



# Effect of sustainable integrated farming systems (SIFS) on dietary diversity of smallholder farmers in India (ID 733)



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**Keywords:** Dietary diversity, food consumption, sustainable integrated farming systems

## INTRODUCTION

Over the past decade, Welthungerhilfe and Indian partners have developed and implemented the approach “Sustainable Integrated Farming System (SIFS)” in India, which aims in increasing farm systems productivity by integrating various elements within a farm. This approach is now upscaled through various projects in South Asia and Africa.

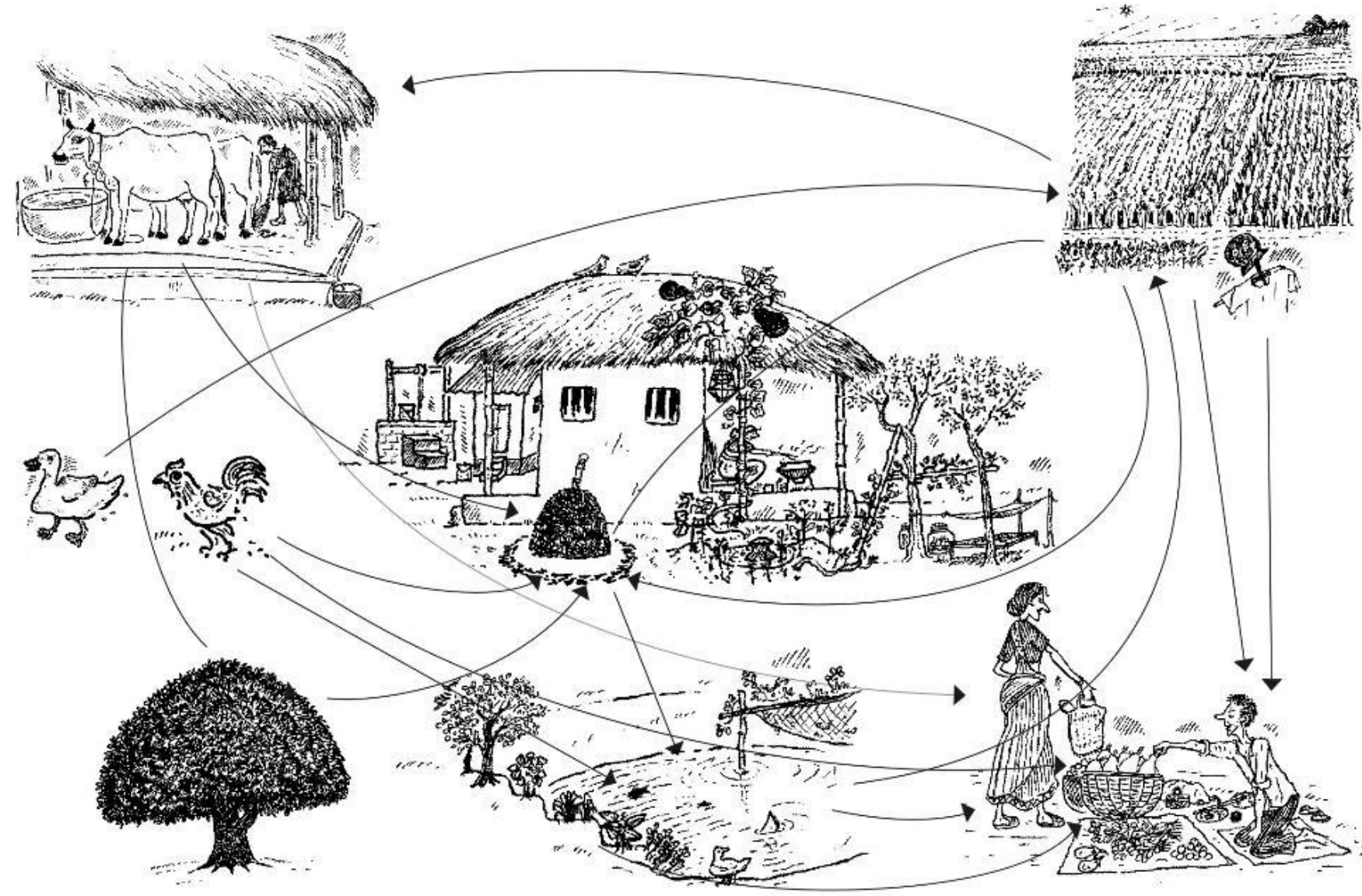


Fig 1: Image explaining inter-element connection/SIFS training manual



Fig 2: SIFS Farm/Jharkhand, India/ Phot: Anshuman

The approach integrates seasonal crops, perennial trees, livestock, poultry, aquaculture and other production subsystems in a way that output from one subsystem is used as input for other subsystems, which is expected to enable farmers to better adapt to and mitigate climate change risks and to improve dietary and income diversity of farmers households.

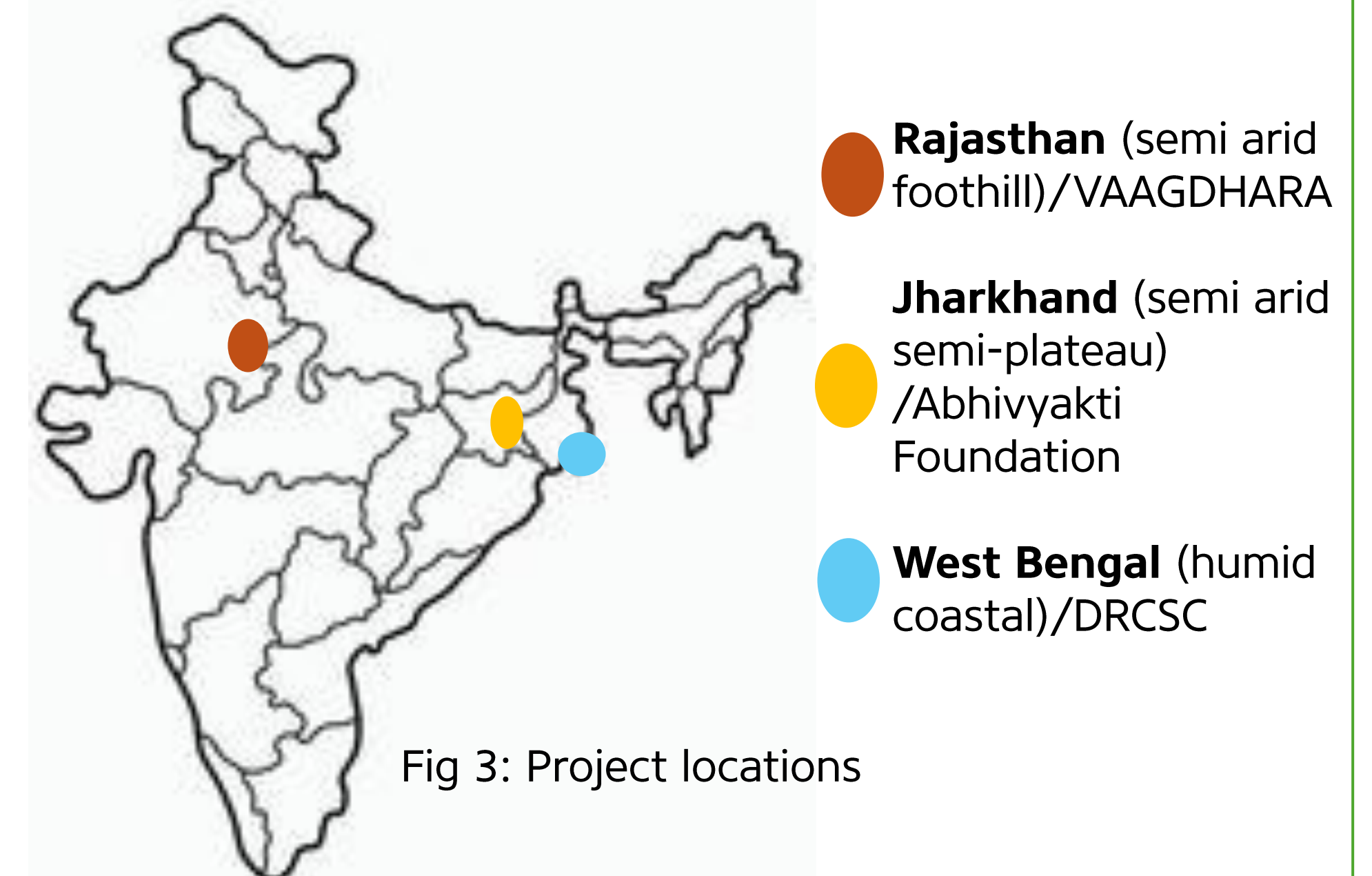


Fig 3: Project locations

To test this hypothesis, the research project ‘Sustainable Integrated Farming Systems for Mitigation and Adaptation of Climate Change with Smallholder Farmers in India’, between Welthungerhilfe, Forschungszentrum Jülich, University of Calcutta and three regional Indian partner organisations, is conducting participatory research.

## RESEARCH QUESTION

The project will address resource use efficiency as well as mitigation of and adaptation to climate change in SIFS from the following four relevant dimensions:

**WP1: Soil Health, GHG Flux and Carbon Storage**

**WP2: Crop Performance**

**WP3: Biodiversity and Ecosystem Service**

**WP4: Nutrition Quality, Diet Diversity, Market Access and Gender Equity**

**WP4 Hypothesis:** SIFS, which diversifies and integrates production elements, can lead to better nutrition of farmer families.

## METHODOLOGY

The projects’ work package on food production for high quality nutrition applies a mixed methods participatory approach.

- The farm profile with livestock and crop diversity: jointly mapped with farmers.
- Data are collected from farmer diaries, surveys and interviews
- Diet diversity, frequency and quantity are collected through Dietary Quality Questionnaire (DQQ) and 24-hour recalls
- **For this poster, the data presented (Nov 24-June 25) were collected through Household Dietary Diversity Score (HDDS)**

The poster explores regional and seasonal variation of crops, dietary diversity and self-sufficiency between New SIFS farms (n=26): 2-4 Years of SIFS farming, Old SIFS farms (n=26): >5 Years of SIFS farming and non-SIFS (n=19) farms.

## PRELIMINARY RESULTS

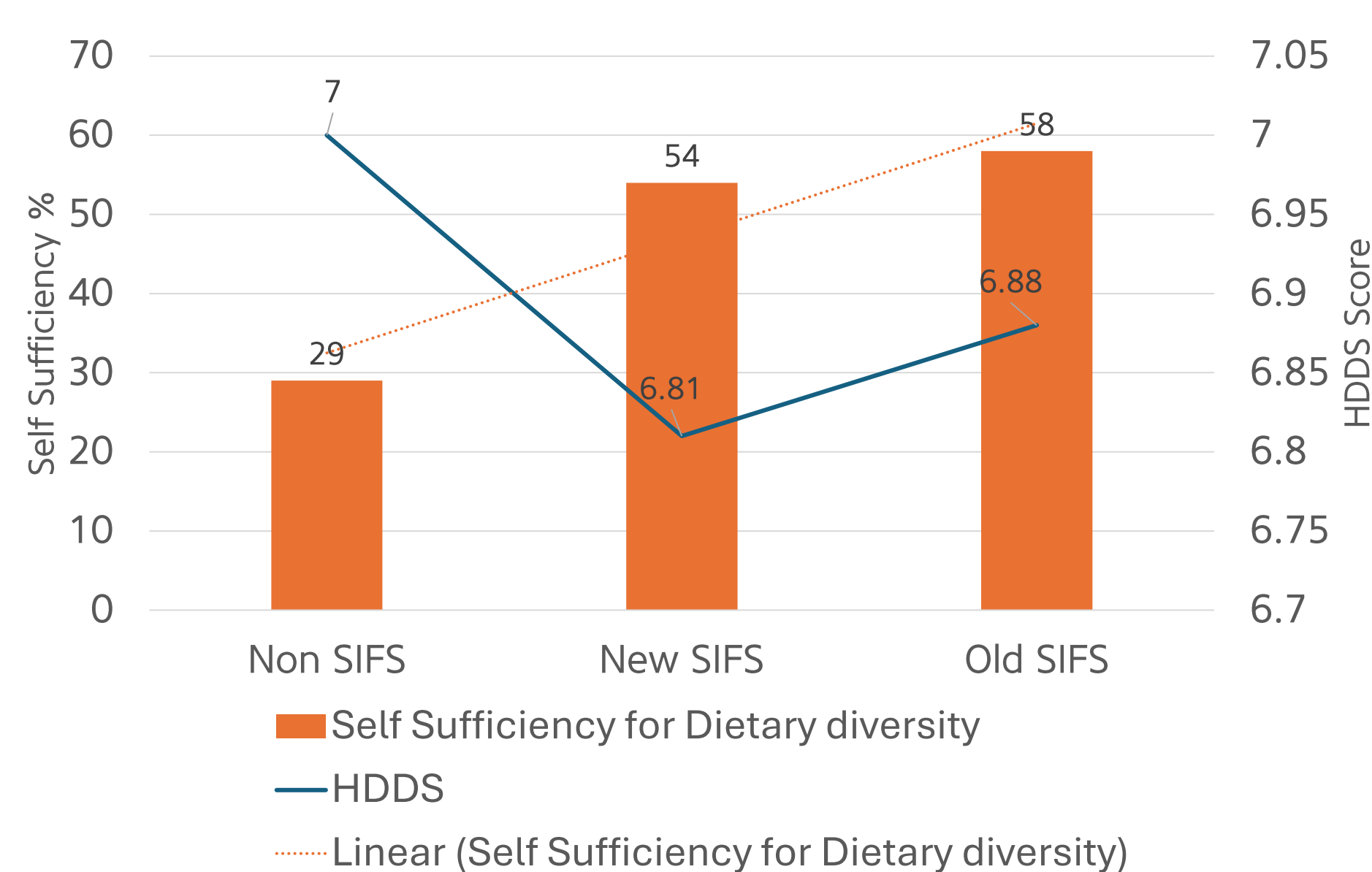


Fig 4, 5, 6: Overall and HDDS score (in number) of farmer families from different farm categories and self sufficiency (in percentage) measured in terms of the contribution from the own farm in the dietary diversity.

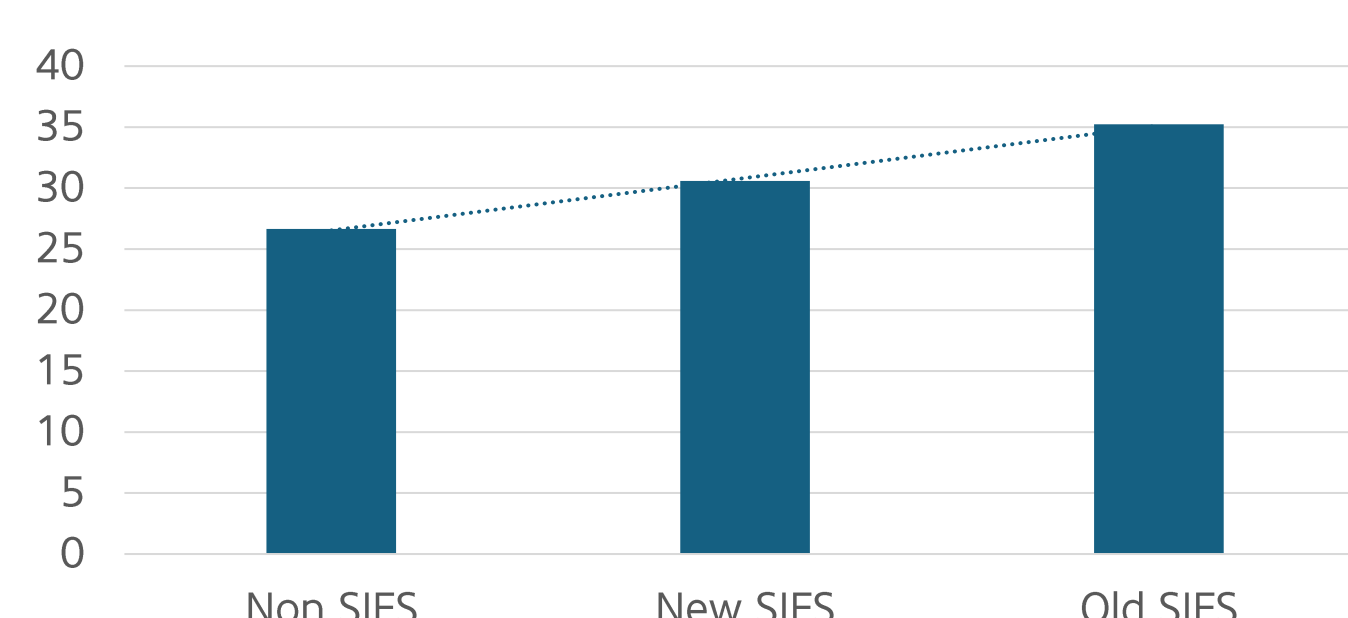
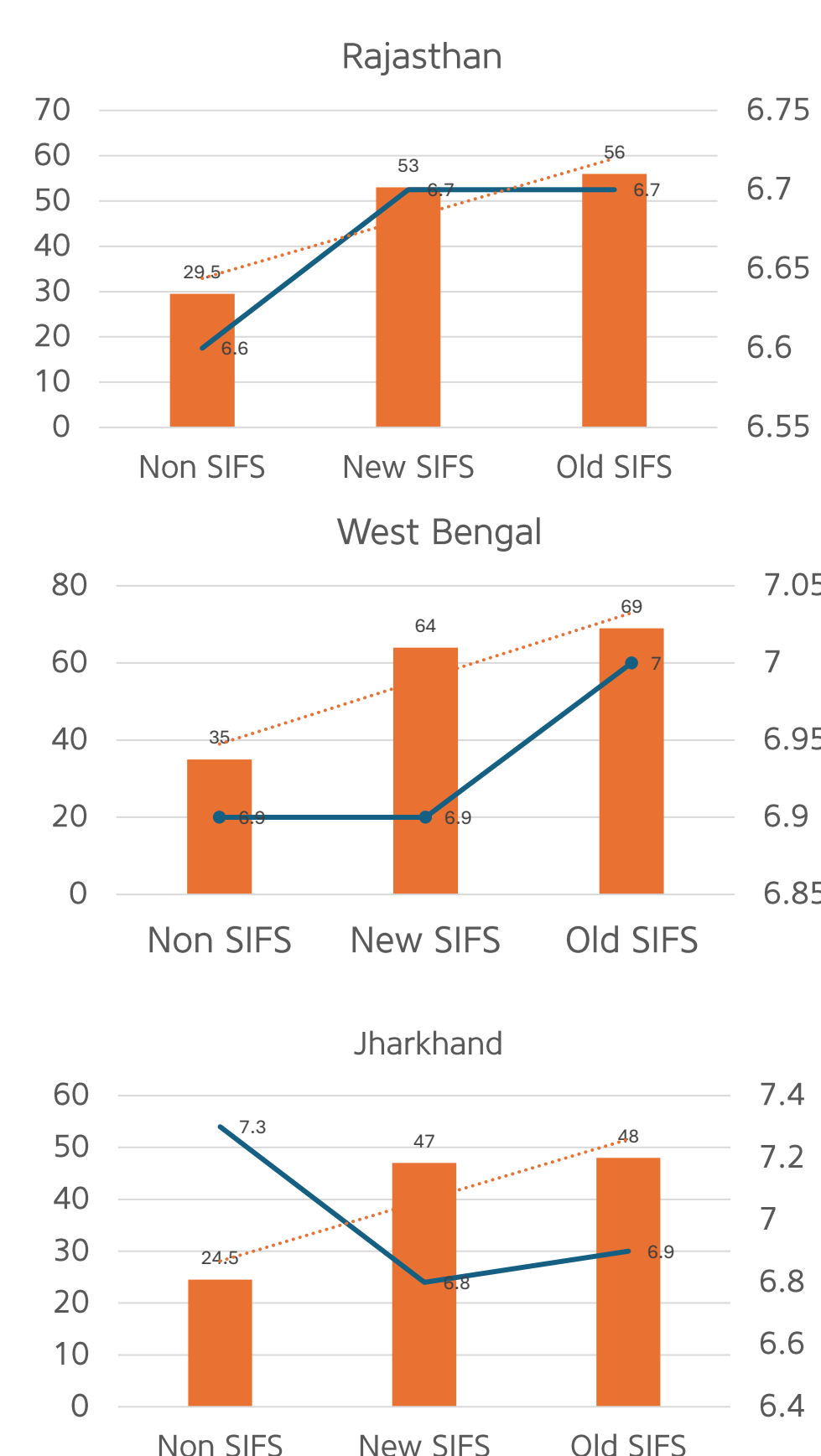


Fig 7: Average number of crop types per farm in the three different farm categories between Nov 24 – June 25



## KEY OBSERVATIONS

### Overall Trend for Self-Sufficiency and HDDS:

- Across the three states, Old SIFS showed the highest self-sufficiency for dietary diversity, followed by New SIFS, while non-SIFS farms lag behind.
- HDDS Scores varied less, yet showing slight upward improvement with SIFS interventions

### State-Specific Trends:

- Non-SIFS households in Jharkhand had the lowest self-sufficiency, while Old SIFS scored highest
- Rajasthan showed a trend of improvement for both self-sufficiency and HDDS, in the order Non-SIFS < New SIFS < Old SIFS
- Old and New SIFS in West Bengal showed high self-sufficiency compared to Non-SIFS, while HDDS was slightly higher for Old SIFS.

Seasonal variation of HDDS was not significant. Across the three regions, food groups like grains and pulses were sourced from the own farms, while more differences existed among SIFS and non-SIFS farms in production and consumption of leafy vegetables, white root and other vegetables.

### Overall Trend for Crop Diversity:

A gradual increase in crop diversity was observed from non-SIFS farms, which had the lowest crop diversity, to Old SIFS farms with the highest crop diversity. In contrast, livestock diversity was similar across systems.

This data trend is from two seasons, namely winter 2024 and summer 2025. More data on quality and quantity of food is forthcoming.

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## ACKNOWLEDGEMENT

Farmers from Banswara, Sundarbans and Deoghar  
University of Calcutta  
Finance, Admin and other staffs from Welthungerhilfe, Forschungszentrum Jülich, VAAGDHARA, DRCSC, AVF



### Supported by

Bundesministerium für Ernährung und Landwirtschaft

German Federal Ministry of Agriculture, Food and Regional Identity