# Assessing the Vulnerability of the Most Vulnerable: a Case-Study in Viet-Nam

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# Background

In 2017, **Viet Nam** ranked sixth in the list of the countries most affected by **climate - related disasters** globally (Eckstein et al., 2018). In the last few decades, the combined effect of natural disasters and climate change has resulted in **severe impacts** on **Vietnamese children**, and particularly on the most disadvantaged ones, who are known to be up to four times more likely to die or be injured in a natural disaster than the general population (Myiagi Prefecture, 2012).

A recent case in point was the 2015-2016 El Niño season, which caused the most **severe drought** in more than 60 years to hit Viet Nam. During this event alone, over **520,000 children** and **one million women** were impacted by **severe malnutrition** and **acute water shortages**. As a result, thousands of children left school and were forced to live in the streets, begging for food. Sadly, this exposed them to **violence**, **exploitation** and **abuse**.

The **Government of Viet Nam**, in partnership with **UNICEF**, appointed **Molino Stewart** Pty Ltd to develop and implement an innovative approach to assess and map risk from natural hazards to children, named **Child-Centred Risk Assessment (CCRA)**.

The scope of a **CCRA** is to use accurate, **child-specific vulnerability indicators** to find out **where** and **why** children are most at risk. This allows taking appropriate **prevention** actions targeting the key issues identified at each location. To date, CCRA studies have been successfully undertaken by UNICEF and Molino Stewart in eleven countries in the East Asia and Pacific Region.



Figure 1 Historical record (1953-2017) of the total number of natural disasters per year in Viet Nam (www.emdat.be)









#### Figure 2 The adopted risk model

# **Training Trainers**

# How was Risk to Children Assessed and Mapped?

### Hazard

"Hazard" is defined as "a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation" (UNISDR, 2009). The CCRA focused on the four most prominent natural hazard types in Viet Nam, identified based on the consequences of recent events. A deterministic approach was used due to the lack of consistent historical records. The following events were assessed at four different study areas:

- Flash flooding and mudslides, in the north mountain provinces of Lao Cai and Yen Bai.
- Storms, in the central coastal provinces of Quang Ngai and Quang Nam
- **Drought**, in the southern province of Ninh Thuan
- **Riverine flooding**, in the Mekong River Delta

#### Exposure

Exposure is defined as "the situation of people, infrastructure, housing, production capacities and other tangible human assets located in Hazard-prone areas" (UNISDR, 2009). Exposure was assessed with the total number of children in each commune.

### **Vulnerability**

Vulnerability is defined as "the conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of Hazards" (UNISDR, 2009). Vulnerability was estimated using a composite Child Vulnerability Index (CVI), obtained aggregating up to 66 different dimensions of child vulnerability, including aspects of education, nutrition, health, wealth, access to water and sanitation, infrastructure and emergency management capabilities. The data needed to obtain the 66 child vulnerability indicators was collected through a survey designed by the project team and delivered to each commune in the study areas by the relevant province. The returned survey presented significant processing challenges because of missing or inconsistent data. The post processing followed the guidelines of OECD (2008) and employed advanced data imputation, normalisation and weighting techniques to obtain a complete and consistent dataset.



In October 2018, a five day training workshop was held in Da Nang, Viet Nam (Figure 3). The aim of the training was to help VDMA personnel, UNICEF staff and selected stakeholders:

- become familiar with the CCRA risk mapping methodology;
- learn how to interpret the study results and maps;
- learn how to independently manipulate and update the input data, should new data become available in the future.

The training was designed to allow the trainees to become trainers themselves, and re-deliver the training workshop to others.



Figure 3 Training workshop participants

### **Societal and Individual Risk**

Hazard, exposure and vulnerability were measured and combined to obtain and map the following two types of risk to children:

- Individual Risk, defined as the average risk to each individual child in a given commune. This type of risk is useful to identify communes where the child population is small but at high risk (e.g. remote locations).
- Societal Risk, or "summed risk", is defined as the cumulative risk to all children within a given commune. This type of risk is usually higher in densely populated communes, where there are a high number of children.

The risk model used in this intervention is shown in Figure 2.

# Results

### The project generated the following outcomes:

- A set of 17 thematic Hazard, Exposure, Vulnerability and Risk maps for children in each study area (Figures 4 to 8).
- A complete and annotated GIS dataset, which end-users may access to investigate and address the underlying causes of high child risk at each location using the guidance provided with the training activity and materials;





#### interpret and update the results.