

# CLIMATE CHANGE AND RESILIENCE

## Land use, Rainfall Change and Water Governance Affecting Food Security and Livelihoods

### Context and objectives

The current prediction indicates that major environmental changes are likely to occur due to climate change, with the majority of these changes happening through transformations in the hydrological cycle (e.g. floods, droughts and storms). Climate change impacts are likely be particularly severe in many developing regions of the world, including Cambodia

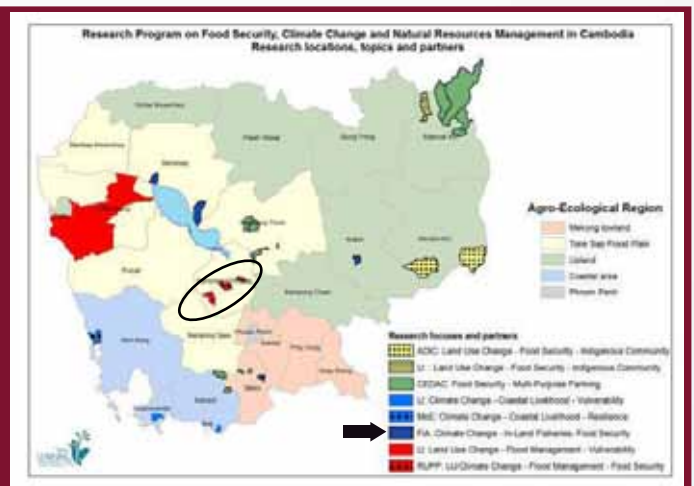
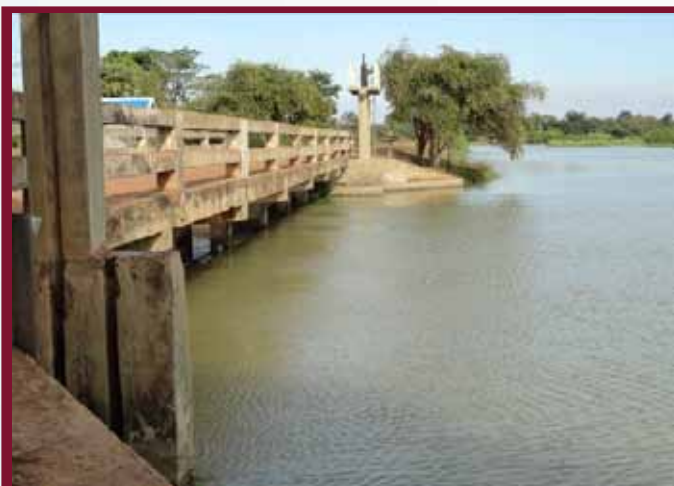
The study is designed to examine the micro-context of environmental change in the Steung Chrey Bak catchment area (Kampong Chhnang province), in relation to change in the land use and hydrological systems. It looks at the impacts of these changes on agricultural production and food security strategies. It also explores the adaptation strategies employed by these communities and households to address the changes. At the same time, the study intends to explore how climate change afflictions, particularly flood and drought affects the food of local communities. It also aims to contribute to policy on water resource management. The research project is a collaborative effort

involving senior researchers, local community actors and undergraduate students of the environmental studies program of Department of Environmental Science (DES) of the Royal University of Phnom Penh (RUPP).

### Methodology

The study examines how farming communities in Steung Chrey Bak catchment area adapt their farming practice and livelihood strategies to ensure food security in a context of land use and hydrological systems changes, subsequently inducing changes in water availability. A multi-scale and multi-driver framework will be used to explain local land use. It will be combined with a hydrological survey of the catchment area (rainfall analysis and flood scenario) and an analysis of institutions that govern water management.

Food security will be scrutinized in three locations of the catchment area (up, middle and downstream) in the context of these environmental changes. Food production and the [evolution of] farming practices will be analyzed



along the change in water availability in the catchment area. Eventually, food production will be analyzed in a livelihood framework to address the diversity of adaption strategies to prevent food insecurity.

This research project is an exploratory research using both qualitative and quantitative methods. Land use change and hydrological system analysis will be conducted in conjunction with other research projects carried-out in the area. Interpretation of time-series satellite images associated with perception-based mapping will identify land use change patterns and their significance to local communities. Rainfall data and hydrological modeling will allow for flood simulations and discussions about future possible flood scenarios.

To add on this, an institutional analysis framework will be designed to look at water management issues. Focus group discussions and in-depth household survey will eventually serve to measure food availability and address it in the context food security adaptive mechanisms.

### Contribution to the program

This cross-disciplinary research contributes to the program in various ways:

- Water management is analyzed from a cross-disciplinary perspective: hydrological modeling is

combined with agriculture and social sciences analyses to identify how past and current issues related to water management are affecting the livelihoods of communities living in the area. The research makes an original scientific contribution by integrating various disciplines to analyze these issues across the geographical boundaries of a river basin.

- Also land use change is understood from a broad perspective. The usual forest cover change versus agricultural expansions analysis is brought one step further by examining the specific change in the agricultural (cropping) system and their significance.
- The research offers an interesting opportunity to associate undergraduate students in environmental sciences in RUPP to improve their research capacity and curriculum.
- In addition, the research will contribute significantly to establishing a long-term field based teaching program nationally and regionally.

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