



Using simulation games for agroecology issues in
South-Eastern Asia

Feedbacks from the field

RADA Game:

Resilient Agriculture through co- Design of Agroecology pathways

Rada Kong, Vuthy Suos, Vira Leng, Sovann Pat,
Rasmey Seng, Jean Christophe Castella, Florent Tivet

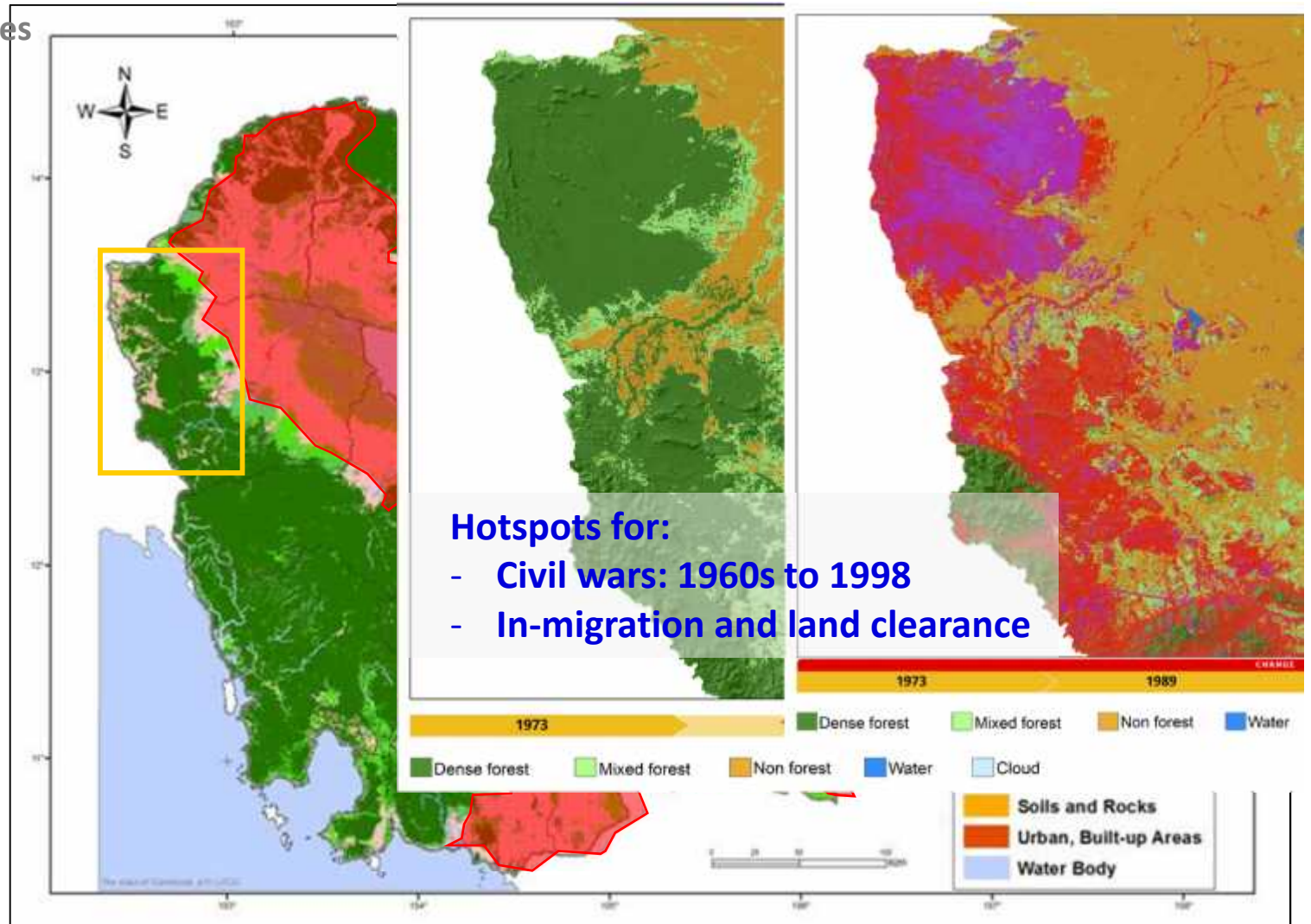


Vientiane, February 7-8, 2018

Contents

1. Context and objectives
2. Key features of the game
3. First outputs
4. Feedback from the game

> Context and objectives



Source: MPWT/JICA (2002)

- Central lowland and peripheral upland agroecology systems
- Remarkable dynamics of agrarian system in peripheral uplands

> Context and objectives

Transitional farming systems

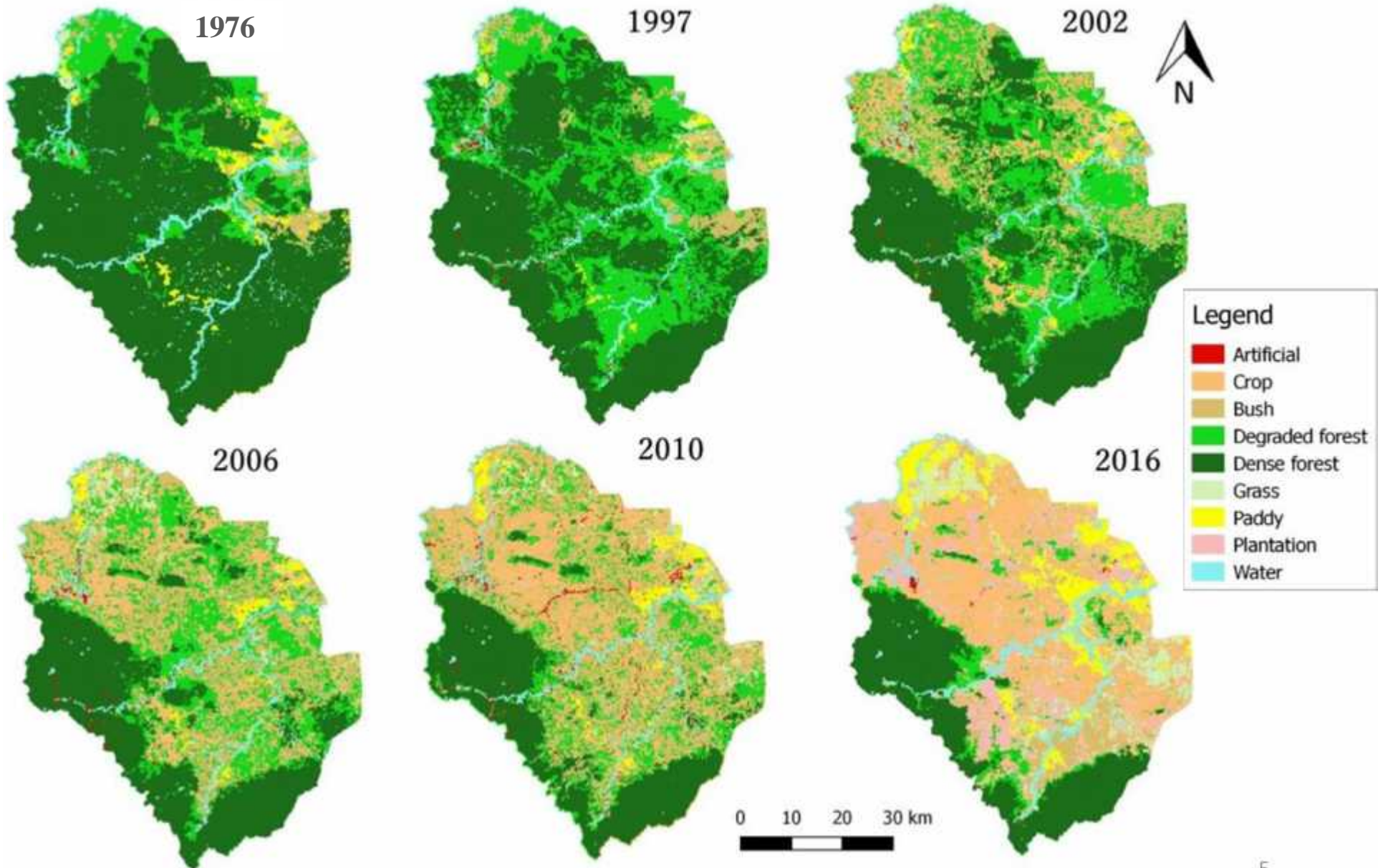


Degradation process



Fast changes in farming systems

LU classification from Landsat



> Context and objectives

.... We want to control



Nutrients export
(15 tons dry tubers/ha)
250 kg N/ha and 200 kg K/ha

Soil under chronic stress
The soil is a capital that should be protected!

> Context and objectives

CA (PADAC) project: Cropping engineering



Early maize followed by cassava



Soybean after sorghum



Maize with Pigeon pea



CT maize

CA early maize



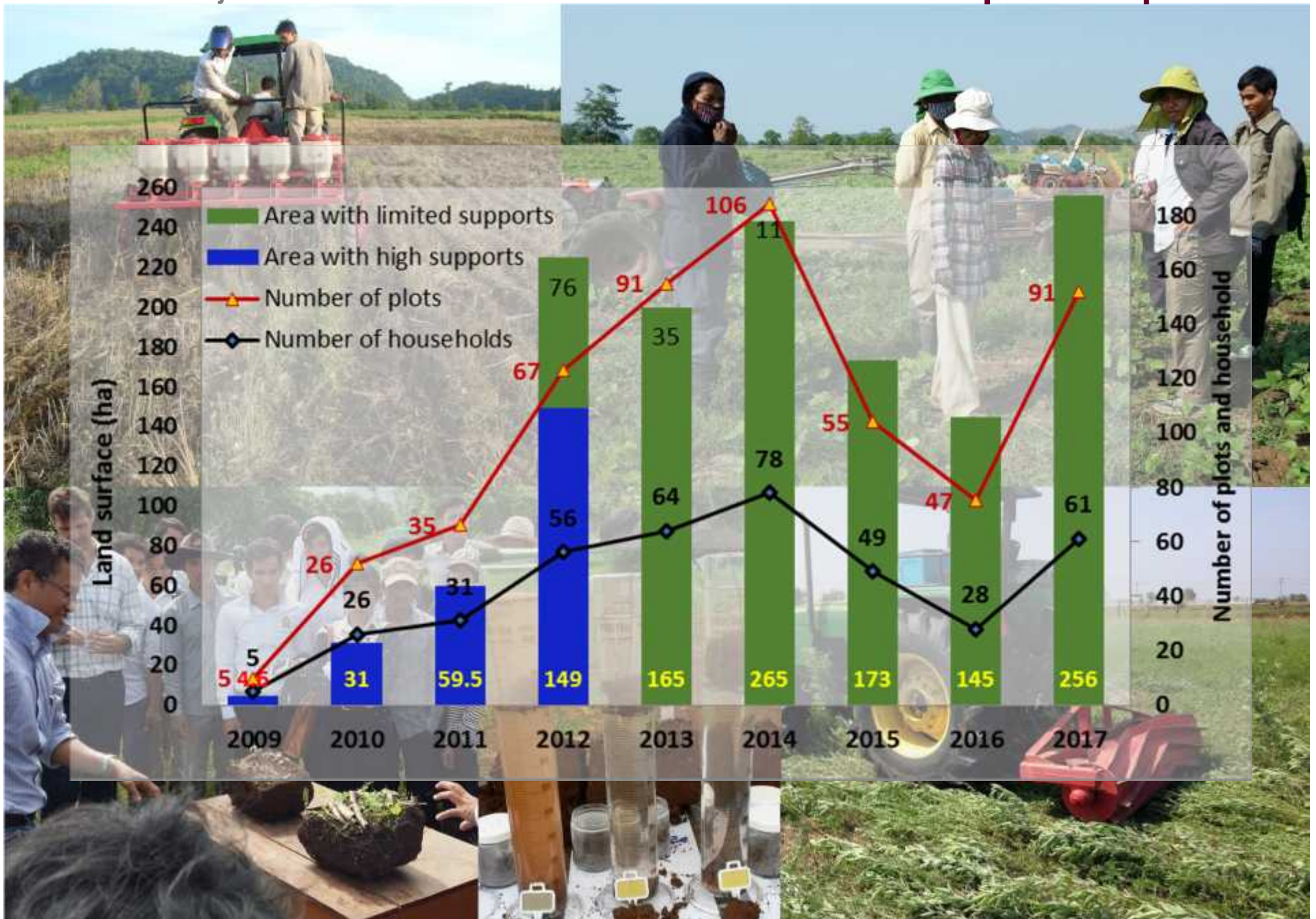
Mungbean for grain



Sunhemp for seed

> Context and objectives

Iterative and adaptation process

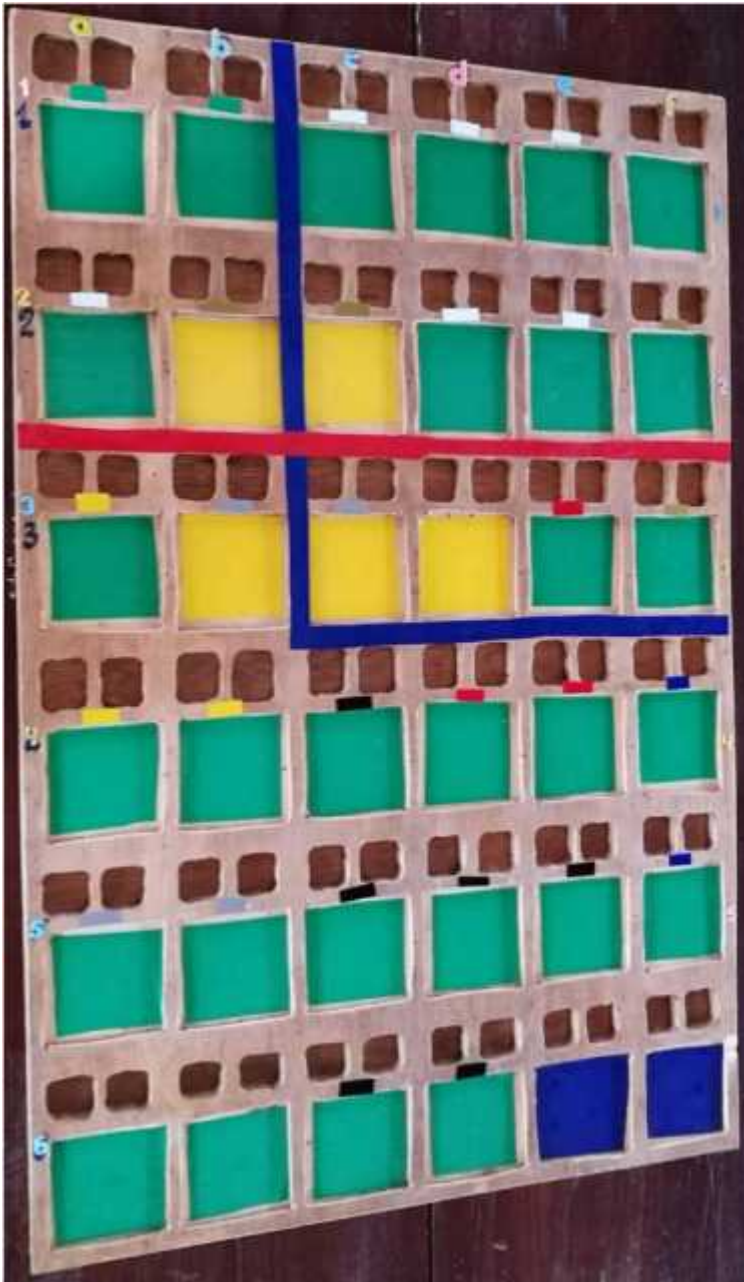


Objectives of RADA game

1. To understand how different types of farmers decide on land uses to improve household economy
2. To explore scenarios of innovations based on agroecology principles

> Key features of the game

Board game



- Spatial board 36 cells with 2 sub-cells each
- 3 main land covers:
 - Upland: 29/36 – 80%
 - Lowland: 5/36 – 14%
 - Mountain: 2/36 – 6%



- Wooden block: different color for different crop and systems
- Button: family labor
- Wooden cube: cattle
- Asset: power tiller, house...etc.
- Banknote
- Dice: risk assessment

> Key features of your game

How to select the players?

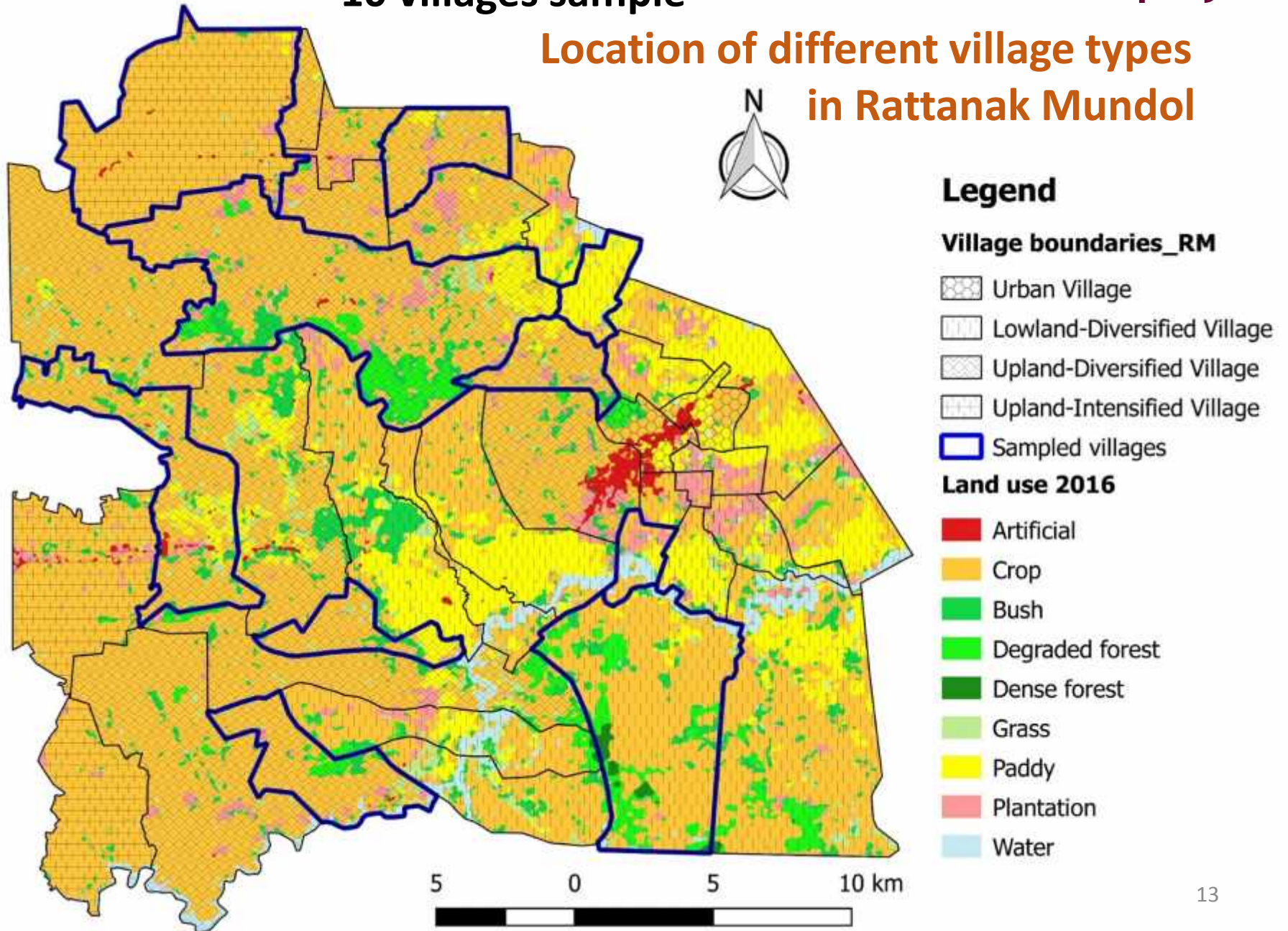


> Key features of your game

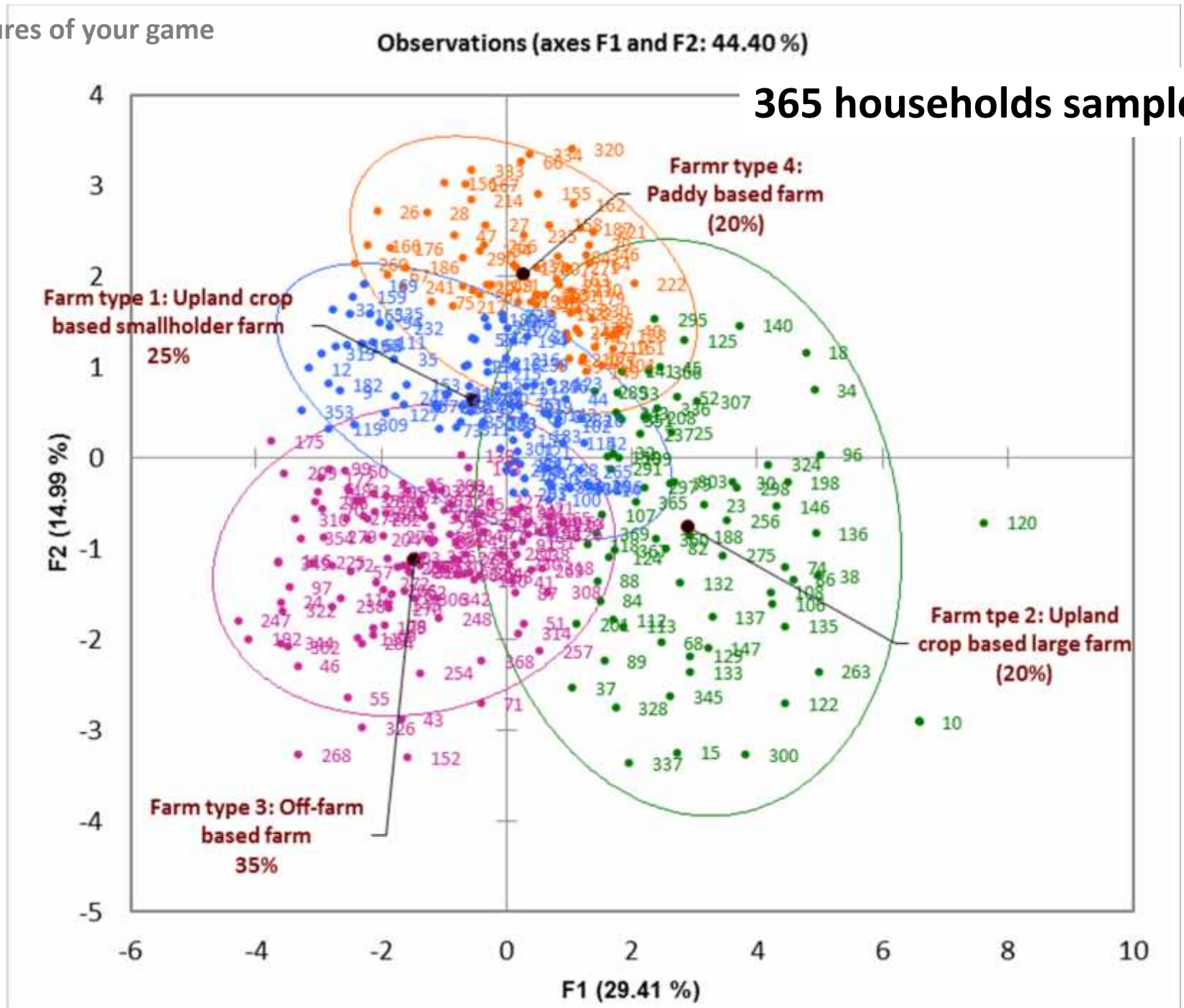
10 villages sample

How to select the players?

Location of different village types
in Rattanak Mundol



> Key features of your game



> Key features of your game

Players: role, goal, and resources

- 8 players/farmers: 2 from each type
- Role: implement crop, livestock, and/or off-farm activities based on their resources, experiences, and parameters
- Goal: accumulate capital and increase household income as soon and as much possible
- Resources:

Player	Color	Upland	Lowland	Labor	Cattle
Big upland	black & white	6	0	4	4
Small upland	red & yellow	3	0	3	0
Paddy	gold & silver	2	2	4	4
Off-farm	green & blue	2	0	2	0

> Key features of your game

Game's round and rules



- Round 1: Period of peanut and soybean (2000-2004)
- Round 2: Period of starting maize (2005-2007)
- Round 3: Period of maize boom (2008-2011)
- Round 4: Period of maize boom with CA pilot project (from 2010)
- Round 5: Period of starting cassava (from 2013)
- Round 6: Period of orchards with uncertainties of market and rain (from 2015)

We would like to address questions of:



- Depletion of soil fertility and decline of crop productivity
- Risks of uncertainties from rainfall and market price

> Key features of your game

Game's round and rules (cont.)

Parameters for crop activities

- 1 poster for 1 round
- Choices on crops based on reality
- Changes on labor based on mechanization and herbicides
- Changes on profits based on monocropping, fertilizers and CA practices

The image displays six posters for different rounds of a game, each detailing crop activity parameters. The posters are arranged in a collage, with Round 1 being the largest and most prominent. Each poster features the ACTAE logo and the title 'ជំពូក ១: សណ្តែកដី និងសណ្តែកសៀង' (Round 1: Peanut and soybean) and 'ជំពូក ២: ពោតមុង' (Round 2: Mungbean), etc. The posters are organized into tables with columns for Crop, Year, Labor (MM), Profit, and Risks. The Labor (MM) column is further divided into Animal-Hand, Power, and Tractor. The Risks column is divided into Rain and Price. The crops listed include Paddy rice, Upland rice, Peanut, Soybean, Mungbean, and Sesame. The posters also include a color-coded legend for each crop.

ដំណាំ Crop	ឆ្នាំ Year	ពលកម្មគ្រួសារ Labor (MM)			ចំណេញ Profit	ហានិភ័យ Risks	
		គោរ-ដៃ Animal-Hand	ថ្នាំស្បៅ Power Herbicides	ក្រាមទំរ ម៉ាស៊ីនប្រគុក Tractor		ភ្លៀង Rain	តម្លៃ Price
ស្រូវទំនាប Paddy rice		3.0		0.6			

> Key features of the game

Game's round and rules (cont.)

Parameters for investment

- 1 poster for 2 rounds
- More recent, more expensive and options based on realities

ខ្ញុំទី: ១-២ ការវិនិយោគ និងសកម្មភាពក្រៅកសិកម្ម
Round 1-2 Investment and off-farm activities

ឈ្មោះ Items	ពលកម្ម Labor	ថ្លៃ Cost	ចំណូល Income	ហានិភ័យ Risks
គោ ទិញ/លក់ Cattle buy/sell		0.6	0.6	
ចំណូលគោ Income cattle				
ពលកម្ម លក់ Labor sell				
ពលកម្ម ទិញ Labor buy				
ដីចំការ ទិញ/លក់ Upland buy/sell				
ដីស្រែ ទិញ/លក់ Paddy buy/sell				
ដីចំការជួល Upland rent				
ដីស្រែជួល Paddy rent				
គោយន្ត Power tiller				
ជួលគោយន្ត Rent power tiller				
ចងកាត Credit				
ដុកធ្លុង Charcoal				
សង់ផ្ទះ Build house				
ម៉ូតូ Motobike				
កុស.វិជ្ជា (ATFP)				

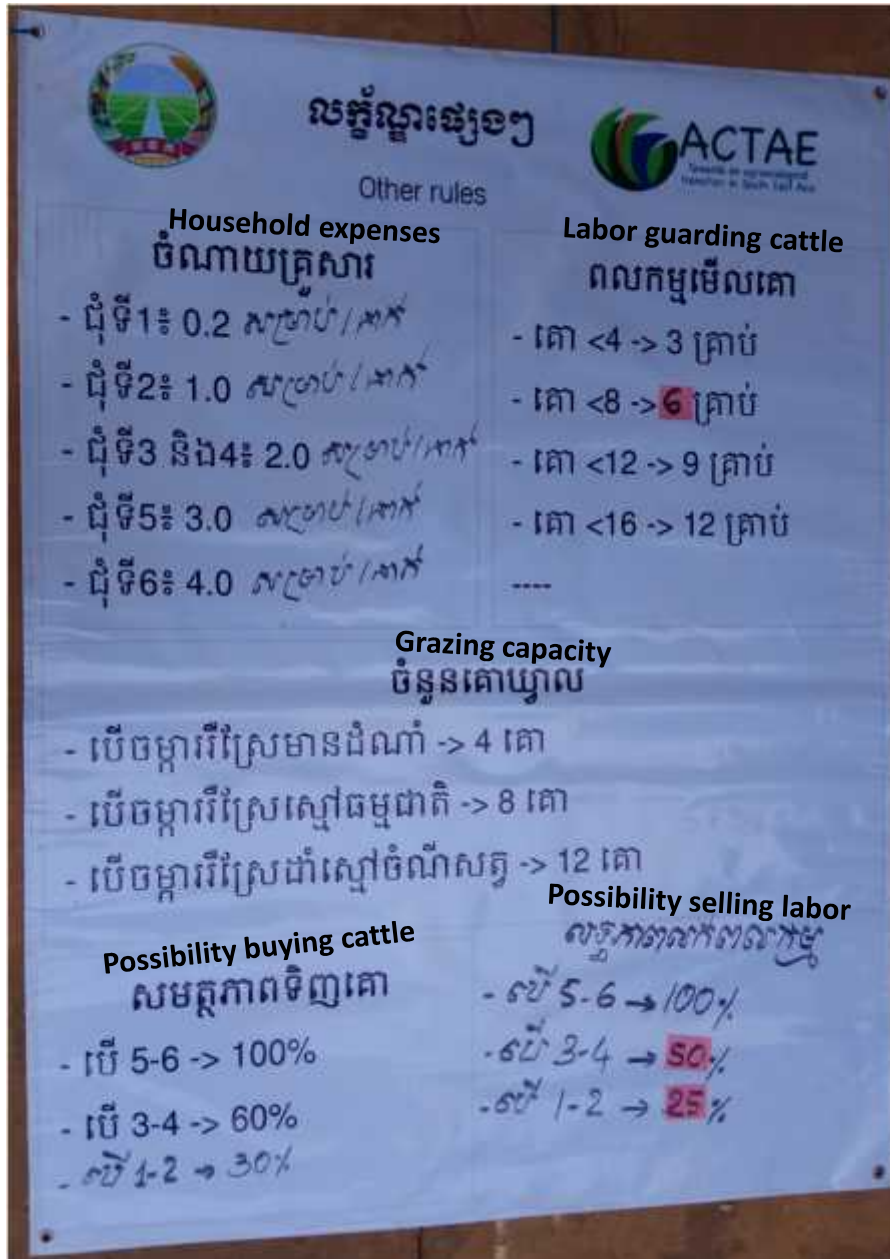
ខ្ញុំទី: ៣-៤ ការវិនិយោគ និងសកម្មភាពក្រៅកសិកម្ម
Round 3-4 Investment and off-farm activities

ឈ្មោះ Items	ពលកម្ម Labor	ថ្លៃ Cost	ចំណូល Income	ហានិភ័យ Risks
គោ ទិញ/លក់ Cattle buy/sell		1	1	
ចំណូលគោ Income cattle				
ដាំស្មៅចំណីសត្វ Pasture				
ចំណូលគោស្មៅដាំ Income cattle pasture				
ពលកម្ម លក់ Labor sell				
ពលកម្ម ទិញ Labor buy				
ដីចំការ ទិញ/លក់ Upland buy/sell				
ដីស្រែ ទិញ/លក់ Paddy buy/sell				
ដីចំការជួល Upland rent				
ដីស្រែជួល Paddy rent				
គោយន្ត Power tiller				

ខ្ញុំទី: ៥-៦ ការវិនិយោគ និងសកម្មភាពក្រៅកសិកម្ម
Round 5-6 Investment and off-farm activities

ឈ្មោះ Items	ពលកម្ម Labor	ថ្លៃ Cost	ចំណូល Income	ហានិភ័យ Risks
គោ ទិញ/លក់ Cattle buy/sell		2	2	
ចំណូលគោ Income cattle			1	បើ 1-2 -> 0.8 if 1-2 -> 0.8
ដាំស្មៅចំណីសត្វ Pasture	3	0.2		
ចំណូលគោស្មៅដាំ Income cattle pasture			1.2	បើ 1-2 -> 1.0 if 1-2 -> 1.0
ពលកម្ម លក់ Labor sell	1 ខែ	0.6	0.6	បើ 1 -> លក់ 1 ខែ

> Key features of the game



Game's round and rules (cont.)

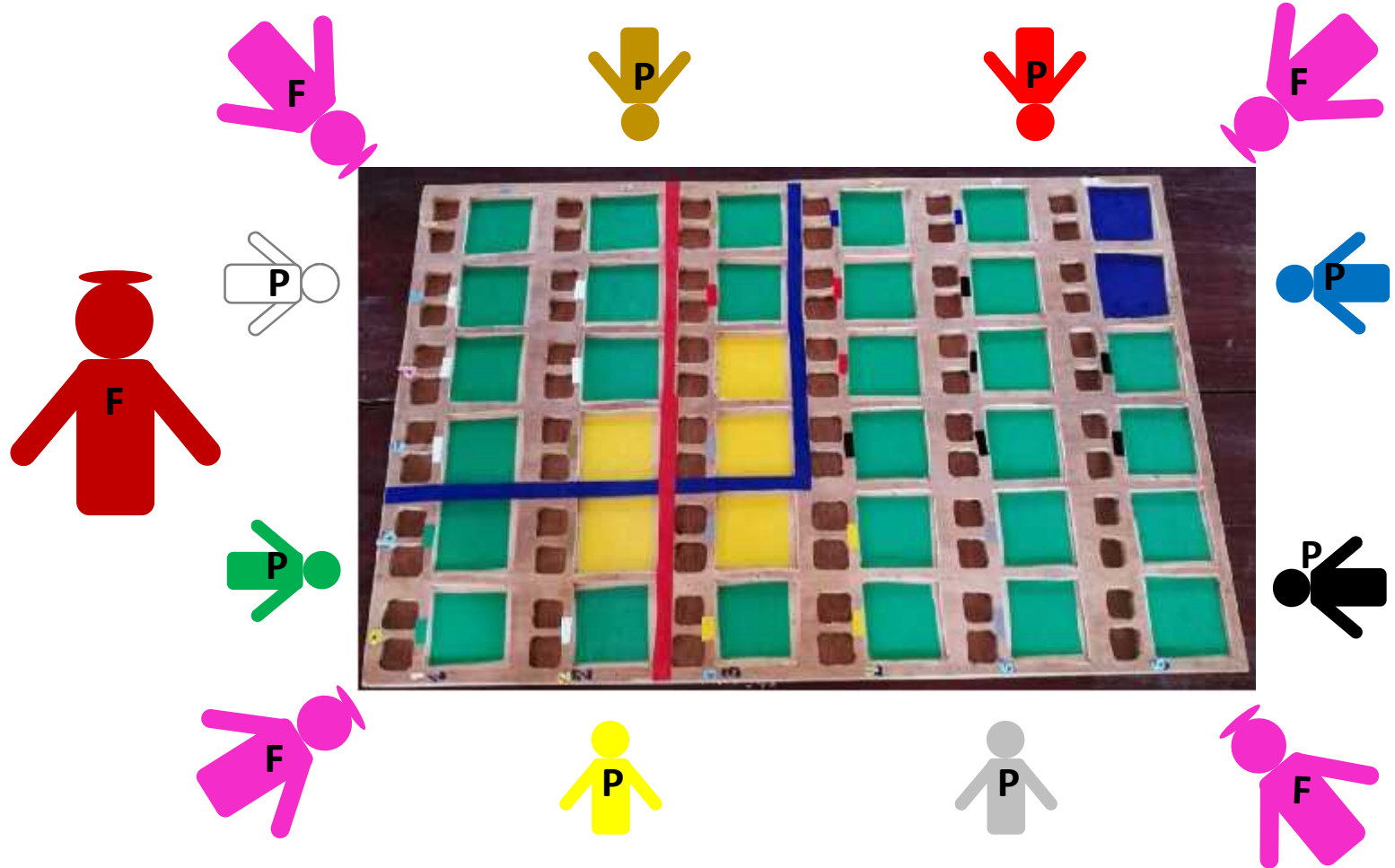
Other rules:

- Household expense
- Grazing capacity
- Possibility for selling labor
- Labor to guard cattle
- Labor for dry and wet season
- Sold asset could re-invest within the round, but selling labor is for next round
- Buying asset at the start of each round

> Key features of the game

Setting up room

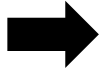
Game implementation



Assistant for buyer, creditor, and seller of all asset

> Key features of the game

1. Introduction



2. Play



3. Risks assessment



4. Results assessment



5. Debrief and discussions



5 steps/round

Game implementation (cont.)



> First outputs

What happened during the game?



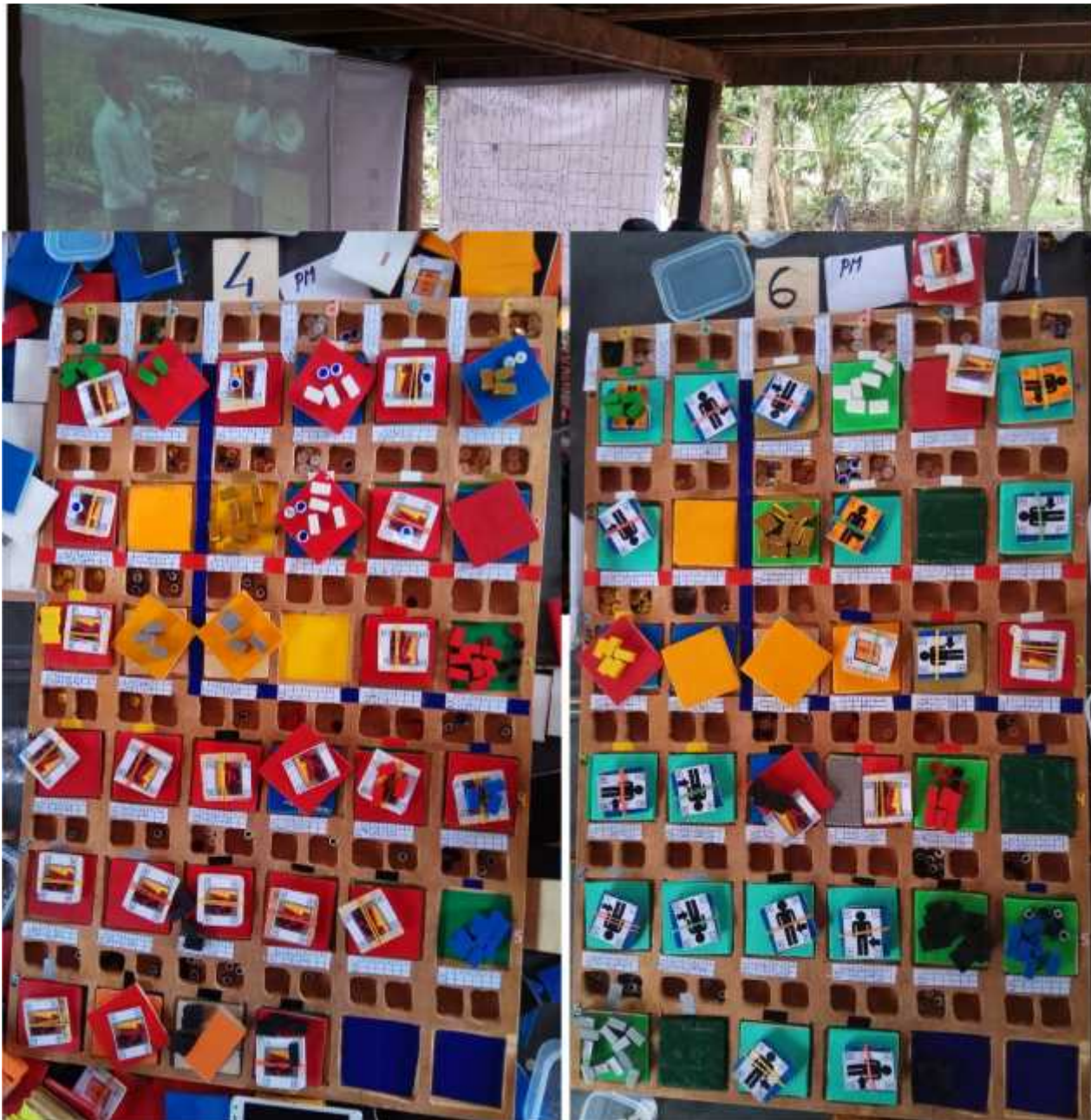
- Players requested to add or correct the parameters, e.g. profit of cassava, mungbean/maize
- Most players played with their reality, not based on parameters
- Low interactions between players, but could be big discussions between cattle owner and crop growers
- Increasing trend of cattle raising (regular income with less risks) and orchards plantation

Feedback from the players?

- All is well aware of the issues of soil fertility and risks with rain and market
- Farmer's solutions in the game:
 - ❑ Most use chemical fertilizers
 - ❑ Some use mungbean or sesame for green manure and rotation crops, e.g. maize//cassava, or at least change varieties
 - ❑ Some diversify activities (like *garbage collector*): annual crops, livestock, orchards, vegetables, off-farm...etc. coping with risks
 - ❑ Most concern about market risks for mango boom, but no real plan (e.g. farmer cooperative) for solution

> First outputs

Feedback from the players? (Cont.)



CA options:

- High rate of trying no tillage and cover crops to restore soil, esp. in non-CA village
- Improved pasture: electricidal fence, cut and carry for fattening
- But, most concern on fire, esp. in orchard plantation

> First outputs



Following outputs of the game?

Proposals:

- Cover crops for restoring soil and/or selling seed/grain for cash
- No-till planting if available service provision
- Improved pasture: different fodder species

Next:

- Replay game as a cinema for whole village
- Game for (1) collective organization and (2) negotiation with other actors (trader, MFI...)

How to improve the game?

How to improve the game design:

- Reduce number of rounds from 6 to 3, only full morning
- Refine more parameters: adding risks to CA options, crops with fertilizers, labor to guard cattle, grazing capacity for improve pasture...etc.

How to improve the game implementation:

- Select active farmers and have 1-2 reserved ensuring 8 players on time
- More time for discussions esp. on CA options to detail constraints and explore feasible / pragmatic options
- Remove all from each round avoid to repeat the play; bigger poster

How to improve the game facilitation:

- Clearly explain the game objective, no winner and no loser
- Demonstrate how to play and allow 1 player to try; give more funs
- Get agreement from all if changing or correcting parameters

Thank you very much for your attention!

Simulation game workshop to explore interventions for agroecology



Acknowledgement:

