Sustainable Development of Urban Regions

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Research for Sustainability

City of Huê, Vietnam; Thừa Thiên-Huế Province, Vietnam

FloodAdaptVN

Integrating ecosystem-based approaches into flood risk management for adaptive and sustainable urban development in Central Viet Nam

FloodAdaptVN analyses spatial dynamics of current and future flood risks in the Thừa Thiên Huế province in central Vietnam. The aim is to support urban planning with a newly developed modular information system for sustainable flood risk management. Ecosystem-based and hybrid adaptation options, as well as potentials of risk transfer, are compared as complementary solutions to conventional measures.

Project Objectives

FloodAdaptVN aims to support decision-making processes of local stakeholders in such a way that flood risks in central Vietnam can be minimised by means of adapted risk reduction and adaptation measures. The project team investigates and compares ecosystem-based approaches that can be integrated into flood risk management in the study area for adaptive and sustainable urban development. Implementation aspects for disaster risk reduction are investigated by FloodAdaptVN as well as prioritisation factors for successful risk management. In order to support local authorities in developing practical measures, the project generates a sound information base on flood-prone regions. Central to this is the »capacity development« strategy, which is intended to enable Vietnamese decision-makers to implement successful risk management in the long term and also guarantees an increase in knowledge and experience on the part of the German actors involved.

Challenges

In central Vietnam, small and medium-sized coastal towns are particularly characterised by a rapid urbanisation trend. The concomitants include extensive surface sealing, the expansion of settlements into flood-prone areas, and a decline in infiltration and retention areas, so that heavy rainfalls lead to enormous surface runoff. Additionally, the narrow and flat settlement area between the inland mountains and the coast only allows very short reaction times to heavy rainfall, which is exacerbated by degraded land and deforestation. Moreover, climate change is expected to lead to stronger and more frequent extreme weather events, such as typhoons with resulting floods in central Vietnam. Such storms cause considerable infrastructural, agricultural, health and economic damage. Due to changing settlement patterns, housing and lifestyles, local vulnerabilities and civil adaptation practices need to be rethought and integrated into planning.

Addressed Sustainable Development Goals of the United Nations

6 CLEAN WATER AND SANITATION

11 SUSTAINABLE CITIES AND COMMUNITIES

13 CLIMATE ACTION

15 LIFE ON LAND

17 PARTNERSHIPS FOR THE GOALS

Flood Hue, October 2020. Image provided by Assoc. Prof. Dr. NGUYEN, HOANG KHANH LINH, International School - Hue University.

Research Approach and Methods

FloodAdaptVN rests upon a participatory, transdisciplinary research design and an extensive stakeholder network. The network is composed of local and national stakeholders as well as (inter)national experts in order to achieve the project objectives and to ensure their integration into political and planning processes. The assessment of current and future flood risks is carried out through a modular framework, which is adapted to local conditions and also transferable to other regions. Methods and products from geodata analysis, earth observation and risk and vulnerability assessment are used. Existing and planned disaster risk reduction, risk transfer and adaptation measures are identified and assessed using a multi-criteria catalogue. The modular approach will be brought together in a flood information system (»FRAME«) and made accessible to local stakeholders.

Focus Topics

- Earth observation, mapping and analysis of nature and infrastructure
- Modelling and scenario development of flood events
- Ecosystem-based disaster risk reduction
- Strengthening climate resilience
- »FRAME« information system for risk-informed planning
- Adaptive and sustainable urban development

»Thua Thien Hue province is building and developing Hue city as a central urban area, surrounded by satellite towns. However, the development of the periurban area towards the sea is being seriously endangered by climate change, e.g. by sea level rise and coastal erosion. Within the framework of FloodAdaptVN, the experts involved in the research project will provide the province with recommendations for the areas affected by floods. This will provide the province with proposed solutions and guidance for future urban development, as well as to ensure a stable livelihood for the affected people.«

Assoc. Prof. Dr. NGUYEN

Expected Solutions and Innovations

In order to reduce current and future flood risks, the FloodAdaptVN project focuses on risk management. The project addresses existing and urgent knowledge gaps regarding the identification of flood risks and adaptation approaches in urban regions of central Vietnam. At the same time, however, those measures have a high potential of also being transferred to neighbouring provinces as well as to other similar urban and coastal areas worldwide. Innovative aspects of the approach include the assessment of multi-risks on the basis of a chain of effects that reflects local and regional complexities. In addition, future risk scenarios are developed and simulated based on locally adapted »Representative Concentration Pathways« and »Shared Socioeconomic Pathways« (2030, 2050, 2100) with and without adaptation measures. Finally, a portfolio of adaptation options is identified and assessed, including risk transfer and ecosystem-based approaches. For risk-informed planning, the modular information system »FRAME« is implemented.

The FloodAdaptVN team at Tam Giang Lagoon in fall 2019.
Image provided by Felix Bachofer.

»With FloodAdaptVN, we pursue a transdisciplinary approach in which we consider different measures for flood risk reduction and adaptation in central Vietnam as different parts of one solution, combine them with each other and identify options for action. This approach is embedded in a dynamic environment of challenges due to climate change and socioeconomic development. At the same time, we see an enormous potential to draw valuable conclusions for Germany and Europe from the experiences of the project partners, as well as from our project results.«

Dr. Felix Bachofer

Cooperation Partners

German Partners

- Eberhard Karls University of Tübingen
- IZES gGmbH
- GEOMER GmbH
- United Nations University, Institute for Environment and Human Security
- Ludwig-Maximilians-Universität München

Vietnamese Partners

- Huế University of Sciences
- International School - Huế University
- Thua Thien Provincial Commanding Committee of Natural Disaster Prevention and Control, Search and Rescue
- Department of Natural Resources and Environment, Thua Thien Huế Province
- Ministry of Natural Resources and Environment, Viet Nam Institute of Meteorology, Hydrology and Climate Change, Sub-Institute of Hydrometeorology and Climate Change

FLOOD ADAPT VN

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