

# Strengthening Impact-based Forecasting and Warning in Viet Nam

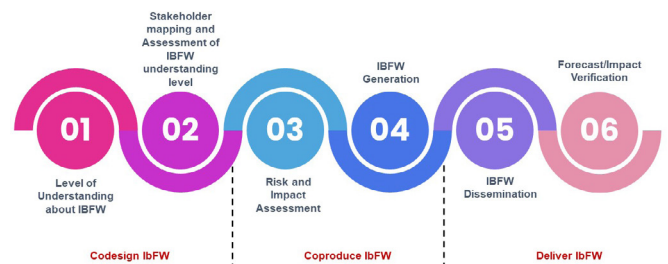
## Case Study

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### The Future of Forecasting: Impact-based Forecasting and Warning

Impact-based Forecasting and Warning (IbFW) represents a significant evolution in meteorological services, shifting the focus from predicting weather conditions to anticipating their potential impacts on society. Unlike traditional forecasts that provide data on temperature, precipitation, wind speed, etc., the impact-based forecasts assess the likely effects of these weather conditions on human activities, infrastructure, and the environment. This approach allows for more actionable information, enabling communities and decision-makers to better prepare for and mitigate the consequences of severe weather events. By integrating advanced technology, social science insights, and enhanced communication strategies, impact-based forecasting aims to improve public safety, enhance resilience, and reduce economic losses in the face of climate change and increasing Climate variability. The IbFW goes a step further and provides a comprehensive service, built on the products of likelihood impacts and actions need to be taken and by the people, communities and CSOs and local authorities. This would also support to trigger the Anticipatory Action (AA) to minimize climate and disaster risks, which are emerging from hydro-meteorological hazards.

As per the Guidelines of the World Meteorological Organization (WMO) the IbFW process comprises of three major key components and six sub-components.



*Components of the IbFW Process*

### IbFW: An essential for Viet Nam

Viet Nam is a country that is prone to climate-induced hazards. Entire Viet Nam's coastline is exposed to typhoons, which strike the country an average of 6-8 times per year. Intense wind and rainfall associated with typhoons frequently cause immense destruction in highly populated coastal areas as well as in deltaic areas such as the Mekong Delta, the country's major rice growing areas. These deltas are also vulnerable to flooding caused by heavy seasonal rainfall. Drought exposure is also higher in Viet Nam and it was significant during 2015–2017. Rainfall in central provinces (such as Ninh Thuan) has been increasing over time, but greater variability has also increased drought incidences.

Viet Nam recognized the effective use of forecasts and early warnings can significantly reduce the impact of hydro-meteorological hazards by empowering institutions and individuals to take anticipatory actions to protect life, property, livelihoods and the environment. In realizing the importance of this, Asian Disaster Preparedness Center (ADPC) supported Viet Nam Meteorological and Hydrological Administration (VNMHA) and Viet Nam Disaster and Dyke Management Authority (VNDMA) to establish IbFW in the country (in piloting in two cities), and bringing sectoral agencies together to strengthen institutional partnerships and to maximize their existing expertise on hazard forecasting,

risk assessment and early warning, to successfully deliver an effective IbFW.

## Readiness Assessment for IbFW in Viet Nam

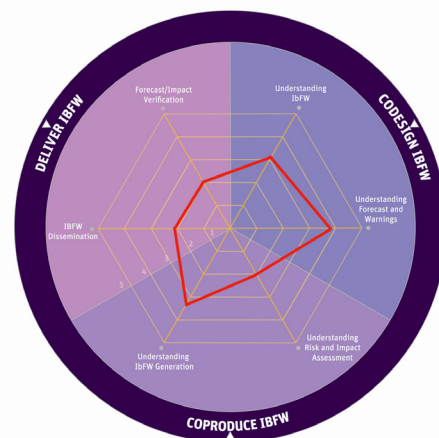
Firstly, ADPC conducted an IbFW readiness assessment to assess existing capacities and future needs related to IbFW of NMHSs, VDDMA and other related stakeholders. The readiness assessment process involved several Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) and consultations with the Viet Nam Meteorological and Hydrological Administration (VNMHA), Ministry of Natural Resources and Environment (MONRE), Viet Nam Disaster and Dyke Management Authority (VDDMA), Ministry of Agriculture and Rural Development (MARD) and other key sectoral agencies, especially agriculture, health, urban, infrastructure and water resources management in Viet Nam.

The result of the assessment was presented to the stakeholders for validation. Overall, the analysis indicates that while there are areas of moderate understanding and performance in IbFW in Viet Nam, several indicators, such as understanding risk, risk assessment, dissemination, and verification, need significant attention and improvement. Focusing on elevating knowledge levels in these areas will bolster the overall effectiveness of IbFW efforts and help build greater resilience to natural hazards in the affected provinces and cities in the country. Additionally, investing in capacity building, stakeholder engagement, and communication will be crucial in advancing IbFW and effectively mitigating risks related to natural hazards in Viet Nam.

The results of the assessment were utilized in developing potential recommendations to overcome some of the challenges encountered when developing IbFW connecting national, subnational and local levels.



*ADPC team conducting IbFW Readiness Assessment with the Vietnamese stakeholders*



*Results of the Readiness Assessment presented on the Spider Chart*



*Report on the readiness assessment for Impact-based Forecast and Warning (IbFW) [Link](#)*

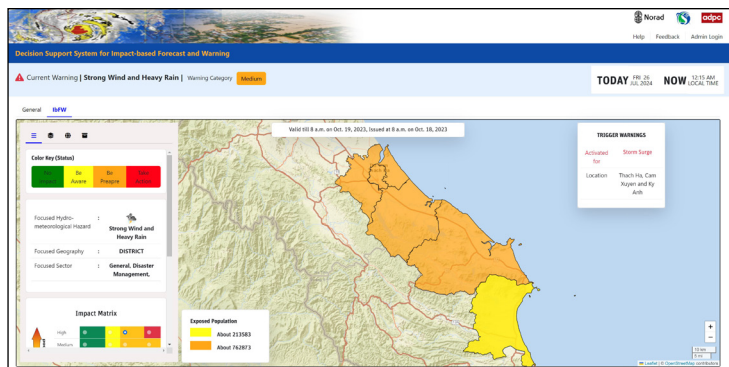
## Decision Support Tool for IbFW

One of the major limitations identified from the readiness assessment was the lack of a Decision Support Tool for implementing IbFW in the country. ADPC supported Viet Nam Meteorological and Hydrological Administration (VNMHA), Viet Nam Disaster and Dyke Management Authority (VDDMA) and People's Committees of My Tho and Nam Dinh Cities to establish IbFW system by developing a Decision Support System (DSS) to ease the decision-making process at national, sub-national and local levels by bringing sectoral agencies together and maximizing their existing expertise on hazard forecasting and risk assessment, communication and dissemination of early warnings for an effective IbFW system in Viet Nam.

The Decision Support System is now being trialed in the northern region, particularly around Nam Dinh city, as well as in the southern region, focusing on My Tho city and its vicinity by the VNMHA, which is the mandated

organization in Viet Nam for monitoring, forecasting and issuing early warnings for hydro-meteorological hazards. This innovative tool empowers VNMHA, VDDMA and local authorities to develop event-specific forecasting and warning products. These customized forecasts furnish vital information, equipping decision-makers at national, provincial, and local as well as city levels to take risk-informed decisions in response to diverse extreme events and emergencies.

analysis at local level in Viet Nam. collation, and analysis at local level in Viet Nam.



Decision Support System for IbFW. [Link](#)



Strategy and Action Plan on implementing IbFW in Viet Nam [\(Link\)](#)

## Action Plan and Strategy

Based on the outcome of the readiness assessment, ADPC developed a "Guidance to develop strategies/action plan on Impact-based Forecasting and Warning (IbFW) in Viet Nam" that would guide relevant stakeholders and development partners to work collaboratively with the national Government in implementing IbFW activities in Viet Nam. This guidance document is developed based on five pillars that are in line with the national priorities of Viet Nam that includes,

- I. Service Quality and Service Delivery
- II. Scientific Research and Application
- III. Governance
- IV. Partnerships and Co-operation
- V. Training and Capacity Building

This guidance document sets out priority areas in a matrix and activities that can be undertaken both at the national and regional levels. The priorities and actions are supported by a set of institutional partnerships that will bring together donor agencies, development partners, international and regional organizations to support weather, climate, water and hydrological services in Viet Nam. Furthermore, this guidance document draws upon international best practices on impact-based forecasting and warning and is mindful of the operational constraints of information/data requirements, availability, collection, collation, and

## Standard Operating Procedure to improve IbFW at Community Level

To enhance the response capabilities, it is crucial to streamline the flow of early warning information down to the last mile. Recognizing the need, ADPC helped develop a Standard Operating Procedure (SOP) for IbFW at the community level. The SOP aims to strengthen the decision-making process at national, provincial, city and commune levels and encourage proactive actions. It serves as a practical guide for stakeholders in Viet Nam, detailing the appropriate steps to take in response to forecasted or existing hazards at different stages, namely, Normal, Alarm and Warning.



SOP for Impact-based Forecasting and Warning

## Bottomline

Through these interventions, ADPC empowered the Viet Nam Meteorological and Hydrological Administration (VNMHA), the Viet Nam Disaster and Dyke Management Authority (VDDMA) and My Tho and Nam Dinh people's committees in implementing Impact-based Forecasting and Warning from national to community level in Viet Nam. The Guidance Document and the Standard Operating Procedure are comprehensive tailor-made reference documents for Viet Nam to further strengthen IbFW within the country.

This case study was developed from the interventions of the **"Urban Resilience to Climate Extremes in Southeast Asia"** program implemented in Viet Nam with the support of the Norwegian Agency for Development Cooperation (Norad). The main aim of the program is to improve the resilience of urban systems and communities to climate extreme events.

**Authors:** Senaka Basnayake, Lalit Dashora, Susantha Jayasinghe and Chinthaka Ganepola



### ASIAN DISASTER PREPAREDNESS CENTER

Head Office, SM Tower 24th Floor No. 979/66-70 Phahonyothin Road, Phaya Thai Sub-District  
Phaya Thai District, Bangkok 10400 **TEL:** +66 2 298 0682-92 **FAX:** +66 2 298 0012 **EMAIL:** [adpc@adpc.net](mailto:adpc@adpc.net)



[www.adpc.net](http://www.adpc.net)



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