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# URBAN DISASTER RISK REDUCTION IN VIETNAM: GAPS AND CHALLENGES

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## ABSTRACT

*Urbanization is bringing many new pressures—for example, natural hazards pose major risks to dykes and embankments along rivers; energy demand is driving the development of dams and hydroelectricity systems; greenhouse gas emissions are rising; there are more frequent and intense extreme weather events and continuing sea level rise; and natural hazards are having a greater impact on safety and infrastructure. With a combination of those issues, many communities in urban and peri-urban areas are increasingly vulnerable to natural hazards and disasters. Efforts in disaster risk reduction (DRR) in Vietnam to date have primarily focused on rural areas and often employ effective community-based disaster risk management (CBDRM) methods. This paper analyzes gaps and challenges in urban DRR in Vietnam.*

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## Key words

*Urban Disaster Risk  
Urban Disaster Resilience  
Disaster risk Reduction  
Climate Change*

## INTRODUCTION

Disaster risk reduction and climate adaptation are priority issues for Vietnam nowadays. Because of its topography, Vietnam is susceptible to several types of natural hazards, including typhoon, flood, landslide, erosion, drought, and climate related impacts such as saline intrusion and sea level rise. Most cities of Vietnam are located in coastal areas or in the two main river deltas, which are highly susceptible to those types of natural hazards (CCFSC, 2014).

Disaster risk management and reduction is not a new area in Vietnam. In fact, its activities have been widely implemented for many years, with government agencies from the national to local levels, Non-government Organizations (NGOs), and civil society all playing an active role. However, in most cases, efforts have simply focused on rural areas, and most activities are related to preparedness, response and recovery.

The approach adopted by government agencies and NGOs includes four main procedures of disaster risk management, including preparation, response, recovery, and mitigation, and highlights five key components: capacity building, pre-impact, emergency, restoration, and reconstruction.

Most cities in Vietnam choose a single framework of analysis through which to interpret vulnerabilities—for instance, through specific hazards, geographical locations, or urban sectors (Tyler, S. et al. 2010). Imposing such a framework of analysis helps ensure that proposed actions respond to the relevant vulnerabilities in the respective framework and should make transparent any gaps in the proposed plan of action. However, using a single analysis framework

also has limitations. For example, cities that focus on geographical vulnerabilities may be more likely to miss an important intervention related to a citywide sectoral issue such as water management or energy system management.

Due to the complexities of urban populations and systems, and the nature of hazards faced by urban communities, it is much more challenging to effectively implement Disaster Risk Reduction (DRR) in urban areas. In the context of a growing urban population, it is essential to develop and organize a system of suitable approaches and tools for DRR and Climate Change Adaptation (CCA) in urban areas, with an initial focus on the urban resilience concept.

This paper summarizes the experiences, difficulties and challenges with the current approach to DRR and CCA in Vietnam, especially in applying these traditional approach and tools for vulnerability assessment in urban and peri-urban areas in the context of urbanization and climate change.

## DISASTER MANAGEMENT IN URBAN AREAS IN VIETNAM

An estimated 80-90 percent of the total population of Vietnam is affected by typhoons, according to the Ministry of Agriculture and Rural Development (MARD)'s Central Committee for Flood and Storm Control (CCFSC). Vietnam experiences an average of 6-8 typhoons or tropical storms of varying intensity each year, with the northern and central coastal regions being hardest hit in the early months of the storm season. Communities along the coast are directly affected, but so too are communities in upland areas, which can experience flash floods resulted from

TABLE 1. RECENT DISASTER BEFORE 2015 IN URBAN AREAS IN VIETNAM

Year	Event	No. of people dead	No. of people injured	No. of people missing	Economic loss (Billion VND)	Cities affected
2014	Flood in July	11		3	N/A	Lang Son, Bac Can and Lao Cai
2013	Typhoon Nari	38			1,491	Cities in the central and north central regions of Vietnam
	Typhoon Wutip	65			11,000	Hue, Quang Tri, Dong Ha and Quang Binh
2012	Typhoon Son Tinh	27			N/A	Cities from Quang Binh to Thanh Hoa
	Flood in the Me-kong delta	83			N/A	12 cities in the Mekong delta
2011	Flood in the Central Region	28			N/A	Cities in the Central Region
2010	Typhoon Mindulee	20				Quang Binh, Ha Tinh and Vinh city
	Flood in October	100				Quang Binh and Ha Tinh city
2009	Typhoon Mirinae	120			N/A	Cities in the south central
2008	Storm Kammuri	133	91	34	1,939	North central cities
	Floods	144			3,000	Hanoi and North central cities
2007	Typhoon Lekima	88	180	8	3,216	17 North and central cities
2006	Typhoon Xangsane	72	532	4	10,402	15 Central and South Central cities
2005	Storm No. 7	68	28		3,509	12 North and Central cities
2004	Storm No. 2	23	22		299	5 Central cities
2003	Floods	65	33			9 Central cities
2002	Floods	171			457	12 cities in the Mekong delta
2001	Floods	393			1,536	12 cities in the Mekong delta
2000	Flash flood	28	27	2	43	5 Northern cities
1999	Floods	595	275		3,773	10 Central cities

Sources: synthesized from Global Facility for Disaster Reduction and Recovery [GFDRR], 2011; CCFSC website; and data from Disaster Management Center [DMC], 2014

the heavy rains of typhoons. River plain flooding is extensive and prolonged throughout the wet season in the large deltas. Most of Vietnam's 2,360 rivers are short and steep, so heavy rainfall in their basins produces rapid, intense, and short-duration floods.

Sizeable portions of the country—especially the Central Highlands and Central Coast—are subject to heavy rainfall. Table 1 lists the main disasters, which occurred in the urban areas and resulted in significant loss of life and property.

## **DISASTER RISK REDUCTION POLICY FRAMEWORK**

Vietnam has a long history of preparedness for, and active response to, natural disasters. The extensive system of dykes and seawalls is evidence that citizens and leaders over the centuries have recognized the country's vulnerability to the consequences of typhoons and other tropical storms. The Government of Vietnam is actively engaged in preparing for what could be even greater future challenges of climate change adaptation and disaster risk management. But there is no recognition in this policy framework that a larger share of the population is increasingly concentrated in urban areas, and that because of their density, complex infrastructure systems and location, urban areas may pose special kinds of disaster risks.

### ***Extensive Regulatory Framework ignores urban areas***

Most of the laws and regulations on natural hazards dealt with the high-risk hazards of floods and storms, while other hazards were dealt with in separate laws and regulations. The legal framework on floods and storms dates back to 1946 when the Central

Dyke Protection Committee—the forerunner of the present Central Committee for Flood and Storm Control (CCFSC)—was established under a decree by President Ho Chi Minh. The framework included the Ordinance on Prevention and Control of Floods and Storms in 1993, the Decree in 1996 providing details for its implementation, the Decision in 1996 on the Establishment of the CCFSC, and Amendments of the Ordinance in 2000. The low-to-moderate-risk earthquakes and tsunamis were regulated in the Prime Minister's Decisions in 2006 and 2007. The Decree on Civil Defense in 2008 dealt with all natural and man-made hazards and specified the structure and role of civil defense forces at national, provincial, district and commune levels (IFRC, 2014).

These laws and regulations defined the functions and responsibilities of different agencies for disaster response, and they did not distinguish any differences between urban and rural areas. Moreover, the disaster prevention and mitigation measures laid down in the above-mentioned laws and regulations were mainly for short-term actions, while building resilience strategy requires long-term interventions. They dealt with measures to prevent or mitigate the impacts of forecasted hazards such as early warning for sea crew and communities, evacuation of people and property from areas at risk, closing disaster-prone areas, preventing ships from going out to sea, directing ships to safe shelters, and guarding dykes. On the other hand, there were some long-term disaster prevention actions identified in the 1993 Ordinance, which required the development of prevention plans for each area, construction of flood and storm prevention and mitigation infrastructures, planning for resettlements, and the promotion of DRR awareness within the

population. The separate law on dykes also provided more details on the infrastructure. However, these ordinances mostly focused on disaster management in the rural context.

In 2007, the national government issued the National Strategy for Natural Disaster Prevention, Response and Mitigation, which outlines Vietnam's strategy for disaster mitigation and management, and focuses on floods, storms and drought. The strategy provides a very concrete and practical action plan, including programs on improvement of legislation and policies, consolidation of organizational structures, community awareness-raising, reforestation and protection of upstream forests, strengthening of disaster management capacities through science and technology, structural measures, and programs on strengthening of early warning and forecast capacities. However, this national strategy did not mention urban areas, and there were no action plans for DRR in the urban context.

A Strategic National Action Plan (SNAP) on Disaster Risk Reduction was released in 2009 with a National program called Community-based Disaster Risk Management (CBDRM). After the approval of the national strategy for natural disaster prevention, response and mitigation, all ministries, provinces and cities have to develop their own strategic action plans and base these action plans on the CCFSC guidance. DMC has been implementing this program with support from donors and NGOs covering 6000 rural communes throughout all regions of Vietnam.

During the period from 2005-2014, the Government of Viet Nam (GoV) made progress in mainstreaming disaster risk reduction into national, sectoral and

provincial socio-economic development planning frameworks, and passed a new Law on Natural Disaster Prevention and Control, which came into effect in May 2014. The majority of sectoral development plans and Socio-economic Development Plans (SEDP) at the national and provincial levels for the period 2011-2015, as well as master plans for the period 2011-2020, had integrated elements of disaster risk management (DRM).

### *Overlaps in disaster management*

The Ministry of Natural Resource and the Environment (MONRE) has been designated as the leading agency for climate change coordination in Vietnam, while the Ministry of Agriculture and Rural Development (MARD) maintains overall responsibility for natural disaster mitigation and response. In addition, the Ministry of Construction (MOC) maintains responsibility of drainage systems and major public works, the Ministry of Planning and Investment (MPI) has purview of the issues of land use and master planning, and the Ministry of Science and Technology (MOST) is involved in climate forecasts.

The Central Committee for Flood and Storm Control (CCFSC), chaired by the minister of MARD, provides a coordinating umbrella for disaster risk management in Vietnam. MONRE is a member on the CCFSC, along with other key national ministries, Vietnam Red Cross, Vietnam Television, Voice of Vietnam, Department of Dyke Management and Flood Control (DDMFC) and the National Hydro Meteorology Centre (NHMC) are also represented. According to their own functions and duties, ministries, sectors and local entities are responsible for effectively implementing and

coordinating relevant objectives, duties and solutions stated in the strategy.

MARD and CCFSC lead the implementation of the National Strategy for natural disaster prevention, response and mitigation to 2020. CCFSC acts as the national focal point, and specific implementation responsibilities are assigned to ministries, sectors, and local entities, which helps to balance and arrange annual investment resources to effectively implement the strategy on DRM. MARD is in charge of inspection and assessment of the strategy implementation by ministries, sectors, and local entities. It conducts review of the strategy implementation every year, and every five years draws out experience and recommends to the Prime Minister suitable adjustments to the contents and solutions in the Strategy.

Each province is required to establish a provincial Steering Committee for Flood and Storm Control (CFSC). This committee is chaired by the Vice Chairman of the People's Committee of the province, and its members come from all relevant functional departments. Activities of the provincial CFSC mostly involves planning for disaster preparedness, disaster response and disaster recovery.

The Prime Minister tasked MONRE with preparing a National Target Program (NTP) to respond climate change, which was approved under Decision 158 in December 2008. It is a clear responsibility of MONRE to guide and assist ministries and provinces in developing and implementing their action plans to respond to climate change. Ministry of Investment and Planning takes the lead and coordinates with other ministries and provinces to develop a standard framework procedure and guidelines for mainstreaming climate

change issues into socio-economic development strategies, programs and planning. Finally, People's Committees of provinces and major cities have the responsibility to develop and implement action plans to respond to climate change in their provinces and cities. But even after 7 years, in 2015, very limited activities have been implemented in the urban area, and there was a lack of collaboration between MONRE and MARD on DRR and CCA. At the sectoral and provincial levels, climate change responses and the effects these will have on DRR have not yet been addressed systematically.

Urban development is especially at risk from this lack of coordination. Urban infrastructure lasts many decades, and once an urban area is developed, the pattern of development will last for centuries. Urban development decisions need to be made with changing climate risks in mind, to ensure that future natural disaster risks are avoided. MOC is a key player in influencing the urban form that cities in Vietnam are taking, in terms of providing policies, guidelines and regulations such as building codes and master plans. Recently, MOC issued Decision 2623/BXD, which requests cities to mainstream climate change and disaster risk reduction into their master plans and urban development plans.

It is evident that while there have been many national policy measures to address DRR, climate change and urban development, they are not coordinated or integrated. For decision-makers in urban areas, this means there is no clear direction on measures they should take to prevent natural disasters in areas with special urban characteristics.

# CHALLENGES IN URBAN DRR PRACTICE AND TOOLS FOR URBAN DRR

## CHALLENGES IN URBAN DRR PRACTICE

Experiences from practitioners who implement pilot projects in the field of DRR and CCA in different cities indicate some challenges in urban DRR compared with typical practice in rural areas, as follows.

- Urban communities have a higher level of demographic complexity than rural areas. The bonds that connect urban community members are weaker, and so are those between communities and the areas they live. This is because people living in urban communities often come from many different places, do not have long-established connections, and often do not know one another or have a strong understanding of the history of natural disasters in their neighborhoods.
- There are more difficulties in engaging urban residents in DRR activities due to differences in income level, standard of living, and lifestyle of urban compared to rural population. Unlike in rural areas, people living in cities often have to travel longer distances to work, and are more strictly controlled by working hours, whether they are administrative employees or workers, so it may be more difficult to structure consultations with local residents.
- Sensitive urban systems and communities challenge the assessment of their vulnerability. Urban systems are more complicated, and more sensitive to factors outside the direct administrative control of the ward/commune

being assessed. For example, when looking at the water supply system of a downstream city, we need to consider influences at the watershed scale.

- There is a lack of tools to assess impacts of local institutions, including laws, regulations, social rules, level of decentralization, and access to information.
- Difficulties persist in mobilizing local government support to DRR policies and actions. Urban local governments are under more pressure and have more priorities, including socioeconomic development priorities. Local government leaders might not agree with adaptive measures suggested because they do not consider them high priorities.
- Impacts of urban-specific processes such as industrialization create further challenges. Urbanization impacts tend to outweigh those of natural disasters or climate change alone. For example, construction and urban development might be the direct causes of serious flooding when a storm happens. It is very difficult for DRR plan to keep pace with this rapid urbanization process.
- There are not enough practitioners and facilitators with experience in urban DRR planning.

## LIMITATIONS OF THE EXISTING TOOLS FOR URBAN DRR

Practitioners, especially VNRC and many other organizations in Vietnam often use a set of key tools to deliver disaster risk reduction measures. The decision about which tools to use and how to use them depends on the specific needs of each locality, as well as available time and human, financial, and physical resources. Importantly, local actors

should be supported in implementing follow-up actions suggested by the Vulnerability and Capacity Assessment (VCA) findings. In addition to the general difficulties in DRR practices in urban areas as described in the previous section, VCA tools also present their own limitations, specifically:

### ***Review of secondary data***

Though urban areas have an advantage over rural areas in terms of information and data, human resources, and education levels of the community, the review of secondary data still faces many challenges because:

- There is no practitioner group with experience in doing research, assessments and analysis in the urban context.
- No clear mechanisms exist for mobilizing data sources, thus information is abundant but very difficult to access and explore, especially highly sensitive information such as land use planning, construction planning, and urban development. On the other hand, the large amount of information from many different sources, sectors and levels is also time-consuming to collect, and difficult to synthesize and analyze.
- There is limited information on flood and storm control, and no instructions for long-term flood and storm control. Available information about climate change scenarios is limited, and not detailed enough for community level research.

### ***Historical profile***

When researching historical profiles, there are usually more available data in urban than in rural areas. However, when doing surveys, interviews or group discussions, it will be difficult to identify the right

group to target due to the greater mobility of urban populations. Urban communities also tend to know very little about the history of disasters in their areas due to short duration of residence. It is also difficult to verify their information.

### ***Mapping***

Though information and data in urban areas (such as administrative maps, topographic maps, and detailed construction plan) are more available, detailed and well-organized, there are difficulties when applying mapping tools in urban areas. This is because cities have higher construction density, with many view-blocking structures. Landscape in urban areas is not as stable as in rural areas, and can alter very rapidly in the urbanization process. Urban people rarely know well about their areas, especially when building construction and infrastructure projects are changing drainage and risk patterns, therefore it is difficult to identify vulnerable areas.

### ***Seasonal calendar***

So far, this tool has only been applied in rural areas, and is based on crop schedules. It can still be used for VCA in peri-urban areas. However, for highly urbanized areas, it should be adjusted to focus on specific aspects of livelihoods only, because urban areas are much more complex in terms of labor market structure and types of livelihoods, which makes it challenging to cover every aspect in in-depth discussions.

Urban livelihoods are less dependent on seasons, therefore this analysis is not useful in describing livelihoods.

### *Focus group discussions*

It is difficult to verify information provided in focus group discussions and to identify groups because the selection and classification of groups are not the same as for rural areas. Urban people have busier lives and work schedules, which might create time pressures and can cause assessment to be hasty and ineffective.

### *Transect walk*

Due to high density and complexity of urban infrastructure, it is difficult to produce the transect diagram.

### *Venn Diagram*

The difficulty in analysis using Venn diagrams is in identifying roles of the political or social organizations of interest, because the amount and complexity of information in urban areas makes it difficult to collect and analyze. This will lead to differences in people's viewpoints and opinions. Venn diagrams only assess people's viewpoints regarding a specific area, and can be challenging when dealing with the complicated and complex urban systems and sectors.

## **DISCUSSION: URBAN RESILIENCE APPROACH FOR URBAN DRR**

It is not feasible or realistic to simply apply rural approaches in urban areas, which face new and more complex risk factors related to infrastructure failures, sea level rise, subsidence, upstream flooding, and regional drainage. Urban DRR often points to large-scale structural interventions, as suggested by the use of outdated data in urban planning. There

is very limited consideration of risk mitigation in implementing these structural interventions (e.g. building dykes), when one failure can paralyze the whole system. In addition, poorly planned infrastructure investments can create a false sense of security. There are also many institutional challenges, especially regarding monitoring and evaluation methods and implementation. In addition, DRR activities often focus solely on emergency responses.

The Asian Cities Climate Change Resilience Network (ACCCRN) takes an action research approach, which has catalyzed city level actors to assess key climate stresses and potential vulnerabilities, and propose measures to respond to these, rather than commissioning external experts or national agencies to prepare such plans (S. Tyler, 2010). ISET has developed a conceptual framework for urban climate resilience. This framework focuses on:

- understanding cities' vulnerability to the impacts of natural disasters and climate change based on three key aspects—systems, agents, and institutions (see more detail in ISET's document: *Catalyzing Urban Climate Resilience: Applying Resilience Concepts to Planning Practice in the ACCCRN Program* (Moench, M., S. Tyler, et al., 2011));
- shared learning dialogues that try to fully mobilize local knowledge and the in-depth scientific knowledge of all stakeholders involved;
- intervention actions that build resilience of these systems, agents and institutions based on their own distinctive characteristics; and
- the innovative and interactive nature of these processes.

A key issue in CCA and DRR practice is how planners can make effective use of available climate information and disaster profile despite large uncertainties and unfamiliar or unhelpful data formats. In early stages of the ACCCRN program, many partners expressed frustration of the lack of data regarding future climate impacts, which they had hoped to use to design infrastructure standards. Below are some aspects that should be considered in urban CCA and DRR planning (Tyler et al, 2010).

- Focus on existing vulnerabilities: Existing CCA and DRR strategies have a strong focus on current challenges and vulnerabilities that are very likely to be exacerbated by climate change. These issues include waterlogging, water scarcity, flood protection, ecosystem degradation and solid waste management.
- “No-regrets” planning: No-regrets strategies are actions that yield positive outcomes regardless of climate conditions and across a wide range of futures. Examples of no-regrets strategies include awareness building, early warning systems, improved service delivery, drainage systems, wastewater management, etc. In many cases, no regrets strategies respond to current problems, guaranteeing benefits that can be felt immediately but will also strengthen resilience to future climate hazards.
- Further studies on potential interactions of climate and key urban systems: Cities identified the need for better local data and detailed scientific studies of plausible local climate impacts that would allow them to plan with more sophistication in the future. A common interest across most cities was learning more about impacts on key hydrological

parameters and water management systems in relation to planned urban development.

- Avoiding maladaptation: City strategies recognize the increasing risks of further development in exposed sites, of overexploitation of key resources (e.g. groundwater), and/or the vulnerability of particular sectors (e.g. fishing, agriculture). They propose approaches that would redirect “business as usual” away from these sensitive sectors or areas.
- Awareness: Several cities have prioritized awareness raising among different groups, from the general public to private businesses and elected officials, in order to generate broad support for resilience actions, and to build capacities for behavioral change and autonomous adaptation.

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