

## TRAINING REPORT

**Project Title: Strengthening the capacity of officials on Integrated Flood Management Plans (IFMP): Integrating IFMP into provincial disaster prevention plans in coastal provinces of Central Vietnam**



# **TRAINING REPORT**

**Project Title: Strengthening the capacity of officials on Integrated Flood Management Plans (IFMP): Integrating IFMP into provincial disaster prevention plans in coastal provinces of Central Vietnam**

## **Project Leader**

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## **Contributors**

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**Binh Dinh, 2023**

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## Abbreviation

APN	Asia-Pacific Network for Global Change Research
MARD	Ministry of Agriculture and Rural Development
VNU	Viet Nam National University
CEFD	Center for Environmental Fluid Dynamics
IFMP	Integrated Flood Management Plans



## Preface

In Vietnam, under the effect of climate change, natural disasters, especially storms and floods, cause more and more damage. Although Vietnam has been active in flood management, these solutions are mainly localized, fragmented, unsystematic or in a short-term period and may cause more severe flooding to nearby areas. Therefore, there is a need for a different approach. IFMP is an integrated management with the aims to maximize the benefits of floodplains and minimize flood damage with a watershed and multisectoral approach. Recognizing the necessity of IFMP, Center for Environmental Fluid Dynamics, VNU University of Science, Vietnam National University organized training for officials with an aim to enhancing efforts in providing support to the officials through tailored research activities; enhancing efforts in providing capacity development to the officials that meet their specific needs by organizing training; and creating holistic and transdisciplinary capacity development activities on IFMP.

The training for local officials of agencies such as: Provincial Steering Committee for Disaster Prevention and Search and Rescue, District Steering Committee for Disaster Prevention and Search and Rescue and other relevant departments and agencies. The presentations received attentions and appreciation as well as the fruitful comments of the experts and representatives from local agencies. Based on the comments raised at the training, Center for Environmental Fluid Dynamics (CEFD) will, in collaboration with the experts, finalize the report and training documentation. The training was successfully organized on April 2023 in Binh Dinh, Viet Nam.

Taking this opportunity, Center for Environmental Fluid Dynamics would like to express sincere thanks to APN for their generous support and to all participants for their active and constructive comments to the training.

## Organization of the training

### Objectives

- (i) Share the knowledge-base of IFMP and how to develop IFMP,
- (ii) Guidance on integrating IFMP into the provincial disaster management plan

### Date of training

24 and 25 April 2023

### Venue

Le Mint hotel,  
No.01-03 Tran Khanh Du street, Quy Nhon City, Binh Dinh, Viet Nam.

### Organizer

Center for Environmental Fluid Dynamics (CEFD), VNU University of Science,  
Vietnam National University.

### Supported by

Asia-Pacific Network for global Change Research (APN).

# PART 1. REPORT OF THE TRAINING

## 1. Introduction

The training course was organized by CEFD in collaboration with the Provincial Steering Committee for Disaster Prevention and Search and Rescue of Binh Dinh with the following main contents:

- Guidance on developing and updating IFMP;
- Guidance on integrating IFMP into the provincial disaster management plan.

A training for local officials of agencies: Provincial Steering Committee for Disaster Prevention and Search and Rescue, District Steering Committee for Disaster Prevention and Search and Rescue and other relevant departments and agencies was held at Le Mint hotel in Binh Dinh on 24 and 25 April 2023.

## 2. Objectives of the training

The general objective of the training was to strengthen the capacity of provincial authorities/organizations and disaster prevention agencies in developing IFMP and integrating it into provincial disaster prevention and control plan.

The specific objectives of the training were to:

- (iii) Share the knowledge-base of IFMP and how to develop IFMP,
- (iv) Guidance on integrating IFMP into the provincial disaster management plan

## 3. Training agenda

Training agenda is detailed below:

Time	Contents	Responsibility
	<b><i>Day 1 – Morning (8:00 – 11:00)</i></b>	
8:00 – 8:30	Opening remarks and introduction of delegates	Dr. Le Minh Nhat
8:30 – 9:00	Introduction to the steps of developing/updating the IFMP	Dr. Le Minh Nhat
9:00 – 11:00	Guidelines for building flood and hazard maps	Dr. Le Minh Nhat
	<b><i>Day 1 – Evening (14:00 – 17:00)</i></b>	
14:00 – 16:00	Guidelines for assessing flood risks	Dr. Le Minh Nhat
16:00 – 17:00	Guidelines for proposing solutions	Dr. Le Minh Nhat
	<b><i>Day 2 – Morning (8:00 – 11:00)</i></b>	
8:00 – 9:00	Guidelines for evaluating the effectiveness and impact of certain construction solutions	Dr. Le Minh Nhat
9:00 – 10:30	Guidelines for prioritizing solutions	Dr. Le Minh Nhat
10:30 – 11:00	Guidelines for building an IFMP report	Dr. Le Minh Nhat

Time	Contents	Responsibility
	<b><i>Day 2 – Evening (14:00 – 17:00)</i></b>	
14:00 – 16:30	Guidelines for integrating IFMP into provincial disaster prevention plans	Assoc.Prof. Tran Ngoc Anh
16:30 – 17:00	Closing remarks	Dr. Le Minh Nhat

#### 4. Training Participants

The training was attended by representatives from the following organizations:

- Dr. Le Minh Nhat, Head of the Representative Office of Viet Nam Disaster and Dyke Management Authority in Central and Central Highlands Regions.
- Representatives of CEFD consultant: Assoc. Prof. Tran Ngoc Anh - Project leader, MSc. Dang Dinh Duc, Dr. Nguyen Quoc Son, MSc. Pham Thi Tuyet May, Ms. Nguyen Hong Thuy.
- Representatives of Steering Committee for Disaster Prevention and Search and Rescue of Binh Dinh Province: Mr. Bui Anh Kiet, Deputy Head of Disaster Prevention Office.
- Representatives of Steering Committee for Disaster Prevention and Search and Rescue of districts, towns, and cities: Tuy Phuoc, An Nhon, Phu Cat, Van Canh.

List of Participants:

No	Full name	Position/Organization
1	Luong Van Khoa	Division of Agriculture and Rural Development of Phu Cat District
2	Le Cong Phuc	People's Committee of Cat Thang Commune
3	Nguyen Van Thao	Cadastral of Canh Hiep Commune, Van Canh District
4	Lam Thi Anh Nguyet	People's Committee of Nhon Hoa Ward
5	Nguyen Anh Quoc	Division of Agriculture of Nhon Hoa Ward
6	Pham Thang Long	Statistical Division of Nhon Thanh Ward
7	Nguyen Van Tam	Division of Agriculture of Tuy Phuoc District
8	Huynh Trong Thu	Division of Agriculture of Tuy Phuoc District
9	Nguyen Thi Anh Truc	Division of Agriculture and Rural Development of Van Canh District
10	Nguyen Tuong Vi	Steering Committee for Disaster Prevention and Control, Search and Rescue of Binh Dinh province
11	Bùi Anh Kiet	Steering Committee for Disaster Prevention and Control, Search and Rescue of Binh Dinh province
12	Nguyen Minh Do	Union of Tuy Phuoc District
13	Dinh Thi Nhon	Cadastral of Canh Hien Commune, Van Canh District

No	Full name	Position/Organization
14	Le Van Hoang	Statistics Division of Canh Vinh Commune, Van Canh District
15	Vo Trung Dung	Steering Committee for Disaster Prevention and Control, Search and Rescue of Binh Dinh province
16	Nguyen Thi Thu Thuy	Steering Committee for Disaster Prevention and Control, Search and Rescue of Binh Dinh province
17	To Anh Tuan	Cadastral of Cat Chanh Commune, Phu Cat District
18	Bui Thai Son	People's Committee of Nhon Thanh Ward
19	Phan Thanh Hoa	Division of Economic of An Nhon town
20	Bach Nhon Tan	Division of Economic of An Nhon town
21	Nguyen Trong Chinh	Division of Economy and Infrastructure of Tuy Phuoc District
22	Le Tung Trong	People's Committee of Cat Tien Town
23	Dao Duy Bang	Division of Agriculture and Rural Development of Phu Cat District
24	Nguyen Thi Quyen	Women Union of Phu Cat District
25	Pham Phu	Binh Dinh Province Water Resources Development Association

## 5. Conduct of the training

The training was inaugurated by Dr. Le Minh Nhat, Head of the Representative Office of Viet Nam Disaster and Dyke Management Authority in Central and Central Highlands Regions, MONRE. He warmly welcomed all participants to the training and provided some background information on the project and emphasized the objectives of the training. The consultant also pointed out that the important of developing IFMP in context of climate change and he hopes that through this training course, the participants will have a better understanding of the significance, objectives, and process of developing IFMP.



Figure 1. Dr. Le Minh Nhat, Representative Office of Viet Nam Disaster and Dyke Management Authority in Central and Central Highlands Regions, MARD, makes the welcome speech

In the first presentation, Dr. Le Minh Nhat gave brief introduction on the definitions of IFMP and the steps of developing/updating the IFMP. Subsequently, he presented in detail the specific steps of implementation, each of which was accompanied by illustrative examples to enable the participants to grasp the precise purpose, input, and output of each step. Specific key contents addressed in this presentation include:

- Definition, objectives of IFMP;
- Difference between traditional flood management and IFMP;
- Comparison between old version and new version of IFMP manuals;
- The steps of developing/updating the IFMP and detailed contents in each step;



Figure 2. Dr. Le Minh Nhat, MARD, presents Developing/updating IFMP

In the second presentation, Assoc.Prof Tran Ngoc Anh presented the importance of integrating the IFMP into the disaster prevention plans, the steps involved, and provided illustrative examples for each step. Specific key contents addressed in this presentation include:

- Responsibilities and tasks of integration implementation;
- Content that needs to be integrated;
- The steps of integrating the IFMP into the disaster prevention plans.



Figure 3. Assoc.Prof. Tran Ngoc Anh, CEFD, presents Integrating IFMP into the provincial disaster management plan

In the discussion: At the end of the training course, the trainers raised several questions related to the training topics to see if the trainees were understood the lectures. In this section, we also want to know how the issues mentioned in the lecture were applied in local specific contexts. This section also allows participants to ask any questions they have, and the trainers answer or respond those questions. Through the training and discussion, the consultant has clarified the concerns of the participants, providing information on the methods and scope of application for each method.

- The consultant has presented clearly and in detail the 6 steps to developing IFMP.
- The local area will encounter many difficulties in carrying out the survey and field investigation step. This step requires surveyors to be proficient in using surveying equipment and have professional certifications to avoid errors in conducting survey.



*Mr. Bui Anh Kiet, Steering Committee for Disaster Prevention and Search and Rescue of Binh Dinh Province*





*Mr. Dao Duy Bang, Division of Agriculture and Rural Development of Phu Cat District*

- Recommendations for the approved IFMP need to include additional annexes of flood maps corresponding to different rainfall scenarios, so that the locality can promptly come up with coping measures when there is rainfall.
- In the section proposing flood prevention and control measures, construction measures were proposed but not implemented due to the lack of additional funding for construction measures.

- Through the training session, the trainees have a better understanding of the role, significance, and importance of developing IFMP.
- At the local level, there are many difficulties with human resources. The training session is extremely useful and necessary to enhance the professional capacity of officials, enabling them to help and share their work with each other.
- The training process takes place in a short period (2 days), but the amount of knowledge is enormous. For trainees to apply the knowledge effectively and understand it more deeply, more training sessions at the local level are needed.



*Mr. Nguyen Trong Chinh, Division of Economy and Infrastructure of Tuy Phuoc District*



*Mr. Phan Thanh Hoa, Division of Economic of An Nhon town*

- The consulting firm has presented clear and detailed steps for developing IFMP and integrating it into the provincial disaster management plan.
- The proposal to prioritize and arrange measures in order of importance is very useful. This content provides a list of non-structural and structural measures to reduce the damage caused by floods.

Finally, Dr. Le Minh Nhat briefly summarized what had been discussed during the training, and thanked all participants for their participation, especially those who contributed to the presentations and discussions.

## 6. Conclusion

After finishing the discussion, representatives of Viet Nam Disaster and Dyke Management Authority, representatives of the Steering Committee for Disaster Prevention and Control, Search and Rescue of Binh Dinh province, the Consultant and delegates come to an agreement on the following:



- Integrated flood management is a relatively new concept that promotes the management of water, land and related resources without compromising ecosystem sustainability. The basic principle of Integrated Flood Management is to maximize the benefits of the floodplain and minimize the loss of life and property caused by floods through flood prevention measures. Realizing the importance of the IFMP, the province has developed IFMP for the Kone - Ha Thanh river basin. Through the training session, local officials were equipped with more professional knowledge, which is also an advantage for the province to continue developing IFMP for other river basins in the province.
- Integrating IFMP into the provincial disaster management plan is very important to avoid overlapping measures as well as make the most of resources in disaster prevention in general and flood in particular.

## PART 2. PRESENTATIONS AT THE TRAINING

### 1. Developing integrated flood management plans



VIETNAM NATIONAL UNIVERSITY  
VNU UNIVERSITY OF SCIENCES  
CENTRE FOR ENVIRONMENTAL FLUID DYNAMICS



### TRAINING ON DEVELOPING INTEGRATED FLOOD MANAGEMENT PLANS (IFMP)

PROJECT: STRENGTHENING THE CAPACITY OF OFFICIALS ON  
INTEGRATED FLOOD MANAGEMENT PLANS (IFMP): INTEGRATING  
IFMP INTO PROVINCIAL DISASTER PREVENTION PLANS IN  
COASTAL PROVINCES OF CENTRAL VIETNAM

1

## MAIN CONTENTS



2

## I. INTRODUCTION TO IFMP AND MANUAL

### Concept (according to WMO and GWP)

Integrated flood management is a process that combines land and water resources management to maximize the benefits of flood-prone areas and minimize the damage caused by floods. Integrated flood management will apply a basin and multi-sector approach, involving communities and supported by mechanisms and policies in flood management.

### Objective

- Maximizing benefits in areas at risk of flooding while minimizing the damage to people and property caused by floods, aiming for sustainable development in river basins, ensuring livelihood security and addressing the vulnerability of communities living in the basin.
- Minimizing damage to people and property.
- Protecting the environment and promoting sustainable development of the ecosystem.

3

## I. INTRODUCTION TO IFMP AND MANUAL

### The differences between traditional flood management and integrated flood management.

Traditional flood management	Integrated Flood management
<ul style="list-style-type: none"> <li>- Flood prevention plan is usually oriented towards extremes (design floods, historical floods)</li> </ul>	<ul style="list-style-type: none"> <li>- Applying risk management principles and may not completely controlled due to unpredictable changes in climate and socio-economic factors, as well as prioritizing multi-criteria measures.</li> </ul>
<ul style="list-style-type: none"> <li>- Measures (either construction or non-construction) focus on the goal of reducing floods and minimizing the local damage caused by floods. Usually, the measures implement in the three phases before, during, and after the flood have not been clearly distinguished. This leads to conflicts and mutual impacts that reduce effectiveness.</li> </ul>	<ul style="list-style-type: none"> <li>- The measures (either construction or non-construction) are considered to be integrated across river basins to harmonize benefits between different areas. Proposed measures for each phase before, during, and after floods are evaluated carefully to prioritize implementation in practice.</li> </ul>
<ul style="list-style-type: none"> <li>- Lack of participation from relevant parties.</li> </ul>	<ul style="list-style-type: none"> <li>- Participation from many stakeholders involved..</li> </ul>

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## I. INTRODUCTION TO IFMP AND MANUAL

### Legal basis:

- The Law on Natural Disaster Prevention and Control No. 33/2013/QH13 (amending and supplementing some articles of the Law on Natural Disaster Prevention and Control and the Law on Dykes No. 60/2020/QH14 dated June 17, 2020) **which includes provisions on the development of a comprehensive flood management plan for river basins within provinces.**
- "The National Strategy for Natural Disaster Prevention and Control until 2030, with a vision to 2050, Decision No. 379/QĐ-TTg dated March 17, 2021 by the Prime Minister of the Government, in which Task and Solution No. 6 is **"Develop and implement a Comprehensive Flood Management Plan for river basins, plans for strong storm and super typhoon, flash floods, landslides, saltwater intrusion, riverbank and coastal erosion control, droughts"**.

### Practical basis:

- In some localities (such as Hue, Quang Binh, Phu Yen, Khanh Hoa...), the implementation of integrated flood management approach has shown to be appropriate.
- Although there are manual available (2016), the application in practice is still difficult, because this is a new approach.

**It is necessary to have a manual for developing IFMP.**

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## I. INTRODUCTION TO IFMP AND MANUAL

**Objective of the manual:** To provide guidance for localities on the process of developing IFMP for river basins in their respective areas.

**Target users of the guide:** People's Committees of provinces/cities, Provincial Steering Committee for Disaster Prevention and Search and Rescue, Department of Natural Resources and Environment, Department of Agriculture and Rural Development, relevant ministries and agencies of the central government, international organizations, and NGOs providing resources to implement the IFMP.

### The manual is structured as follows:

- Introduction
- Part 1: General information of manual
- Part 2: Introduction to Integrated Flood Management
- Part 3: Main contents for developing IFMP
- Part 4: Responsibilities of parties involved in building IFMP
- Conclusion
- References
- Appendix

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## I. INTRODUCTION TO IFMP AND MANUAL

Content	Old manual (2016)	New manual
<b>Part 1 General information of manual</b>		
- Overview of the Document	- Orientation of documents for developing IFMP, fully updated documents up to the time of handbook preparation.	- Updating newly issued, amended and supplemented legal normative documents.
<b>Part 2: Introduction to Integrated Flood Management</b>		
- Flood situation and damage	- Overview of flood situation and flood damages up to the time of manual development (2010)	- Updating the damage data until 2020.
- Integrated flood management of river basins	- Provide the definition and specific objectives of Integrated Flood Management	- Evaluation of the manual in 2016 and the current status of integrated flood management plans in the central provinces

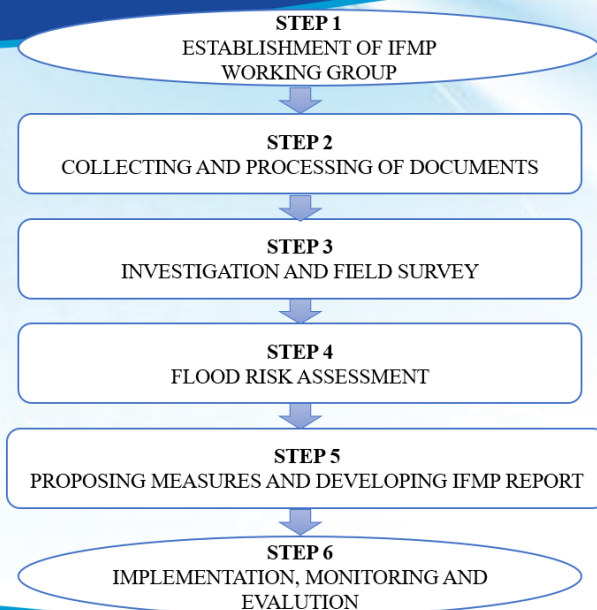
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## I. INTRODUCTION TO IFMP AND MANUAL

	Outdated document (2016)	New material
<b>Part 3: Main contents for developing IFMP</b>		
Step 1: Establishing the working group.	- Tasks for the team to carry out have not been summarized yet	- Identifying the tasks that the working group needs to carry out.
Step 2: Reviewing documents	- Not collect and evaluate documents on natural characteristics, socioeconomic conditions, infrastructure, flood situation, and documents related to flood prevention and control in the river basin. - Not evaluate the previous IFMPs	- Supplementing the collection and evaluation of documents on natural characteristics, socio-economic conditions, infrastructure, flood situation, and documents on flood prevention and control in the river basin. - Supplement the evaluation of previous IFMPs
Step 3: Field investigation and survey	- The detailed guidance for the required tasks is not provided	- Detailed guidance on the tasks to be carried out
Step 4: Flood risk analysis	- Not providing many risk analysis methods and still using simple risk assessment methods	- Provide advanced risk analysis methods (qualitative, quantitative) and risk assessment approaches
Step 5: Propose solutions and Develop Comprehensive Flood Management Plan report (CFMP)	- The implementation schedule for measures has not been specified, and a template table of measures has not been provided - The main content of the report lacks legal basis, evaluation of the current state of flood prevention and control in the river basin, and a section on assigning responsibilities	- Providing a phased implementation plan for measures and a template for a list of measures. - The main content of the report is supplemented by legal basis, assessment of the current situation of flood prevention and control on the river basin, and assignment of responsibilities.
Step 6: Implementation and Review/Evaluation of IFMP	- A detailed guidance on implementing, reviewing, and evaluating the work is needed.	- Unchanged

## II.GUIDANCE ON THE STEPS FOR DEVELOPING IFMP

### The process of implementation



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## II.GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



1. Identify the relevant parties.

2. Sending official letters to departments and agencies.

3. Establishment of a working group decision.

### 1. Identify the involved parties:

- Provincial People's Committee and centrally-governed cities;
- Other relevant departments and agencies.

### 2. Send official letters to the departments and agencies:

- The Provincial Steering Committee for Disaster Prevention and Search and Rescue sends official letters to the relevant departments and agencies.

### 3. Decide to establish a task force:

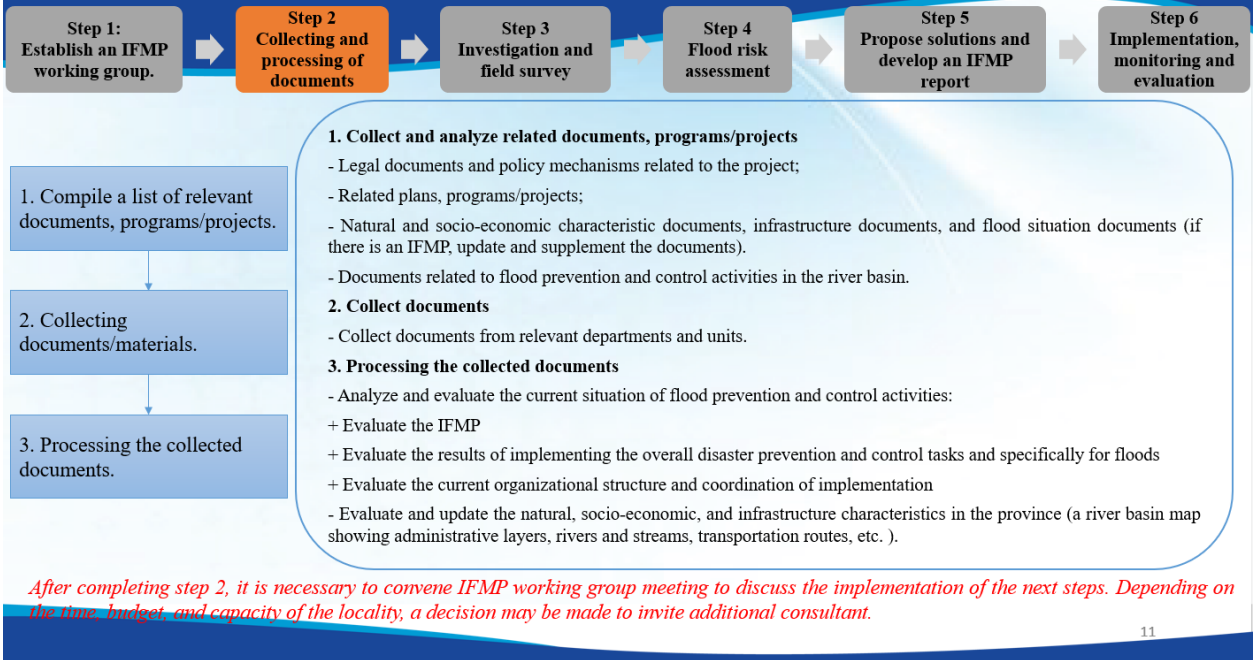
- The provincial People's Committee makes a decision to establish IFMP working group.

*Note: The list of IFMP working group members must include at least one official from the Department of Agriculture and Rural Development, the Department of Natural Resources and Environment, the Department of Planning and Investment, the Department of Finance, the Department of Industry and Trade, and the provincial Hydro-Meteorological Station.*

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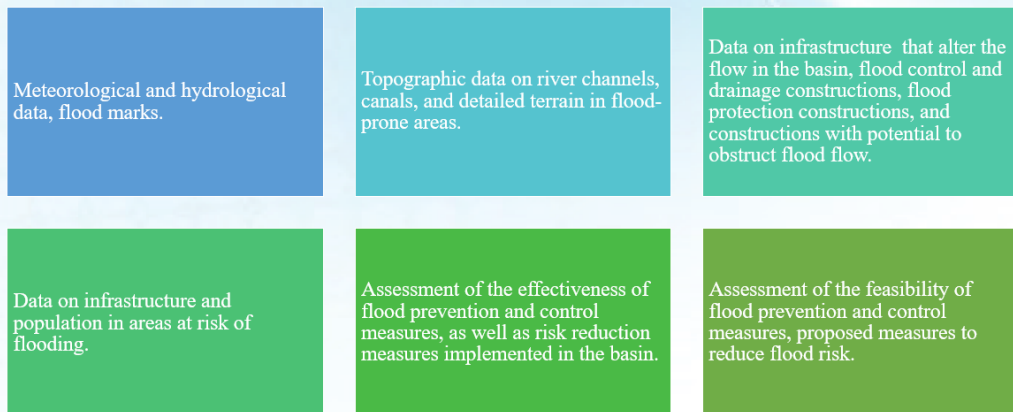
## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



Some important contents that need to be surveyed and updated information.



## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



*Some investigation and field survey images.*



Measure flood depth.



Measuring flood levels using DGPS equipment.



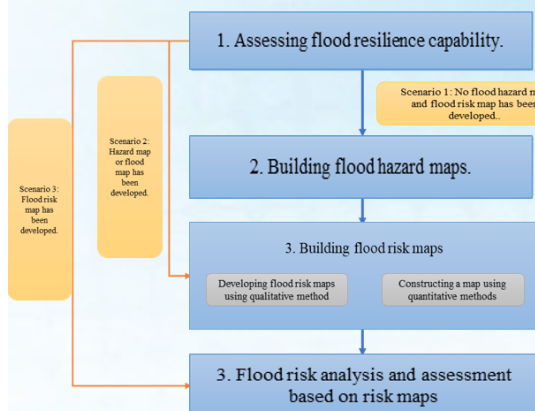
Additional surveying of topographic, river cross-sections data using depth sounder equipment combined with DGPS.



Surveying infrastructure in flood-prone areas.

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## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



### 1. Assessing flood resilience capability:

- Assessment of legal compliance, mechanisms, and policies;
- Assessment of human resources and capacity of flood control forces;
- Assessment of the current situation of flood forecasting and warning at the local level;
- Assessment of equipment, materials, and facilities for flood control;
- Assessment of the capacity of core response forces in flood control;
- Assessment of the current situation of information systems and communication at the local level;
- Assessment of the community's awareness and skills in responding to natural disasters and training for flood control at the local level;
- Assessment of flood control infrastructure;
- Assessment of the current situation of support for post-flood damage control;
- Assessment of financial resources for implementing flood control activities at the local level, either through direct or indirect investment.

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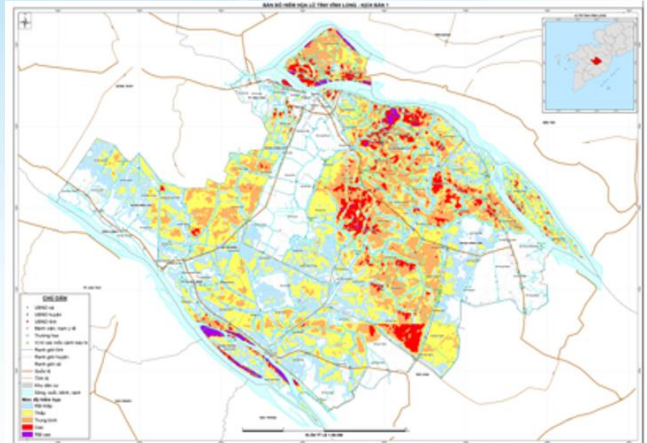


## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



### 1. Building flood hazard maps:

- Flood hazard map shows the levels of flood (based on 3 factors: inundation depth, velocity, and inundation duration).
- The map displays:
  - + Specialized layer: the maximum inundation depth and scale, distribution of peak flood velocity, and duration of inundation across space.
  - + Background layer: geographic factors and hydraulic system such as reservoirs, pumping stations, dams, dykes, etc.



*Flood Hazard Map of Vinh Long Province,  
Source: Project "Investigation, Survey, and Issuance of Water Levels  
Corresponding to Flood Alert Levels in Vinh Long Province"*

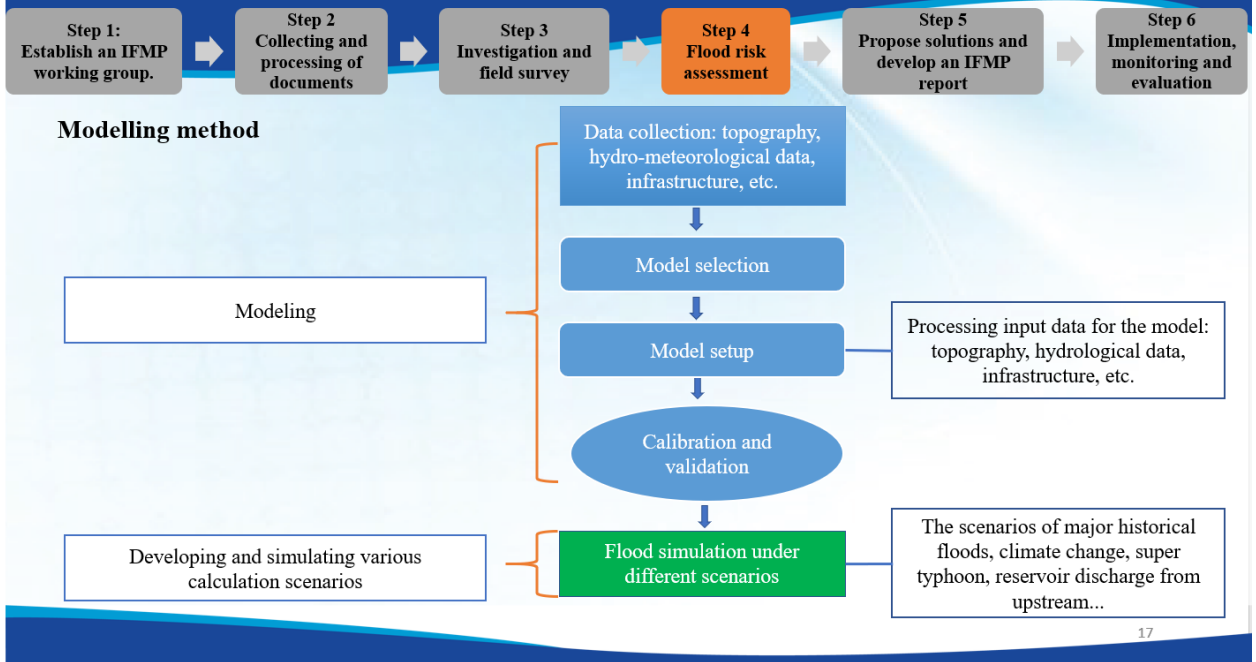
## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



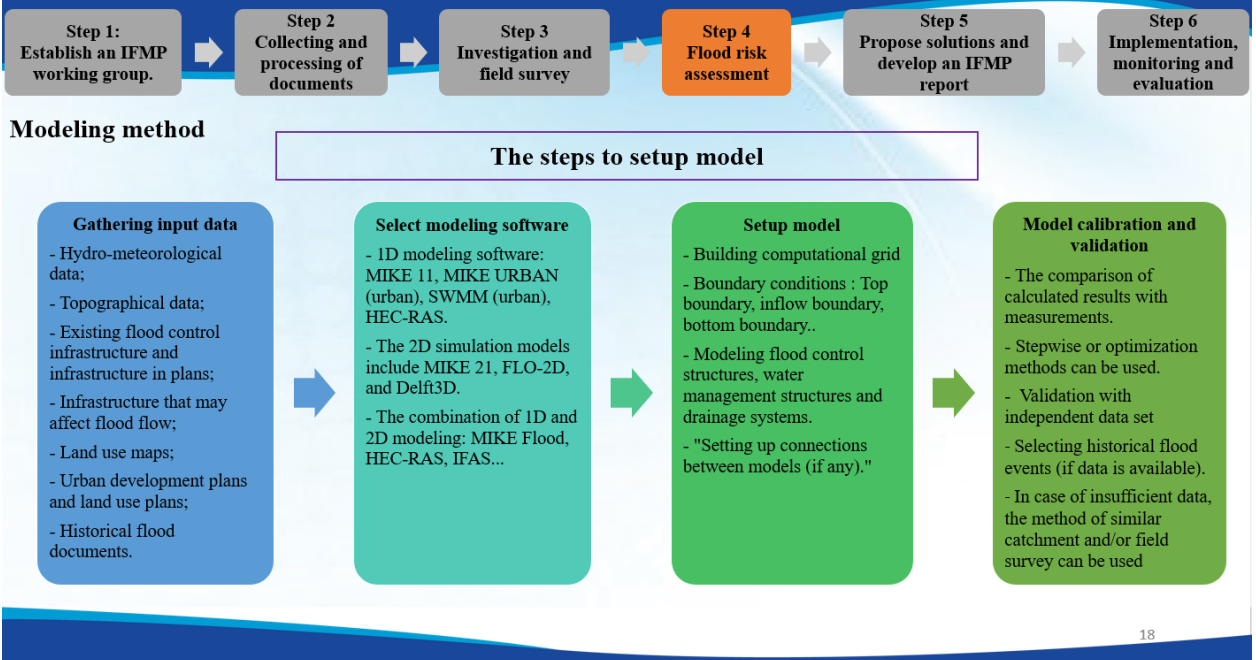
### Method of developing flood hazard maps

Survey method	Remote sensing method	Modeling method
<ul style="list-style-type: none"> <li>Based on the survey of the area, elevation investigation, location of flood marks, determine the flooded areas by spatial interpolation method..</li> <li>Combine with data from the digital elevation model to develop maps.</li> <li>Advantages: Allows for quick simulation of maps based on actual measurement data and digital elevation models.</li> </ul>	<ul style="list-style-type: none"> <li>Apply to develop flood events that have occurred in the past.</li> <li>Combining the digital elevation model and water level measurement data to develop maps.</li> <li>Depend on the quality and resolution of the captured images.</li> <li>Cannot analyze the depth of flooding.</li> </ul>	<ul style="list-style-type: none"> <li>Using hydrological and hydraulic models to simulate rainfall and flood flows according to calculated scenarios.</li> <li>Required input data: hydro-meteorological data, terrain data, cross-section data of the river, measured flood data used for calibration and verification.</li> <li>Using GIS tools to stack and integrate information and develop maps.</li> </ul>

## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



### Modeling method

#### Developing computational scenarios

- Historical flood events in the locality;
- Natural disaster risk level for floods and inundation in the locality (as regulated in Article 45, Decision No. 18/2021/QĐ-TTg);
- Climate change scenarios issued by the Ministry of Natural Resources and Environment;
- Super typhoon and flood scenarios caused by upstream reservoir discharge;
- Land use plans, urban development plans,... (related to scenarios of water exploitation, changes in urban infrastructure, etc.);
- Proposed measures to minimize flood damage (single measures or a combination of multiple measures).

*Note: For coastal provinces in Central Vietnam, attention should be paid to the scenario of climate change and sea level rise.*

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## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



### 2. Building flood risk maps

- Building GIS database
- Developing hazard maps

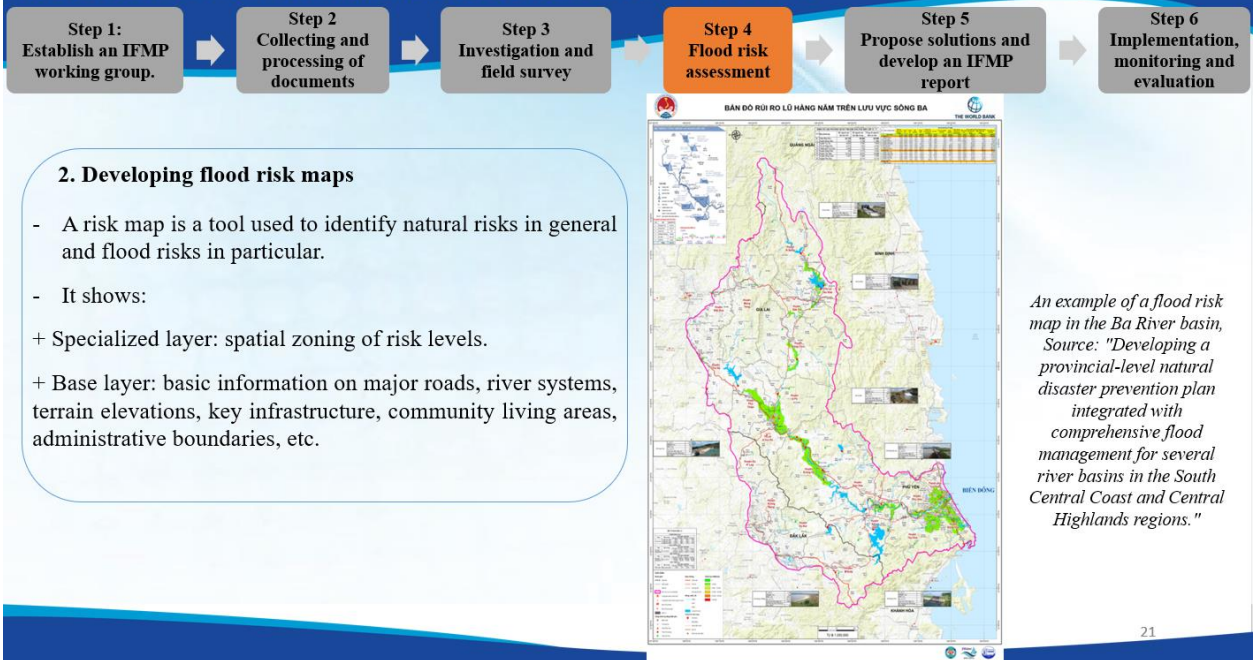
- Disaster hazard refers to the level (intensity) of a natural phenomenon that can cause adverse impacts to affected objects.
- Risk is the damage that a natural disaster can cause to people, property, environment, living conditions, and socio-economic activities.

#### DATABASE

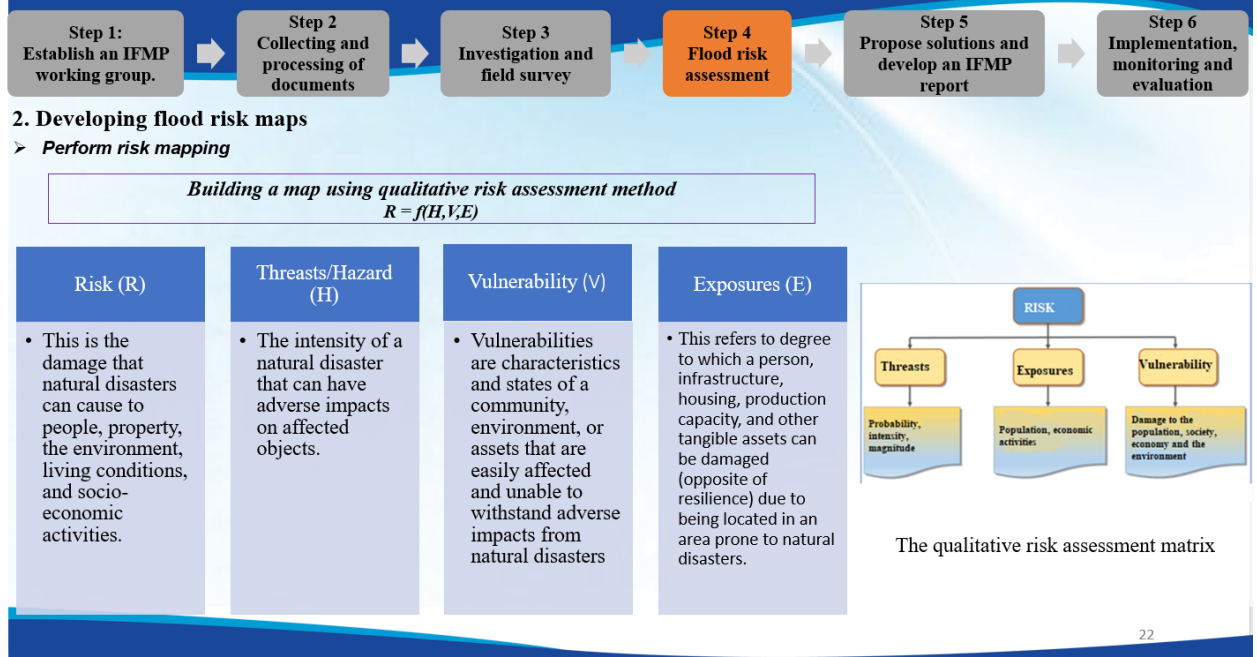
- Geographic data: administrative boundaries, transportation networks, hydrological systems, land use/land cover, topography, socioeconomic and demographic data.
- Specialized data: exposed data, vulnerable data, hazardous data...
- The simulated results of flood hazards corresponding to different scenarios.
- Development plans/strategies

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## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP





## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



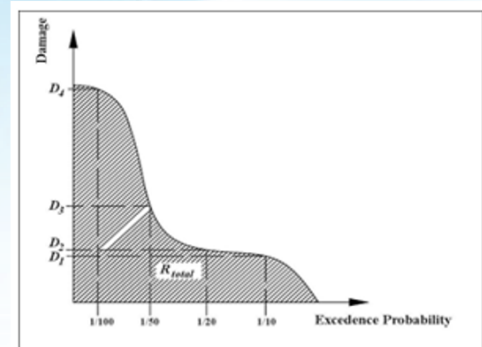
### 2. Developing flood risk maps

#### ➤ Perform risk mapping

*Constructing flood risk maps using quantitative risk assessment method.*

#### Quantitative risk assessment.

- It is a function of Probability and Damage. In other words, flood risk is determined by the expected annual damage value and the sum of all flood frequencies.
- The advantage is that it can better estimate the economic value at risk and compare the risk levels of different areas.



*Probability-based damage function*

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## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



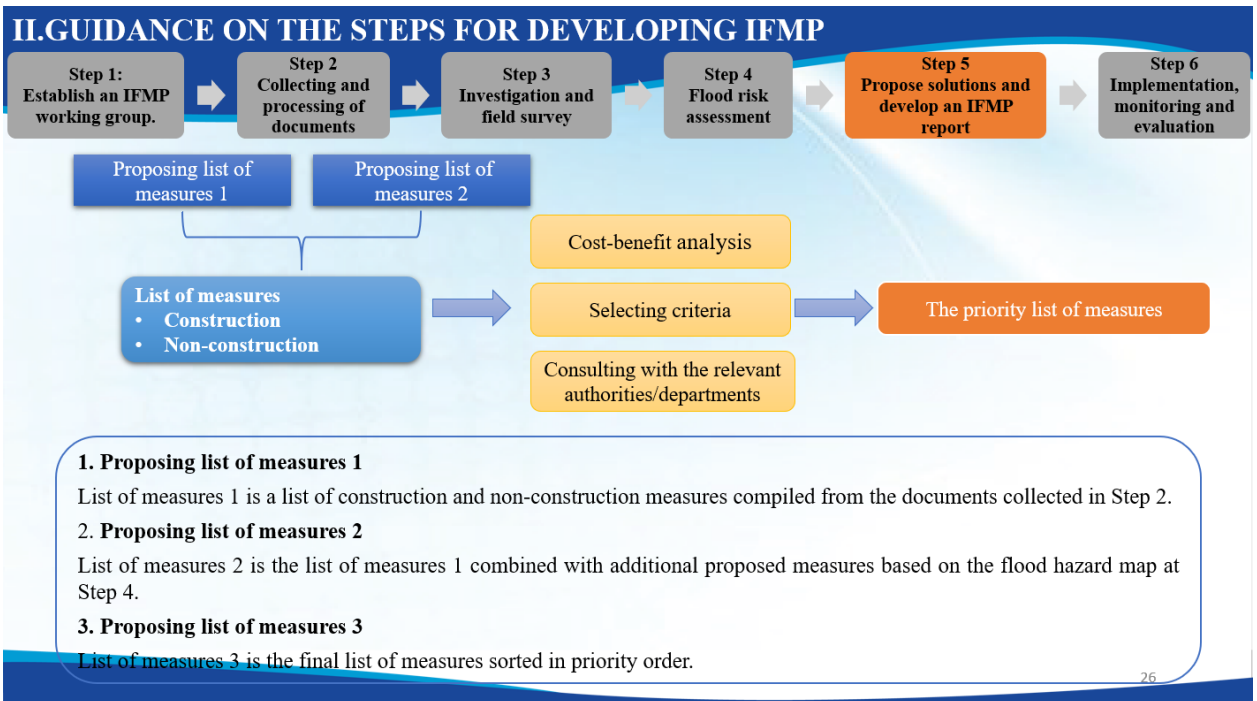
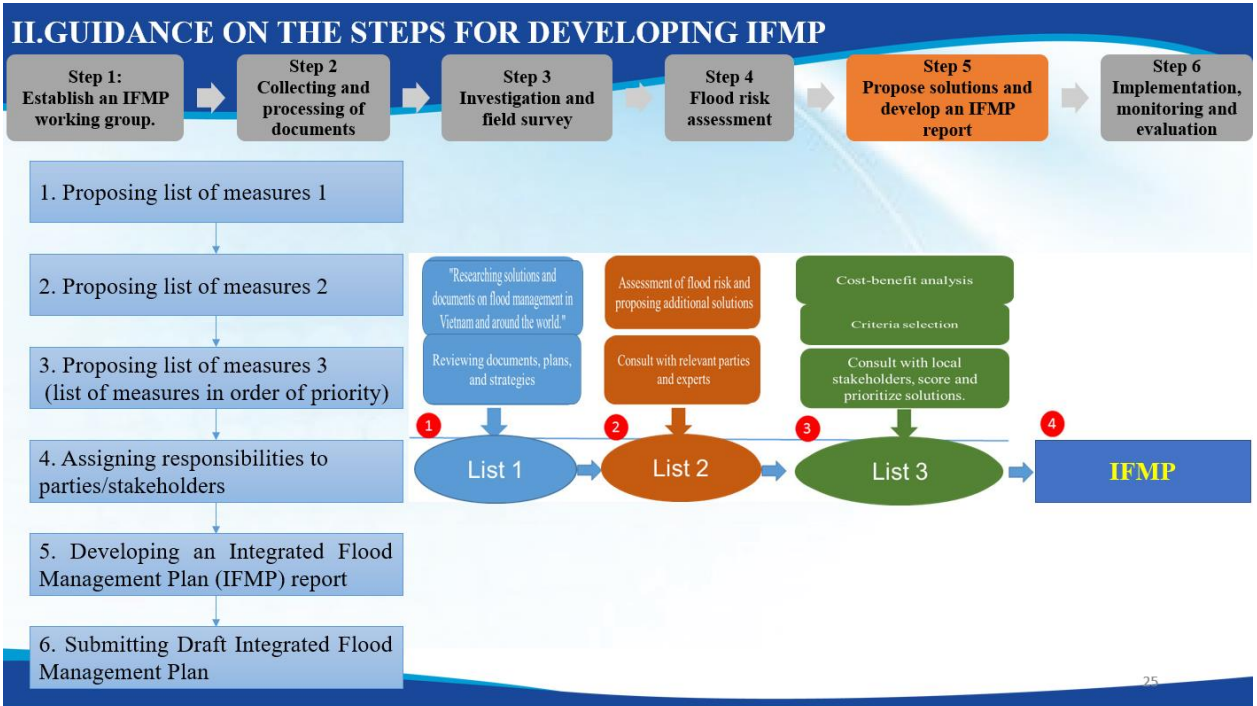
### 4. Analysis and assessment of flood risk based on flood risk maps

- Based on the flood risk map that has been developed, identify the risk zones and then analyze and evaluate the risk according to 5 levels (Decision No. 18/2021/QĐ-TTg dated April 22, 2021 on regulations on forecasting, warning, information dissemination on natural disasters and levels of natural disaster risk):

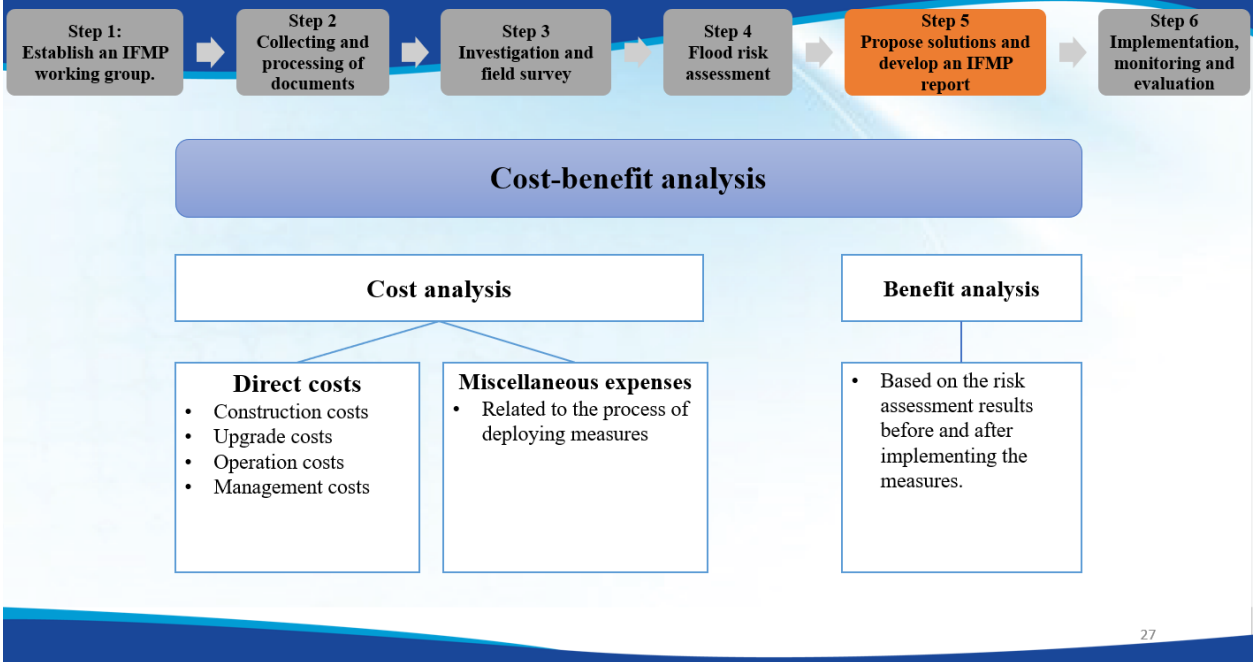
- +Low risk,
- +Moderate risk,
- +High risk,
- +Very high risk,
- +Catastrophic risk.

- For river basins that have already developed flood hazard maps or flood inundation maps, the development of flood hazard maps can be omitted.
- For river basins that have already developed flood risk maps, the development of flood hazard maps can be omitted.

24

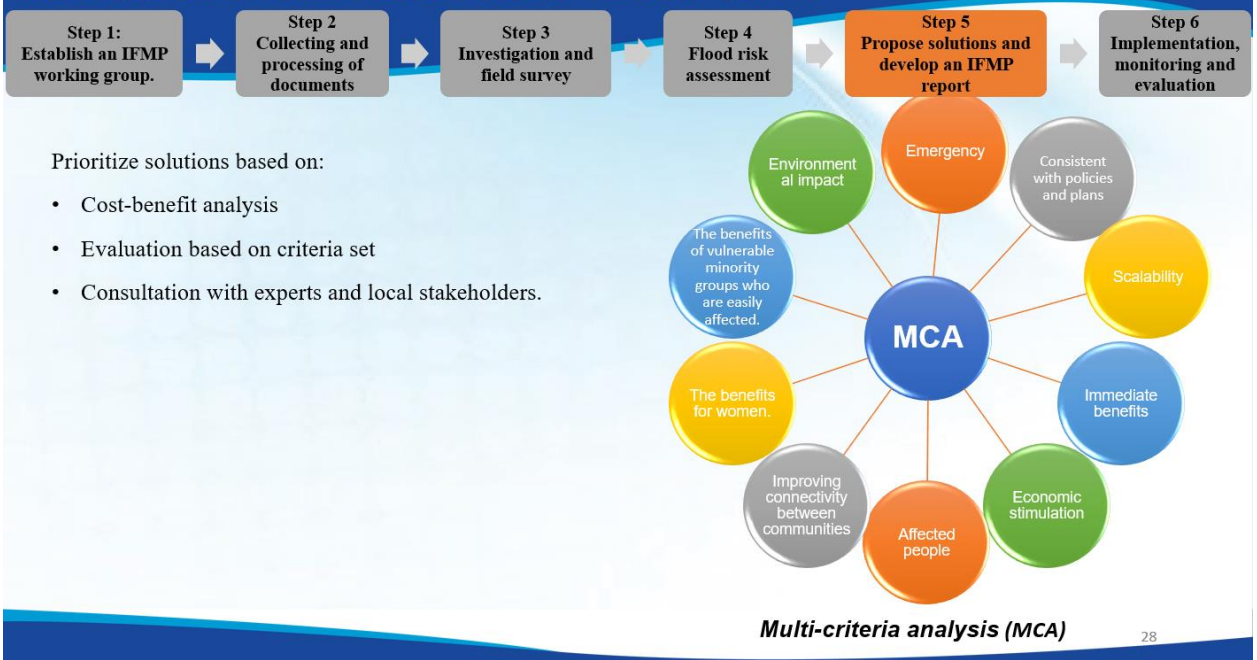


## II.GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



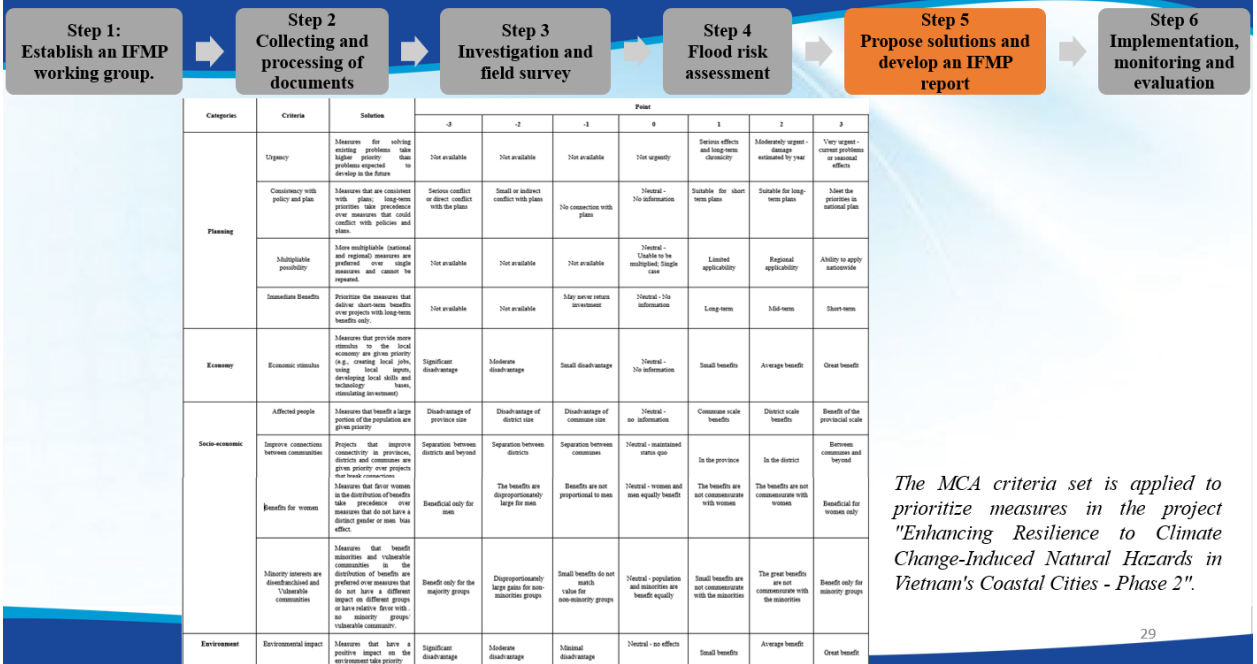
27

## II.GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



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## II.GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



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## II.GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



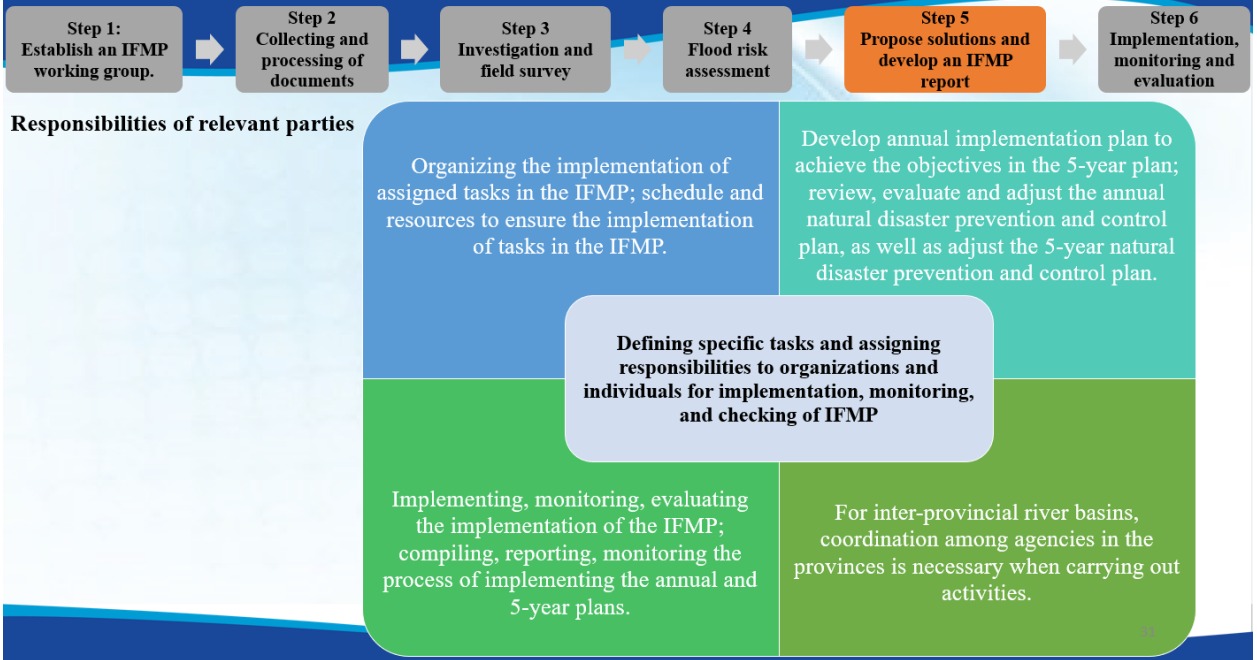
The template table of flood prevention and control measures

No.	Program/ Project	Objectives	Lead Agency	Coordinating Agency	Implementation divergence			Expense	Budget resource			
					Year	Year	Year		Local	Central	Other sources	
A	STRUCTURAL MEASURES											
A.I	Prevention and mitigation phase											
...	...	...	...	...	...	...	...	...	...	...	...	
A.II	Response phase											
...	...	...	...	...	...	...	...	...	...	...	...	
A.III	Remedial and reconstruction phase											
...	...	...	...	...	...	...	...	...	...	...	...	
B	NON-STRUCTURAL MEASURES											
B.I	Prevention and mitigation phase											
...	...	...	...	...	...	...	...	...	...	...	...	
B.II	Response phase											
...	...	...	...	...	...	...	...	...	...	...	...	
B.III	Remedial and reconstruction phase											
...	...	...	...	...	...	...	...	...	...	...	...	

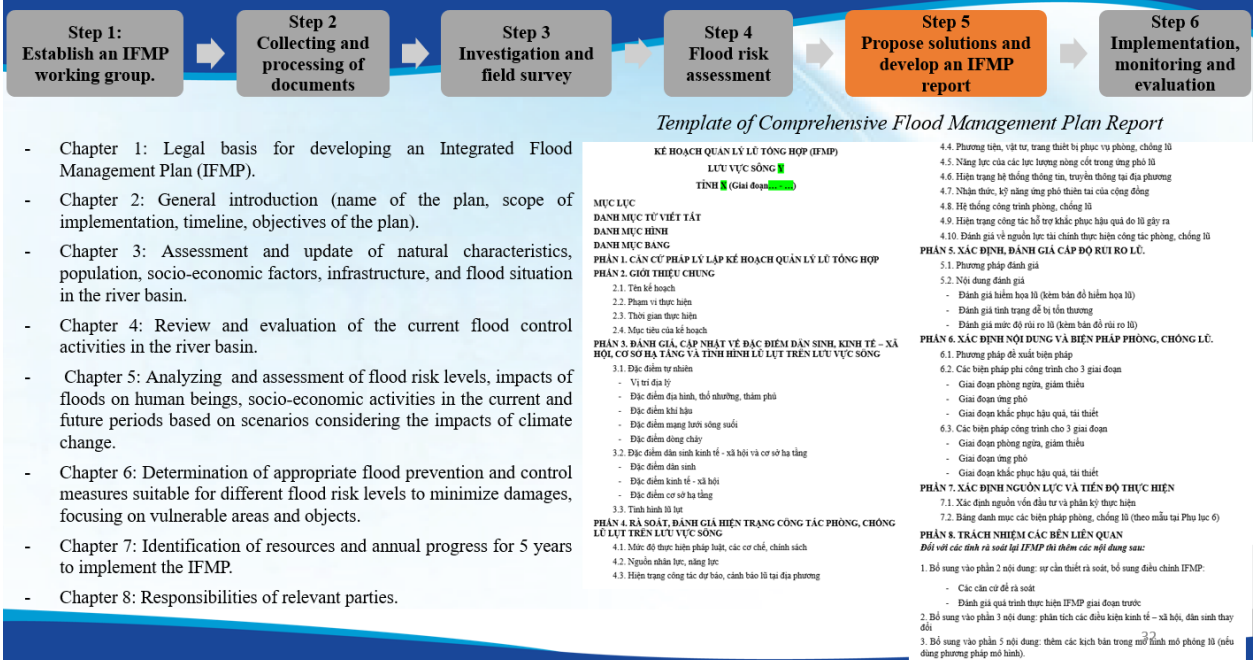
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## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



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## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



- After the IFMP Working Group completes the IFMP Development Report, the Department of Agriculture and Rural Development will draft a Plan and submit a letter to the provincial People's Committee.
- The Department of Agriculture and Rural Development will direct the IFMP Working Group to complete the Plan and Report based on the feedback received.
- The Department of Agriculture and Rural Development will coordinate with the Provincial People's Committee Office to submit the draft Plan.

### Decision approving the IFMP

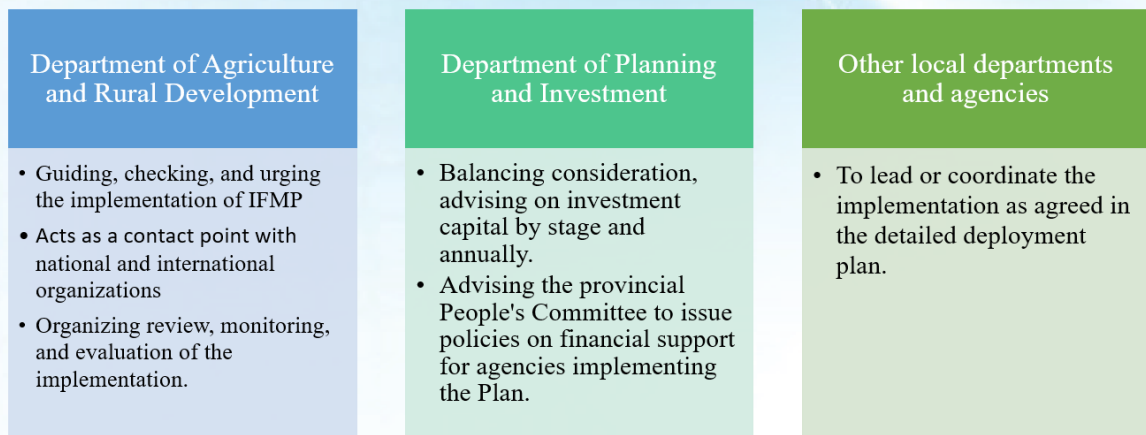
ỦY BAN NHÂN DÂN ...TỈNH... Số: ... ngày ... tháng ... năm ...	CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM Độc lập - Tự do - Hạnh phúc ... ngày ... tháng ... năm ...
<b>QUYẾT ĐỊNH</b> Về việc phê duyệt kế hoạch quản lý lũ tổng hợp lưu vực sông ... tỉnh ... giai đoạn 20... - 20...	
ỦY BAN NHÂN DÂN TỈNH ...	
Căn cứ ... (một số Luật có liên quan như Luật Tổ chức hội đồng nhân dân... Luật Phòng chống thiên tai, một số Nghị định hướng dẫn có liên quan...) Căn cứ ... (các Quyết định của Thủ tướng Chính phủ, các Bộ ban ngành TW, UBND tỉnh về các lĩnh vực liên quan đến phòng chống thiên tai) Căn cứ ... (Thành lập Tổ công tác lập IFMP, lập Ban chỉ đạo dự án...) Xét đề nghị của Sở Nông nghiệp và PTNT tại tờ trình số ...	
<b>QUYẾT ĐỊNH:</b>	
Điều 1. Phê duyệt Kế hoạch quản lý lũ tổng hợp lưu vực sông Y tỉnh X giai đoạn 20... - 20... (có bản cáo kèm theo) với những nội dung chủ yếu sau:	
1. Tên kế hoạch: ... 2. Phạm vi thực hiện: ... 3. Thời gian thực hiện: ... 4. Mục tiêu của kế hoạch: ... 5. Nội dung của kế hoạch: ... a) Khung kế hoạch b) Các biện pháp công trình và biện pháp phi công trình (Đính kèm danh mục các biện pháp phòng, chống lũ theo mẫu tại phụ lục 6) 6. Dự kiến tổng số nhu cầu vốn đầu tư: ... 7. Nguồn vốn đầu tư: ... 8. Tổ chức thực hiện: a. Sở Nông nghiệp và PTNT b. Sở Kế hoạch và Đầu tư c. Sở Tài chính	
Nơi nhận: - Như Điều 1 - TTU, TT HĐND tỉnh (báo cáo) - CT, các PC UBND tỉnh; - LHPV UBND tỉnh; - AMV, X...	TÀI ỦY BAN NHÂN DÂN CHỦ TỊCH

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## II. GUIDANCE ON THE STEPS FOR DEVELOPING IFMP

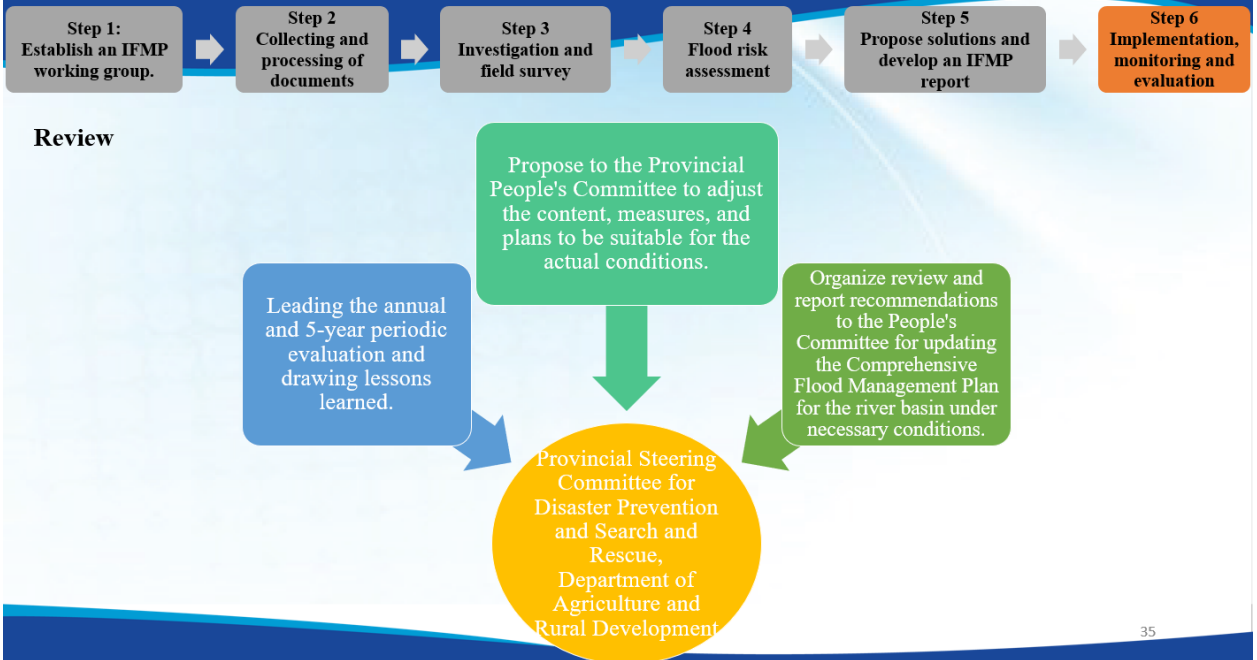


### Implementation

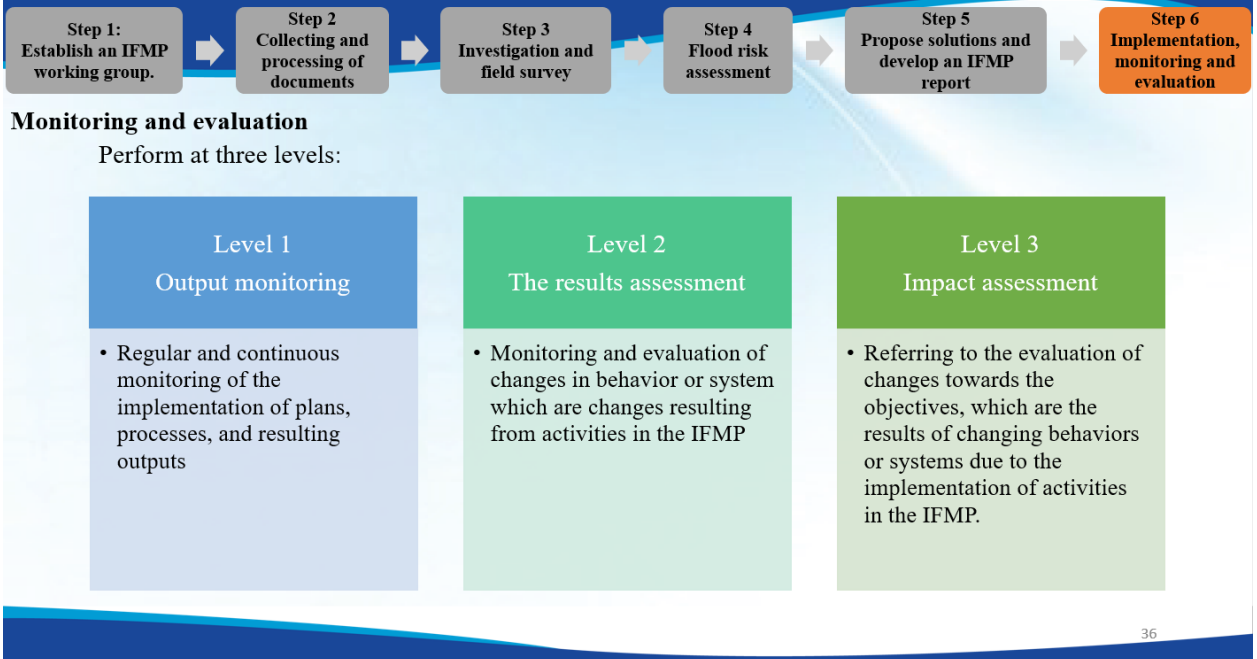


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## II.GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



## II.GUIDANCE ON THE STEPS FOR DEVELOPING IFMP



### III. CONCLUSION AND DISCUSS

- The manual is developed based on the 2016 manual document and practical implementation experiences of localities that have developed IFMPs. The document provides detailed steps to develop Integrated flood management plans for the locality.
- The manual is designed to support provincial People's Committees in developing IFMP for river basins within their jurisdiction. Depending on the actual situation, localities can flexibly implement the steps and methods introduced in this manual.
- The objective of the training course is to enhance the knowledge of local officials, help them understand the process of building IFMPs, the data, methods, and tools used at each step, thereby developing practical-oriented proposals and controlling the quality of the product during the development process.
- Localities should consider proposing necessary training courses in the near future.

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## Thank you!

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## 2. Integrating IFMP into the provincial disaster prevention plans



VIETNAM NATIONAL UNIVERSITY  
VNU UNIVERSITY OF SCIENCES  
CENTRE FOR ENVIRONMENTAL FLUID DYNAMICS



### TRAINING ON INTEGRATING IFMP INTO THE PROVINCIAL DISASTER PREVENTION PLANS

PROJECT: STRENGTHENING THE CAPACITY OF OFFICIALS ON  
INTEGRATED FLOOD MANAGEMENT PLANS (IFMP): INTEGRATING  
IFMP INTO PROVINCIAL DISASTER PREVENTION PLANS IN  
COASTAL PROVINCES OF CENTRAL VIETNAM

#### Report contents

1. General information;
2. Overview of Natural Disaster Prevention and Control Integrated Flood Management Plans;
3. Process and content integrated.

## General information

**Project:** Strengthening the capacity of officials on Integrated Flood Management Plans (IFMP): Integrating IFMP into provincial disaster prevention plans in coastal provinces of Central Vietnam.

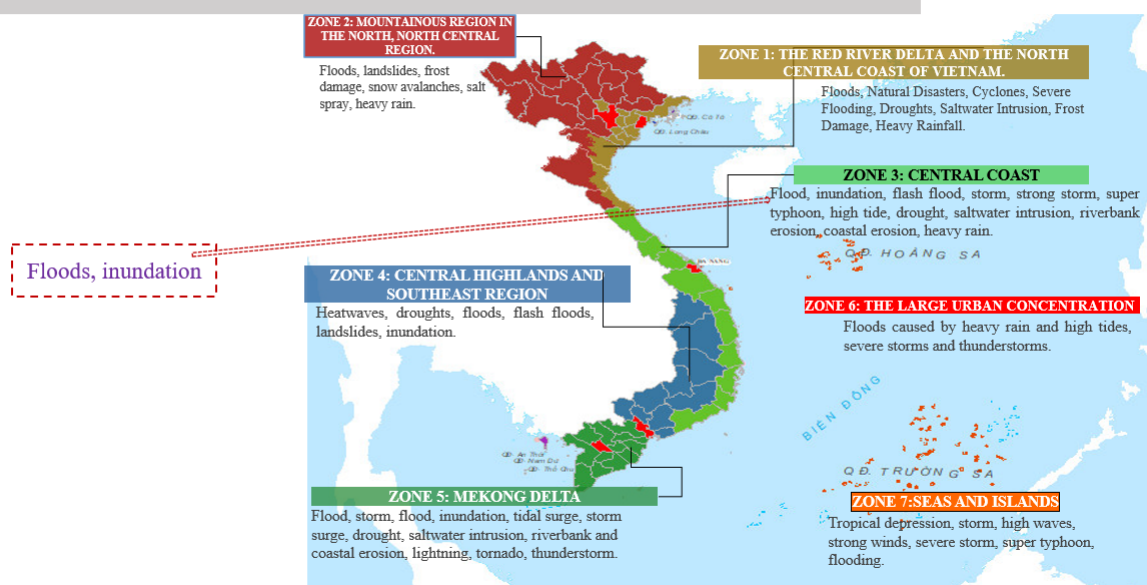
**Grant:** Asia-Pacific Network for Global Change Research (APN)

**Areas:** Quang Nam, Quang Ngai, Binh Dinh

**Time:** 1/10/2022 – 30/9/2023

**Objectives of the Project:** The main objective of the project is to improve the quality and effectiveness of disaster prevention at the provincial level, in order to reduce the damages caused by floods. It can be done through strengthening the capacity and knowledge of officials in the relevant departments and agencies in developing integrated flood management plans, guiding the integration of the IFMP into the provincial disaster prevention and control plan.

## Typical natural disaster zoning in Vietnam



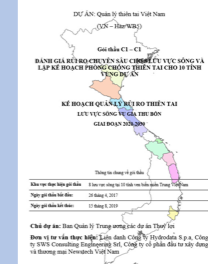
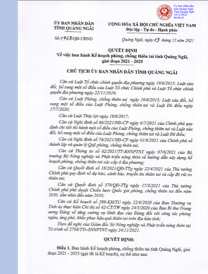
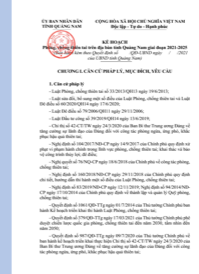
(Source: Circular No. 02/2021/TT-BNNPTNT guiding the development of disaster prevention and control plans at all levels in localities)

## Flooding affects Binh Dinh



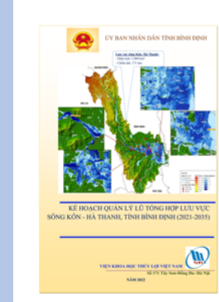
## The Provincial Disaster Prevention Plans Framework

1. Legal basis for planning;
2. Purpose, requirements;
3. Characteristics of natural, social, economic, and infrastructure conditions;
4. Evaluation of the current state of disaster prevention and control work;
5. Identifying and assessing natural disaster risks;
6. Measures for disaster prevention and control;
7. Integrating disaster prevention and control content into plans, programs, and projects;
8. Determining resources and annual and 5-year progress;
9. Determining the responsibilities of organizations and individuals.



## Integrated Flood Management Plan (IFMP) Framework.

1. Legal basis for developing Integrated Flood Management Plan according to river basin;
2. Natural, socio-economic and infrastructure characteristics in the province;
3. Review and evaluate the current situation of flood prevention and control in the river basin;
4. Identify and evaluate the level of flood risk, the impact of floods on people and socio-economic activities;
5. Propose flood prevention and control measure;
6. Determine the responsibilities of organizations and individuals.



## Instructions for integration: 3 questions to be answered.

**Question 1:** What are our responsibilities and duties?

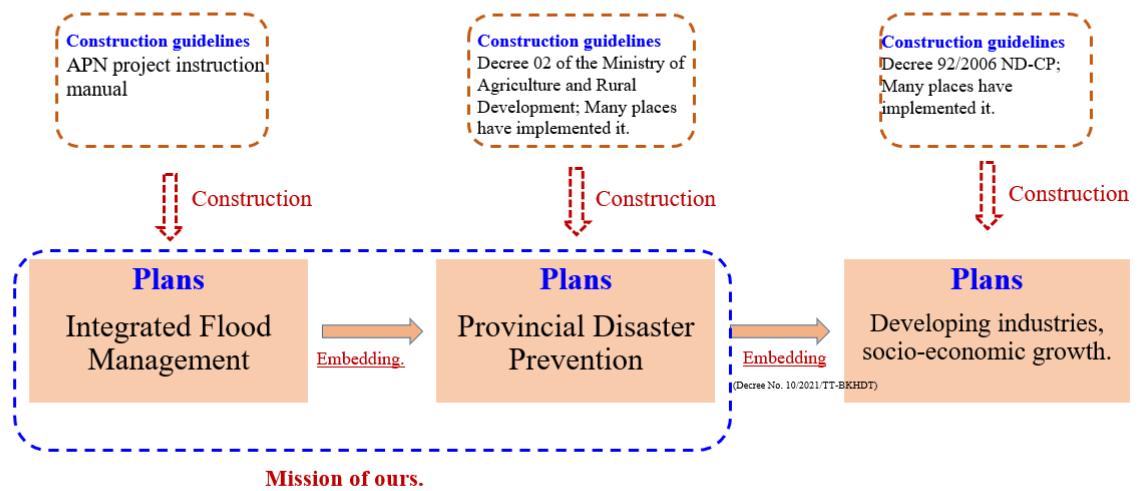
**Question 2:** What content needs to be integrated?

**Question 3:** How should the integration be carried out (process, content)?



## Responsibility, duty.

Answering question  
1

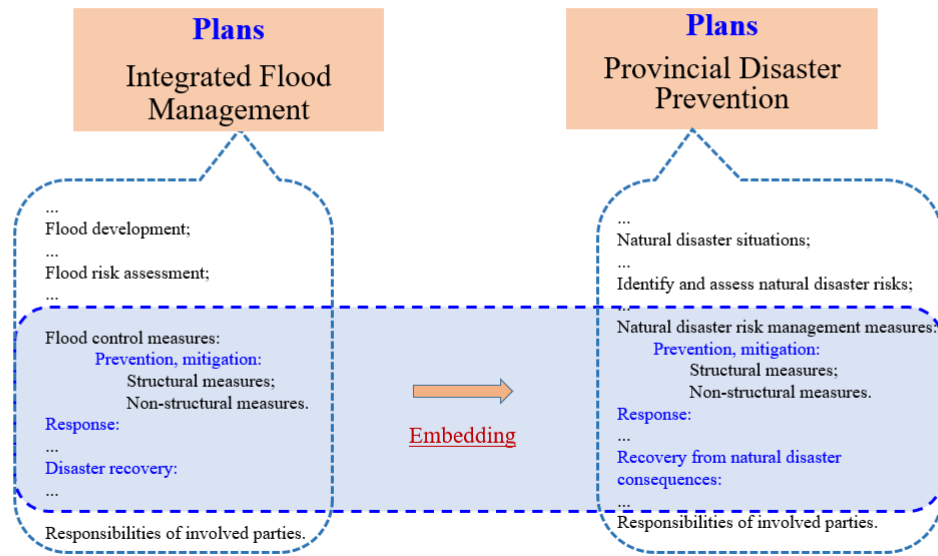


## The objective of integrating manual.

- Clarify the purpose, significance, content, and implementation methods of integrating IFMP;
- Provide technical basis for provincial officials to integrating IFMP into the provincial disaster prevention plans;
- Serve as a reference document for relevant parties on integrating IFMP into disaster prevention activities and local development.

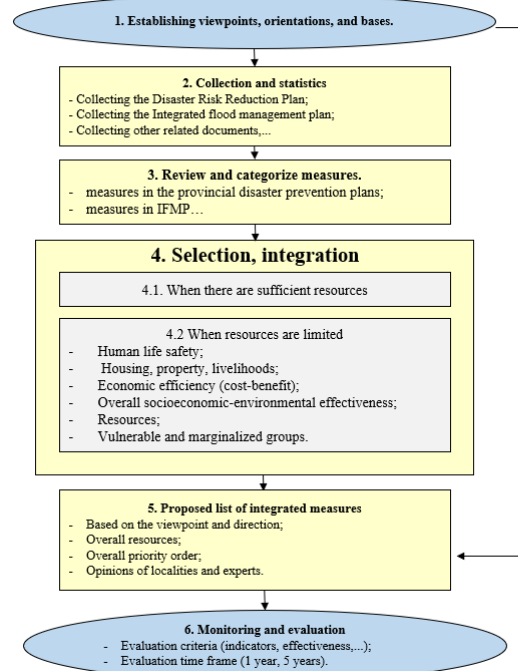
## Embedding content

Answering question 2



## Content Integration Process

Answering question 3



## Step 1: Establish viewpoint, direction, principles

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- In accordance with the spirit of remeasures, decisions, legal documents, development plans, etc.;
- Clear objectives and content;
- Balancing benefits, risks, and being suitable for the natural characteristics of each region and locality to ensure sustainable development (human, economic, environmental...);
- Suitable for the characteristics of each sector, local resources, focus, ensuring feasibility and effectiveness;
- Harmonizing measures in all 3 phases: prevention, mitigation (both structural and non-structural), response and recovery from natural disasters, ensuring system, coherence, and comprehensiveness;
- Considering the impact of other types of natural disasters;
- Reviewing the 5-year plan, annual plan of the previous period if the new plan has not been approved;
- Conducting review and survey if necessary;
- ...

## Step 2: Collection and statistics

**What, where?**

14

### 1. Collect approved the provincial disaster prevention plans:

- Record-keeping agency (Department, Committee,...);
- Final report on the provincial disaster prevention plans;
- Approved the provincial disaster prevention plans;
- Other reports, meeting minutes, workshop records;

...

### 2. Collect approved Integrated Flood Management Plan (IFMP):

- Record-keeping agency (Department, Committee,...);
- Final report on Comprehensive Flood Management of the province;
- Approved Comprehensive Flood Management Plan of the province;
- Other reports, meeting minutes, workshop records;

### 3. Other documents:

- Other relevant documents;
- Opinions of citizens, management levels, experts;
- ...

### Step 3: Review and categorize the measures.

Form of result

#### 1. Review and categorize the measures in the provincial disaster prevention plans:

- Review;
- List;
- Classify, categorize;

...

#### 2. Review and categorize the measures in the IFMP:

- Review;
- List;
- Classify, categorize;

...

- ✓ Prevention, mitigation:
  - Structural measures;
  - Non-structural measures;
- ✓ Response:
  - Structural measures;
  - Non-structural measures;
- ✓ Natural disaster recovery:
  - Structural measures;
  - Non-structural measures;

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### Step 3: Review and categorize the measures.

Answer form

#### FORM 1

- ✓ Prevention, mitigation:
  - Structural measures;
  - Non-structural measures;
- ✓ Response:
  - Structural measures;
  - Non-structural measures;
- ✓ Natural disaster recovery:
  - Structural measures;
  - Non-structural measures;

#### FORM 2

- ✓ Structural measures:
  - Prevention and mitigation
  - Response
  - Recovery from natural disasters
- ✓ Non-structural measures:
  - Prevention and mitigation
  - Response
  - Recovery from natural disasters.

#### FORM 3

- ✓ Structural measures:
  - Improving the legal framework and policy mechanisms:
    - Prevention and response measures
  - Strengthening organizational structure and disaster management capacity:
  - ...
- ✓ Non-structural measures:
  - Investment, upgrading of disaster prevention and water conservancy works:
    - Prevention, response, etc...
  - Investment, upgrading of construction works taking into account disaster prevention:...
  - ...

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## Step 3: Review and categorize the measures.

**DẠNG KẾT  
QUẢ**

17

### ✓ Structural measures:

- Complete the legal document system and policy mechanism.
  - *Prevention, response, ...;*
- Strengthening the organization, machinery, and capacity for natural disaster management:
- Develop, review, and implement plans, strategies, and options:
- Improving forecasting and warning capabilities at the provincial level.
- Raising awareness and knowledge of disaster prevention and mitigation for the community.
- The program for forest planting and protection.
- The application of science and technology in agricultural production....
- ...

### ✓ Non-structural measures:

- Investing and upgrading natural disaster prevention and hydraulic works.:
  - *Prevention, response, ...;*
- Considering natural disaster prevention in investment and upgrading of construction works.
- Investment and upgrading of transportation infrastructure combined with natural disaster prevention and mitigation.
- Infrastructure for water supply and drainage.:
- Sheltering docks for ships and boats during storms.
- Hydropower reservoir:
- Measurement, monitoring and early warning works.:
- ...

## Step 4: Selection, integration

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### measures of IFMP

- Structural measures;
- Non-structural measures.

**Embedding.**

### Provincial disaster risk reduction measures

- Structural measures;
- Non-structural measures.

Structural measures,  
Non-structural measures:

- Subcategories:
  - Prevention;
  - Response;
  - Mitigation.
- ...

### Integrating IFMP measures into the provincial disaster prevention plans.

#### Criterion for selection:

*One side has, one side doesn't;*

*There are many similar contents.:*

- *Standardize one comprehensive measure..*

*There are some similar contents.:*

- *Compare time, purpose, perspective, etc.*

- ...

- *Cost-benefit analysis*



## Step 4: Selection, integration (ensured resource)

Integration of documents

### The IFMP measures

- ✓ Structural measures.:
  - Prevention, mitigation;
  - Response;
  - Recovery from natural disasters...
- ✓ Non-structural measures:
  - Prevention, reduction;
  - Response;
  - Overcoming natural disaster consequences



### The Provincial Disaster Prevention Plans measures.

- ✓ Structural measures:
  - Prevention, mitigation;
  - Response;
  - Disaster recovery..
- ✓ Non-structural measures:
  - Prevention, mitigation;
  - Response;
  - Disaster recovery.

### IFMP Plans + Provincial Disaster Prevention Plans

(Example: 15 IFMP measures + 20 Provincial Disaster Prevention measures = 35 measures)

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## Step 4: Selection, integration (limited resources)

Resource constraints.

### measures of IFMP

- Structural measures;
- Non-structural measures.



### Provincial disaster risk reduction measures

- Structural measures;
- Non-structural measures.

Project, non-project:

- Subcategories:
  - Prevention;
  - Response;
  - Remediation.
- ...

### Integrating IFMP measures into the Provincial Disaster Prevention Plans.

#### Selection criteria:

*One side has it, one side doesn't.*

*There are many similar contents:*

- Agree on a comprehensive measure

*There are some similar contents:*

- Compare the time, purpose, viewpoint, ...;
- ...
- Cost-benefit analysis..

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## Step 4: Selection, integration (limited resources)

### Criterion for selection and integration

(limited resources)

- Human life safety (B2);
- Housing (B2);
- Property, livelihood (B2);
- Economic efficiency (Cost-benefit) (B3);
- Overall economic, social and environmental effectiveness;
- Resources;
- Vulnerable groups and gender....
- ...

Tables:

B2

B3

...

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## Step 5: Proposed list of integrated measures

### Criteria for consideration:

- Perspective and direction;
- Overall priority order;
- Total resources available;
- Opinions of citizens and experts;
- ...



MCA criteria evaluation

**List of measures**

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## Step 6: Monitoring and evaluation

23

### Evaluation criteria

- Pros, cons, causes, and measures;
- Realistic resource investment;
- Through indicators of reducing damage to property, people, and the environment...

### Evaluation time

- Evaluation cycle for the results of implementing the provincial disaster prevention plans is 01 year;
- Evaluation cycle for the results of implementing the provincial disaster prevention plans is 5 years.

### Supervision responsibilities

- The Department of Agriculture and Rural Development is responsible for implementing and supervising...;
- The Steering Committee for Natural Disaster Prevention and Search and Rescue...
- ...

## Responsibility of parties

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### Provincial People's Committee (PPC)

- Direct the Department of Agriculture and Rural Development to lead and coordinate related departments and agencies to implement integration;
- Direct the Department of Planning and Investment and the Department of Finance to coordinate to determine costs and benefits, mobilize resources to implement measures...
- Issue a Decision on the integrated IFMP in to the provincial disaster prevention plans;

### District People's Committee (DPC)

- Leading and coordinating with organizations to collect and analyze data, providing support as needed.....
- ...

## Target audience of the guide

- Provincial and central cities' People's Committees;
- Provincial Steering Committee for Disaster Prevention and Search and Rescue;
- Department of Agriculture and Rural Development, and related departments;
- Central Ministries/Agencies;
- International organizations, NGOs supporting resources to implement IFMP and PCTT plans, and stakeholders involved in planning.



## THANK YOU!

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