments (2005)
	Bali Action Plan and Roadmap (2007) COP13
ASEAN Agreement on Disaster Management and Emergency Response (AADMER) (2005)	Second National Communication of Vietnam(2010)
	Nairobi Work Programme (2005-2010)
Roadmap and regional action programs Icheon (2010)	NTP – CC (2009)
National action plan to prevent natural disasters by 2020 (2007)	National climate change strategy (2011)
National action plan to prevent natural disasters by 2020	National action plan to respond to climate change (2012)
Disaster prevention law (2013)	Second report on technology needs assessments (2012)

5. Challenges

- **Integrated approach to climate change adaptation and disaster risk reduction to address damage losses**
- **Challenges**
  - *Scale of time and space:*
    - Minimize disaster risks at local focus - which is directly affected by the disaster
    - Addressing the impact of climate change through adaptation measures are primarily interested at national level and international level
    - Some adaptation activities have been implemented at the local level, just pilot project framework
  - Differences in the nature of the time scale between disaster risk reduction and climate change adaptation
    - The activities of disaster risk often focus only on the relief operations the emergency, occurs in a short time
    - Inactive, underestimated the importance of developing adaptation strategies for climate change and disaster risk reduction in long-term to build resilience.

5. Challenges

Challenges

- Lack of coordination of related issues to climate change adaptation and disaster risk reduction at national level
- No criterion or criteria to guide the implementation and monitoring of adaptation activities and disaster risk reduction
- Dissent on two areas: while some said that adapting to climate change must be integrated into disaster risk reduction, other comments that disaster risk reduction should be seen as a topic throughout the climate change adaptation

6. Recommendation

Require a fundamental transition in the development and implementation of policies and approaches from each sector to coordinate to a comprehensive approach, multi sectors development and implementation of policies.

- Creating a network of active stakeholders in the field of DRR and CCA at local and national levels, including vulnerable communities, sharing knowledge and experience to address loss and damage;
- Find funding from organizations for the implementation of activities in the framework proposed;
- Develop joint programs for the planning and implementation, in collaboration with stakeholders in DRR and CCA community.
- Development of agreements to share experiences in the planning and development of CCA and DRR activities between stakeholders at all levels.

CỤC KHÍ TƯỢNG THỦY VĂN VÀ BIẾN ĐỔI KHÍ HẬU
APN ASIA-PACIFIC NETWORK FOR GLOBAL CHANGE RESEARCH

Thank you

CỤC KHÍ TƯỢNG THỦY VĂN
VÀ BIẾN ĐỔI KHÍ HẬU

APN ASIA-PACIFIC NETWORK FOR GLOBAL CHANGE RESEARCH

EXPERIENCE FROM UNDERTAKING ACTIVITIES RELATED TO BUILDING CAPACITY ON LOSS & DAMAGE AT PROVINCIAL LEVEL

Dr. Tran Huu Tuan
College of Economics, Hue University
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Contents

1. Activities related to building capacity on Loss & Damage at provincial level
2. Review best practices
3. Sharing case study of "Assessing physical damage of the floods 2007 in Quang Nam province"

Part 1:

Activities related to building capacity on Loss & Damage at provincial level

- Meeting with DMHCC on contents and activities related to the project that Hue College of Economics (HCE) is responsible for.

- Reviewing provincial documents and regulations related to DRR & CCA in the context of L&D.

•Collection of data & information related to DRR, CCA, and L&D at provincial and community levels

- **Preparation of materials, lectures for the training courses that will be organized at provincial levels;**
- **Preparations for organizing the first training course that take place in TTH province: prepare list of participants, official invitations, meeting avenues...**

Dự án:

"XÂY DỰNG NĂNG LỰC CHO CÁC BÊN LIÊN QUAN Ở CẤP QUỐC GIA, TỈNH VÀ CÁC CỘNG ĐỒNG VÙNG SÂU VÙNG XA VỀ THIỆT HẠI VÀ MẤT MÁT LIÊN QUAN ĐẾN GIẢM THIỂU RỦI RO THIÊN TAI VÀ THÍCH ỨNG VỚI BIẾN ĐỔI KHÍ HẬU"

NỘI DUNG VÀ CHƯƠNG TRÌNH TẬP HUẤN

XÂY DỰNG NĂNG LỰC VỀ GIẢM THIỂU RỦI RO THIÊN TAI VÀ THÍCH ỨNG VỚI BIẾN ĐỔI KHÍ HẬU DƯỚI GÓC NHÌN THIỆT HẠI VÀ MẤT MÁT

Thực hiện:

Trần Hữu Tuấn

Trần Văn Giải Phóng

Trần Tuấn Anh

Bài giảng 1:

Biến đổi khí hậu và Rủi ro thiên tai

TS. Trần Văn Giải Phóng,

Bài giảng 3:

Thiệt hại và Mất mát Liên quan đến RRTT và BĐKH

TS. Trần Hữu Tuấn

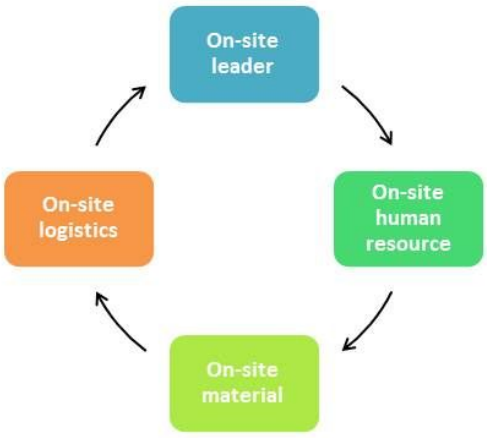
tuantranhuu@yahoo.com

- Orgazing the first training course in Thua Thien Hue province (at Nam Dong district)

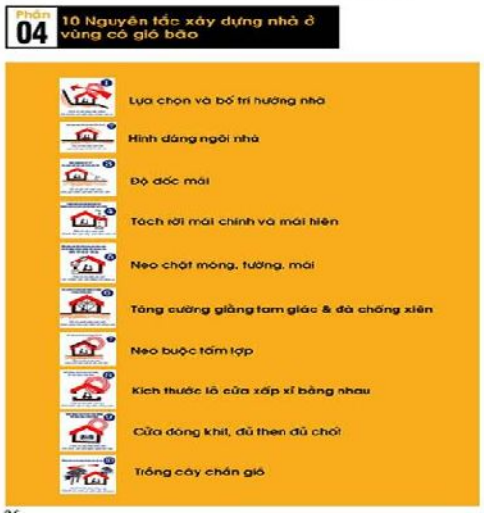
Part 2:

Review best practices related to DRR & CCA in the context of Loss & Damage

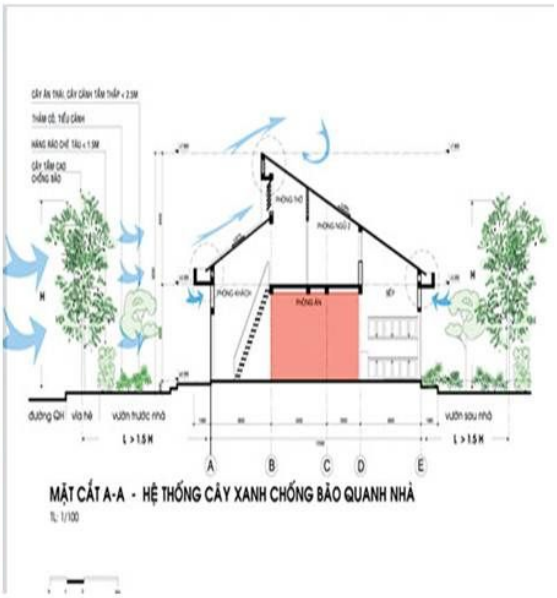
1. Model of "4 on-site actions" applied at Loc Tri commune, Phu Loc district, Thua Thien Hue province



2. 10 key principles for cyclone-resistant construction by Development Workshop France (DWF) in Central Vietnam

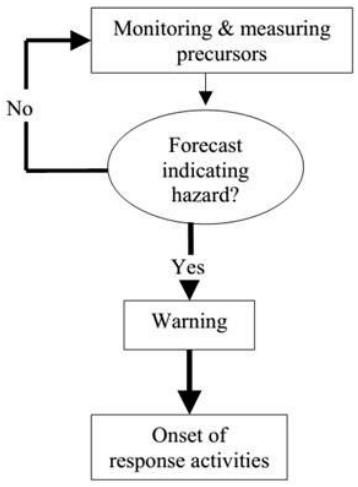


3. Model of building cyclone-resistant house by Da Nang city's Women Union



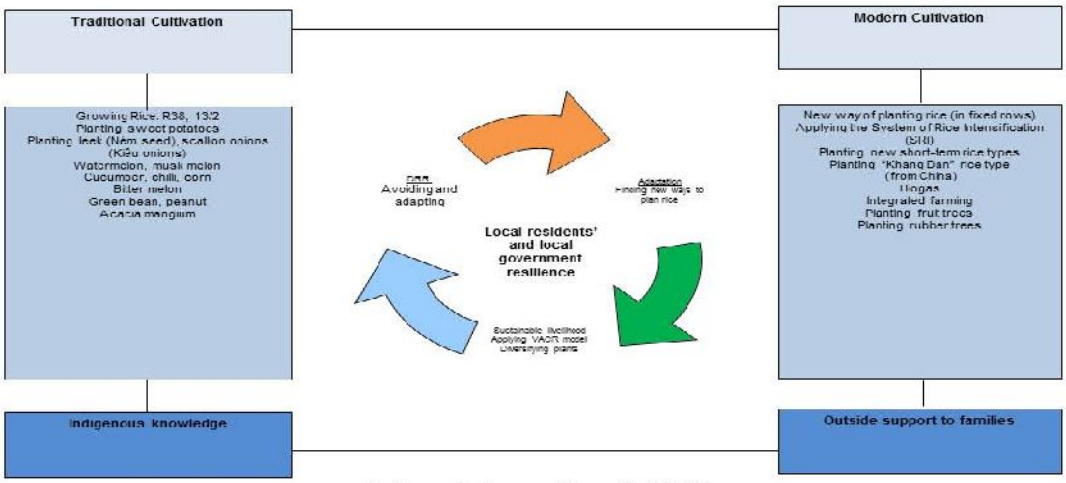
4. Program on planting mangrove forest in coastal provinces by Vietnam Red Cross:from 1994 to 2010, more than 22,000 ha of mangrove forest were planted by VNRC members, volunteers and local people in eight provinces of Vietnam.

5. Buidling "people-cented" early warning systems in Hai Lang district, Quang Tri province



ıre 3. Four phase framework of early warning systems

6. **Climatically adaptive farming measures by local communities and households**



Oxfam International, 2009

7. Diversified sources of income to sustain the family's economy in Quang Nam province

8. Improved local experience in disaster prediction in Central Vietnam

Part 3:

CASE STUDY:
Assessing physical damage of the floods 2007 in Quang Nam province

3.1 INTRODUCTION

- SHARING a part of the paper: "**Estimating the welfare loss to households from natural disasters in developing countries: A contingent valuation study of flooding in Vietnam**", *Journal of Global Health Action*, 2012, 5: 17609; (Navrud, S., T.H. Tuan and B.D. Tinh, 2012).
- ***Flooding in Quang Nam in 2007***
- The year 2007 was recognized as 'the year of flooding' in Quang Nam
- In 2 months, there were nine flooding events in the Quang
- Nam province, including three big floods that occurred
- over a 20-day period (from October 15 to November 5,
- 2007).
- Consequently, many communities were inundated,
- with the water rising to 1.51.7 m, i.e. about 0.51.5 m
- higher than the water levels of a historical flood in 1999

3.2 RESEARCH METHOD

- This study aimed to estimating physical damage & loss caused by floods in 2007 in Quangnam province.
- Damages include::
  - (i) damages of housing assets and
  - (ii) damages to agriculture, aquaculture, and animal husbandry...

Sample selection & household surveys

- A multi-stage cluster sampling technique was applied to randomly choose the two districts, villages within the selected districts, and households within the selected villages;
- 23 villages were selected for household surveys;
- Local enumerators conducted face-to-face interviews with respondents from a total of 706 households in July 2009.

3.3. Study results

profiles of repondents

Table 1. Characteristics of the respondents and their household ($N = 706$ households)

Characteristics	Description	Result
Gender (%)	Male	75.5
	Female	24.5
Age (years)	Mean	51
	Minimum	22
	Maximum	85
Years of schooling (%)	Never attended school	20
	Did not complete primary school	38
	Graduated primary school	20
	Graduated senior high school	9
Household members (No.)	No. of household members (mean)	4.1
	Working members (%)	65.6
	Children < 15 years (%)	24.0
	Members >60 years (%)	9.4
House type (%)	Permanent	26
	Semi-permanent	61
	Not permanent	13
Area size of agricultural land (m^2)	Median	1,667
	Minimum	0
	Maximum	15,000
Income per household per year (VND); 1 US$ = 19,000 VND	Average (SD)	19,139,158 (14,857,376)
Percentage of very poor households (%)	Income less than 7 million VND/year	22.7
Main household income source (%)	Agriculture	56
	Industry	3
	Services	3
	Other (interest, remittance, etc.)	38

Economic value of direct physical damages caused by the 2007 floods

Table 6. Economic damage cost (in VND) per household due to the 2007 floods

Type of damage	Min	Max	Mean	%
Damage to crops	0	41,000,000	983,423	25.8
Damage to livestock	0	26,000,000	849,646	22.3
Damage to aquaculture	0	45,000,000	160,765	4.2
Damage to family-based industry and service	0	830,000	6884	0.2
Damage to house	0	81,900,000	1,492,152	39.1
Damage to family goods	0	8,550,000	117,625	3.1
Damage to house due to public infrastructure	0	25,130,000	207,599	5.4
Total damage	*0*	*83,740,000*	*3,816,105*	*100.0*

Testing hypotheses

3 hypotheses have been assumed & tested:

(i) the very poor suffer most from being exposed to flood;

(ii) households with livelihoods largely depending on natural resources experience more severe damages;

(iii) households located in flooded areas have greater damage than those located in less-flooded areas.

Hypothesis 1:

- We tested the first hypothesis by comparing the economic flood damage of the very poor (defined as monthly household income of less than 7,000 VND), the income distribution, and the relationship between flood damage expressed in percentage of household income and income distribution.
- The very poor had significantly lower economic damage resulting from the 2007 floods (mean ± SD: 3,689,7509 ± 5,223,597 vs. 5,090,5869 ± 9,007,653; P=0.093), but they were more vulnerable because the flood damage made up a significantly larger portion of their annual household income (27.62% ±26.48 vs. 14.06% ± 19.73; P<0.0001).
- This result confirmed that poor households are more vulnerable to floods;

Hypothesis 2:

- The second hypothesis was tested by looking at the relationship between flood damage and the percentage of household income coming from agricultural activities.
- As expected, the economic damage to households that fully depended on natural resources like agriculture were significantly higher (5,050,280 ± 9,608,627) than for households that were not fully dependent on agricultural activities (3,320,856 ± 6,144,137; $P < 0.007$).
- The result suggests that households' diversification in income sources is an effective coping strategy in the event of flooding.

Hypothesis 3

- We tested the third hypothesis by exploring the relationship between flood damage and the level of flooding.
- Damage costs of households located in flooded areas were not significantly different from damage costs in less flooded areas.
- This finding may be due to the fact, among other things, that this flood was not an average annual flood but an extreme event in the study area.

Thanks for your attention!

LOSS AND DAMAGE BY CLIMATE CHANGE IMPACTS IN AGRICULTURAL SECTOR: DIFFICULTIES AND CHALLENGES

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Chief of OCCA,
Ministry of Agriculture and Rural Development

CONTENT

- Part I - Overview
- Part II – Loss and Damage in Agriculture Sector
- Part III - Difficulties and Challenges in inventory, report and subsidy
- Part IV – Conclusion and Recommendation

Part I- Overview

Land
- Natural land: 33 mil ha
- Agr area: 25 mil ha
- Agr production land: 9.6 mil ha
- Paddy area: 4 mil ha

Population
- Total: 87 mil ppl
- Density: 263 ppl/km2.
- 70% of total ppl live in rural areas

Average Agr area < region and world.

Decrease from 100m2 (2001) to 900m2 (2010)

Agriculture of Viet Nam

- GDP growth rate of Agr 3.8%/yr
- ~ 20% total GDP of Viet Nam
- GDP decrease from 24.5% (2000) to 20.58% (2010)
- Food security: Avg food: 445kg (2000); 513kg (2010)
- Exportation increase: 4.3 bil USD (2000); 19.5 bil USD (2010)

Source: Strategy, development plan and draft five-year sector restructuring scheme

Part II. Loss and Damage in Agriculture Sector

2.1. Agriculture

No	Item	Unit	2010	2011	2012	2013	2014
1	**Flooded paddy area**	**ha**	**157.696**	**248.768**	**223.188**	**129.347**	**178.899**
	+ Heavy damage	ha	2.507	54.367	-	-	-
	+ Lost area	ha	9.706	17.349	32.865		20.172
2	**Total flooded crop area**	**ha**	**150.520**	**101.620**	**185.195**	**216.322**	**51.165**
	+ Heavy damage	ha	121	1.208	-	-	-
	+ Lost area	ha	6	4.832	80.634	-	-
3	Flooded rice seed area	kg	1.216	3.135.402	-	-	-
	+ Lost area	ha	13	1.151	-	133	22
4	Wet, lost food	Ton	48.558	55.958	-	-	-
5	Wet, lost seed	Ton	4.014	61.214	28	-	-
6	**Lost industrial crop area**	**Ha**	**319**	**2.030**	**19.461**	**46.543**	**-**
7	**Damaged industrial crop area**	**Ha**	**1.634**	**65.516**	**7.541**	**35.942**	**35.206**
8	Damaged cane area	Ha	8.990	3.195	-	-	-
9	Damaged plantation area	Ha	729	74	387	-	-
10	Fallen trees	Tree	506.328	62.580	-	-	-
11	Damaged fruit tree area	Ha	2.409	72.579	4.742	12.794	-
	+ Death area	Ha	3	6.770	4.742	-	-
12	Cattle death	item	4.567	3.054	250	18.035	512
13	Pig death	item	32.555	4.992	13.791	28.244	3.591
14	Poultry death	item	767.782	156.343	477.842	1.166.901	48.636

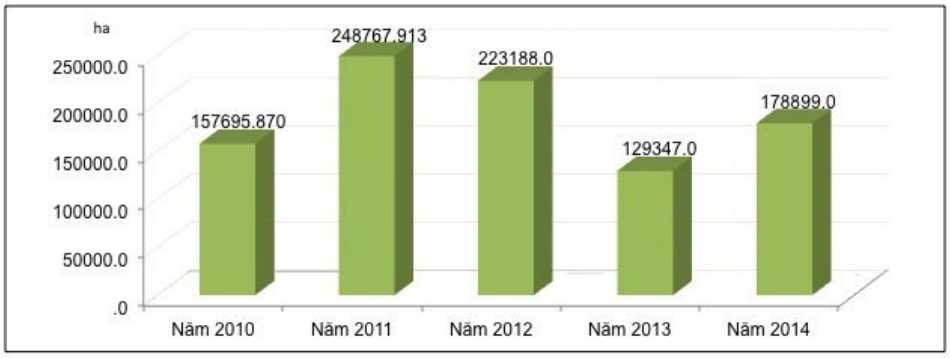


Figure 1.1. Flooded paddy area from 2010 to 2014

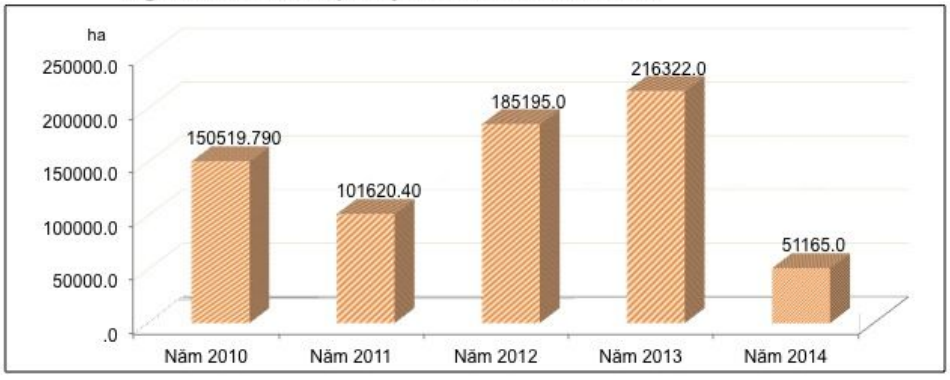


Figure 1.2. Flooded crop area from 2010 to 2014

Table 2.1. Forecast decline in spring rice yield potential during period 2030 - 2050 based on average scenario (B1) MONRE, 2009

Vùng	Diện tích canh tác lúa xuân năm 2008 (1000 ha)	Suy giảm tiềm năng năng suất (kg/ha)		Suy giảm sản lượng (1000 tấn)	
		2030	2050	2030	2050
ĐBSH	566,3	-219,0	-695,0	-124,0	-393,6
Tây bắc	38,0	-730,0	-1.258,0	-27,7	-47,8
Đông Bắc	193,2	-283,0	-534,0	-54,7	-103,2
Bắc Trung Bộ	331,9	-246,0	-836,0	-81,6	-277,5
Nam Trung Bộ	212,3	-474,0	-807,0	-100,6	-171,3
Đông Nam Bộ	75,8	-391,0	-642,0	-29,6	-48,7
Tây Nguyên	69,1	-707,0	-1.125,0	-48,9	-77,7
ĐBSCL	1.526,5	-495,0	-681,0	-755,6	-1.039,5
Tổng số	**3.013,1**	**-405,8**	**-716,6**	**-1.222,8**	**-2.159,3**
Giảm (%)	-	**-6.67**	**-11.78**	**-7.93**	**-14.01**

Ghi chú: Năng suất lúa xuân bình quân cả nước là 5.38 tấn/ha, sản lượng lúa xuân trung bình là 15,418 triệu tấn giai đoạn 1995-2008

LOSS BY CLIMATE EXTREME EVENTS IN ALL SECTORS

TOTAL LOSS BY NATURAL DISASTER FROM 2000 TO 2014			
Year	Loss by Natural Disaster		
	Death and missing ppl	Estimated damage	
		mil VND	mil USD
2010	362	16,062	880
2011	295	13,507	683
2012	262	15,935	783
2013	284	27,853	1,331
2014	133	2,828	134

Assessment:

According estimated results, if area and rice production are the same as 2008's:

- **Rice production will decrease by 8.37% (2030) and 15.24% (2050) compared to its potential.**
- **Corn production will potentially decrease by 18.71% (2030) and 32.91% (2050) compared to its potential.**
- **Soybean yield will potentially decrease by 3.51% (2030) and 9.03% (2050) compared to its potential**

If SLR rise as scenario, by 2100, Mekong Delta will lose a further 7.59 mil tons of rice. Other challenges such as productive land decrease due to urbanization and industrialization, degradation and depletion of natural resources will additionally major threats to national food security.

2.2. Irrigation

No	Item	Unit	2010	2011	2012	2013	2014
1	**Volume of soil erosion, drift and sedimentation**	**m^3**	**2.584.708**	**6.865.401**	**233.945**	**153.100**	**653**
	+ Gov dyke	m^3	-	31.208	637	-	-
	+ Local dyke	m^3	29.127	4.025.235	15.656	-	-
	+ Canal, reservoir	m^3	230.969	2.072.613	-	-	29.639
2	Rock slides, drifting	m^3	287.207	379.887	-	-	-
	+ Dyke	m^3	132.786	0	-	110.150	-
	+ Canal, reservoir, dam	m^3	72.512	3.419	-	-	-
3	Dyke, riverbank eboulement	m	218.776	3.460.932	-	-	-
	+ Gov dyke	m	-	61.084	637	11.127	272
4	Dyke eboulement	m	3.595	28.997	8.103	34.343	-
5	**Canal eboulement, damage**	**m**	**462.899**	**1.521.869**	**56.432**	**602.017**	**42.310**
6	Canal bridge, broken, drifted sewer	item	545	1.317	-	-	-
7	Broken, drifted small irrigation items	item	122	565	119	-	-
8	Damaged small irrigation items	item	2.430	391	238	-	-
9	Drifted pumping station	item	349	112	19	-	-
10	Flooded pumping station	item	85		-	-	-

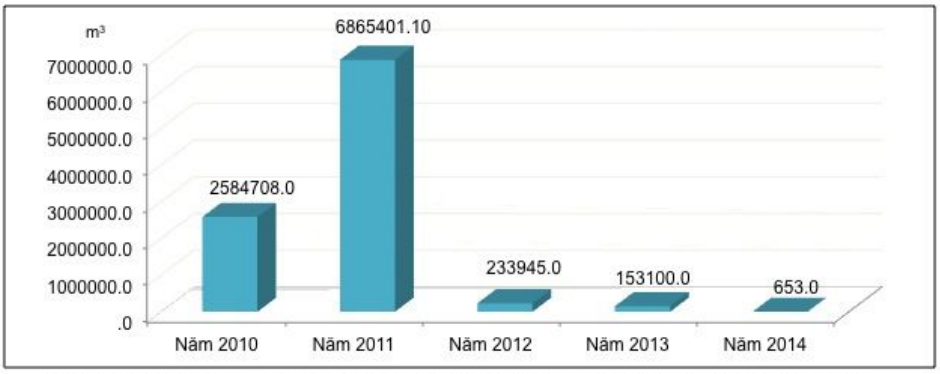


Figure 1.3. Volume of soil erosion, drift and sedimentation during 2010 -2014

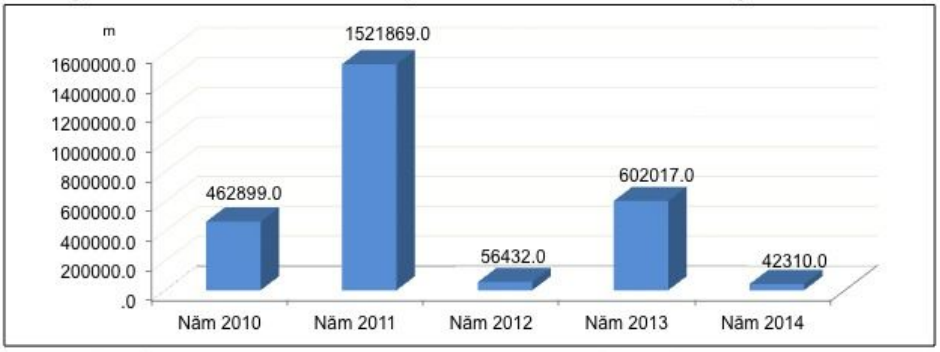


Figure 1.4. Canal, dyke eboulement, damage during 2010 -2014

2.3. Fisheries

No	Item	Unit	2010	2011	2012	2013	2014
1	**Area of broken aquaculture area**	**ha**	**28.481**	**14.700**	**36.339**	**103.344**	**1.071**
2	Fish cage floating	Item	25	6.625	-	1.323	145
3	Lost volume of fish, shrimp, scrab	Ton	995	7.000	296	12.707	37
4	**Shrinked boat**	**Ton**	**164**	**163**	**706**	**792**	**39**
5	Damaged boat	item	357	49	530	-	-

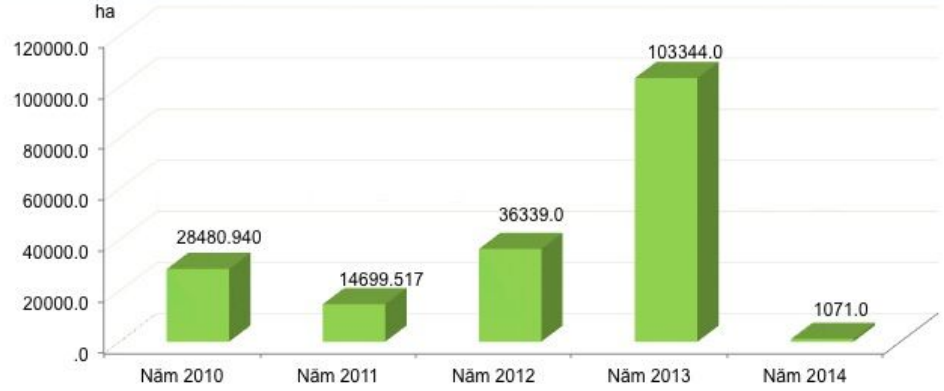


Figure 1.5 Broken aquaculture area during 2010 - 2014

Risk of natural disasters and climate change for fisherman:

Vietnam has 58% of the population to coastal areas where livelihoods are mainly based on agriculture and fishing, about 480,000 people directly employed in fishing, seafood processing 10,000 and 2,140,000 provision services related to fisheries. It is noted that most people in coastal areas are the poor in society. Because natural catches decline, the economic foundation of all coastal communities are not stable. In agricultural production, reduced food output will push up the price, increasing the number of poor, malnourished people. More ... also adversely affect fishermen. Vietnam will face more difficulties in achieving the goals of economic development - social as poverty alleviation. Living standard in this area is low with high poverty rates.

2.4. Forestry

The evolution of El Niño showed that in 1997 - 1998 this phenomenon has damage the world economy about 34 billion dollars, killing 24,000 people. In Southeast Asia, El Nino has caused severe drought; in particular in Viet Nam, El Niño has caused severe droughts in Central Highlands, the South with 312 million USD loss.

Drought increases the risk of wildfires. Wildfire becomes a problem: In the past few decades, the annual average loss rate is tens of thousand hectares of forests, including forest loss due to wildfires around 16.000ha / year. According to incomplete statistics on wildfires and its damage in the last 40 years (1963-2002) from the FPD, the total number of wildfires was over 47,000 cases, the area of damage on 633,000 hectares (mostly young forests), including 262 325 hectares of plantations and 376 160 ha of natural forest.

Drought from late 1997 to May 4/1998, causing damage to the central provinces, among that the forestry sector loss about 1.400 billion. In addition, the cost for drought control in late 1997 and in 1998 was nearly one billion. During the strong El Nino, winter-spring drought seriously occurred at a large scale in all 3 regions. In 2/2010, a major fire lasting more than one week (from 8 - 17.2) has destroyed 700 hectares of forest in the Hoang Lien National Park

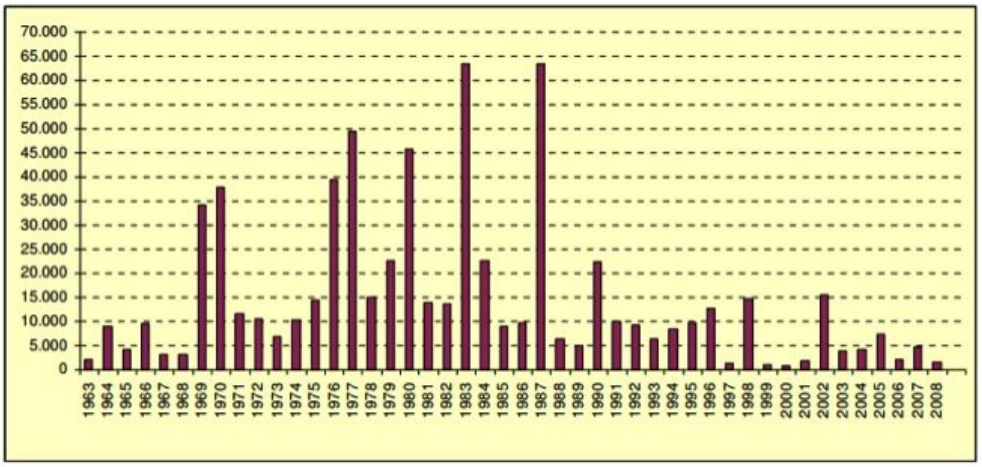


Figure 1.5 Wildfire in VietNam during 1963 - 2008

Source: MARD, 1963-2008

PART III- Difficulties and Challenges in inventory, report and subsidy

3.1. Difficulties

- Lack of proper & appropriate natural disaster forecasting model in Viet Nam
- Loss in large scale;
- Short occurrence time;
- Sources for addressing immediate loss are prioritized
- Regional and local report data sources are inconsistent and not prompt
- Losses are diverse, involving variety of sectors
- Limitation of active disaster prevention
- Supporting finance sources from State budget

3.2. Challenges

- Supporting sources for damage much smaller than actual loss
- Impacts of loss on lives and activities of people in affected regions are diverse and difficult to quantify
- Time to overcome loss last long, particularly in agriculture sector (long term industrial trees, fruit trees and crop)
- Calculation, inventory tools are difficultly quantify exactly and fairly

PART IV. CONCLUSION AND RECOMMENDATION

4.1. Conclusion

Structure of damage caused by natural disasters in annual average agriculture value accounted for 52.1% (period 2010-2014) of total loss in GDP. Agricultural value contribute to a small proportion of GDP but is the living sources of over 70% of the population. Consequently any damages caused by natural disasters on agriculture would bring more damage to poor farmers and resilience capacity will be difficult because it requires a longer time.

4.2. Recommendation

- Gov and relevant ministries should rapidly develop equitable and fair mechanisms and policies to support areas adversely affected by natural disasters. Build natural disasters forecasting and early warning model;
- Local gov, especially in communes should give strong directives to displaced and damage prevention. Have damage inventory report promptly
- Raising awareness for locals in active disaster prevention and response
- Mainstream socio-econ development activities into mid- and long term development planning, taking account of CC scenarios.

DISASTER MANAGEMENT CENTRE

DISASTER MANAGEMENT CENTRE (DMC)

Functional support, service management and implement state-specific tasks in the field of prevention, disaster reduction and adaptation to climate change on a national scale.

1. Disaster management based on community department
2. Department of Information Technology and Geospatial
3. Disaster reduction cooperation deparment
4. Training and communcation departmen
5. Department of adminstration and finance

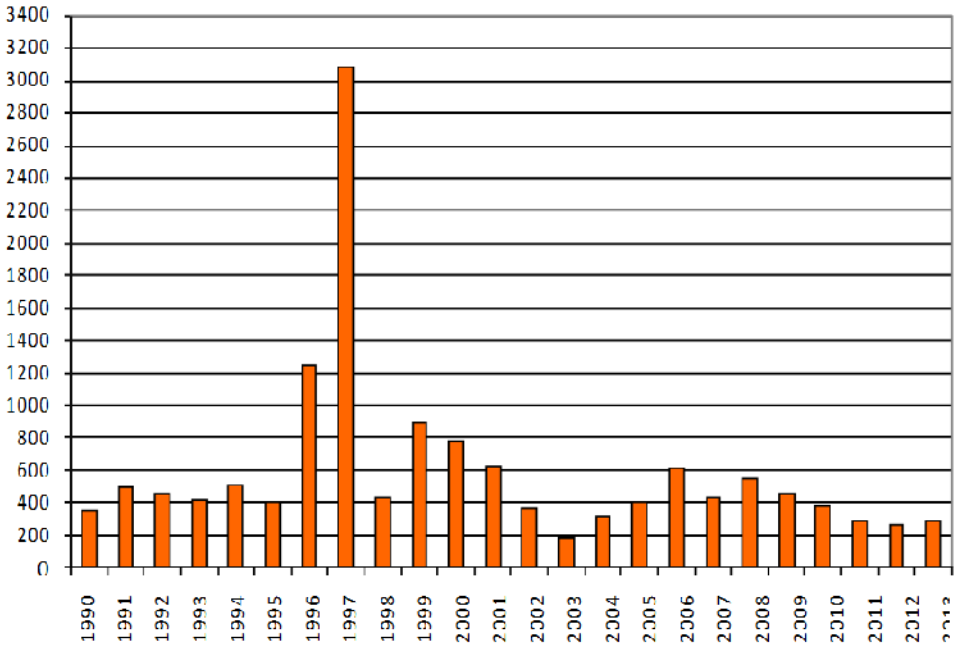
DISASTER MANAGEMENT CENTRE (DMC)

MAIN TASK:

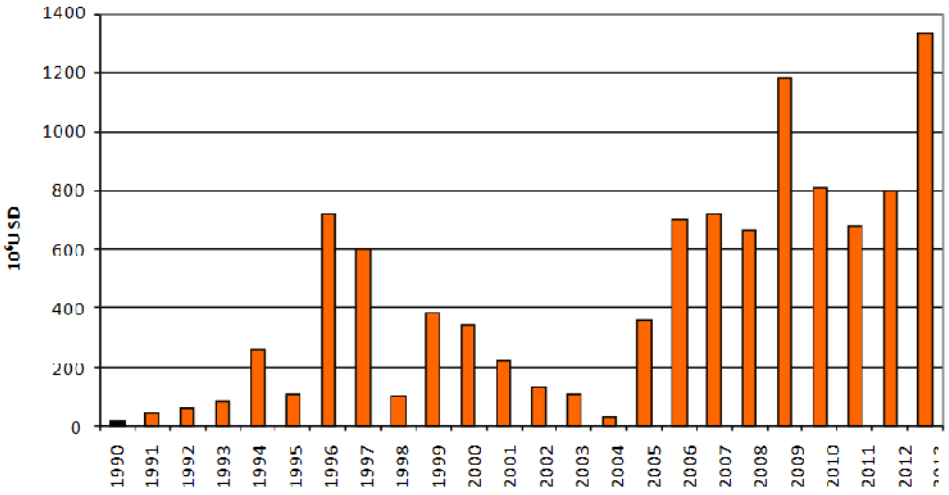
1. Project "Raising awareness of the community and the disaster risk management community based"
2. Apply technology and geospatial information for disaster prevention.
3. Develop and manage databases
4. Research and develop technical guidance, specialized tasks for disaster prevention
5. Join appraisal programs, schemes and projects on disaster prevention.
6. Technical consultancy and training

DISASTER PREVENTION SYSTEM IN VIETNAM

Loss and damage



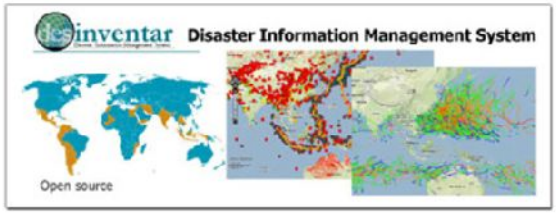
Loss and damage

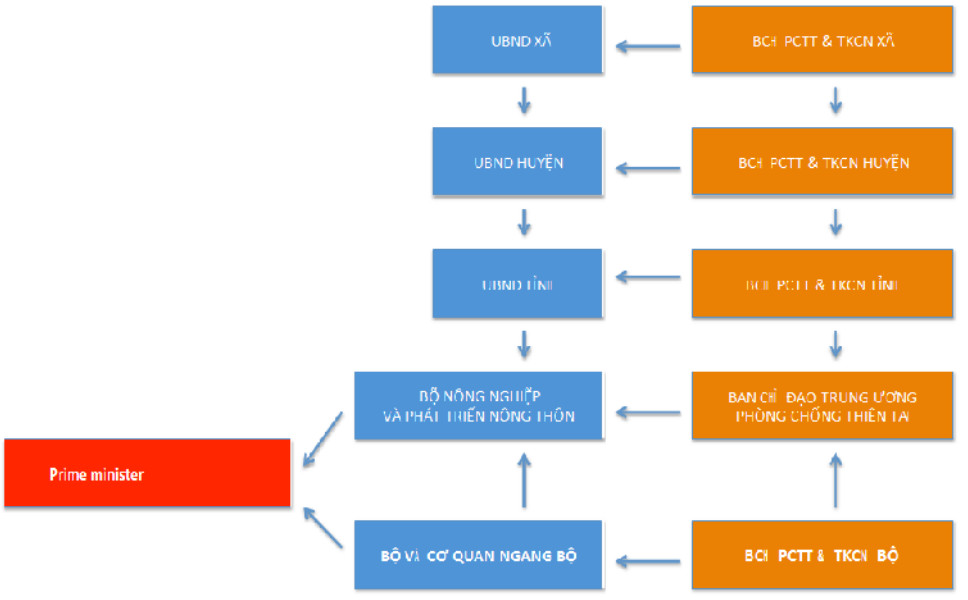


Statistical, assessing loss and damage system

1. Disaster prevention law
2. Decision No. 31 QD/PCLBTW dated 24/02/2012 CCFSC Steering Committee

3. Damage assessment and post-disaster needssystem after Disaster (DesInventar)





Opportunity - Challenges

1. Opportunities:

- Laws and Legal Documents
- Develop instruction guideline circulars between MARD and MP.
- The system of disaster prevention; unification of data and methods
- The development of science and technology, and direction of Government's about applying in science and technology applications in the activities.
- Interests of the supporting organization.

2. Challenges:

- Human resources (capacity…)
- Synchronize Data serves multidisciplinary and multi-sector
- Unified system of adminstration data about damage.
- Storage system at all level, particularly at commune level
- Criteria for determining loss data needs after disaster, rehabilitation, reconstruction.

Trung tâm Phòng tránh và Giảm nhẹ thiên tai – Disaster Management Center

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DEPARTMENT OF DISASTER PREVENTION

INTRODUCTION GUIDE STATISTICS, ASSESSMENT OF DAMAGE CAUSED BY NATURAL DISASTERS

Content

- The legislation for damage assessment
- Methodology of damage assessment
- Statistical form for damage assessment
- Pros and cons
- Provisions of the Disaster Prevention Law on statistics, assessing damage

I. Legistation for damage assessment

- Disaster Prevention Law No. 33/2013 / QH13
- Statistics Law No. 04/2003 / QH11
- Systems of national statistical indicators (Decision No. 43/2010 / QD-TTg dated 02/6/2010 by Prime Minister)
- Appendix 04, Regulation 31 / QD-CCFSC 24/02/2012
- Manual of assessing damage caused by natural disasters

II. Definition of assessing damage.

Statistics, damage assessment is the process of collecting information, statistics and analysis of the level of impact of disasters on people, the economy, society and environment in localities where natural disasters occur.

III. The purpose and significance of the statistics, assessing the damage.

Purpose: Statistics, damage assessment aim to determine the extent and scope of the disaster impact on people, property and the environment in the area of the disaster.

Significance: Based on statistics, assess the damage of disasters has collected and analyzed to propose remedial plan for the affected area and warning solutions and prevention for next disaster.

IV. Principles of statistical and damage assessment

1. Ensure competence and regulations in statistical work, evaluating the damage.
2. Ensure objectivity and transparency; reflect on the extent of damage.
3. Ensure consistent and coordinated among agencies and units related to statistical activities.

V. Methodology of damage assessment

1. Observation and investigation at the scene to count and statistical loss of people, material, crops, fisheries, natural resources and infrastructure, and record the results in statistical form.

2. Collect data through surveys and through people and local government report.

3. Analyze, evaluate and quantify the damage value of the data collected.

4. Summary and report

VI. Indicator System in statistical form

Based on statistical form specified damages caused by natural disasters in Appendix 04, Regulation 31 / QD-CCFSC date 24/02/2012 and the national statistical indicators on disasters and the extent of damage (expression of 027.H / BCB-ARD issued with Decision No. 15/2014 / QD-TTg dated 17/02/2014), damage caused by natural disasters can be quantified by the statistical indicators and quantitative value by province and by type of disaster, including the following basic criteria:

VI. Indicator System in statistical form

1. Group targets sbout human damage (including dead, missing, injured)
2. Group targets about housing damage (collapsed and washed away or damaged, roofs)
3. Group losses about education, health care
4. Group targets about agriculture and forestry damage (including rice area, plated, flowers, vegetables, cash crops, livestock and poultry losses)
5. Group targets about irrigation losses
6. Group targets about fishery damage

VI. Indicator System in statistical form

7. The Group targets traffic losses
8. Group norm loss of communication
9. Group indicator of building damage
10. Group targets water damage and environmental sanitation

VII. Report on statistical, assessing damage

- Emergency report
- Quick report
- Summary report
- Periodic report (semi-annually, annually)
- Statistical form of damage caused by natural disasters.

VIII. Pros and cons

- Pros
  - Having a unified form for statistical damage caused by natural disasters for all levels and sectors
  - Volume indicators are relatively complete with 14 types of disaster stipulated in Decree 14/2010 / ND-CP on the functions, duties and coordination mechanism of the Central Steering Committee on the prevention of natural disasters.
  - Basically meet the requirements for damage assessment, remedial for 14 disasters.
  - The form has considered about gender
  - Has defined the reporting period: Urgent Report, express reports, final reports, semi annual report, annual report

VIII. Pros and cons

- Cons
  - Statistical tables apply to all stages of disaster so troubled in emergency reporting period and reported daily express.
  - Determine the price for some kind of damage during quick reports, consolidated reports are in trouble. Mostly only provisional and estimate.
  - Excluding 21 types of natural disasters such as the provisions of Law Disaster Control and Regulation of warning, forecasting disaster communications.
  - Missing some indicators of damage to perennial crops, forests, agricultural land encroachment, mangrove, erosion.

II. Pros and cons

- Cons
  - Statistical indicators should be considered to be remove as temporary housing omitted, bathrooms due to low value or having other indicators reflect the type of damage (Lao Cai)
  - Some targets is difficult to determine necessary adjustments to suit the target name as residential land
  - Need additional, specific indicators of damage such as roofs blown away, the damage, the damage on 50%, below 50%, the wooden floors, fences, dike embankments under special grade III to special grade,…

VIII. Pros and cons

- Cons
  - Clarify and classify solid houses, semi-permanent housing, temporary housing
  - In some cases not clearly define the damage when disaster occurred two consecutive.

IX. Disaster Prevention Law provisions on statistical, assessing the damage caused by natural disasters

- Organizations and individuals report damage caused by natural disasters in the jurisdiction of objective agency,
- People's Committees at all levels synthesis, statistics, assess the damage; check for damage assessments and reports on people's committee. provincial people's committees report to the Prime Minister and to the Ministry of Agriculture and Rural Development

IX. Disaster Prevention Law provisions on statistical, assessing the damage caused by natural disasters

- Steering Committee for Disaster Prevention of ministries, summary damages reports of the Central Steering Committee for Disaster Prevention.
- MARD synthesis and evaluation of damage in the country reporting the Prime Minister and publication of data about loss.

IX. Construct Circular on statistics and assess the damage caused by natural disasters

- Circular name: Joint Circular guiding the statistics, assess the damage caused by natural disasters. (According to Decision No. 1061 / QD-TTg dated 01/7/2014 of plans to implement the Law on prevention of natural disasters)
- Leading agency: Ministry of agricultural and rural development
- Coordination: related ministries

IV. Construct Circular on statistics and assess the damage caused by natural disasters

- Point of view:
  - Adhere to the Party's guidelines and policies, the law of the State in the prevention disaster
  - Unified form central to local level throughout the country.
  - Clearly, public, transparent, pragmatic and consistent with the conditions and socio-economic characteristics of the locality; meet statistical requirements, assess the immediate damage and long term.
  - Ensure inheritance rules on statistics, assess the damage caused by natural disasters in recent years

IV. Construct Circular on statistics and assess the damage caused by natural disasters

- Main content:
  - Scope of modification and subjects
  - Interpretation
  - Principes of statistical and assessing damage
  - Methodology of statistical and assessing damage
  - Indicators, statistical form of damage caused by natural disasters
  - Report on statistical and assessing damage
  - Reporting Regime
  - monitoring, inspection of statistics, assessing damage
  - Responsibility of agencies and unit who involved statistical and assess damage

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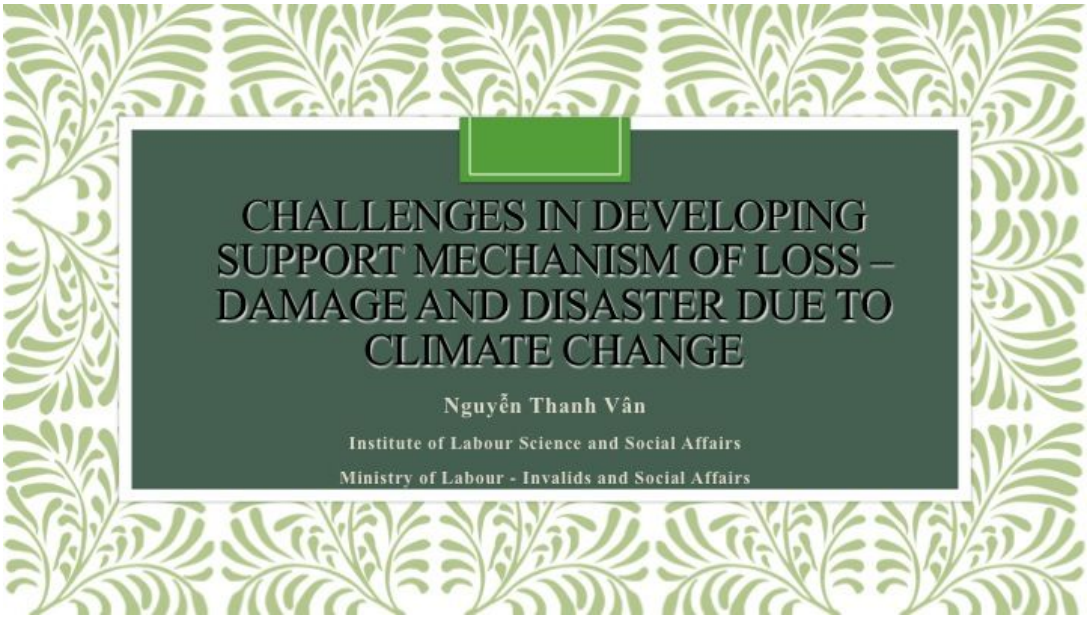


CONTENT

- LOSS - DAMAGE SUPPORTING MECHANISM AFTER DISASTER IN VIETNAM
- CHALLENGES IN IMPLEMENTING POLICIES
- CHALLENGES IN DEVELOPING SUPPORT MECHANISM OF LOSS AND DAMAGE DUE TO CLIMATE CHANGE
- RECOMMENDATION

I. LOSS - DAMAGE SUPPORTING MECHANISM AFTER DISASTER IN VIETNAM

- 1/ DAMAGES AND LOSS DUE TO DISASTER - CC IN VIETNAM
- Germanwatch - 2014:

Honduras, Myanmar, Haiti, Nicaragua, Bangladesh and Vietnam. – Vietnam ranks 6th on climate risk index. Summarizing 20 years of Vietnam from 1993 to 2012:

- ✓ 419.70 dead people/ year;
- ✓ average: 0.52/ 100.000 dead people due to disaster
- ✓ GDP fell 0.91 %
- ✓ Disasters appear 213 times

- Statistical :

2006 - 2011 disaster has killed more than 2,000 people; over 4,000 people were seriously injured; over 317,000 houses fallen, collapsed float, fire; over 1,960 thousand houses were flooded, damaged; total losses of over 74,000 billion inhabitants.

I. LOSS - DAMAGE SUPPORTING MECHANISM AFTER DISASTER IN VIETNAM

In the field of Labour sector, specific object of support losses, damages as follows :

- Loss and damage: only focus on the most important loss and damage such as essential for human life (such as life, health, food, housing)
- Support: irregular support to overcome difficulties.
- Subjects : individuals, households suffered damage (not to mention the loss of business, public works ...)

I. LOSS - DAMAGE SUPPORTING MECHANISM AFTER DISASTER IN VIETNAM

2/ EXTREME WEATHER TRENDS - DISASTER OF CLIMATE CHANGE IMPACTS

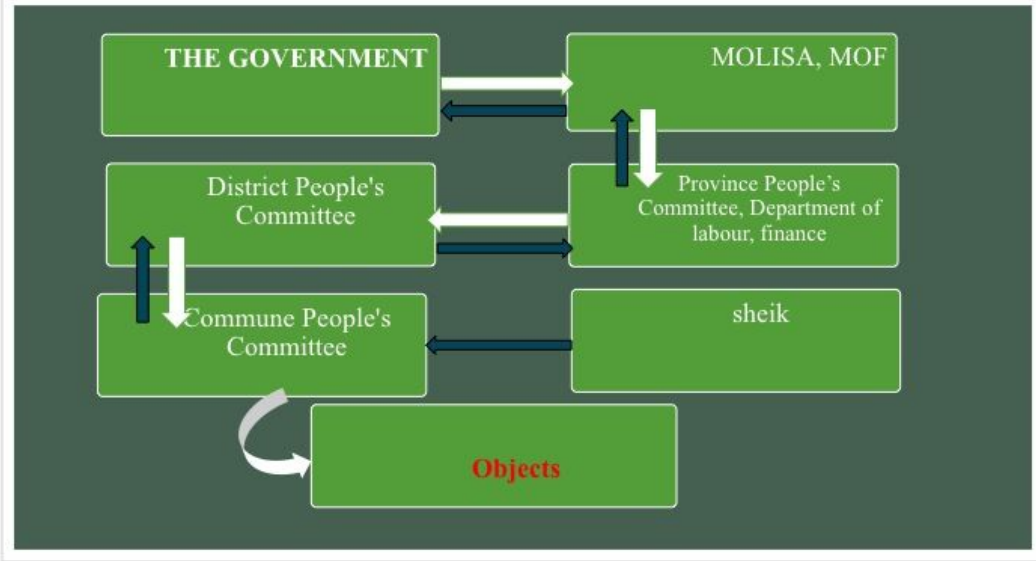
- The number of intense hurricanes is likely to increase
- The number of days and number of heat waves has increased and expected in most areas
- The frequency of heavy rainfall is expected to increase in the 21st century in many areas of Vietnam. Heavy rains will increase the risk of landslides in mountainous areas.
- The change in rainfall and temperature could lead to expected changes in flood.
- Drought likely rise in the 21st century in some seasons and in most climates
- The number of round cold weather variations caused quite complex and volatile.
- The rise in average sea levels are likely to contribute to the rising trend of extreme water levels along the coast..

No.	Objects	Beneficiary level
1	There are dead people or missing	4.500.000 dong per person
2	There are serious injuries	1.500.000 dong per person
3	houses are fallen, collapsed, drifted, burnt or seriously damaged	6.000.000 dong per person
4	Displaced household emergency, housing risk due to landslides, floods	6.000.000 dong per person
5	Section 3.4 households living in disadvantaged areas	7.000.000 dong per person
6	Famine Relief	15 kg of rice/ person/ monthly from 1-3 month
7	Persons at risk outside the residence suffered serious injuries, the family did not know to take care	1.500.000 dong per person
8	People wandering beggars while awaiting to be sent to the residence	15.000 dong per person/ monthly not over 90 days
9	People risk dying outside their residential places, unknown to their families for burial	3.000.000 dong per person

I. LOSS - DAMAGE SUPPORTING AFTER DISASTER IN VIETNAM

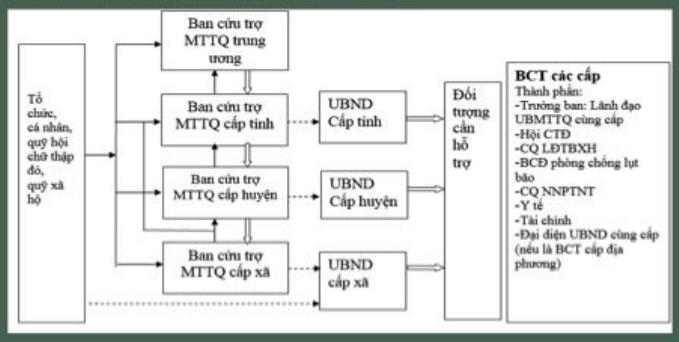
❖ SUPPORT FROM THE BUDGET: MOLISA regulation

- Decree No. 67/2007 / ND-CP dated 13/4/2007
- Decree No. 13/2010 / ND-CP dated 27/02/2010
- Decree No. 136/2013 / ND-CP dated 21/10/2013



I. LOSS - DAMAGE SUPPORTING AFTER DISASTER IN VIETNAM

❖ SUPPORT FROM SOURCES OUTSIDE THE BUDGET



I. LOSS - DAMAGE SUPPORTING AFTER DISASTER IN VIETNAM

Central budget expenditures 500-1,000 billion and 40000-60000 tons / year

Year	Dead (people)	Injured (people)	Houses collapsed (house)	Houses flooded, damaged (house)	Damages (billion)	Rice supports from government (tons)	Central budget support (billion)
2006	553	2.133	267.363	8.397	15.542	12.800	922
2007	492	740	15.825	739.761	11.490	63.515	717
2008	400	241	3.440	212.338	10.992	44.700	890
2009	430	783	24.701	319.273	19.096	58.920	1.009
2010	256	298	4.558	243.849	5.607	76.066	1.065
2011	200	206	1.118	437.365	11.496	70.096	660
2012	269	440	6.324	386.678	7.800	42.905	547
2013	313	1.150	11.109	851.393	23.717	67.223	1.060
Total	2.913	5.991	334.438	3.199.054	105.740	436.225	6.870.00

III. Difficulties in implementing policies

1. Resources

- Finance
- Human

2. Coordination mechanism

3. Terms details

Identify objects

- Natural disaster
- Support levels

4. Trust

- Between stakeholders
- Fair and equity

5. Other

- Procedures,
- Awareness
- Media
- …

IV. CHALLENGES IN DEVELOPING SUPPORT MECHANISM OF LOSS AND DAMAGE DUE TO CLIMATE CHANGE

1. **Current difficulties in implementing support policies**

2. **Reform or new construction?**

3. **Mainstreaming climate change**
   - Methods to integrate climate change
   - Difficult in calculations of pension,
   - Policy adjustments for various provinces.

4. **Financial resource mobilization**

V. RECOMMENDATION

1. Actively promote / participation Warsaw international mechanisms
2. To accelerate the mobilization of domestic resources and foreign
3. Develop mechanisms for coordination of resources between provinces
4. Supporting from national budget
   - Detailed regulations on targeting support;
   - Research level of support based on a minimum meet the essential needs of human,
   - Expansion of beneficiary
   - Reviewing and eliminating duplication

   5. Develop a mechanism to coordinate the trust between parties to actively coordinate resources better, more efficient distribution

CONTENT OF REPORT

I. Ben Tre Overview

II. Climate change and disaster in Ben Tre

III. Deployment of responding to climate change and disaster in Ben Tre Province

IV. Result of implementation of responding to climate change

V. Result, difficulties and limitations

VI. Recommendation

VĂN PHÒNG CHƯƠNG TRÌNH MỤC TIÊU QUỐC GIA ỨNG PHÓ VỚI BIẾN ĐỔI KHÍ HẬU TỈNH BẾN TRE

RESPONSE TO CLIMATE CHANGE AND DISASTER IN BEN TRE PROVINCE

I. BEN TRE OVERVIEW

- Belonged to Mekong delta; regional area: 2.360,20km2.
- Terrain height 1-2 meters above sea level; lowland just under 1 metre above sea level, frequently flooded when the tide. .
- the vast river system; with 4 large estuaries: Co Chien, Ham Luong, Ba Lai, Tien Giang
- 65km coastline with 20.000km2 privilege

(http://dpi-bentre.gov.vn)

I. BEN TRE OVERVIEW (cont)

- Economic growth rate (GDP) in 2014 was estimated to increase by 7.7%.
- Average income reached about 31.15 million / person.
- Economy mainly focus on agriculture (coconut garden, fruit trees, livestock and poultry, ...) and aquaculture (shrimp, clams, oysters, crabs, and fishing ...).
- Industry, trade and services and tourism development is not highly compared with other regions in the country.

II. CLIMATE CHANGE AND DISASTER IN BEN TRE

CLIMATE CHANGE IN BEN TRE

Due to specific natural conditions, Ben Tre should be considered as one of the most heavily influence by sea level rise Provinces

- Sea levels rose about 20 cm compared to 10 years ago.
-The average temperature of the province in the 20th century increased about 0.05 - 0,150c
- Rain vagaries of time and intensity.
- The extreme events occur and affect more frequently (storms, depressions, unseasonal rains, droughts, intense heat).

IMPACT OF CLIMATE CHANGE ON BEN TRE PROVINCE ACCORDING TO CLIMATE CHANGE SCENARIOS

CLIMATE CHANGE SCENARIO IN BEN TRE (B2 – to 2100)

As predicted climate change impacts virtually across sectors

- Economic impact (agriculture, forestry, fisheries, construction, ...): scenario sea level rise of 75 cm.
- The area of flooded will be 162.81 km2 for rice; 95.14 km2 for aquaculture 95.14 km2 and 40.38 km2 for fruit trees.
- 12 health facilities, 16 temples, 3-ports, 8 bus station and four major bridges will be affected.
- 80.186 km of provincial and about 255 km of district roads will be affected.

CLIMATE CHANGE SCENARIO IN BEN TRE (B2 – to 2100)

Salinization: 4% according to the scenario

Impact on temperature change trend

+ Temperatures tend to rise: in 2020 (27,30C), 2100 (28,90C), ranged between 1-20C.

Impact on trends of rain:

+ Rainfall shows no variations: 2020 (1575.2 mm), 2100 (1594 mm), an increase of 200 mm.

Impact on natural ecosystems, biodiversity:

+ 41.05 Km2 affected forest.

Flooded area due to sea level rise

Flooded area (Km2) in Districts according to scenario B2

Area	Water level				
	12 cm Year 2020	17 cm Year 2030	30 cm Year 2050	46 cm Year 2070	75 cm Year 2100
Tp Bến Tre	4,76	4,80	5,58	6,47	9,09
Chợ Lách	34,44	36,49	39,09	41,18	47,89
Châu Thành	25,24	27,25	32,67	39,60	55,18
Giồng Trôm	32,31	34,88	42,13	57,13	93,92
Ba Tri	*35,94*	*39,24*	*47,43*	*67,66*	*169,92*
Mỏ Cày	50,23	51,94	54,88	61,06	88,86
Bình Đại	*31,35*	*37,69*	*60,27*	*89,87*	*171,32*
Thạnh Phú	*57,82*	*58,17*	*60,01*	*62,70*	*89,07*
% Area flooded in province	12,24 %	13,07 %	15,39 %	19,15 %	32,62 %

DISASTER IN BEN TRE

- ***Before 1990 no significant natural disasters.***
- ***Disasters are complicated, causing much damage and adversely affect the life of citizens, social and economic development of the province. the disaster prone areas of coastal provinces are three districts: Bình Đại, Ba Tri, Thạnh Phú; riparian areas; river islets of province: Giồng Trôm, Chợ Lách, Mỏ Cày Nam, Châu Thành.***

DISASTER IN BEN TRE

Storms, depressions

- Typhoon No. 5 (Linda) 1997 made a loss of total of 300 billion damage.
- Typhoon No. 9 of 2006 (Durian) killed 18 people, 700 people missing, 280,000 displaced households, total losses about 4000 billion.
- 2010 - 2014, the estimated total damage (rice, fruit trees, ornamental flowers, boats, ...) due to the impact of storms, depressions: 20.5 billion.

Salinization

- Complicated and delving deep into the land.
- 4 ‰ salinity line on the main river estuaries from about 50-60 km. 84,900 households living freshwater shortage.
- Salinization earlier than other province's compared to climate change scenarios.
- 1% salt concentration covered almost the entire province.

DISASTER IN BEN TRE

Tides

- 000 - 2008 caused total losses of about 340.1 billion, 1,870 households affected.
- Tide peaked in 2013 (199 cm) above the highest tide of the year period 1984 - 2012 (197 cm).
- From 2013 to 2014 about 8,000 dike overflow and erosion; 68,000 m of roads were flooded, 1,650 hectares of agricultural land were flooded, estimated losses of about 39 billion.

Erosion

- Tides combined with the water flowing as state erosion on a pole.
- From 2013 to 2014, estimates the total loss of 22.7 billion, 107 households need to be relocated, 4.5 hectares of coastal erosion.

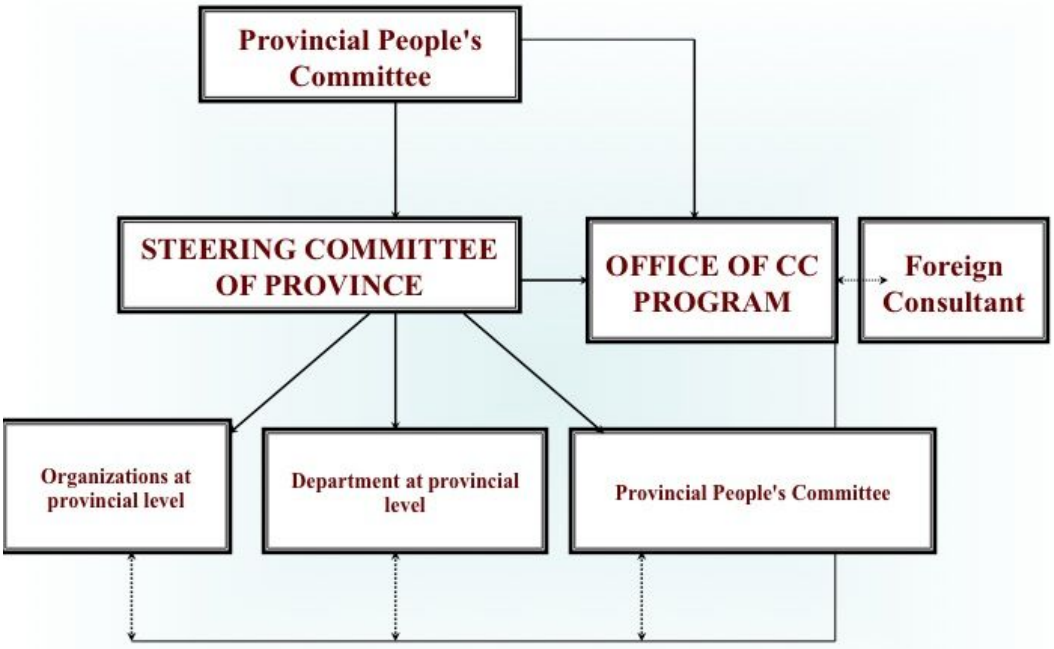
Tornadoes

- From 1999 to 2009, as 288 houses were completely destroyed; roofs, damaged 682 homes.
- From 2012 to 2014, estimates the total damage caused by the tornado about 31.8 billion, 895 homes suffered damage (82 apartments collapsed completely).

III. DEPLOYMENT OF RESPONDING TO CLIMATE CHANGE AND DISASTER IN BEN TRE PROVINCE

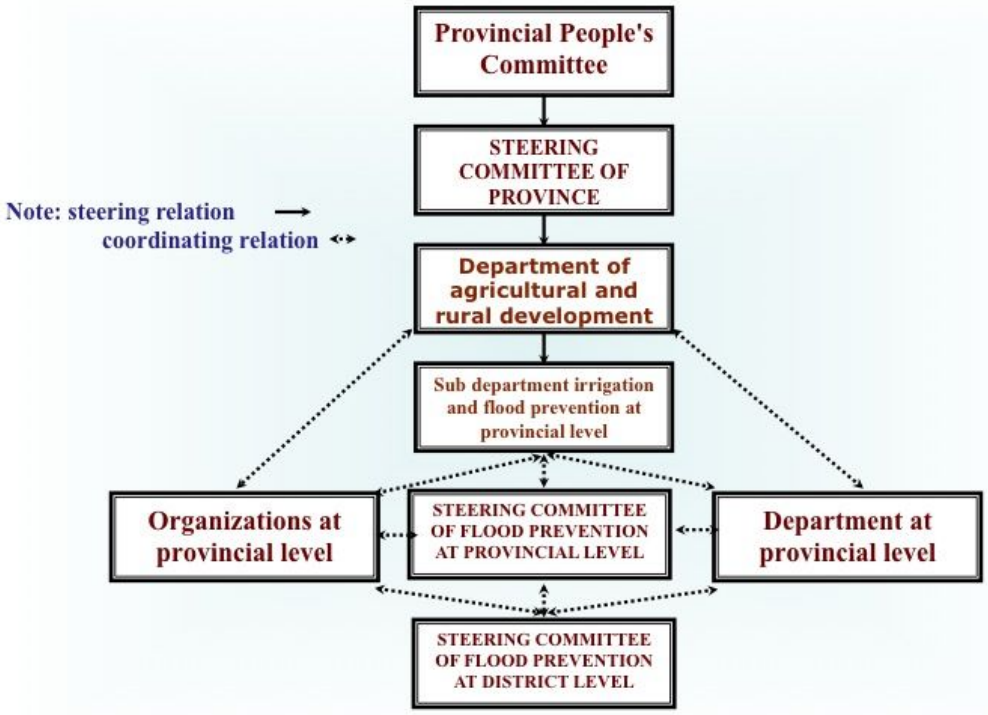
THE ORGANIZATION, DIRECTION AND ADMINISTRATION

The coordination of the operations unit in response to climate change, prevention, disaster reduction is tight, good to promptly advise the provincial People's Committee in implementing institutions and organizations management and administration.



Organization framework of NTPCC in Ben Tre

Note: steering relation: ⟶; coordinating relation: ⟷



ORGANIZING FRAMEWORK

SSUED ON POLICIES AND PLANS TO RESPOND TO CLIMATE CHANGE AND DISASTER

DOCUMENTS ON RESPONDING TO CLIMATE CHANGE

- Framework action plan to respond to climate change (Decision No. 1720 / QD-Committee dated 07/27/2009)
- Action plan to respond to climate change and sea level rise (Decision No. 1224 / QD-Committee dated 27/05/2011 of Provincial People's Committees, replacing Decision No 1720 / QD-Committee)
- Implementation of Resolution IX Provincial Party Congress, in 2011, the provincial People's Committee issued scheme "Responding to climate change and sea level rise stage in Ben Tre province from 2011 to 2015 and directions towards 2020" (decision No. 1983 / QD-Committee dated 06/9/2011 of the provincial people's Committee).

DOCUMENTS ON RESPONDING TO CLIMATE CHANGE

- Action Programme of 29-CTr / TU dated 23/9/2013 of the provincial People's Committee to implement Resolution No. 24-NQ / TW dated 03/6/2013.
- Plan No. 435 / KH-Committee dated 27.01.2014 on the implementation of the action program of the 29-CTr / TU of the Provincial Party Committee.
- Deployment of responding to climate change, the provincial People's Committee issued the plan period 2011 - 2015 and the annual plan for coping with climate change.

DOCUMENTS ON DISASTER RISK REDUCTION

- Action Plan No. 4089/KH-PCLB-UBND October 8, 2008.
- Decision No. 1355 / QD-UBND June 10, 2010 approved Management Plan for Disaster Risk synthetic Ben Tre Province 2020.
- Plan No. 03 / KH-SNN implementing a project to strengthen community awareness and disaster risk management community-based Ben Tre period 2010-2020
- Decision No 27/2013 / QD-UBND August 15, 2013 provides for mechanisms and policies to support the seedlings, livestock and aquaculture production to restore areas damaged by natural disasters and epidemics in the area Ben Tre province.
- Official Letter No. 538 / HD-SNN-STC dated 09/25/2013 guiding the implementation of Decision No 27/2013 / QD-UBND.
- Decision No 16/2014 / QD-UBND defined level of support and allocate population stabilization disaster areas, especially hard, free migration, SUF Ben Tre province.



IV. RESULT OF IMPLEMENTATION OF RESPONDING TO CLIMATE CHANGE



RESPONSE TO CLIMATE CHANGE

- Building the foundation about responding to climate change (Plan of Action, the scheme cope with climate change, the Steering Committee and the Office of the National Program to respond to climate change);
- Update scenario for climate change of Ben Tre based on Vietnam climate change scenarios; Assess the impact of climate change on areas: biodiversity, tourism, coastal residential area;
- Build 15 farming on soil salinity in terms of climate change.
- Select 04 rice varieties with salt tolerance of high yield; determining threshold salinity some fruit trees of the province (durian, rambutan, mangosteen, green grapefruit).
- Construction works 06 local dike; water plant, water reservoir pipe 2383, 03 the storm, planted 200 ha of coastal forests,….

COMMUNICATION, CAPACITY TRAINNING

important goal throughout the process
Of the province's in order to response to climate change

Performing NTP, from 2010 to 2013 province was implemented :

- 19 training courses at district and commune people with about 3500 staff and students;
- 11th round of public consultation;
- Drafting and printing 15,400 manuals, 1,500 leaflets; Climate Change 2000 Report of Ben Tre;
- 18 categories of climate change on Television and Ben Tre;
- Installation of 12 copies propaganda hoardings placed on roads.

DISASTER REDUCTION AND PREVENTION

- From 2011 to 2014, Committee for Flood protection and search and rescue coordination with provincial agencies, boards commander flood prevention and search and rescue at district and commune held 45 training courses for officials levels with approximately 1466 participants.
- Dong Khoi newspaper Open Forum on flood prevention and disaster reduction in communities. Radio and television channel of the province performed a TV Reportage on disaster risk management. .
- To cope with storm surges and erosion. the province has implemented many projects such as river dykes and sluices under dyke Cash (Binh Dai),…
- Supports more than 50 households displaced riparian areas at risk of erosion and helps to stabilize people's lives.

V. RESULT ASSESSMENT, DIFFICULTIES AND LIMITATIONS

RESPONSE TO CLIMATE CHANGE

- The province has issued timely program, proposals, plans of action to implement the response to climate change
- Communication, training had helped enhancing capacity of staff. The community understand more about climate change (80% of households have a basic understanding climate change, over 60% of basic schools integrating the knowledge base on climate change education, teaching)
- Research and evaluation has identified climate change impacts affecting each sector and industrial construction are planned, from that proposed the measures to respond.
- The results of pilot project has brought practical results, improve the quality of life of poor people in areas frequently affected .

LIMITATIONS

- Responding to climate change in Ben Tre just stop at the level of implementation of small-scale projects. (funding for each project under the 15 billion) solve urgent problems ahead; lack of funds to invest in key priority projects with large scale and long term
- Do not have guidance from Central so Local encounter trouble in organizing.
- responding to climate change is not comprehensive, weak on developing models of fuel saving, energy; reduce greenhouse gas emissions.
- The training content limited to basic information about climate change, there was no organize specialized training courses, staff training and communication on climate change,…

DISASTER REDUCTION AND PREVENTION

- Building the foundation for the prevention and reduction of natural disasters. The coordination between the Steering Committee at all levels and departments are close.
- Communication activities, training, search and rescue exercises are conducted regularly to improve staff and people capacity.
- Steering Committee for Flood and Storm Search and Rescue promptly advise the provincial People's Committees of provinces solve remedial after disaster.

LIMITATIONS

- Irrigation system in Ben Tre has not completed and not connected to others resulting in annual regular saltwater intrusion and storm surges caused great impact on the lives and activities of people and produce.
- Funding sources for implementation of the scheme Raising community awareness and disaster risk management based on the province's communities still had some limitations so that it can not be deploy training courses on disaster risk at the community, communication information on the work of disaster risk management through the mass media ,...

VI. RECOMMENDATION

- Gradual improvement on policies and regulations to create legitimacy in the implementation and deployment of state management tasks to cope with climate change.
- There should be guidelines, agreed on the organization implemented to respond to climate change in the direction of compact, efficient and consistent with local conditions, to avoid overlap between the sectors, single location.
- Mekong Delta should establish binding regulations between provinces in the region in implementing coping with climate change effectively, especially irrigation system planning, regulating water use and protection flooded the entire region.

VI. RECOMMENDATION

- Steering Committee for Flood and Storm should regular organize training courses and seminars to exchange and share experiences, enhance their knowledge and skills for the Board members especially in building project dealing with strong storms, hurricane.
- Government fund priorities state budget for investment in the region, the province which was assessed to be severely affected by climate change and natural disasters. For Ben Tre, the Government should consider investing urgent projects (satisfy both objectives responding to climate change and prevention, disaster reduction associated with livelihood) as follows: Water Supply Project residential for Cu Lao Minh City area in terms of climate change and rising sea levels, Anti-erosion embankment in Mo Cay River, upgrading of sea dikes project, Construction of anti-erosion of river embankment in Giao Hoa, An Hoa bridge area, Long Hoa commune, Binh Dai district , protection and development of forests in Ben Tre Province period 2015-2020.

THANK YOU

WORKSHOP REPORT

OPERATING EXPERIENCE OF CLIMATE CHANGE ADAPTATION, DISASTER RISK REDUCTION IN CAN THO CITY

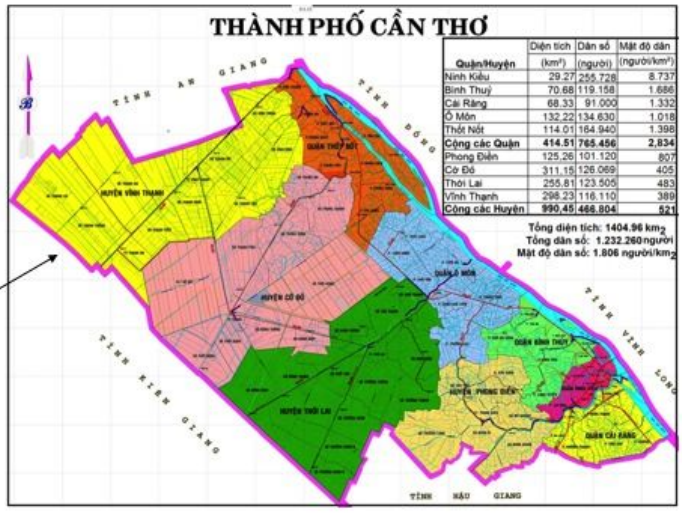
HANOI, 15/5/2015

CONTENT

1. Can Tho city context
2. Natural disasters and climate change situation in Can Tho
3. Activities on climate change and DRR
4. Direction of adaptation climate change and disaster risk reduction in the future
5. Implementation solutions

1. Can Tho city context

Terrain: low and relatively flat, averaging about 0.5-1m height above sea level. Land row along the Hau River, Highway 1 and Highway 91 foolproof from 1.0 to 1.5 m above sea level.



Quận/Huyện	Diện tích (km²)	Dân số (người)	Mật độ dân (người/km²)
Ninh Kiều	29,27	255.728	8.737
Bình Thủy	70,68	119.158	1.686
Cái Răng	68,33	91.000	1.332
Ô Môn	132,22	134.630	1.018
Thốt Nốt	114,01	164.940	1.396
Cộng các Quận	**414,51**	**765.456**	**2.834**
Phong Điền	125,26	101.120	807
Cờ Đỏ	311,15	126.069	405
Thới Lai	255,81	123.505	483
Vĩnh Thạnh	298,23	116.110	389
Cộng các Huyện	**990,45**	**466.804**	**521**

Tổng diện tích: 1404.96 km²
Tổng dân số: 1.232.260 người
Mật độ dân số: 1.806 người/km²

1. Can Tho city context

- **Potential development**
  - Agricultural production
  - Aquaculture

Rice Vinh Thanh

Phong Dien fruit

Thot Not fish

4

1. Can Tho city context

- Ecotourism Development
- Ecological gardens, floating markets, water activities ...

- Advantages in the development of waterway traffic, Road traffic and aviation

1. Can Tho city context

- Ecotourism Development
- Ecological gardens, floating markets, water activities ...

- Advantages in the development of waterway traffic, Road traffic and aviation

2. Natural disasters and climate change situation in Can Tho

2.1. Damage due to Disaster

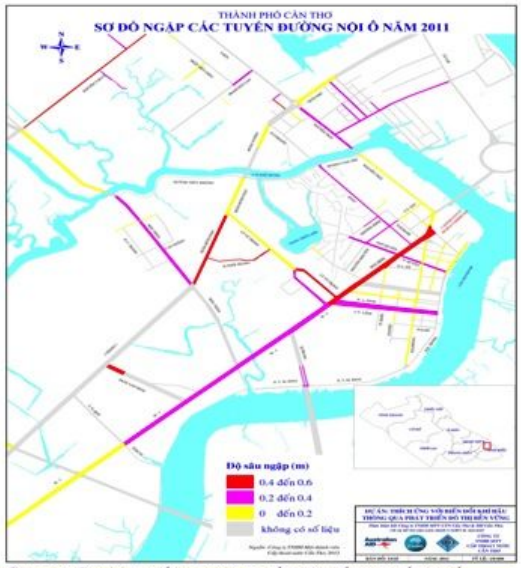
THỐNG KÊ THIỆT HẠI DO THIÊN TAI GÂY RA TRÊN ĐỊA BÀN TP. CẦN THƠ
Giai đoạn từ năm 2004 đến năm 2014

STT	LOẠI THIỆT HẠI	Đơn vị tính	Giai đoạn 2004-2014											TỔNG
			2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
1	***Sét đánh:***													
	- Chết người:	người	0.0	3.0	6.0	5.0	2.0	-	4.0	2.0	1.0	2.0	2.0	**27.0**
	- Bị thương:	người	0.0	0.0	2.0	2.0		1.0	-	-	0.0	-	-	**5.0**
2	***Lốc xoáy:***	đợt	10.0	37.0	29.0	14.0	40.0	30.0	9.0	39.0	48.0	39.0	49.0	**344.0**
	- Chết người:	người	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	**0.0**
	- Bị thương:	người		31.0	4.0	-	-	-	-	3.0	-	-	7.0	**45.0**
	- Nhà sập:	căn	23.0	131.0	85.0	17.0	54.0	48.0	26.0	72.0	55.0	40.0	110.0	**661.0**
	- Nhà bị tốc mái xiêu vẹo:	căn	41.0	436.0	1,230.0	33.0	200.0	121.0	73.0	118.0	240.0	75.0	256.0	**2,823.0**
3	***Tai nạn chết đuối:***	người	2.0	9.0	0.0	3.0	6.0	2.0	1.0	10.0	6.0	7.0	3.0	**49.0**
4	***Sạt lở bờ sông:***	điểm	-	-	-	5.0	-	2.0	4.0	12.0	5.0	4.0	1.0	**33.0**
	- Chết người:	người	-	-	-	-	-	-	2.0	2.0	-	-	-	**4.0**
	- Bị thương:	người	-	-	-	-	-	-	-	5.0	-	-	-	**5.0**
	- Nhà bị hư hại hoàn toàn:	căn	-	-	-	41.0	3.0	-	4.0	24.0	6.0	6.0	1.0	**85.0**
	- Nhà bị ảnh hưởng:	căn	-	-	-		11.0	2.0	-	-	-	10.0		**23.0**
5	***Ngập lụt***		-	-	-	-	-	-	-	-	-	-	-	-
	- Nhà bị ngập	căn	7,805.0	5,420.0	0.0	6,050.0	-	-	-	27,826.0	-	-	-	**47,101.0**
	- Điểm trường bị ngập:	điểm	45.0	18.0	0.0	13.0	-	-	-	117.0	-	-	-	**193.0**
	- Lộ GTNT bị ngập:	km	205.4	109.0	30.8	162.2	2.9	-	-	81.4	-	-	-	**591.7**
	- Lúa bị ngập:	ha	315.0	9,565.0	0.0		1,063.2	-	-	2,007.0	1,050.0	-	-	**14,000.2**
	- Rau màu bị ngập:	ha	129.3	245.0	0.0	28.8	-	-	-	692.5	-	-	-	**1,095.6**
	- Vườn cây ăn trái bị ngập:	ha	3,069.4	1,741.5	0.0	2,842.0	-	-	-	10,525.3	-	-	-	**18,178.2**
	- Thủy sản bị ngập:	ha	516.0	509.2	0.0	0.7	-	-	-	967.0	-	-	-	**1,992.9**
6	***Đình lũ***	m	**1.930**	**1.950**	**1.990**	**2.030**	**2.000**	**1.930**	**1.940**	**2.150**	**2.070**	**2.150**	**2.080**	**22.2**
7	***Tổng thiệt hại***	Tỷ đồng	-	13.76	9.39	5.60	1.60	1.06	2.55	242.91	3.26	2.83	5.73	***288.69***

2. Natural disasters and climate change situation in Can Tho

2.1. Damage due to disaster

a) Flood:



Source: Project adaptation to climate change through sustainable urban development, CSIRO-CTU

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2. Natural disasters and climate change situation in Can Tho

2.1. Damage due to disaster

a) Flood: some pictures about flood situation in Can Tho city

Tran Van Kheo in heavy flood in 11/2014

serious impact on the lives of people in the city of Can Tho

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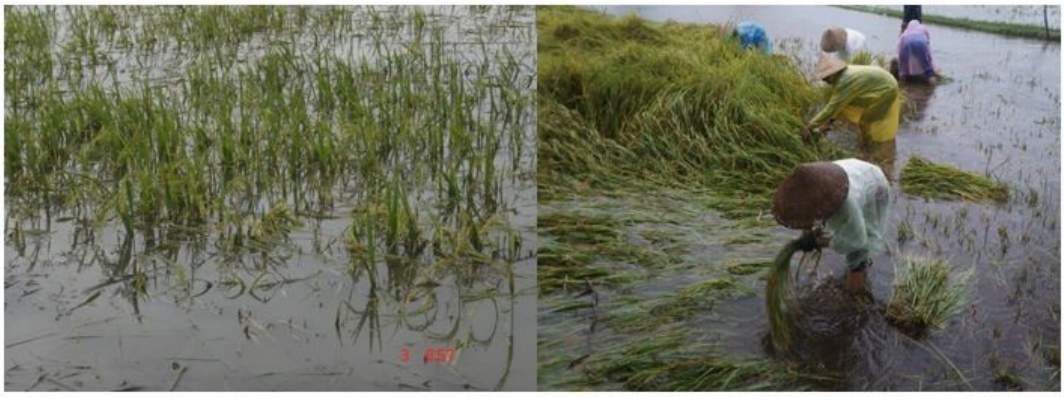
2. Natural disasters and climate change situation in Can Tho

2.1. Damage due to disaster

a) Flood: pictures about flood situation in Can Tho city



Fall Winter wheat outside the embankment on Vinh Thanh districts affected by floods late 9/2011

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2. Natural disasters and climate change situation in Can Tho

2.1. Damage due to disaster

b) Erosion:

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2. Natural disasters and climate change situation in Can Tho

2.1. Damage du to disaster

b) Erosion:

Erosion of KV BINH DUONG, P. LONG HOA BINH THUY 18/6/2011: affected people living near ROAD ROUTE 918 - 1,000 MILLION DAMAGE ESTIMATE

Erosion of LONG HOA BRIDGE (09/5/2011): 02 PEOPLE DEAD, 05 INJURED, 12 BLOCK WAS COLLAPSED

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2. Natural disasters and climate change situation in Can Tho

2.1. Damage due to disaster

c) tornadoes:

Tornadoes in Co Do district – Can Tho city 2014

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2. Natural disasters and climate change situation in Can Tho

2.1. Damage due to disaster

b) Erosion:

Erosion paths in Tra Nien Bridge Date 03/03/2010 Phong Dien district, length 100 meters, 20 meters deep, eroded 03 apartments, 02 dead

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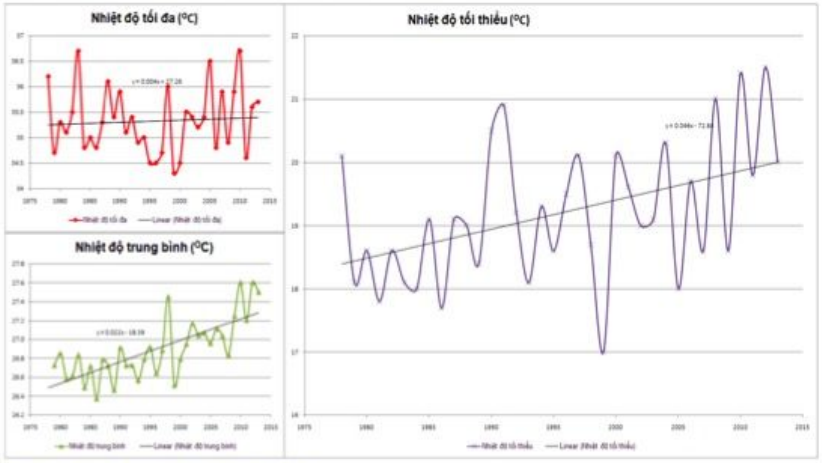
2. Natural disasters and climate change situation in Can Tho

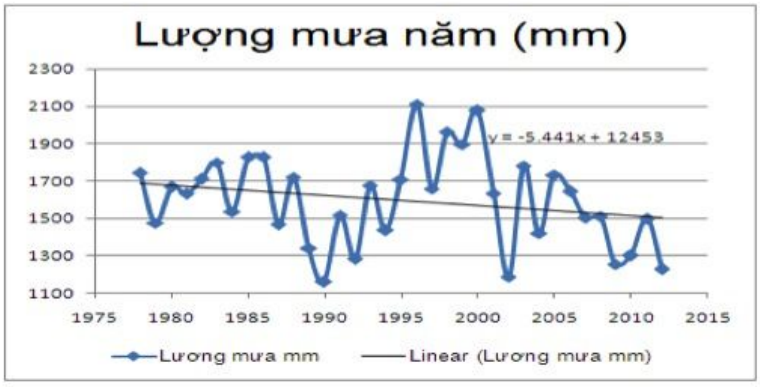
2.2. Climate Change Situation in Can Tho
a) Nhiệt độ không khí gia tăng.



Nguồn: Đài khí tượng thuỷ văn Nam Bộ

2. Damage caused by natural disasters and climate change

2.2. Climate Change Situation in Can Tho
b) Annual rainfall tends to decrease.



Nguồn: Đài khí tượng thuỷ văn Nam Bộ

2. Damage caused by natural disasters and climate change

2.2. Climate Change Situation in Can Tho

c) Declining humidity.

Source: Radio Southern meteorology

d) Trend of declining average wind speed.

- Wind speed tends to decrease about 10,4m/ second;
- Year 2004 about 9,084m/ second,
- Year 2008 about 3,0 m/ second

2. Damage caused by natural disasters and climate change

2.2. Climate Change Situation in Can Tho

e) Changing hydrology and salinity intrusion in the dry

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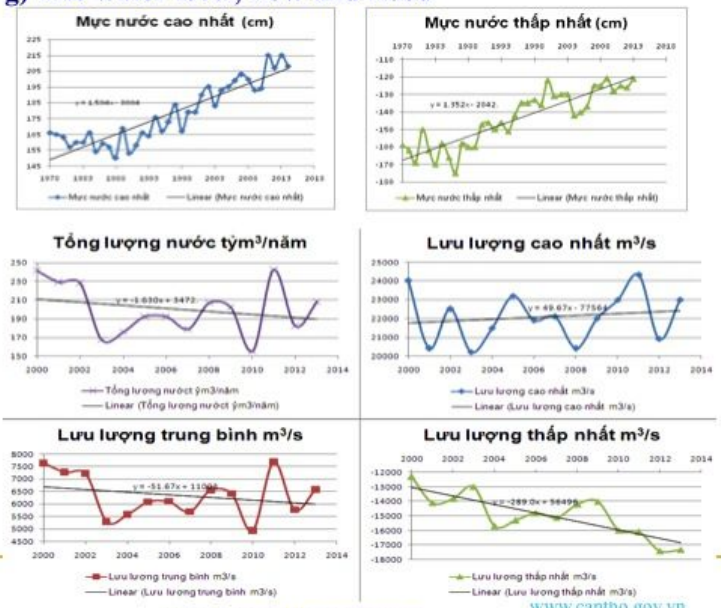
2. Damage caused by natural disasters and climate change

2.2. Climate change situation in Can Tho

g) The water level, flow and flood

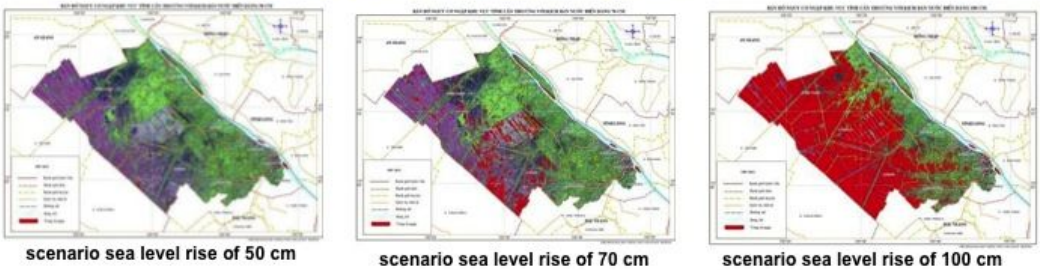


Source: Center of Mekong hydrology

2. Damage caused by natural disasters and climate change

2.2. Climate Change Situation in Can Tho

g) The water level, flow and flood (cont)



scenario sea level rise of 50 cm

scenario sea level rise of 70 cm

scenario sea level rise of 100 cm

Average sea level rise (cm)	The proportion of flooded area (%)	Acreage flooded (km²)
50	2,47%	34,4
70	11,9%	165,5
100	58,3%	810,3

(Source: Scenarios of climate change and sea level rise for the city of Can Tho, MoNRE)

2. Damage caused by natural disasters and climate change

2.2. Climate Change Situation in Can Tho

h) River erosion

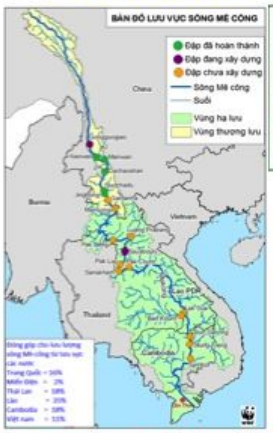
Nguồn: Chi cục Thuỷ lợi TPCT

i) Tornadoes and hurricanes

2. Damage caused by natural disasters and climate change

2.3. Other challenges

a) Inactive in controlling of water resources



If further review of transboundary impacts caused by mining activities in the upstream countries, especially projects related to hydropower dams..

Climate change and the upstream dams in the future will be the dual threats related to water level and flow of the Mekong Basin.

(Lê Quang Trí, 2013)

b) The phenomenon of ground deformation, subsidence

Workshop "research project Results Phase 1-the land subsidence in Ca Mau peninsula" in Can Tho city dated 17.06.2013, the Ministry of Agriculture and Rural Development, and the Institute of Geography PSC TNB Technical Royal Norwegian co-chair

3. Activities on climate change adaptation, disaster risk reduction in Can Tho

- **Promulgating policies and strategies**
- **About climate change**

- Issued action plan to respond to climate change period 2010 - 2015

- Issued Plan of enhancing adaptive capacity to climate change of city officials

- Issued action plan to respond to climate change period 2015 - 2030

3. Activities on climate change adaptation, disaster risk reduction in Can Tho

- **Promulgating policies and strategies**
- **About climate change**

- Resolution No. 07-NQ / TW dated 06/02/2012 of People's Committee of Can Tho City

- Program 39-CTr / TU dated 25/07/2013 of People's Committee of Can Tho City

- Decision No. 3604 / QD-Committee dated 11/14/2013 of People's Committee of Can Tho City - Issued Planning Program implemented the 39-CTr / TU

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3. Activities on climate change adaptation, disaster risk reduction in Can Tho

- **Promulgating policies and strategies**
- **About climate change**

- Implement the National Program to Respond to Climate Change (Decision No. 158/2008 / QD-TTg) city implemented 03 projects as follow:

+ "Assessing the impact of climate change on the region, industry and objects of Can Tho City";

+ "Strengthening awareness of organizing and managing the implementation of local programs";

+ "To build an action plan to respond to climate change in Can Tho city".

3. Activities on climate change adaptation, disaster risk reduction in Can Tho

- **Promulgating policies and strategies**
- **About climate change**

- Establishment of the Project Steering Committee to respond to climate change in the city of Can Tho (referred to as the Steering Committee Decision 158) (Decision No. 1716 / QD-Committee dated 06/25/2014)

- Implementing over 05 projects responding to climate change with the funding of the project from agencies and international organizations

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3. Activities on climate change adaptation, disaster risk reduction in Can Tho

- **Promulgating policies and strategies**
- **About disaster risk reduction**

- Plan No. 13 / KH-Committee dated 23/3/2010 to raise community awareness and disaster risk management based on the City's community in Can Tho from 2010-2020.
- Planning prevention and erosion of rivers and canals, Tp. Tho under Decision No. 3164 / QD-Committee 19/11/2010, is implementing 04 key irrigation works.
- Decision No. 572 / QD-03 Committee on 08 May 2013 by Can Tho City People's Committee Chairman v / v approve the project "Management of flooding and erosion of community-based urban for Can Tho".

3. Activities on climate change adaptation, disaster risk reduction in Can Tho

- **Promulgating policies and strategies**
- **About disaster risk reduction**

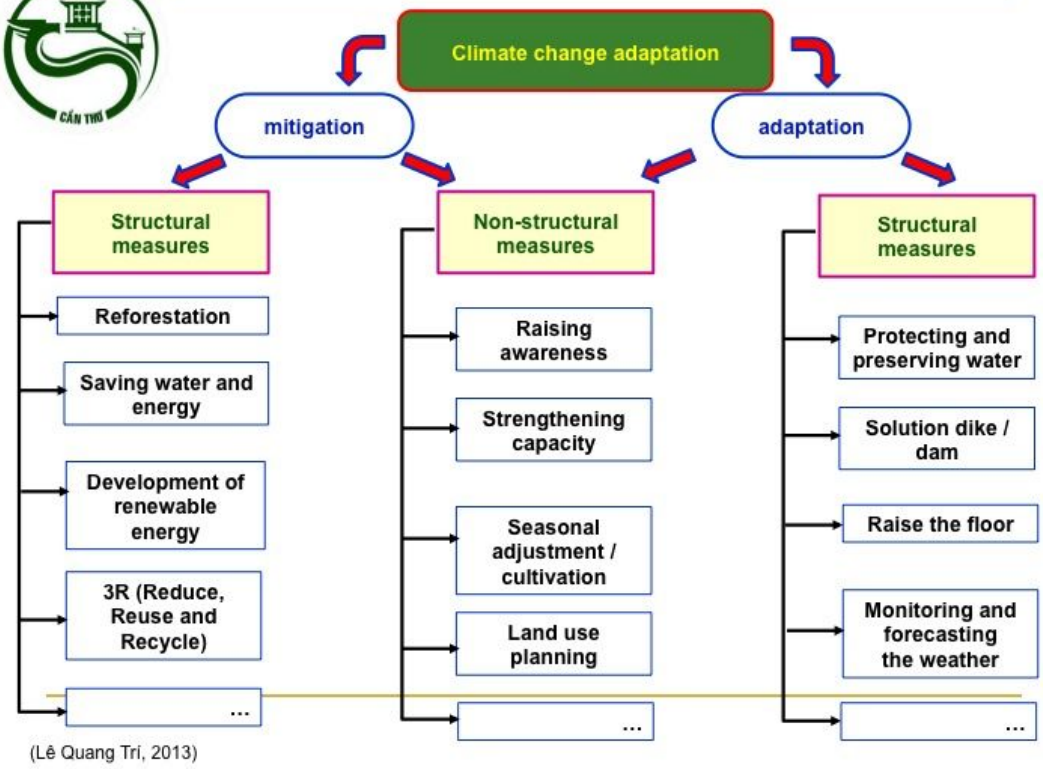
- In 2014, implemented the project "Institutional Capacity Building for Disaster Risk Management in VN, especially the risks related to climate change", UNDP..

- Ongoing Phase 3 project financing solutions for disaster risk to cope with climate change TA8012-REG ADB funded.

- Strengthen the Committee for the prevention of natural disasters and search and rescue Tho (Decision No. 1153 / QD-Committee dated 04/16/2015).

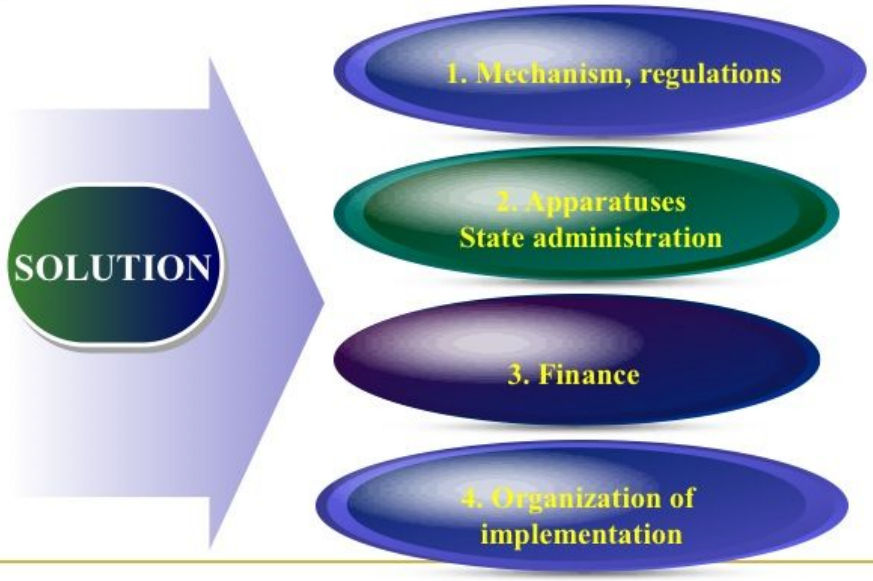
4. Direction of adaptation to climate change, disaster risk reduction in future

- Simulation of climate changes.
- Assess the impact of climate change on all sectors.
- Identify the vulnerability, the degree of damage.
- Capacity building, awareness, consciousness and behavior of environmental protection - ecology.
- Propose and test the adaptive model.
- Search for plants and animals with the ability to adapt.
- Review of development planning.
- Forecasts of economic developments - health, environmental and social protection.
- Readjust the appropriate policies.
- Develop and maintain a network of information and warning systems.
- Enhancing cooperation, exchange and national information sharing.



(Lê Quang Trí, 2013)

5. Implementation solutions



ANNEX 1.
Workshop Agenda

Time	Contents	Responsibility
08:30 – 9:00	Registration	DMHCC, MONRE
09:00 – 09:10	Participant introduction	DMHCC, MONRE
09:10 – 09:30	Opening remark	Mr. Truong Duc Tri, Deputy Director General of DMHCC, MONRE
09:30 – 10:00	Relationship between CCA and DRR in the context of Loss and Damage	Dr. Le Minh Nhat, DMHCC, MONRE
10:00 – 10:10	Q&A	
10:10 – 10:30	Sharing experience on implementing activities of capacity building on Loss and Damage at provincial level	Dr. Tran Huu Tuan, Deputy Head of Faculty of Economic and Development, Hue Economic University
10:20 – 10:40	Q&A	
10:40 – 11:00	Photo session and Break	
11:00 – 11:30	Loss and Damage by climate change impacts in agricultural sector: Difficulties and Challenges	Ass Prof/Dr. Dinh Vu Thanh, Deputy Director General of Department of Science and Technology, MARD
11:30 - 11:40	Q&A	
11:40 – 12:10	Disaster risk management: Opportunities and challenges in reducing loss and damage	Dr. Bui QuangHuy, Disaster Mitigation Center, MARD
12:10 – 12:20	Q&A	
12:20 –13:15	**Lunch**	
13:15 – 13:45	Introduction of the guidance on disaster damage inventory and evaluation	Ms. Dang Huong, Disaster Prevention Department, MARD
13:45 - 13:55	Q&A	

13:55 – 14:25	Difficulties and challenges in developing supporting machenism of loss and damage by climate change and disaster in Viet Nam	Ms. Nguyen Thanh Van, Institute of Labour Science and Social Affairs, MOLISA
14:25 – 14:35	Q&A	
14:35 - 15:15	Experience on implementing climate change adaptation and disaster risk reduction of Ben Tre province	- Mr. Le Huynh DuyAnh,Office of Climate change of Ben Tre province
15:15 - 15:45	Experience on implementing climate change adaptation and disaster risk reduction of Can Tho province	- Ms. Le Dinh Van Khanh, Office of People Committee of Can Tho
15:45 – 16:45	Discussion	All participants
16:45 – 17:00	Conclusion	Mr. Truong Duc Tri, Deputy Director General of DMHCC, MONRE

ANNEX 2.
List of Participants

No	Full name	Position/Organization
Ministry of Natural Resources and Environment		
1	Truong Duc Tri	Deputy Director General, Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
2	Le Minh Nhat	Director, CCA Division, Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
3	Nguyen ToanThang	Director, Clitech, Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
4	Nguyen Tien Sy	Office Division, Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment

5	Vu Hai Ninh	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
6	Pham Thi Minh Hoa	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
7	Hoang Thi Hoa	Department of Legislation, Ministry of Natural Resources and Environment
8	TuyetChinh	Natural Resources and Environment News
9	NongAnh Duong	Department of Legislation, Ministry of Natural Resources and Environment
10	Nguyen DucCuong	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
11	Nguyen Trong Hung	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
12	Pham ThiTra My	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
13	Nguyen Thanh Hang	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
14	Luong QuangHuy	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
15	Vu Minh Tuan	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
16	Pham Quoc Tien	Clitech, Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
17	Nguyen DieuHuyen	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
18	Le Thi Mai Thanh	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
19	Nguyen Viet Hung	Natural Resources and Environment News
20	Nguyen DucThien	Natural Resources and Environment News
21	Phan Thi Ha	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
22	Vu Van May	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
23	Bui Duc Son	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and

		Environment
24	Nguyen Van Viet	Vietnam Institute of Meteorology, Hydrology and Environment
25	Nguyen Huu Tai	Hydrometeorology Forecast Center
26	Nguyen ThiHien	Clitech, Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
27	Ngo ThiThanhHuong	Clitech, Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
28	Pham ThiTuyet May	Clitech, Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
29	Nguyen Van Dai	Vietnam Institute of Meteorology, Hydrology and Environment
30	Doan Le UyenGiang	National committee on climate change
31	Vuong Xuan Hoa	Vietnam Institute of Meteorology, Hydrology and Environment
32	Tran Mai Kien	Vietnam Institute of Meteorology, Hydrology and Environment
33	Nguyen Ngoc Linh	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
34	Nguyen Tran Linh	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
35	Nguyen Bich Nguyet	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
36	Le HuuThuan	Water Resource Management Department, Ministry of Natural Resources and Environment
37	Hoang Minh Tuyen	Vietnam Institute of Meteorology, Hydrology and Environment
38	Tran Danh Trieu	Hydrometeorology Network Center
39	Nguyen Viet Dung	Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resources and Environment
40	Nguyen Le Tuan	Ministry of Natural Resources and Environment
41	Nguyen Mai Dang	HANOI Water Respources University
42	Nguyen Van Sy	HANOI Water Respources University
43	Do LenhDuy	HANOI Water Respources University
44	Pham DucToan	Vietnam National University

45	Pham Thu Thuy	Vietnam National University
Line ministries		
46	Nguyen Thi Mai Phuong	Environmental Management Department, Ministry of Health
47	Nguyen Thi Xuan Thang	Ministry of Industry and Trade
48	Hoang Ha	University of Education 1
49	Tran Hong Nhung	Department of Legislation, Ministry of Finance
50	Hoang Nghia Nam	Nhan Dan Newspaper
51	Bui QuangHuy	Disaster Management Center, Ministry of Agriculture and Rural Development
52	Pham La Anh Thu	Disaster Mitigation Center, Ministry of Agriculture and Rural Development
53	Luong Minh Ngoc	Disaster Mitigation Center, Ministry of Agriculture and Rural Development
54	Hoang ThiHien	Disaster Mitigation Center, Ministry of Agriculture and Rural Development
55	Truong Quang Hoc	Hanoi National University - Member of Vietnam Panel Climate Change (VPCC)
56	Le Van Chinh	Ministry of science and technology
57	Ha Huy Ngoc	VAST
58	Phung Tien Thanh	Department of Environment, Ministry of Transportation
59	Nguyen Thanh Van	Institute of Labor Science and Social Affairs, Ministry of Labour, Invalids and Social Affairs
60	Dang ThiHuong	Central Steering Committee for Disaster Prevention
61	Hoang DucTrong	Department of Science, Technology and Environment, Ministry of Agriculture and Rural Development
62	Nguyen ThiTho	Sustainable Rural Development (NGO)
63	Vu The Thuong	Vietnam Non-governmental organizations and Climate Change Network
64	LuuThi Thu Giang	CARE Int
65	Hoang Van Tam	Ministry of Industry and Trade
66	Nguyen Sy Ha	EBA project, GIZ
67	Dang HuongGiang	Institute of Energy, Ministry of Industry and Trade
68	Truong Viet Truong	Ministry of Industry and Trade

69	Tran Anh Duong	Ministry of Transportation
70	Nguyen TrungThanh	Ministry of Transportation
71	Pham Thi Dung	Ministry of Agriculture and Rural Development
72	Vu Tan Phuong	Ministry of Agriculture and Rural Development
73	Mai Van Trinh	Ministry of Agriculture and Rural Development
74	PhungTuuBoi	Institute of Forestry
75	Nguyen Song Ngoc	Consultant of Ministry of Transportation
76	Nguyen Thi Hai	Vietnamese Academy of Forest Sciences
77	Pham LanHuong	Ministry of Finance
78	Bui NguyetAnh	Ministry of Education and Training
79	Pham Thu Huong	Ministry of Agriculture and Rural Development
80	Nguyen Thuy Thu	International Law Department, Ministry of Justice
81	Ta ThiNhuQuynh	National Assemby's Institute of legislation studies
82	Nguyen Thi Hong Hue	Dept of Economic - National Assemby's Committee of Econ
		Local Governments
83	Huynh Le DuyAnh	Office of NTPRCC, Ben Tre province
84	Huynh ThanhĐiền	Office of NTPRCC, Ben Tre province
85	Do Van Phuc	Office of NTPRCC, Ben Tre province
86	Vo Van Ngoan	Office of NTPRCC, Ben Tre province
87	Ho TinhNhat	Office of Steering Committee for Flood Prevention, Ben Tre province
88	Tran Huu Tuan	Hue Economic University
89	Nguyen Van Vy	Center for Flood Prevention of Central and Highlands (Da Nang)
90	Pham Tan Phat	Steering Committee for Flood Prevention,Da Nang
91	Nguyen Quoc Tan	Department of Environment Protection, Quang Ngai province
92	Pham PhuocToan	Quang Nam DONRE
93	Nguyen Van Tam	BinhThuan DONRE

94	Nguyen Bao Trieu	NinhThuan DONRE
95	Bui Minh Son	KhanhHoa DONRE
96	Nguyen Thai Nhu Tri	Chief of Office, Steering Committee for Flood Prevention, KhanhHoa
97	Tran Van Tuan	Chief of Office, Steering Committee for Flood Prevention, NinhThuan
98	Le Dinh Van Khanh	Office of Can Tho's PC
99	Le Van Toan	Can Tho DARD
100	Bach Dinh Trinh	Can Tho DARD
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