INTERNATIONAL WORKSHOP

TRANSITIONING TOWARDS AGROECOLOGY AND REGENERATIVE AGRICULTURE: A CONTRIBUTION TO FOOD SYSTEMS TRANSFORMATIONS

24-27 OCTOBER 2023, Siem Reap, Cambodia

Participatory impact assessment for climate-resilient integrated farming systems

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Organizers:

Partners:

Outline

- Introduction to project
- Impact assessment
- Key results
- Recommendations

IFAD funded project – Scaling-up Climate Resilient Agriculture (SUCRA) project (2018 – 2022)

- ✓ The goal is to improve household incomes and build community resilience to climate change by promoting **integrated farming systems**.
- ✓ 1,500 smallholder farmers in Kampong Chhnang and Pursat province
- ✓ Sub-Component 3.2 of ASPIRE of MAFF

Integrated farming systems (IFS): *aim to* ***combine multiple crops*** *(e.g., cereals, legumes, tree crops, vegetables) and* ***multiple enterprises*** *(e.g., livestock, apiary, aquaculture)* ***on a single farm*** *in an integrated manner (Behera et al., 2015).*

→ **Fostering sustainable land management/agro-ecological practices**

Study sites

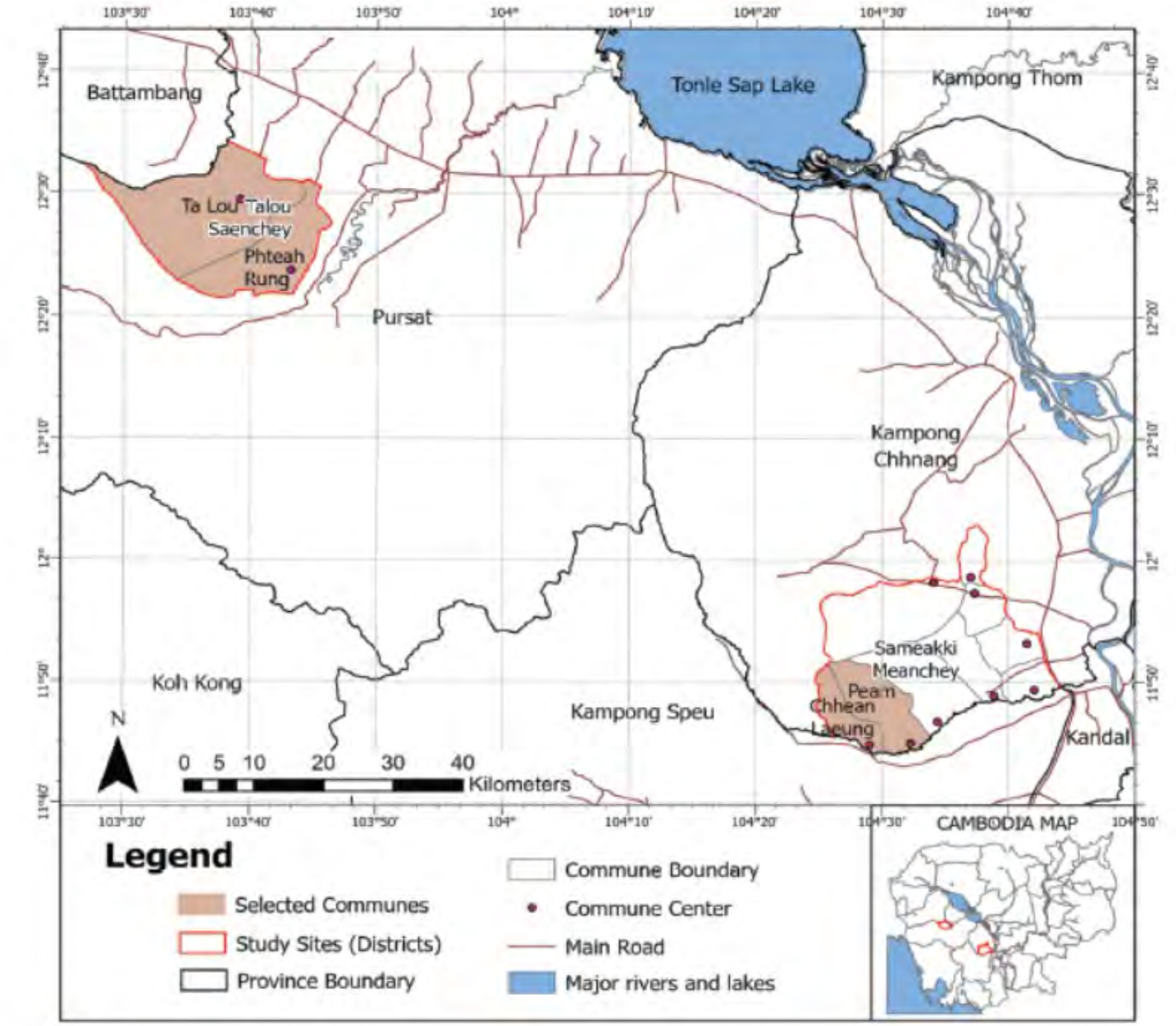
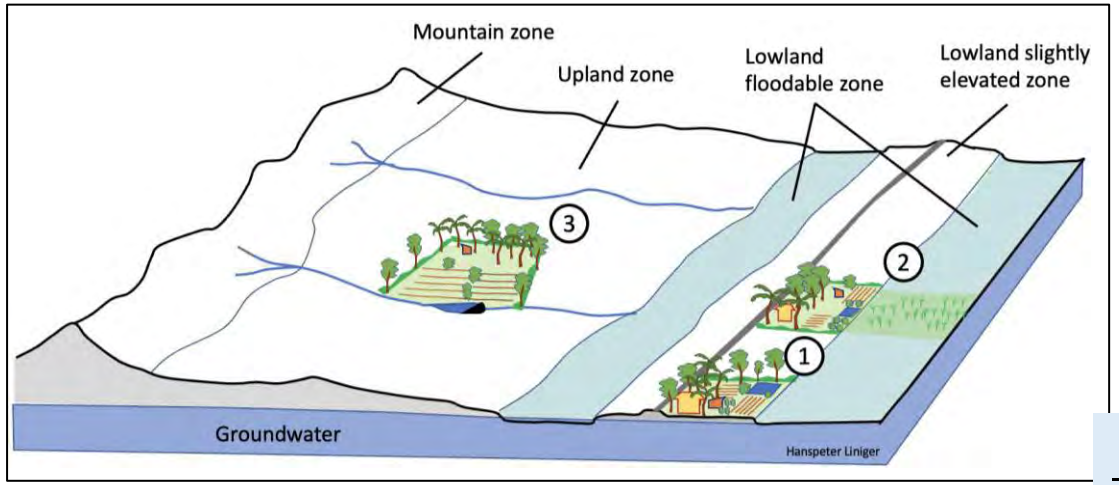


Figure 1. Map showing locations of the study sites in Pursat and Kampong Chhnang provinces.

[Tim et al., 2023]

General Landscape Units (GLU) identified



Key biophysical and social criteria	General Landscape Units (GLUs)		
	HOMESTEAD	HOMESTEAD WITH RICE	CHAMKAR
Agro-Ecological Zone	Lowland / flood plains; Upland above floodplains	Lowland / flood plains	Mostly upland
Slope	Flat (0-2%)	Flat (0-2%)	Gentle, moderate to rolling (<15%)
Groundwater table	Shallow (<1m) to medium (<5m)	Shallow (<1m) to medium (<5m)	Very deep (>10m) to inaccessible (>50m)
Settlement history	Settled >30 years ago	Settled >30 years ago	Newly settled / cleared land / forest
Residential house	Yes	Yes	No
Average farm size [ha]	0.52	0.78	0.67
Labour availability (family / casual workers)	Medium to high	Medium to high	Low

GLU Types:

1. Homestead
2. Homestead with Rice
3. Chamkar

[Tim et al., 2023]

Homestead – IFS including artificial pond and aquaculture (GLU1 – IFS M3)

1

Photo: Hanspeter Liniger

Vegetables, fruit trees, multi-purpose crops, small livestock, and **artificial pond and aquaculture:**
1: Farmhouse
2: Pond with fish
3: Irrigated leafy vegetables
4: Irrigated climbing/fruit vegetables
5: Agroforestry with fruit trees
6: Banana, herbs along walk path
7: Small livestock (chickens, ducks)
8: Wells
9: Water storage tanks
10: Vegetable nursery
11: Living fence, multipurpose trees, indigenous trees

Homestead with Rice – IFS including paddy rice-fish aquaculture (GLU2 – IFS M5)

2

Photo: Sophea Tim

Vegetables, fruit trees, multi-purpose crops, small and **large livestock** and forage, and **artificial pond and paddy rice-fish aquaculture**:
1: Farmhouse
2: Staple of large livestock (cows)
3: Chicken house
4: Forage under coconut trees
5: Vegetables
6: Sugar cane between fruit trees
7a-7b: Bamboo
8: Compost making place
9: Newly planted mango and citrus
10: Rice field
11: Rice-fish-pond aquaculture
12: Indigenous trees
13: Irrigation canal

Chamkar – IFS including irrigated commercial crops (GLU3 – IFS M7)

3

Photo: Hanspeter Liniger

Irrigated commercial crop cultivation integrating vegetables, fruit trees, multi-purpose crops:
1, 2, 3: Cashew plantation
4: Excavated pond for water harvesting in a natural stream
5: Natural shrub as a stream buffer
6: Irrigated mixed vegetables intercropped with fruit trees
7: Lemon trees
8: Mango trees
9: Resting shade

Irrigation from pond and natural stream

Integrated Farming System (IFS) Models

7 IFS Models:

M1: IFS including **small livestock** – agroforestry – fruit/ vegetable production

M2: IFS including **large livestock** – agroforestry – fruit/vegetable production

M3: IFS including **artificial pond and aquaculture** - agroforestry – fruit/vegetable production – small/large livestock

M4: IFS including **paddy rice cultivation** - agroforestry – fruit/vegetable production

M5: IFS including **paddy rice-fish aquaculture** - agroforestry – fruit/vegetable production

M6: IFS including **rainfed commercial crops** - agroforestry – fruit/vegetable production

M7: IFS including **irrigated commercial crops** - agroforestry – fruit/vegetable production

Key components / characteristics	HOMESTEAD			HOMESTEAD WITH RICE		CHAMKAR	
	IFS M1	IFS M2	IFS M3	IFS M4	IFS M5	IFS M6	IFS M7
IFS Model including	Small livestock	Large livestock	Pond & aquaculture	Paddy rice cultivation	Paddy rice-fish-aquaculture	Rainfed commercial crops	Irrigated commercial crops
Mixed vegetables	Key component	Key component	Key component	Key component	Key component	Key component	Key component
Multi-purpose crops/bushes/trees	Key component	Key component	Key component	Key component	Key component	Key component	Key component
Leguminous crops	Optional component	Optional component	Optional component	Key component	Key component	Key component	Key component
Commercial crops				Optional component	Optional component	Key component	Key component
Fruit trees	Key component	Key component	Key component	Key component	Key component	Key component	Key component
Small livestock	Additional component	Key component	Key component	Key component	Key component	Optional component	Optional component
Large livestock (>2)		Additional component	Key component	Key component	Key component	Optional component	Optional component
Pond and fish culture			Additional component	Optional component	Optional component		
Paddy field				Additional component	Key component		
Paddy field-fish aquaculture					Additional component		
Composting (fertilizer)	Key component	Key component	Key component	Key component	Key component	Optional component	Optional component
Bio-digester (gas production for cooking and lighting)		Optional component	Optional component	Optional component	Optional component		
Water source: Pond/well/tap water	Key component	Key component	Key component	Key component	Key component		Additional component
Irrigation (importance)	+++	+++	+++	+++ (dry season)	+++	Mostly rainfed	++
Colour legend:	*Key component*		*Additional component*		*Optional component*		

Tim et al., 2023

(Tim et al., 2023)






Activities

- ✓ Farmer mobilization and training on IFS and related topics
- ✓ Development of IFS farm plans
- ✓ **Decision support workshops with farmers**
- ✓ Training farmers on post-harvest technologies
- ✓ Implementation of farm plans
- ✓ **Assessment framework and monitoring of IFS**

Key figures

- ✓ 1,502 HHs (female: 834) trained on IFS and related topics
- ✓ 1,500 IFS farms set up (all with farm plans)
- ✓ 28 communities of practices (CoP) groups formed

Lead: IIRR and RUA

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Objectives of the Impact Assessment

- ✓To assess impact of the IFS practices on a farm
- ✓To compare initial and end of project assessment using bio-physical and socio-economic indicators (monitoring)
- ✓To identify suitability of IFS practices for different landscapes.
- ✓To train the project team and stakeholders (PDAFFs) on data collection, data entry, data analysis and dissemination of results.

Co-development of Impact Assessment Framework

- The tools are **co-designed** through an online process building on existing tools
- Process includes **capacity building** components on IFS

SUCRA ASSESSMENT TOOLS

Core team

- CDE/WOCAT (leading)
- RUA Team
- Local Consultant

Executive partner

International Institute of Rural Reconstruction (IIRR)

Assessment of Impacts

Google Earth image

Nov 2019

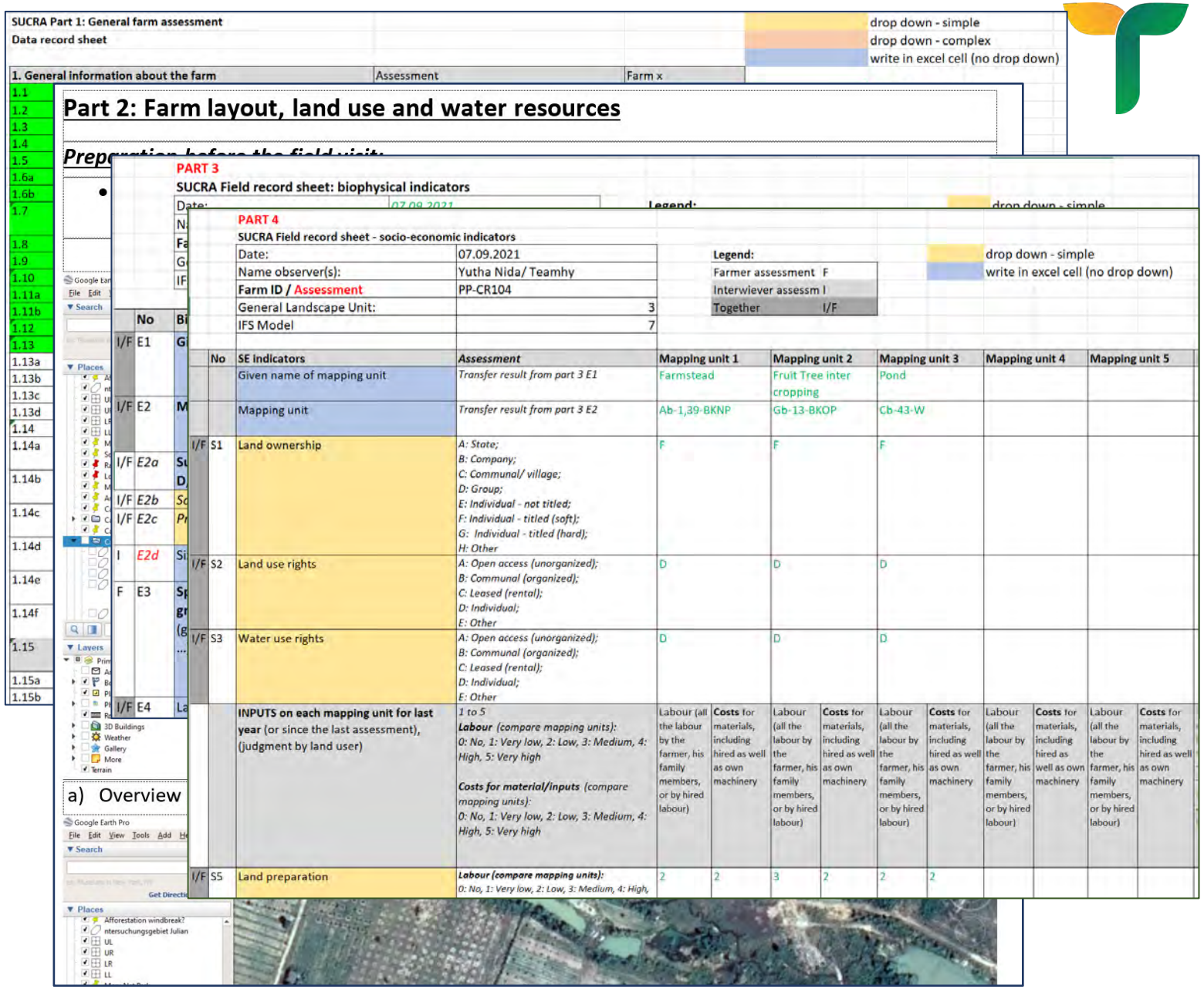
VS

Drone picture

Aug 2021

The Assessment Tools consist of five parts – plus a field manual

- Part 1: General farm assessment
- Part 2: Farm layout, land use, IFS practices and water
- Part 3: Biophysical indicators assessment sheet
- Part 4: Social-economic indicators assessment sheet
- Part 5: Data entry analysis



Data collection at an IFS farm

Drone picture and mapping unit delineation

Interview the farmer

Observe the farm and collect bio-physical data

Panorama photo

Key results

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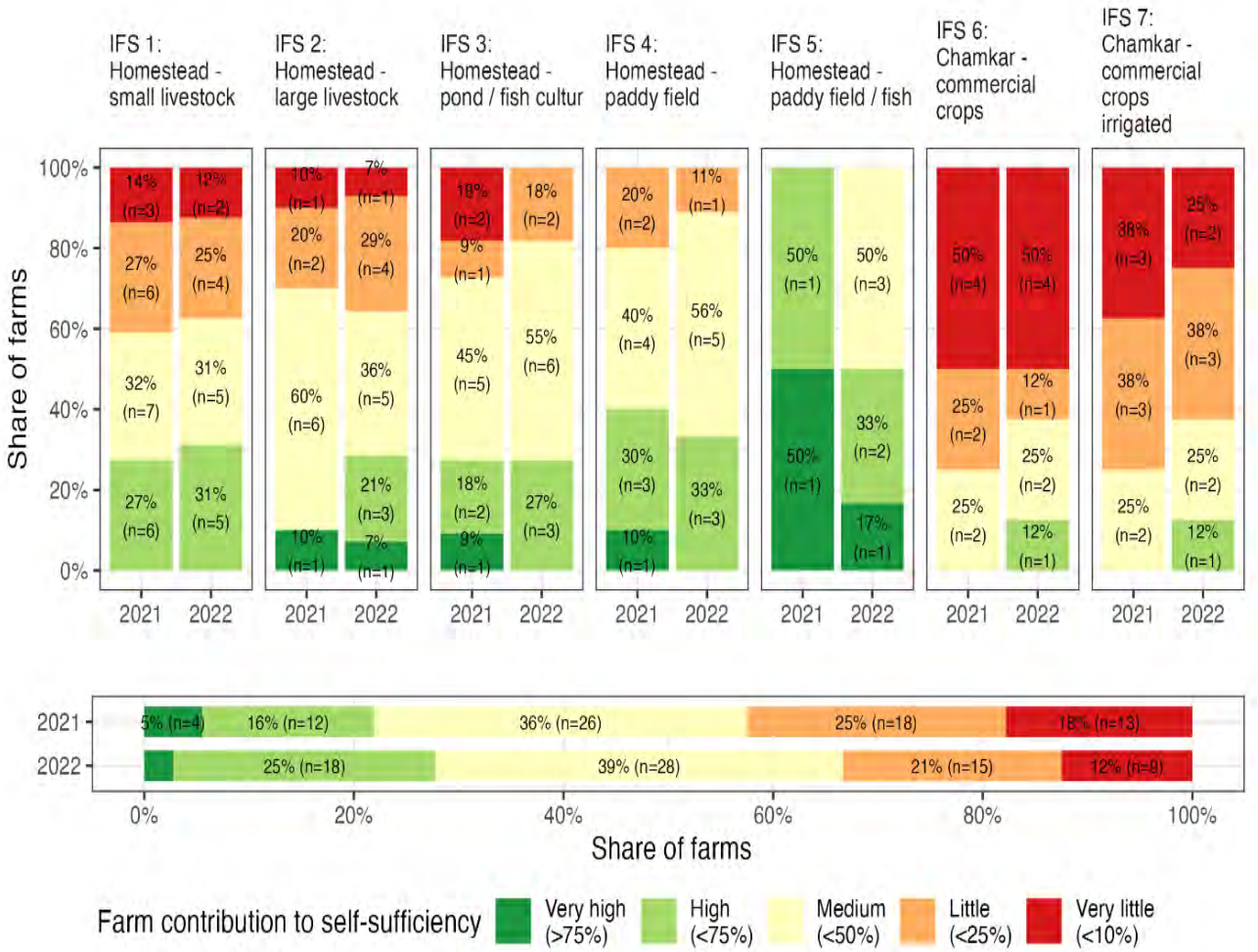
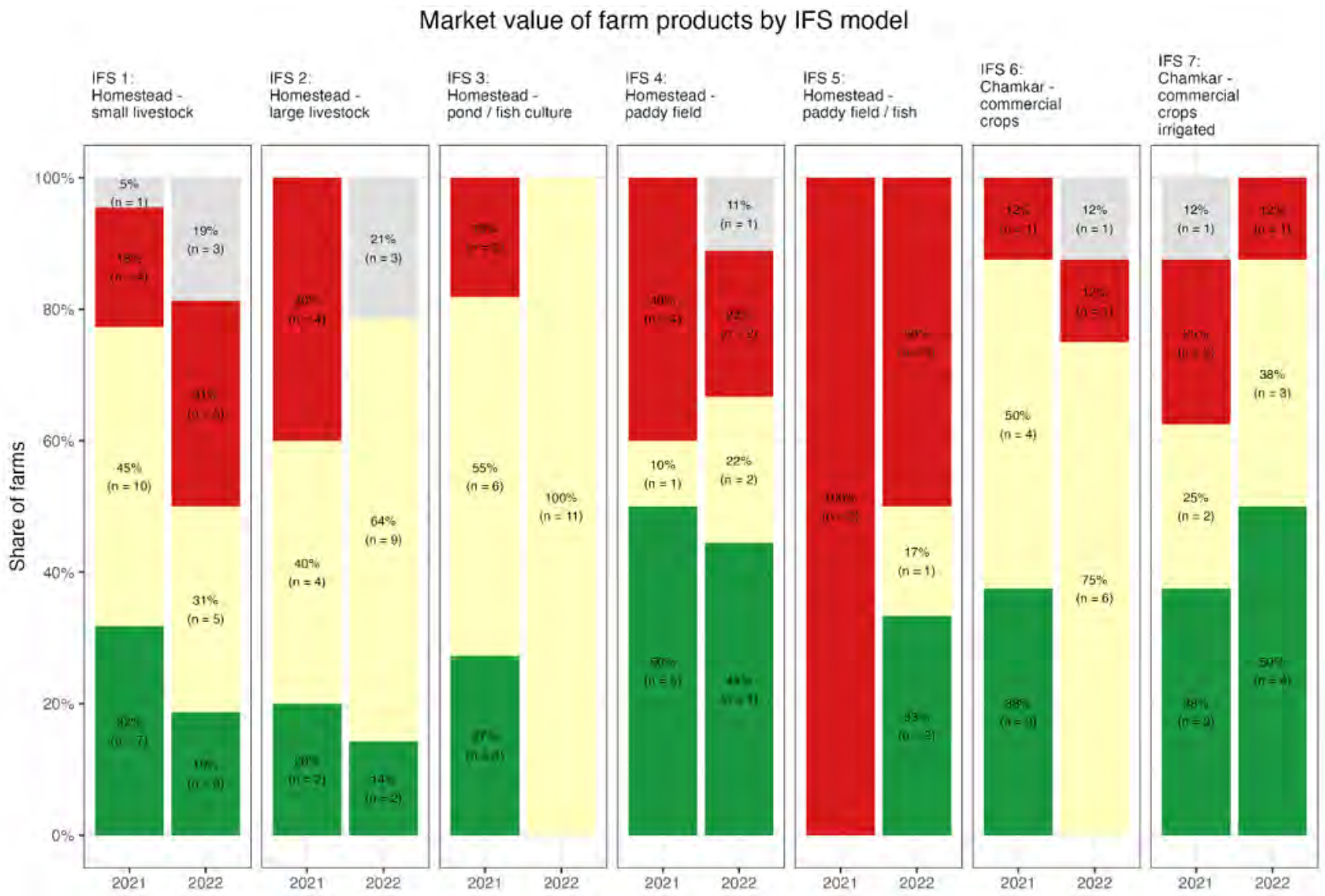
Farm contribution to self-sufficiency by IFS



Impact assessment allows to compare different IFS models,
e.g. **self-sufficiency.**

- Homestead with rice & fish (IFS 5) has highest contribution.
- Chamkar (IFS 6 & 7) has the lowest as it is market oriented.

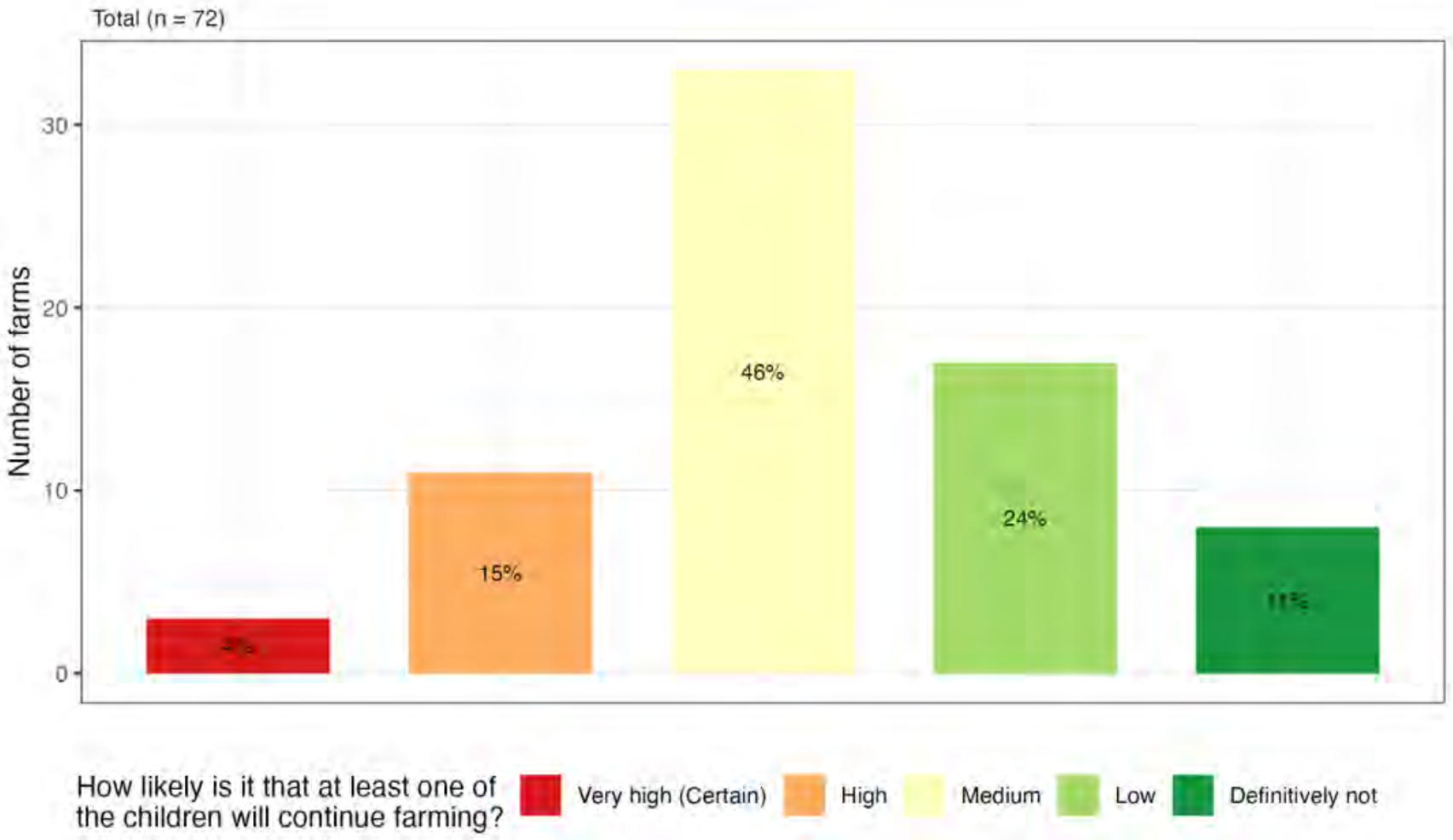
Market value of farm products



Market value is mostly increasing for all IFS

→ More indicators have been assessed:
soil health, impact of climate extremes, ...

Likelihood of children continuing farming

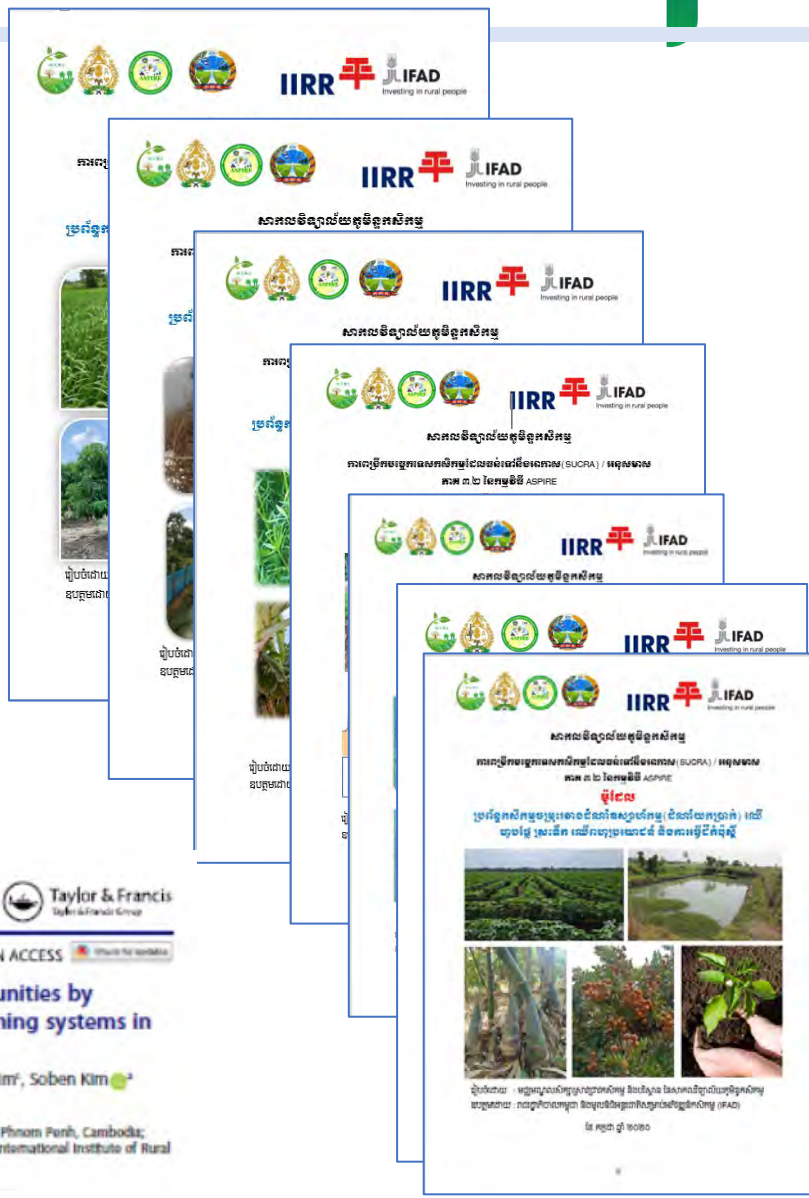


Key concern for the future:
Few young farmers are interested to continue farming

→ What would make farming more attractive?

Knowledge Products by the Project

- SUCRA leaflet
- Posters of 7 IFS models
- Guideline of IFS community of practice (CoP)
- Guideline of IFS promotion with farmers
- Journal article (Tim et al. 2023)



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Strengthening climate resilience of rural communities by co-producing landscape-specific integrated farming systems in Cambodia

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Recommendations and outlook

- ✓ Farms and IFS practices have to be linked to the respective **agro-ecological zone/landscape.**
- ✓ **Proper monitoring and evaluation** of the impacts of IFS is needed to show the benefits and reveal constraints for large-scale implementation of IFS.
- ✓ Implementation projects should support **long-term impact assessment** including bio-physical and socio-economic indicators.

- ✓ The approach is suitable for **upscaling to other projects and areas/provinces** in Cambodia.
- ✓ Farming should be made **more attractive for the young generation** by promoting new business opportunities.

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