INVESTIGATING THE JUSTICE DIMENSION OF WATER INFRASTRUCTURES:

DEMONSTRATION AND INSIGHTS FROM A SERIOUS GAME IN KANDAL PROVINCE, CAMBODIA

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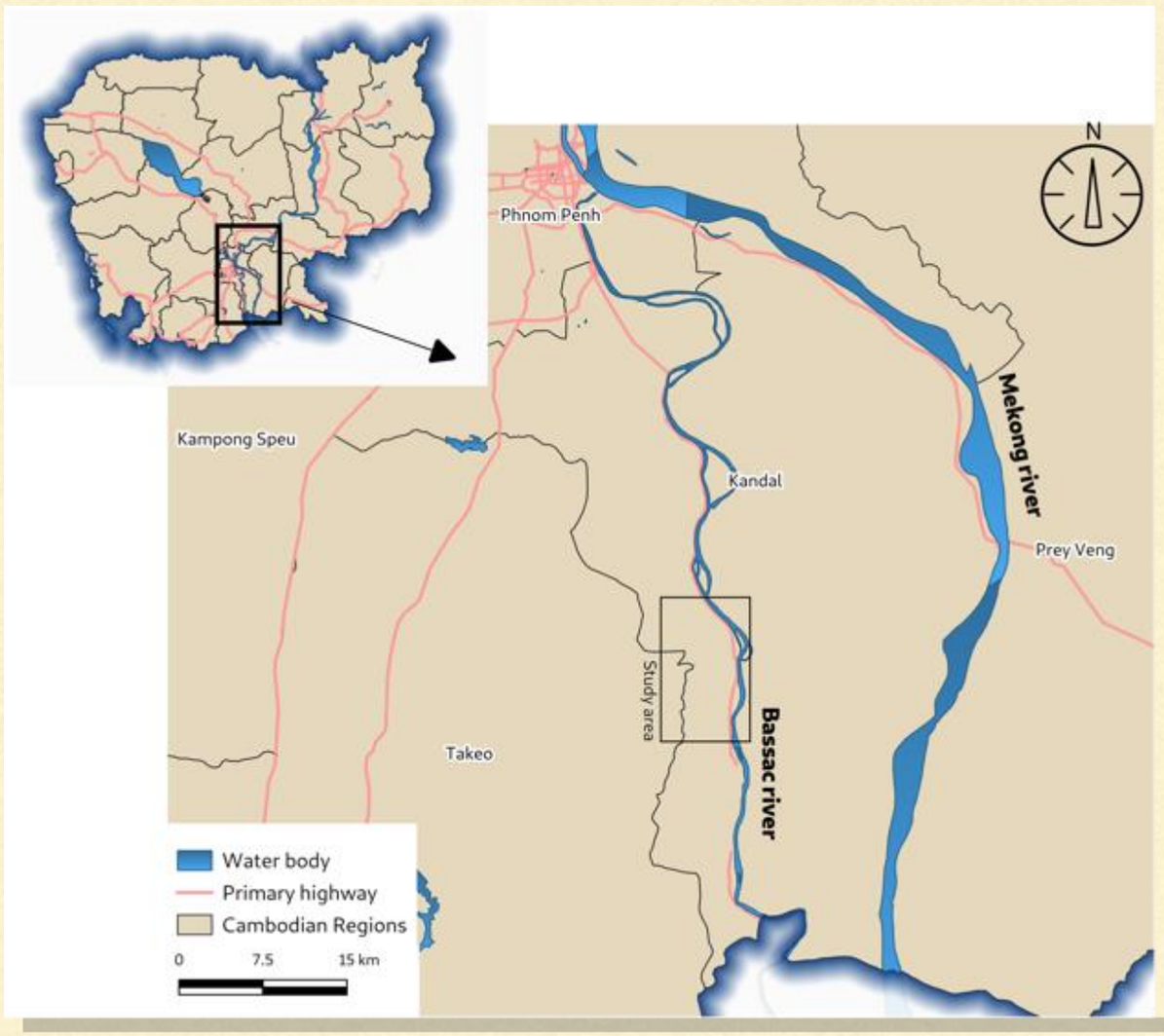
WHERE ARE WE?

THE UPPER MEKONG DELTA IN CAMBODIA



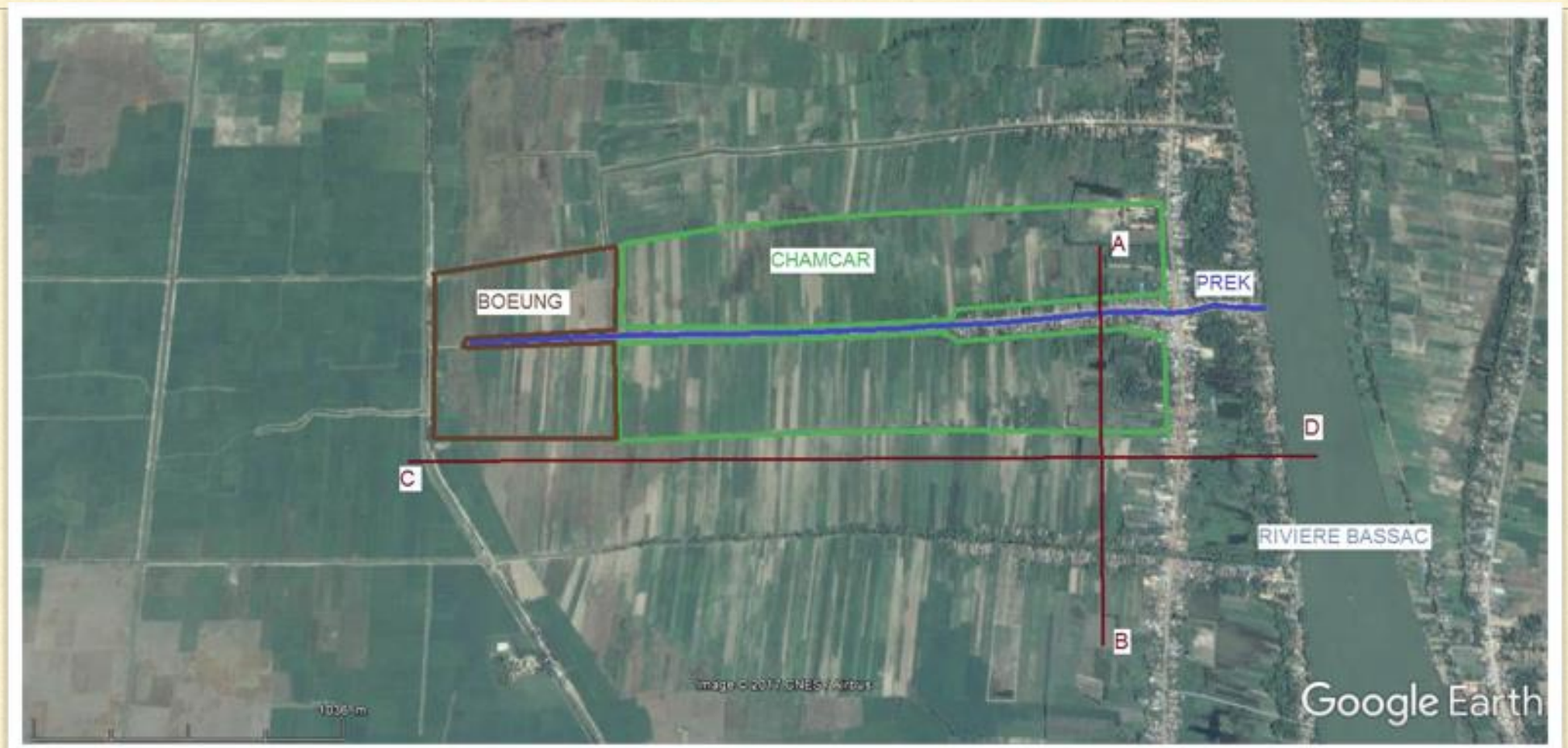
PREK: AN ICONIC INFRASTRUCTURE

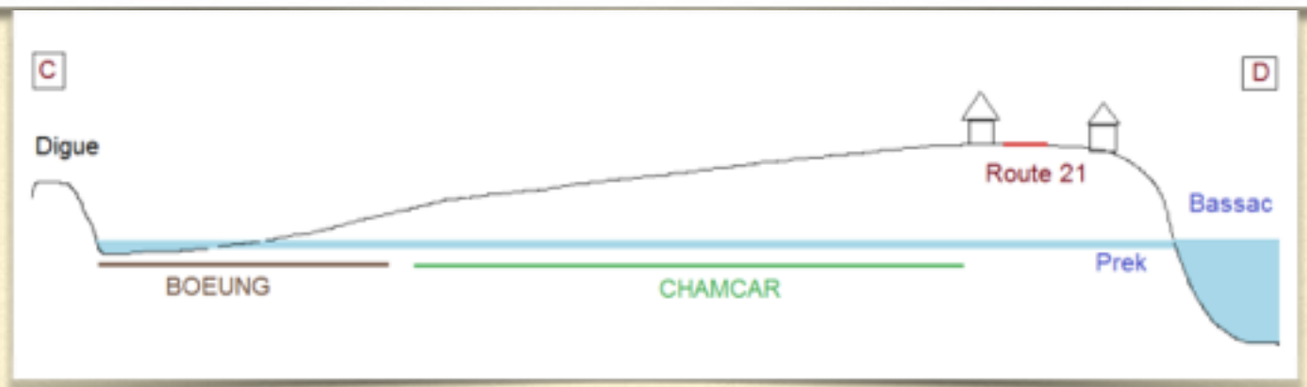
- Earthen canal (300 to 3,000 meters) branching from the Bassac and Mekong Rivers and constituting a water channel ‘inland’ towards low lying wetlands

- ‘Built’ during the protectorate period –second half of 19th century) initially for land reclamation

- Recent attempts at ‘rehabilitation’ to sustain intensification of agriculture

PEOPLE AND SPACE





Fisheries during the wet season (September-February)

Recession rice (November-January)

High value crops (sugar cane, vegetables, orchards) thanks to pumping in the Chamkar

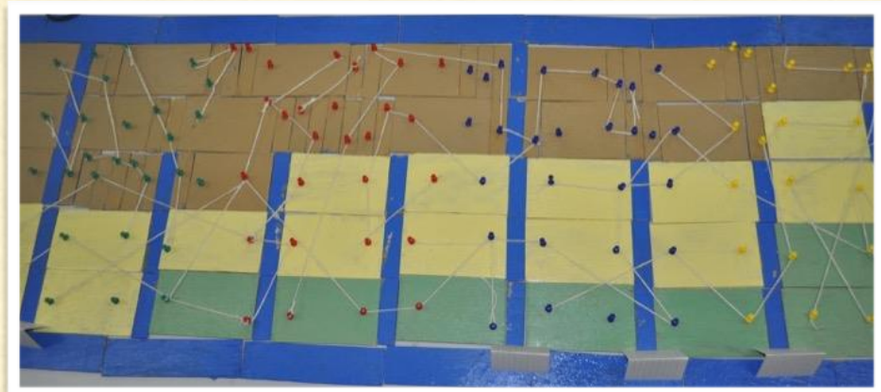
20/09/2017

02/05/2018

06/12/2018

SERIOUS GAME TO ADRESS ISSUES OF ENVIRONMENTAL JUSTICE

Users of natural resources



Regional level decision makers

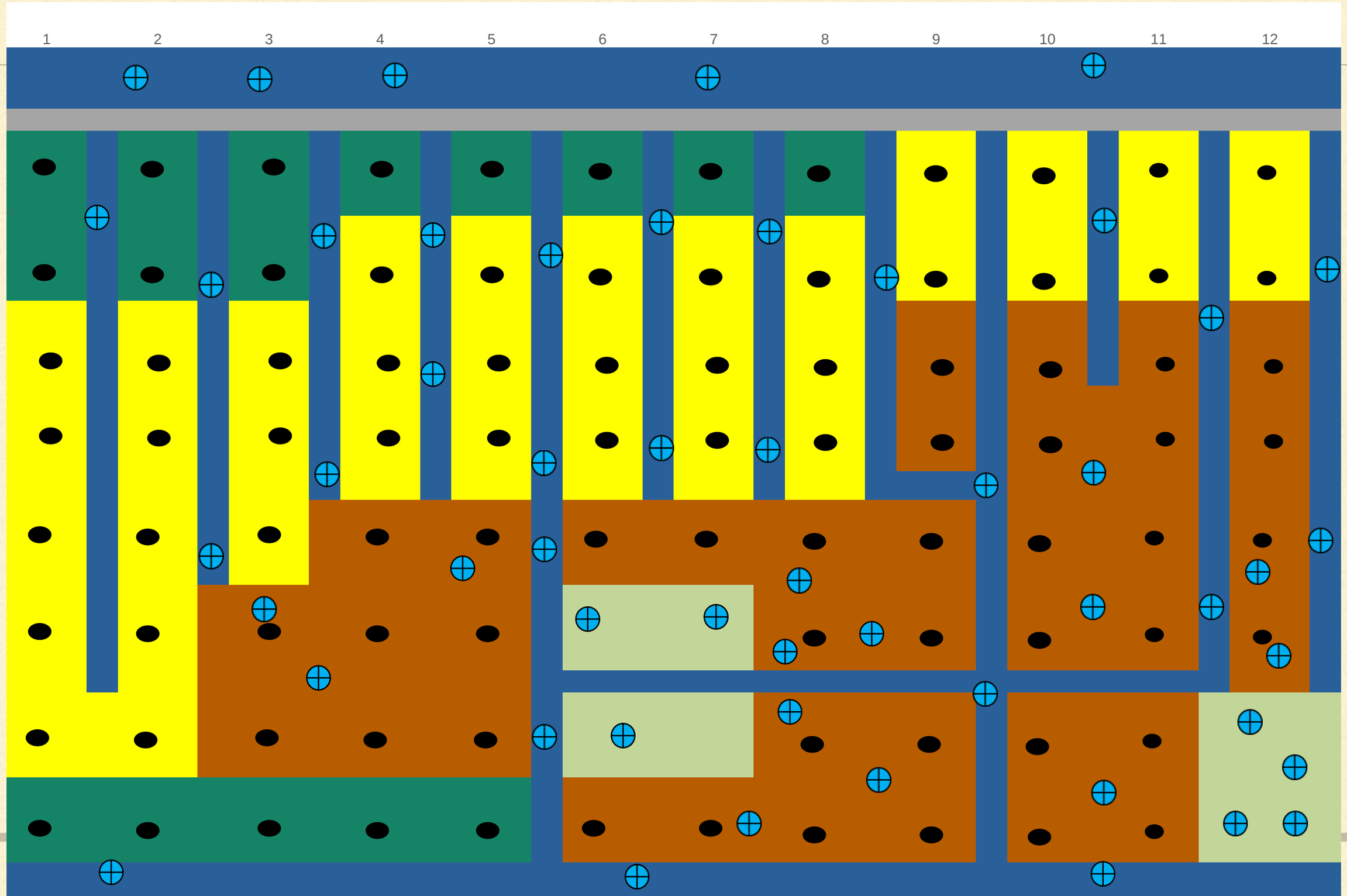
2 serious games designed for different audiences

- Regional decision makers
- Users of Natural resources

Objectives: (1) Discussing the justice implication of different infrastructure development modalities; (2) Questioning the role of diverse stakeholders in choosing infrastructures development paths

LET'S PLAY, SERIOUSLY…

THE *DAI PREK* SERIOUS GAME



ROLES

PDOWRAM

Provide legal and technical support to irrigation development through the coordination of the National Water Resources Strategy. Aim at:

- *Freedom for all from the threat of loss of life and livelihood as a result of floods and droughts.*
- *Sufficient water where it is needed, to provide for food security, people's livelihoods, and economic activity.*
- *A water environment that is unpolluted and supports healthy fisheries and aquatic ecosystems.*

Objective: Minimize flood risk in the Chamkar and allows for floods in Boeung

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

Fisheries Administration

Promote a water environment that is unpolluted and support healthy fisheries and aquatic ecosystems to ensure the long-term sustainability of fisheries

Objective: Improve the livelihoods of the population through sustainable fishing and protection of the natural vegetation

Local Government

Coordinate the action of sectoral ministries to ensure an integrated development of the area.

PROVINCE/DISTRICT

Objective: Equitable improvement of livelihoods in the constituency

Line Administrations
Sectoral Objectives

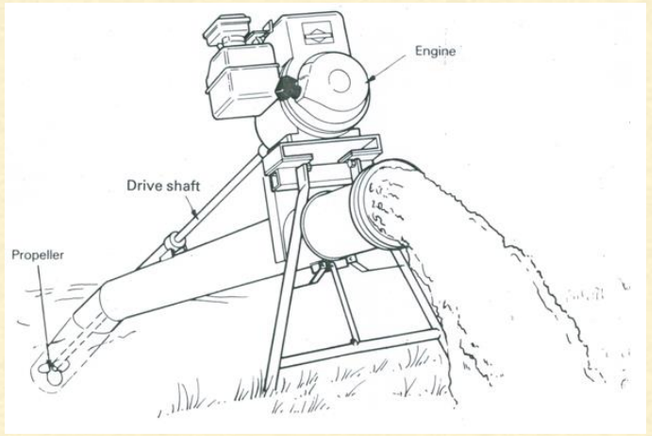
Local administration and/or elected representative

ACTIONS

- Polder (3)
- Pumping station (5)
- Water control gate (4)
- Individual fishing (3)
- Collective fishing (2)
- Commercial fishing (1)
- Selling input (2)
- Sustainable agriculture promotion (2)
- Land clearing (2)

Each action has a differential impact on agricultural production, fisheries, satisfaction of the population and these impacts further depend on the water regime

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

OBJECTIVES

- Increase agriculture production by 50% in the Chamkar and the Boeung

- Ensure there is still some fish in the area
- Ensure there is still some natural vegetation in the area

- Ensure part of the Boeung is flooded
- Limit flooding to the Boeung area

- Ensure levels of livelihoods increase
- Ensure equity in livelihood improvement

- Chamkar production 52 Units >> 77 Units
- Boeung production 38 Units >> 57 Units
- At least 4 plots of natural vegetation remain
- At least 12 plot of Boeung (brown) are flooded
- Maximum 1 plot of Chamkar (green/yellow) is flooded
- At least 10 fish resources still available (stock replenishment)
- At least 25 fish harvested
- Difference in livelihoods across communes < 5 units

DEBRIEF/FEEBACK

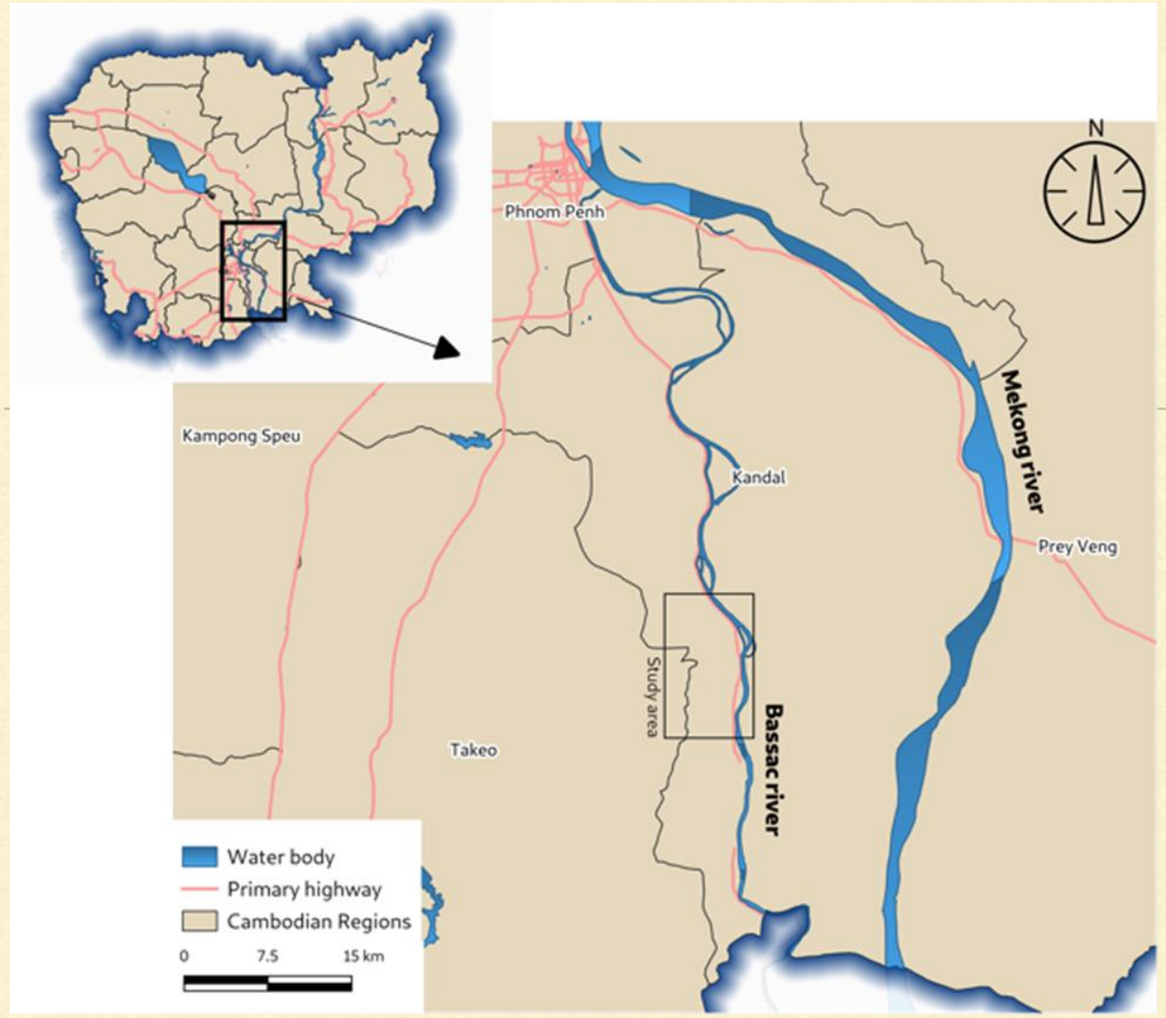
Distributive

Collective planning allows redressing injustice? e.g.

- Differential access to multiple natural resources
- Spatial and social distribution of risks

Are those aspects accounted for in the game you just played?

BACK TO WHAT HAPPENED THERE…



SOME INSIGHTS FROM THE SESSION IN CAMBODIA

- 2 groups in parallel (2 boards)
- Same activities than today (2 rounds)

- Attendance:
  - ✓ Fisheries administration
  - ✓ Agriculture administration
  - ~~✓ Water/irrigation administration~~
  - ✓ Donors (EU, AFD)
  - ✓ Research organizations (World Fish)
  - ✓ Local elected representatives (commune chiefs)
  - ✓ Local administration (district)

COMPARING THE BOARDS

Boards are strikingly different from one round to the other

- First located in the Boeung, polders have then be positioned around Chamkar land (shift from flood protection to intensification of agriculture).
- Strong territorial/spatial dimension to players' actions
- Path dependency of infrastructure development (building blocks)
- More careful about impacts of actions on fishery resources (these were all lost in round 1)

COMPARING THE RESULTS

These tables show the gain or loss vis-à-vis an initial livelihood level of 20/board			

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

Board 2/Round 2			
Normal	Extreme flood	Polders resist	Droughts
19	**-10**	**13**	**8**

- Livelihoods improved “more” in case of collective decision/planning (round 2) than in case of individual decision (round 1)
- Strategies designed through collective decision making seems be “more resilient” in the sense that the systems cope better with floods and droughts (less losses)

Aims at triggering a discussion among stakeholders

Results are highly dependent on the game calibration: « you get what you input »

Possible artefact of “rules” learning

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Procedural

Using a boundary object (such as a serious game) allows building legitimacy of multiple view points?

How to/what to do to have actual influence?