

COSTEA2

Understanding and Managing the Cambodian Floodplains, The Preks of Kandal Province



Objectives



- Understand flood dynamics and hydrological processes at local and regional scale
- Characterize agricultural systems and multiple ecosystem services of the flood plain
- Participatory identification of « alternative » development pathways that are not only based on the construction of hard infrastructures



Main Partners in Cambodia



- **ITC** Hydrological analysis
- **RUA** Agricultural and environmental studies
- **ISC** Participatory approach
- **IRD** Scientific and methodological support



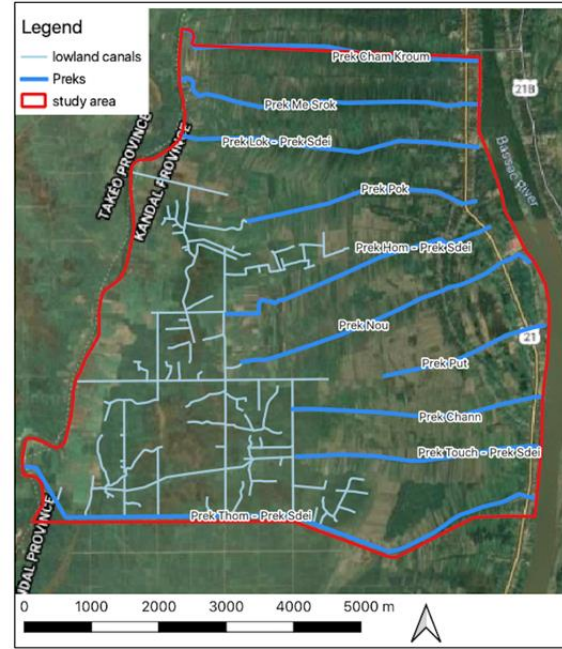
Presentation of the study area





The “Prek Area” in Kandal Province

- Upper Mekong delta in Cambodia
- ~1,500 km²
- Mekong and Bassac Rivers
- ~ 200 **Prek Channels**, excavated during French protectorate (from the mid 1800s onwards), connect rivers to lowlands (Boeungs) through a breach in the river levees
- **Support intensive agricultural systems AND multiple uses and services:** household water supply, fisheries, transportation, siltation and land raising, flood dissemination, ‘diverse’ ecosystem
- **Rehabilitation projects** (e.g. re-excavation) over the last 10 years in the view to increase water availability in the dry season





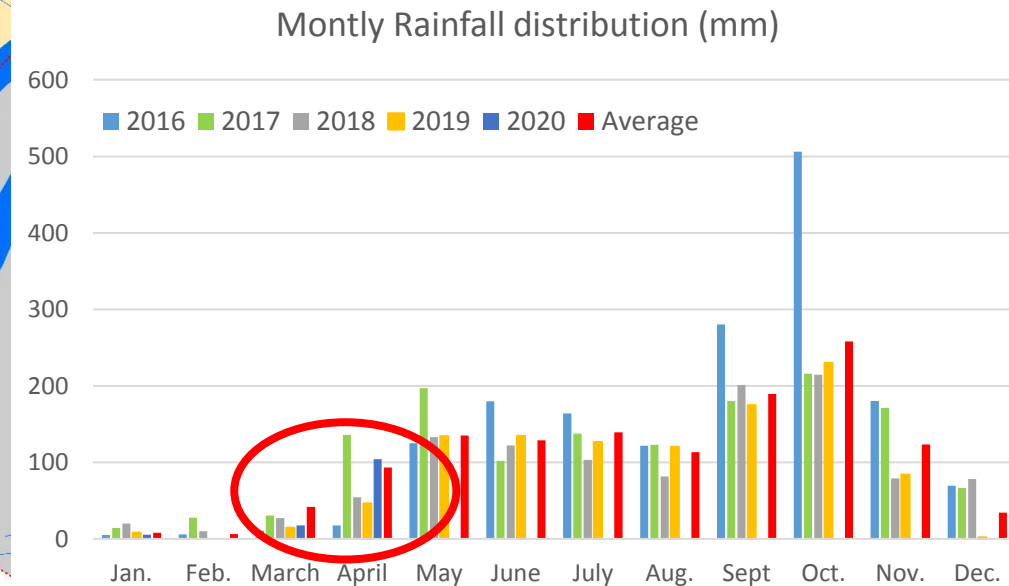
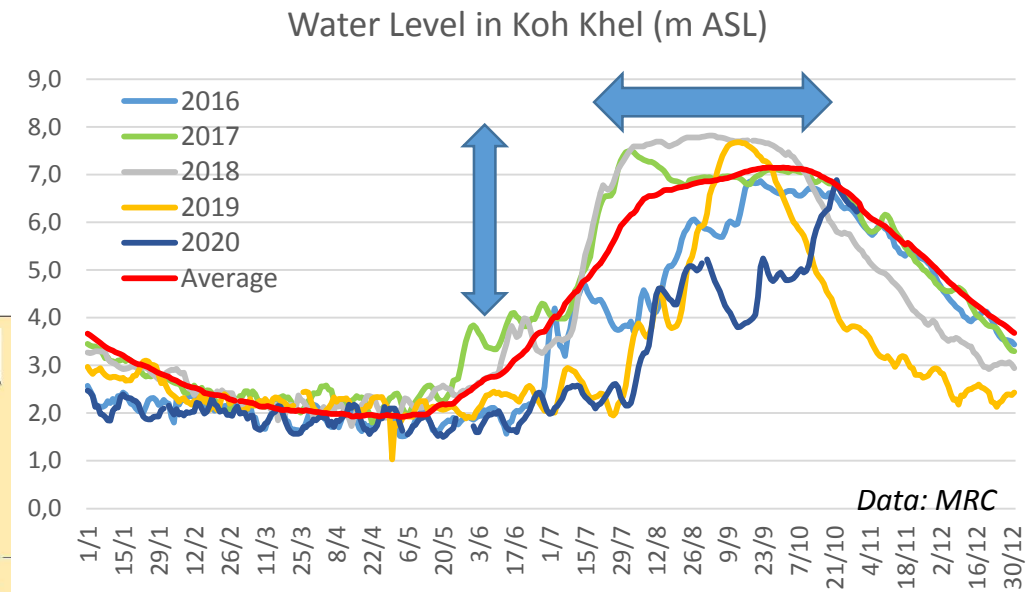
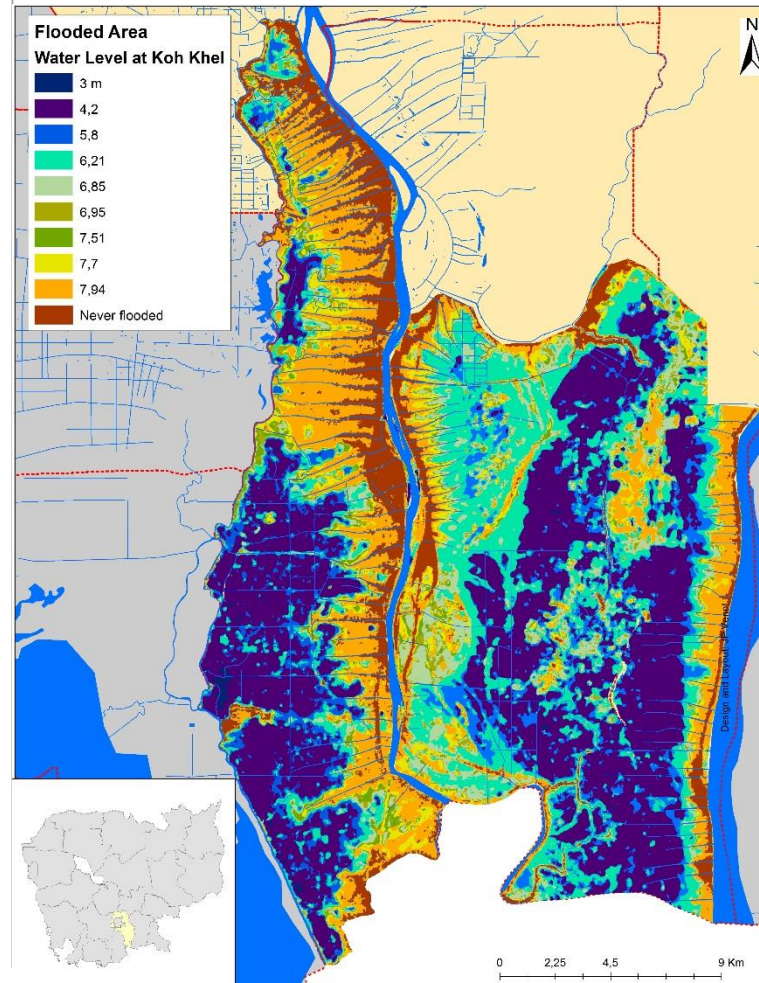
Flood dynamics and hydrological processes at local and regional scale

A BRIEF INTRODUCTION



Preliminary Results -regional

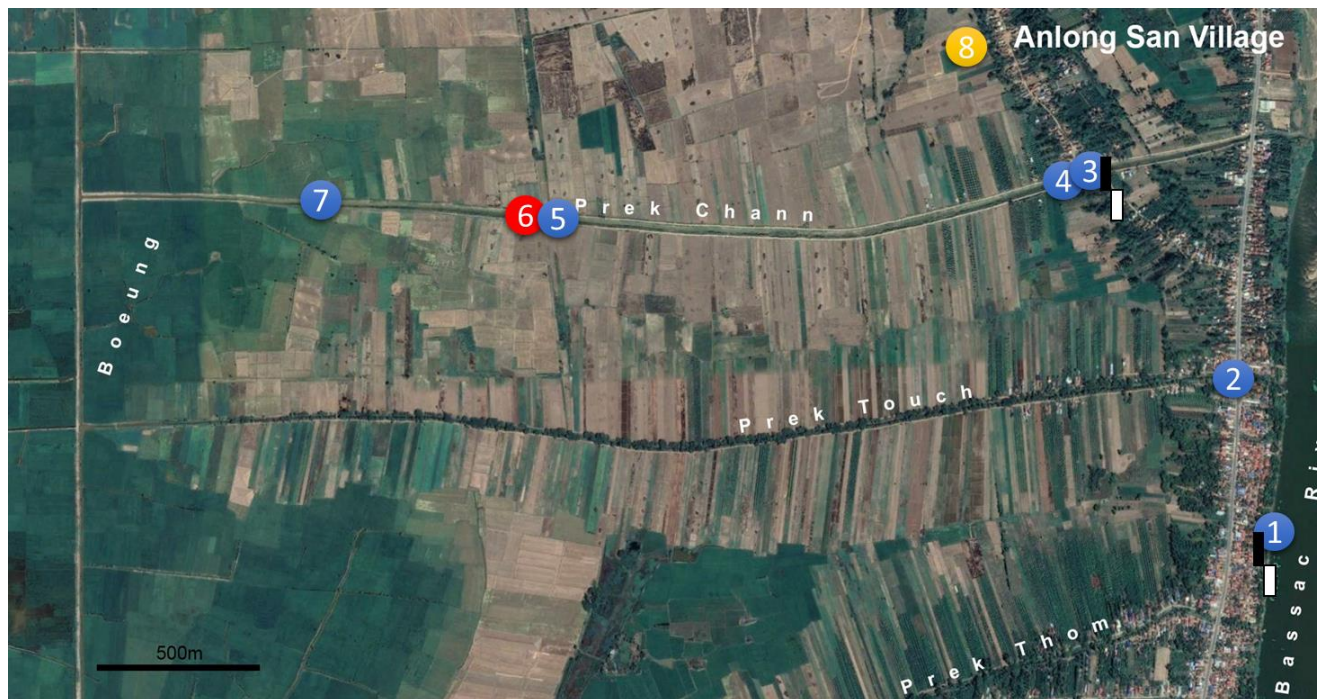
- Hydrology of the area determined by the Mekong
- Flood dynamics are becoming increasingly difficult to predict (upstream dam management, erratic rainfall patterns)
- High variability regarding timing and spatial extent of the flood
- Rainfall deficit during the dry season
- Increased vulnerability of agricultural systems in the “transition zone”





Preliminary Results-local

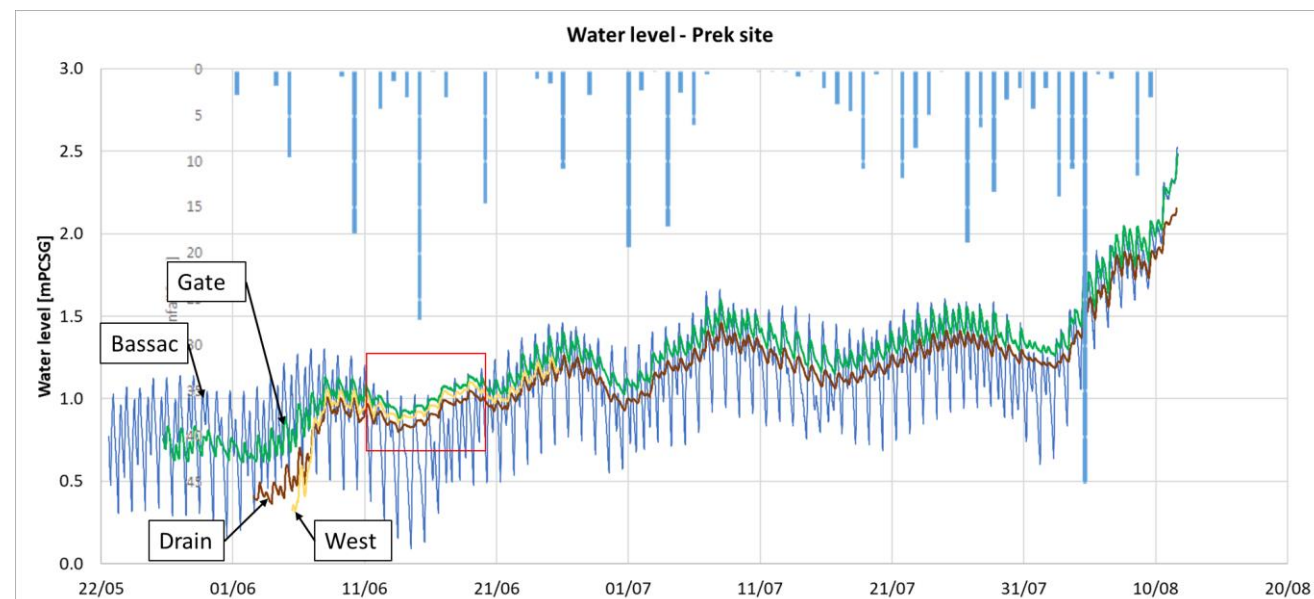
- Installation of a monitoring network along 2 preks (one rehabilitated and one non rehabilitated)
- Measurement of water levels, water EC, and rainfall data
- Qualitative detection of pesticides in water



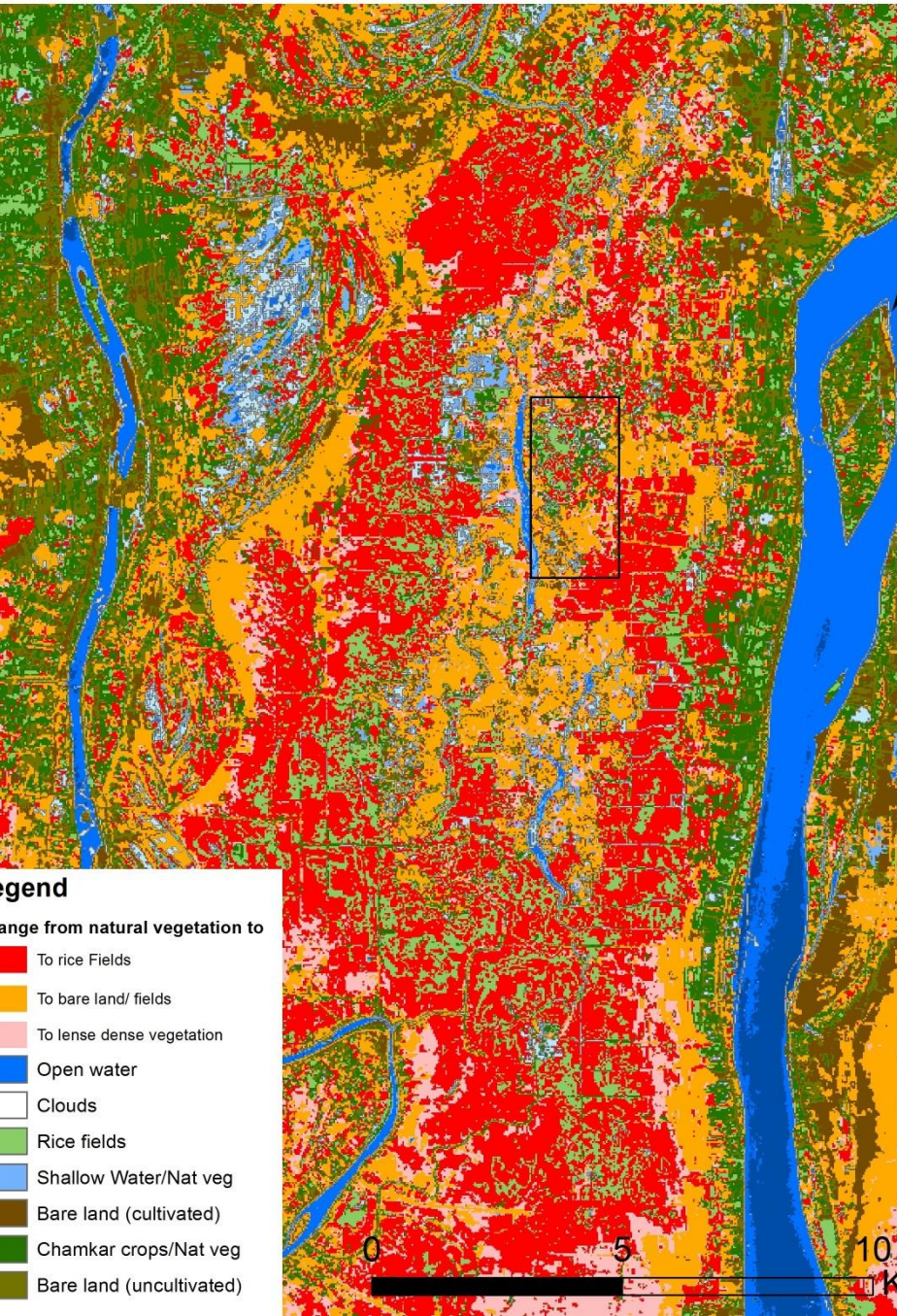
Logger

- Water level
- Meteo
- Water EC

Staff gauge



Change in land cover (2000-2019)



Agricultural systems and multiple ecosystem services of the flood plain

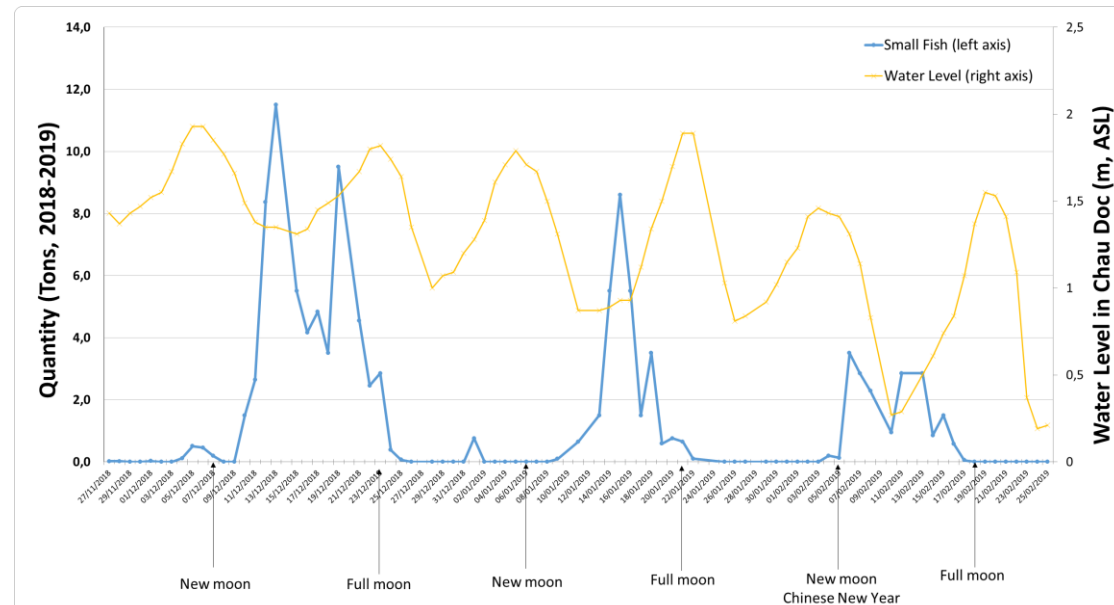
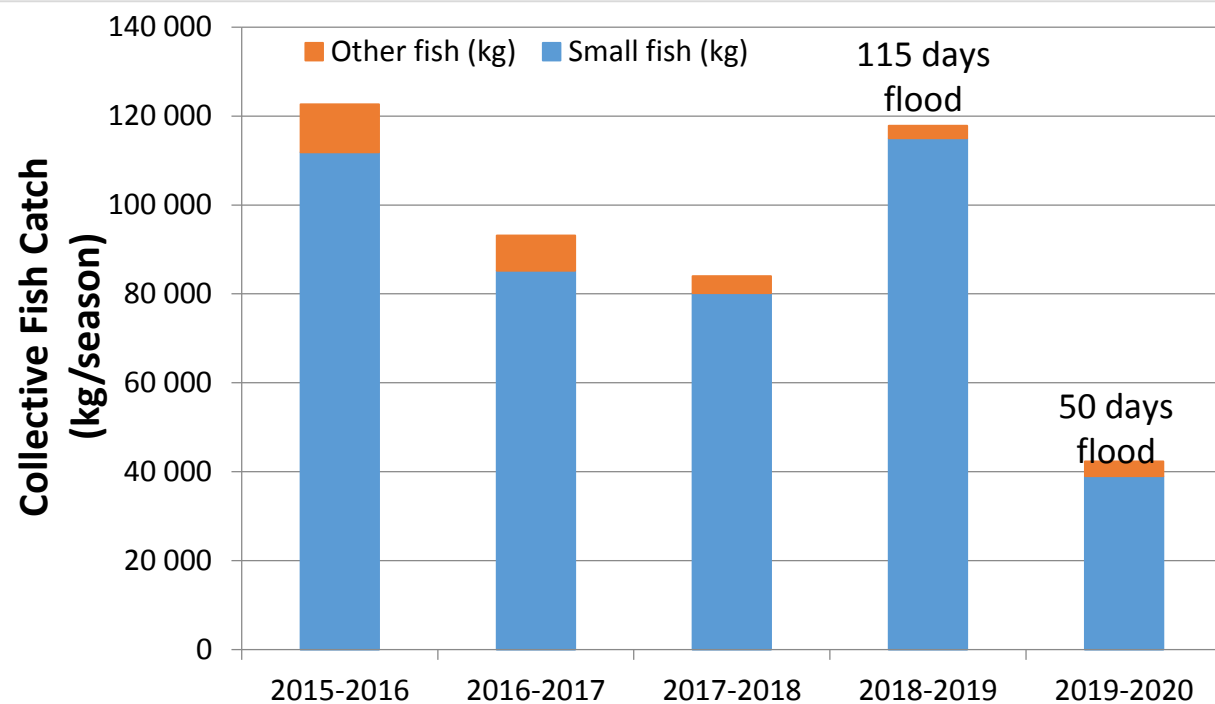
A BRIEF INTRODUCTION





Preliminary Results-Fisheries

- Main fishing period is between November and February
- Individual fishing of primary importance and collective fishing of secondary importance
- Productivity of floodplain ecosystem hinges on duration and progressivity of floods
- Decrease in the area and productivity of fishing grounds due to large scale uncoordinated land reclamation
- Increase vulnerability of the poorest households, esp. Cham (Muslim) households
- Challenges in governance

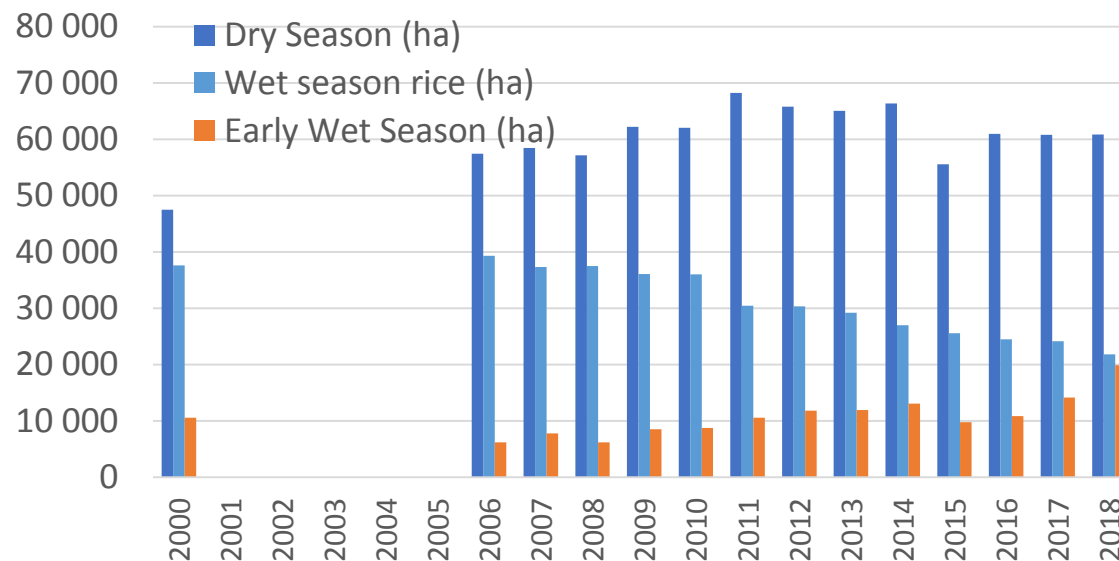




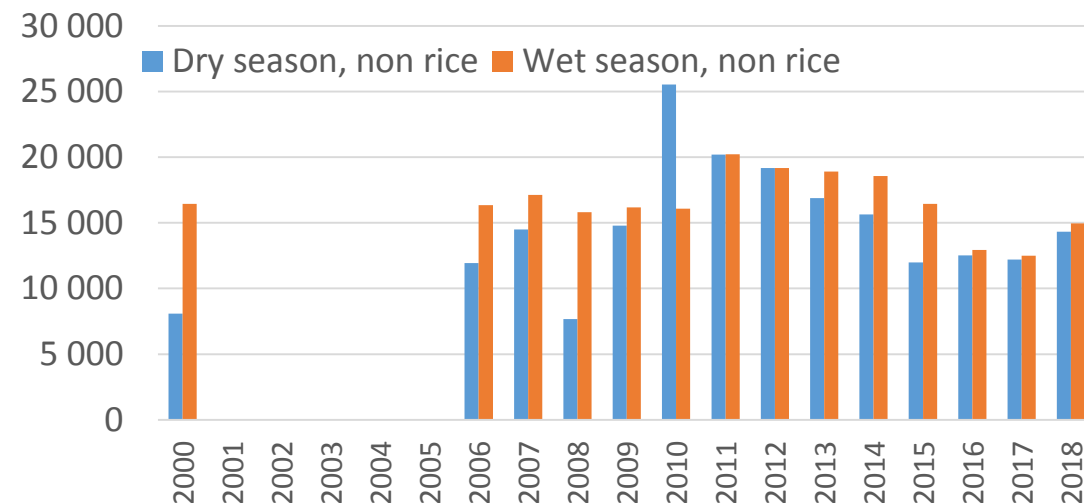
Preliminary Results- Agriculture

- 2 main types of agricultural systems: rice cultivation in the Boeung (low lying area) and vegetables/fruit trees in the Chamkar ('high') areas
- Rice over ~ 100,000 hectares (60% in dry season, 2nd province of Cambodia)
- Increase in EWS rice (due to increased water availability and demand in Vietnam?)
- About 30,000 hectares of annual crops per year
- Increased area of fruit trees (area unknown)

Area of rice cultivation per season (ha)



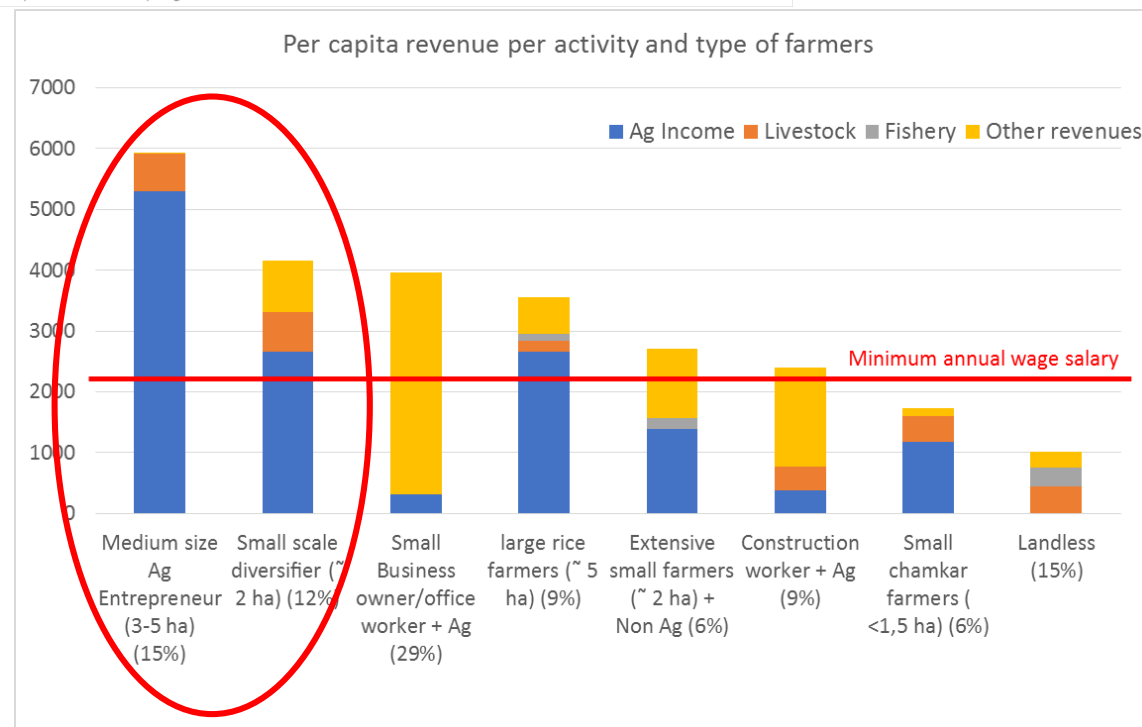
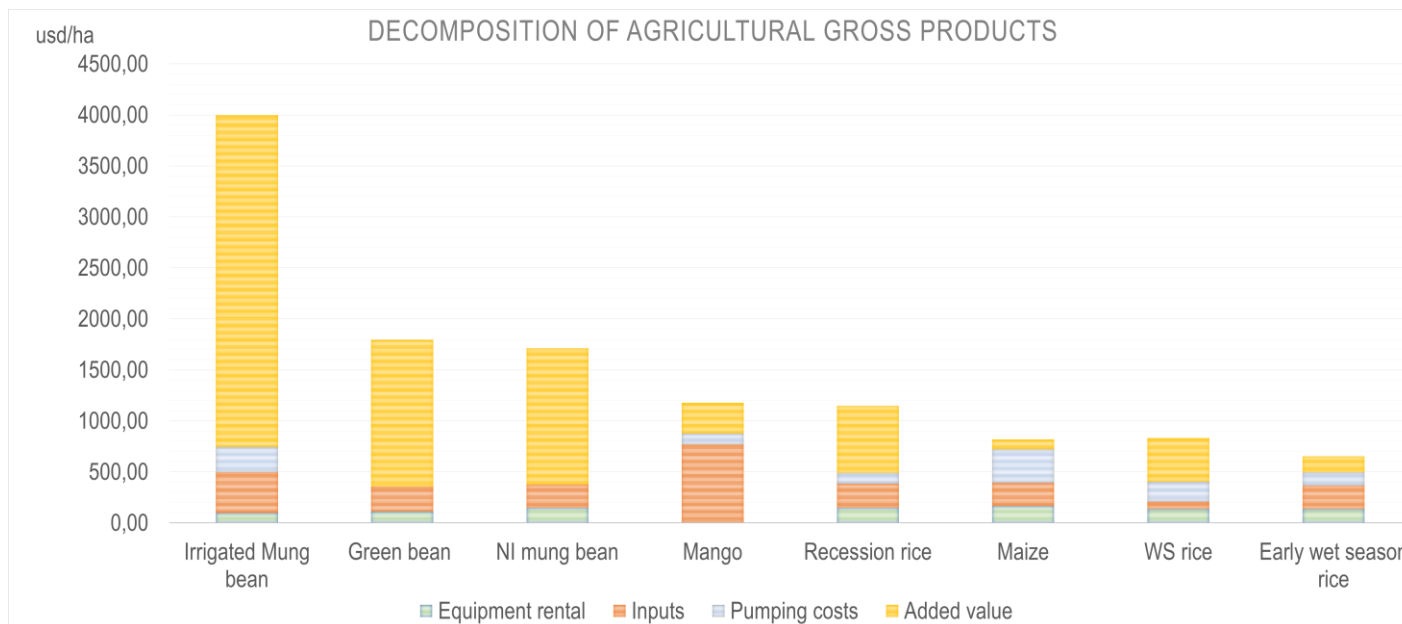
Annual crops per season (ha)





Preliminary Results- Agriculture

- Large diversity of farming systems
- Cultivated area larger than country and province average (???)
- Low profitability of rice farming (esp. in dry season due to drought despite large area)
- Low profitability of mango (50% of which cultivated as secondary activity)
- Emergence of small and medium scale farm-entrepreneurs (15% of farmers)





Pekel et al.
(2016)



Participatory identification of « alternative » development pathways

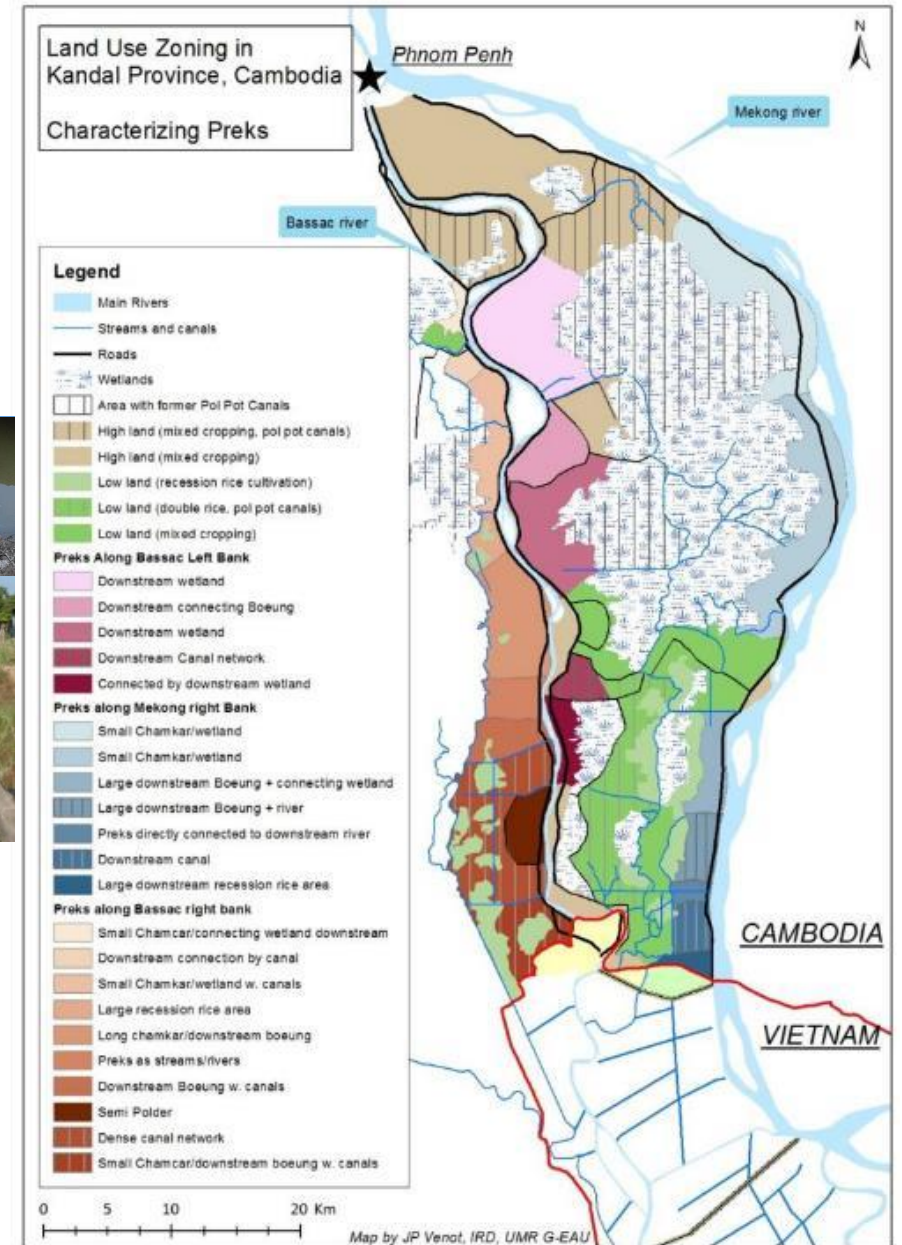
A BRIEF INTRODUCTION





Preliminary Results - Rehabilitation

- Rehabilitation approach tends to be generic and focused on **excavating prek channel** and building **water control infrastructures**
- Focus on increasing **water availability in the dry season**
- Need to account for **diversity of preks IN their surrounding environment** instead of implementing a blanket approach
- **Planning at local and landscape levels** is necessary (integrated approach)





Preliminary Results- Participation principles

- COSTEA research and methods in support of AFD development activities (WAT4CAM project)
- Importance of “buy-in” from development agents
- **Ad-hoc and adaptive approach**
- **Versatile serious game called “Dai Prek”** re-designed at every session
- Tool **inspired from** reality rather than accurate representation of reality
- Implemented **at local level** (farmers and decision makers) to discuss choices over specific engineering options and **at national level** (PMU) to discuss principles and planning of interventions at regional level
- **Objective:** “open the horizon” over the multiplicity of possible interventions and “model” expected impacts.
- **Perspectives:** a series of participatory workshop to lay the ground for a participatory master plan (??)

Pumping Station		
		Normal
	Chamkar production	+2
	Boeung production	+1
	Fish	0
	Satisfaction	-1

Dice	10-12	1
Loss	Big Flood	Low Flood
Chamkar production	0	-1
Boeung production	-2	0
Fish population	0	0
Satisfaction	0	0



PDA

Engage in the development of policies and strategies for agriculture and food security notably by reducing the variability of crops yields

Objective: Increase crop production for food security and market



Board 1/Round 1			
Normal	Extreme flood	Polders resist	Droughts
7	-19	-19	-4

Board 2/Round 1			
Normal	Extreme flood	Polders resist	Droughts
16	-23	-17	-1





Indicative Timeline (3 years)

Participatory activities are implemented alongside the WAT4CAM project and adjusted according to project progress and activities

Pesticides residues analysis in water is conducted alongside the project

Cross learning: the study is also implemented in Morocco and Ecuador

