Trade-offs between ecosystem services in rice cropping system

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Workshop on conservation of the floating rice - based agro-ecological farming systems in the Mekong Delta, Vietnam
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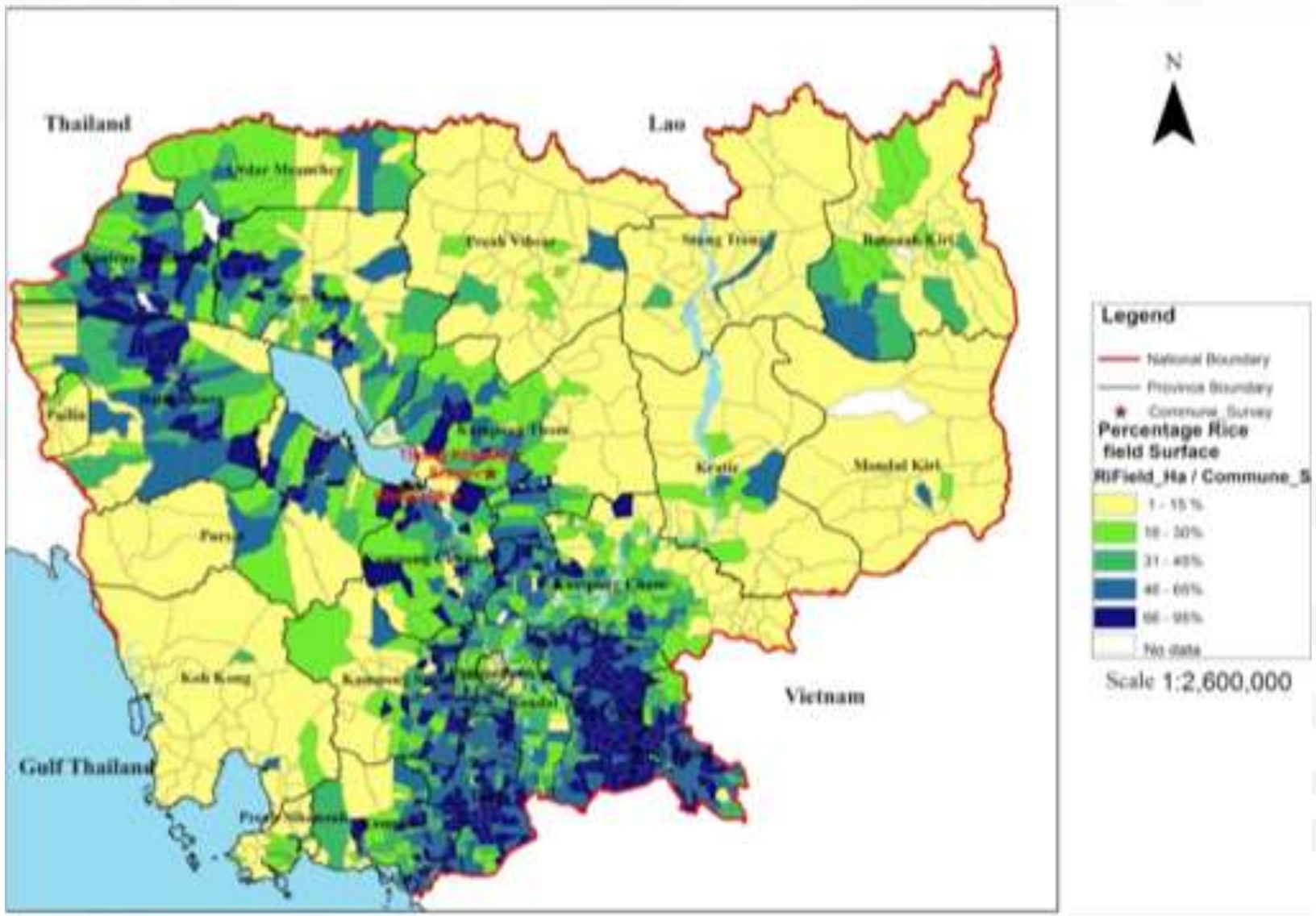
Introduction

Cambodia is an agricultural country and Indo-Burma biodiversity hotspot: 4 of the global 200 Ecoregions "habitats of terrestrial, aquatic, marine and bird species".

Main agro-ecosystem:

waste central floodplain of Tonle Sap Lake (TSL) and Lower Mekong river basin

- One quarter of the country's surface
- and equal to 80% of total rice field surface.
- High fertility but high risk of flood



Cambodian Important agro-ecosystem

➢ 15,000 km^2 in rainy season (May-Oct) and 2,500 km^2 in Dry season (Nov-Apr).

➢ Biosphere Reserve of Cambodia and the world's most productive freshwater and wetland ecosystems :

- fourth most productive captive fishery in the world, representing 16% of the Mekong river fish capture.
- flood regulation "flood pulse"
- and large seasonal reproductive grassland habitat to two-thirds of the world's bird populations.

Ecosystem of Tonle Sap Lake, a productive and vulnerable agro-ecosystem needs to be preserved

Farmer choices on an agro-ecosystem with high risk of flood

3 main strategies from farmers to combine different rice cropping systems on TLS agro-ecosystem:

- ➢ Increase productivity with low risk of flood: “short-term rice”
- ➢ Continue to produce despite floods and adapt to wate regime: “rainy season rice” and “floating rice”
- ➢ Increase value-added: “organic rice”

Trade-off between Ecosystem Services in Short-term rice

A simple view

Ecosystem Services (ES):

High Provisioning services

- High Yield

Ecosystem Disservices

- Disturb water flow and sedimentation
- Decrease inland aquatic habitat and agro-biodiversity
- Increase Water and Soil Pollution
- Produce food with high chemical residues
- Reduce genetic resources in rice varieties

Trade-off between Ecosystem Services in Short-term rice

A simple view

Low provisioning service:

- Low yield

Other provisioning serves:

- NTFPs
- Fish, Vegetables and other agro-biodiversity
- Grazing
- Fire wood

Others ES:

<u>Regulating service</u>:

- Flood regulation, Habitat and Biodiversity
- soil formation from deposit
- Preserve fauna, flora and amphibians of rice fields.
- Less chemical residue leaching into water.
- soil biodiversity and water quality

Economic comparison

An example

	Yield	Price	Income	Cost for Chemical Input	Cost for labour and others	Cost Rent land & Water	Margin 1 (without land and water cost)	Margin 2 (with land rent & water costs)
	t/ha	$/t	$/ha	$/ha	$/ha	$/ha	$/ha	$/ha
STR	4.65	200	930	220	344	236	366	130
FR	1.6	190	304	47	140	0	117	

Total cost: 800$

Perspective from different actors for rice sector in Cambodia

Government

Policy will : Productivity increase and export

Farmer

- Farmers like eating floating rice
- Farmers advised that floating rice is good for health, in particular older people because this rice can ease blood circulation and joint pains.
- Floating rice uses less chemical inputs, so there are less chemical residues in soil and water.
- If floating rice farmers continue to produce on existing rice fields and keep Roneam trees in their rice field, floating rice can contribute to Fishery Natural Resources management.
- Floating rice and animal grazing is a harmonious combination.

Consumer

- Health degradation caused by chemical inputs
- Negative impact of agriculture on environment

The future is in our hand

OR

Produce in harmony
“rice - agrobiodiversity - human”?

Thank you for your attention