

# Cash Alone Is Not Enough:

Mixed Evidence on Maternal & Child Nutrition from Madhya Pradesh's  
Maternity Benefit Programme (MMSSPSY)

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16<sup>th</sup> Finance Commission, Govt. of India

# The Debate

**The choice between cash and in-kind transfers is fundamentally a design question shaped by programme objectives, market functionality, and beneficiary agency.**

## **Cash Transfers**

- Enhance household autonomy and optimise welfare under well-functioning markets (Gangopadhyay et al., 2015).
- Associated with lower administrative and delivery costs relative to in-kind systems (Khera, 2017).
- More effective when women retain intra-household control over resources (Schady & Rosero, 2008).

## **In-Kind Transfers**

- Assure a minimum level of nutrient intake and reduce fungibility-related diversion (Currie & Gahvari, 2008).
- Particularly relevant in settings with limited market access or high food price volatility (Narayanan & Saha, 2020).
- THR under ICDS demonstrates relatively broader coverage and reach.

## **Synthesis**

- Emerging evidence supports **hybrid modalities**, leveraging the complementarity of cash and kind to strengthen nutrition outcomes (Alderman et al., 2017).

# Background

- MMSSPSY provides ₹16,000 in 2 instalments to improve maternal health & nutrition.
- While cash transfers improve liquidity and access, evidence globally shows that income support alone may not translate into improved nutrition without complementary inputs.
  - E.g., Alderman (2016); Ruel & Alderman (2013) highlight the need for nutrition-sensitive design, not just cash.
- Nutritional outcomes in MP remain weak, anaemia high, and meaningful dietary change limited.
- Raises an important policy question: Should transfers be cash, kind, or a calibrated combination?

# The nutrition paradox: cash delivered, outcomes unchanged

- 76.8% of lactating mothers in MP remain anaemic; majority moderately or mildly anaemic.
- Cash was expected to boost intake of IFA-rich diets, but this has not materialised.
- Low dietary diversity—heavy reliance on cereals & vegetables; limited protein, fruits, dairy.
- Similar patterns reported in global literature:
  - Cash transfers often increase calorie intake but not micronutrient-rich foods (Hoddinott et al., 2014).
  - Behavioural norms affect intra-household allocation of food (Behrman & Deolalikar, 1988).
- MP findings align with this: ICDS Take-Home Ration (THR) often shared within households; social norms restrict women's dietary intake.
- Thus, cash alone does not alter nutrition behaviour without awareness, agency, and food availability.

# Cash freedom ≠ nutritional improvement

- Only 0.09% used the entire cash on nutritious food.
- 53.7% did not spend any money on nutritious items.
- Majority used cash for: Usual food (56.7%), medical needs (41.9%), household goods, savings, debt repayment.
- Literature supports this divergence:
  - Cash expands choice but does not guarantee nutrition spending (Schady & Rosero, 2008).
  - Women's control over resources crucial for spending on nutrition (Yoong, Rabinovich & Diepeveen, 2012).
- In MP: Women have limited control over transfers; large second instalment often appropriated by household heads.
- Poor nutritional knowledge accelerates misallocation.
- Result: Cash transfers fail to translate into better nutrition pathways, consistent with global evidence.

# Strong Preferences for Nutrition Kits

- 58–61% of lactating women want nutrition kits alongside cash.
- Preference higher in rural areas, where market access is weaker.
  - 63% prefer THR; remainder prefer ready-to-eat meals.
  - 25–31% prefer more than two instalments to increase control & prevent diversion.
- Literature alignment:
  - In-kind transfers often improve diet quality, not just intake (Currie & Gahvari, 2008).
  - THR in India shown to have higher reach than cash (Narayanan & Saha, 2020).
  - In contexts with low nutrition knowledge, in-kind ensures minimum micronutrient intake (Alderman et al., 2017).
- Our findings strongly match the broader evidence:
  - Beneficiaries do not see cash and kind as substitutes—they want a hybrid model.

# Design bottlenecks dilute the nutritional intent

- First instalment (₹4,000) often received after delivery due to complex conditionalities—defeating its purpose for ANC nutrition.
- The large second instalment (₹12,000) is captured by household heads, not the mother.
- ICDS supply chain issues: leakage, poor quality, time delays.
- Literature links such implementation gaps to weak outcomes:
  - PDS and THR require strong supply chains to avoid leakages (Khera, 2011).
  - Cash transfers face last-mile exclusion and financial literacy barriers (Muralidharan et al., 2016).
- Information, Education & Communication (IEC) weak across districts—critical for nutrition-sensitive programmes.
- Governance heterogeneity in MP further complicates delivery.
- Result: programme finances health service utilisation, but not decisive improvement in nutrition pathways.

# Policy Implications

- Hybrid transfers (cash + nutritious in-kind supplements) improve diet quality more effectively than cash alone.
- Convert the large second instalment into smaller, regular payments to reduce diversion and strengthen women's control.
- Introduce light nutrition-linked conditions (counselling, IFA adherence, basic dietary diversity), ensuring feasibility and low administrative burden.
- Strengthen IEC and behaviour change communication through improved frontline worker training and consistent counselling.
- Enhance supply chain quality and monitoring for THR via digitised tracking and timely distribution.
- Overall: Cash expands access, but cash alone is insufficient; a calibrated hybrid model is more effective in improving maternal and child nutrition in MP.

My participation was made possible through the generous support of the  
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This work was funded by **National Health Mission, Madhya Pradesh**





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Towards Impact at Scale

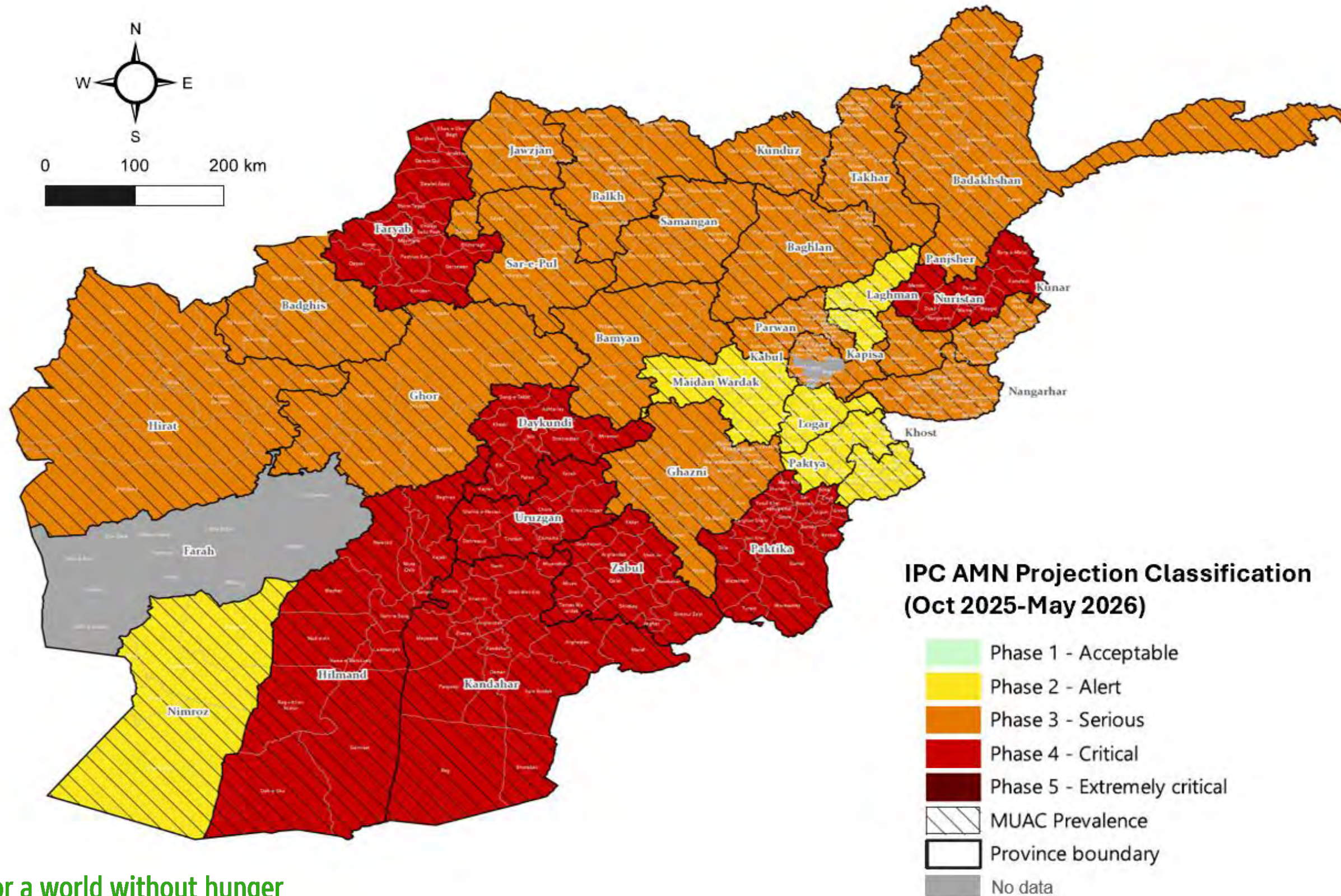
# Harnessing Social Protection to Improve Dietary & Nutrition

Transforming Nutrition During Afghanistan's Lean Season: Innovative Nutrition-Sensitive Market-Based Solutions Empowering Vulnerable Households

Mekbib Hailegebrile Seife  
Food Security and Nutrition Expert  
Welthungerhilfe (WHH) Afghanistan



# Rationale



## Challenges in Afghanistan:

- Access to fresh foods, particularly vegetables and fruits is very low
- Focus on malnourished children (SAM and MAM) required
- Improved access and availability of nutritious and fresh foods urgently needed
- Local markets challenged by low household purchasing power
- Household dietary diversity low across the country

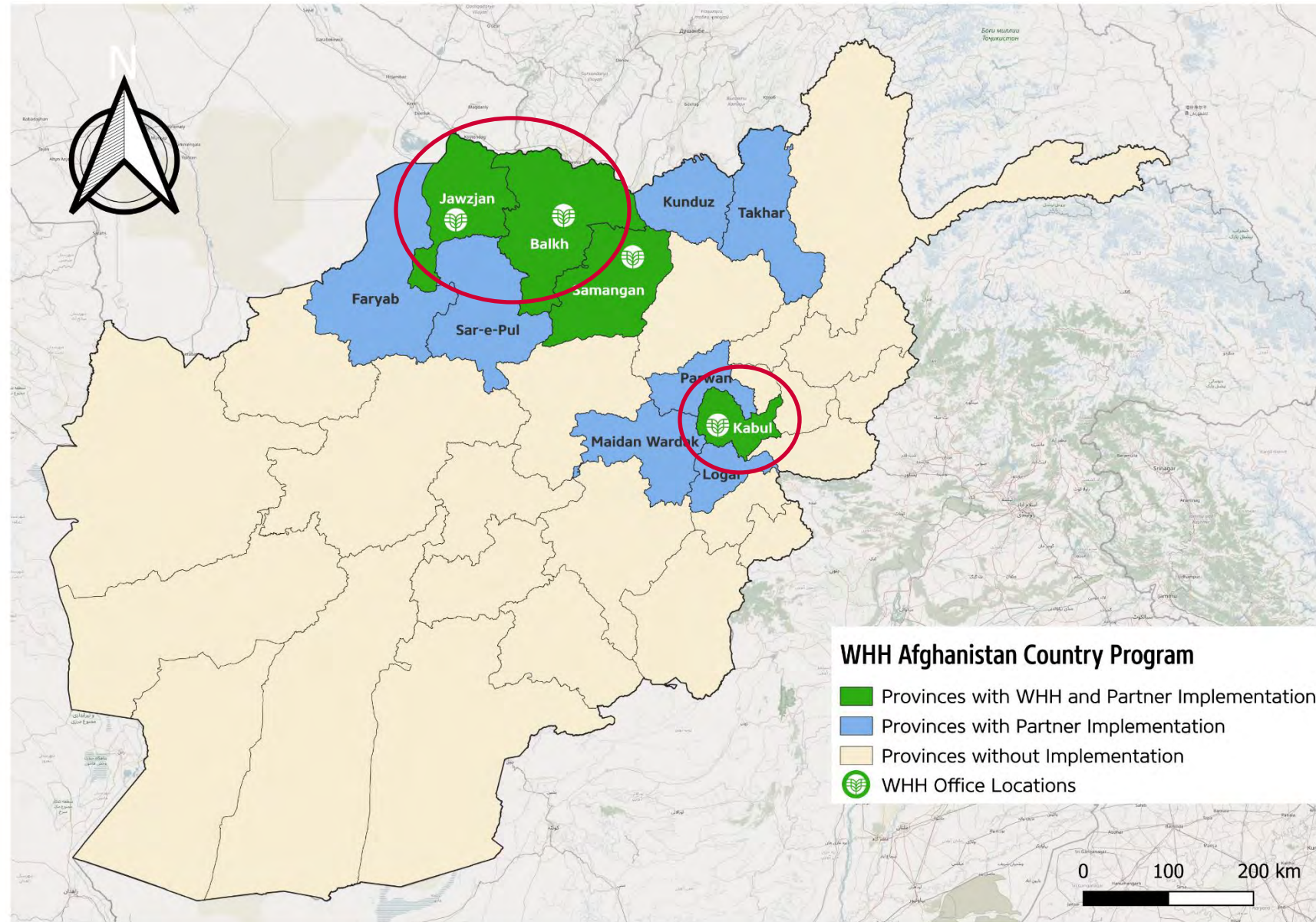


**3.7 million cases of children aged 6-59 months acutely malnourished**



**1.2 million cases of pregnant or lactating women acutely malnourished**

# Project in Focus



## Emergency response to food, nutrition and water security crisis in Afghanistan

### Who:

- Welthungerhilfe
- Local vendors
- Redrose, a digital financial service platform for humanitarian action
- Funded by GFFO

### Where:

- Balkh, Jawzjan, and Kabul Provinces

### What:

- Multi-sectoral emergency response
- Including Fresh Food Voucher Modality as preventative nutrition response
- Total reach ca. 140,000 individuals

### Sectors



# Fresh Food Voucher Modality

## Fresh Food Market Assessment

- Identify available fresh produce and seasonal availability
- Assess potential local vendors and prices

## Engage vendors for animal-source and fresh produce

- Select nutritious foods, determine quantities and pricing
- Finalize contract agreements with 24 vendors
- Provide training on **food safety** and **RedRose** functions

## Project Participants

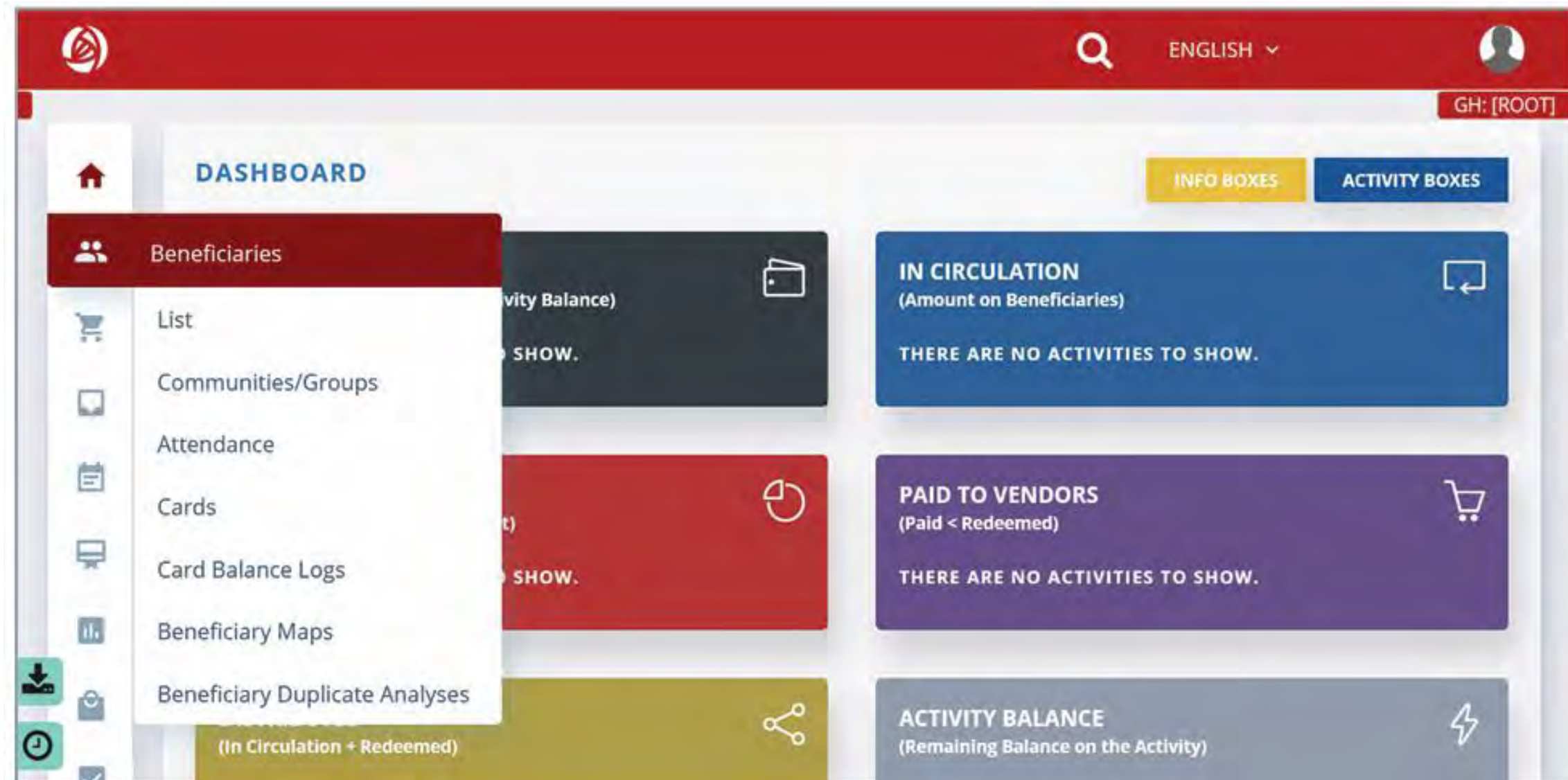
- 1,410 families with children in SAM & MAM treatment
- Nutrition literacy sessions to improve dietary diversity
- €50 monthly e-vouchers per household for 3 months
- Redeemable bi-weekly at local vendors

## Intervention Duration

- 3 months (June-August 2024), peak malnutrition season



# RedRose Digital System










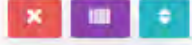




## How it works

- Smart cards, printers, and phones (accessories)
- Provide training for project staff
- Register project participants' and vendors' profiles
- Configure fresh food types, quantities, and prices in the system
- Top up €50 monthly in smart card
- Ensure 24/7 online support

# Methodology

Show 100 entries

IMAGE	ORDER	SHORT NAME	ADDITIONAL NAME	CATEGORY	BARCODE	PRICE RANGE	ACTIONS
	10	Apple سیب	Apple سیب		—	• 1 kg [lowest: 130, recommended: 130, highest: 130]	
	20	Banana کپه	Banana کپه		—	• 1 kg [lowest: 155, recommended: 155, highest: 155]	
	30	Okra بامیه	Okra بامیه		—	• 1 kg [lowest: 50, recommended: 50, highest: 50]	
	40	Cucumber بخرنگ	Cucumber بخرنگ		—	• 1 kg [lowest: 35, recommended: 35, highest: 35]	
	50	Eggplant بانجان سیاہ	Eggplant بانجان سیاہ		—	• 1 kg [lowest: 40, recommended: 40, highest: 40]	
	60	Tomato بانجان روئی	Tomato بانجان روئی		—	• 1 kg [lowest: 30, recommended: 30, highest: 30]	

Showing 1 to 6 of 6 entries

[EXPORT](#)



# Key Findings - Survey

Women in the **acceptable food consumption** category rose to 21.8%, higher than men's 13.2%; women in *poor* category dropped to 67.3%, below men's 70%.

Women meeting **minimum dietary diversity** increased from 9.1% to 61.7%, with those not meeting it dropping from 90.9% to 38.3%.

About 69% mothers reported **better food diversity**, healthier meals, and more regular eating.

Mothers noted improved health in **malnourished children** and preventive benefits.

The intervention helped **maintain dignity and safety for women.**



# Key Findings - Community Voices



*"We got food, we felt better, our month was good, we had food, and we were happy. Our depression and worries decreased." (Woman head of household, widow, Kabul)*

*"We gave them [nutrition food] to other children in the family because there was no other food." (Mother of malnourished child, Balkh)*

*"I used to feed only the malnourished baby, but when other children cried, I had to give them as well." (Mother of malnourished child, Jawzjan)*

# Strengths and Weaknesses

## ✘ Weaknesses

- Limited fresh food **availability** in some areas during the lean season
- Few local vendors in rural areas.
- Initial **unfamiliarity** with the e-voucher system among participants and vendors.
- Unstable internet **connectivity** for smooth data synchronization.

## ✔ Strengths

- Improve **HH dietary diversity** and nutrition during lean season.
- **Better nutrition** for malnourished children and PLW.
- Strengthened **local markets** for sustainability.
- Increasing **access and availability** to fresh, nutrient-rich foods.
- **Nutrition sessions** enabled healthier food choice.
- Protected **women's dignity and safety**.
- Reduced **local authority interference**.



# Implications for Scaling and Policy



Strong partnerships across the **food system**; local vendors, nutrition actors, donors, and tech providers.



Supportive policies and robust monitoring to build **resilient market systems**.



Collaboration with **nutrition, health, education, and social protection** sectors.



Incentives that motivate **private sector and rural vendors**.



Alignment with **government strategies** and coordination with NGOs.



**Donor support** ensuring reach, relevance, and sustainability.



Thanks for your attention!

My participation was made possible through the generous support of  
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# Institutionalising Fortified Wheat Flour in Himachal Pradesh's Public Distribution System

An Implementation Experience

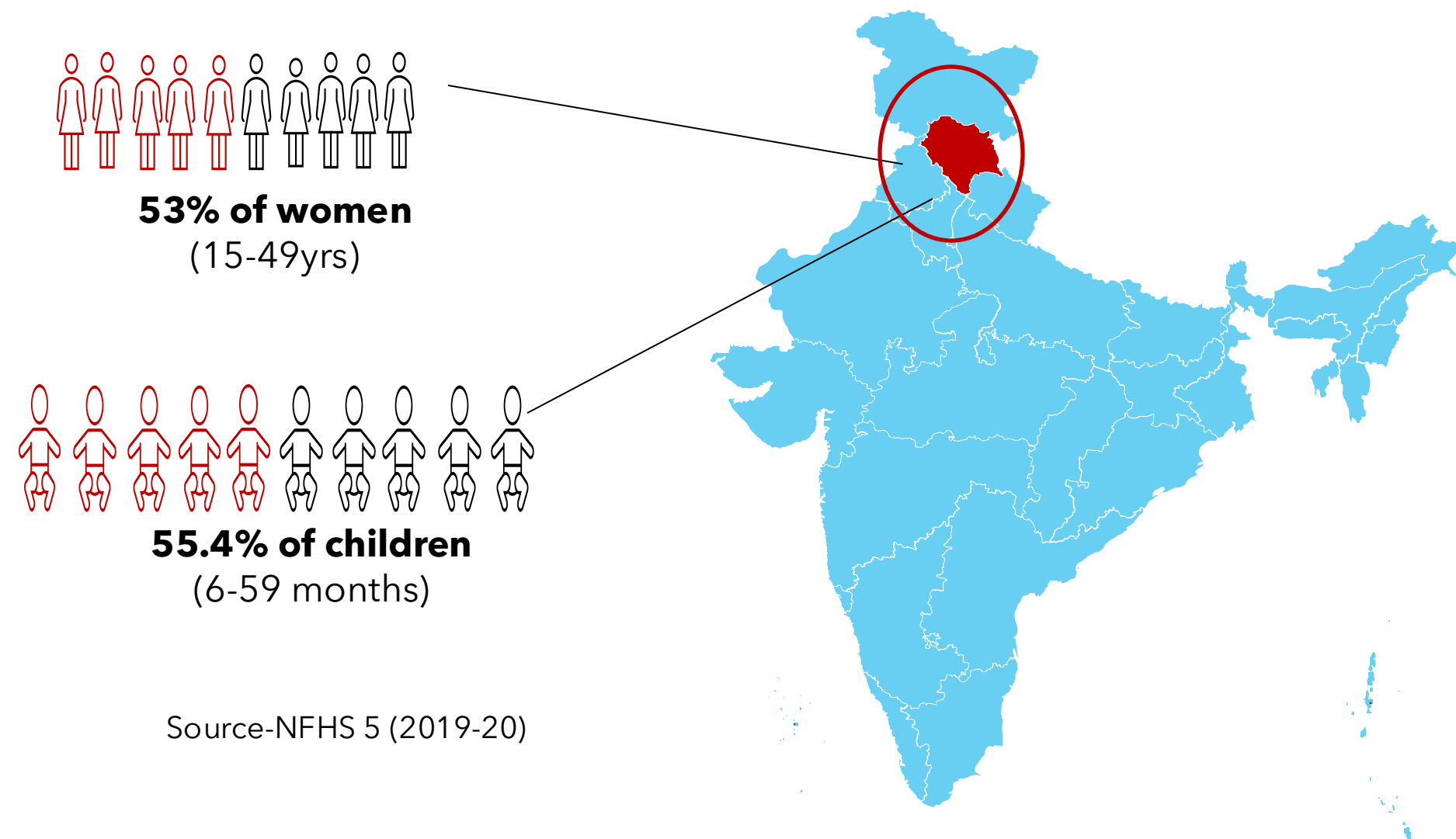
Presenter Name: Mihika Wakhloo

Department/Division: MNCH

Organization: KHPT

# Background

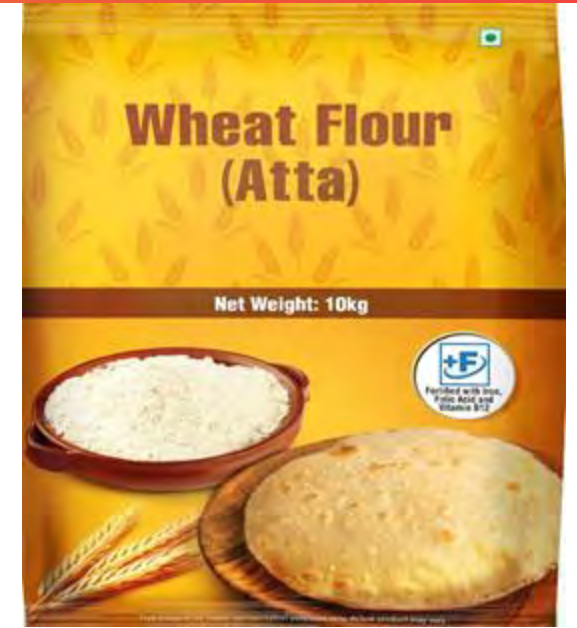
- **Himachal Pradesh**, a mountainous state in North India and has high anemia prevalence
- The Government of Himachal Pradesh recognized **anemia** as a **foremost concern**
- Anemia can have various causes, and the leading cause is inadequate intake of dietary iron
- Population group most **at risk** of anemia-
- To address this challenge, government decided to **mainstream wheat flour fortification in the food -based safety net program - Public Distribution System (PDS)**



Anaemia prevalence- Himachal Pradesh



# NATIONAL REGULATIONS AND SPECIFICATIONS FOR WHEAT FLOUR FORTIFICATION?



As per the FSSAI standards, whole wheat flour/Refined wheat flour, when fortified, shall contain added iron, folic acid and Vitamin B-12 at the level given in the table below:

Micronutrient	Level of Nutrients (per kg)	Source of Nutrients
Iron	28 mg- 42.5 mg *	Ferrous citrate or Ferrous lactate or Ferrous sulphate or Ferric pyrophosphate or electrolytic iron or Ferrous fumarate or Ferrous BisGlycinate;
	14 mg- 21.25 mg	or Sodium Iron (III) Ethylene diamine tetra Acetate Trihydrate (Sodium ferredetate-Na Fe EDTA);
Vitamin B12	0.75 µg- 1.25 µg	Cyanocobalamine or Hydroxycobalamine;
Folic Acid	75 µg- 125 µg	-






\* added at a higher level to account for less bioavailability  
Wherever "Iron (As Fe)" is used as a source of nutrient, heme iron shall not be used in any form in any article of food

Nutrition country profile (NLIS) | Country statistics (GHO) | WHO country page

Policy	Start date	End year
Food Safety and Standards (Health Supplements, Nutraceuticals, Food for Special Dietary Use, Food for Special Medical Purpose, Functional Food and Novel Food) Regulations, 2016	2018	---
National Multisectoral Action Plan for Prevention and Control of Common Noncommunicable Diseases	2017	2022
Food safety and standards (Food product standards and food additives) Amendment Regulation 2015	2016	---
Food Safety and Standards (Fortification of Foods) Regulation, 2016	2016	---
National Action Plan and Monitoring Framework for prevention and control of ncommunicable diseases (NCDs) India	2013	2020
National Programme For Prevention And Control Of Cancer, Diabetes, Cardiovascular Diseases & Stroke (NPCDCS)	2013	2017
National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases & Stroke (NPCDCS)	2013	2017
United Nations Development Action Framework (UNDAF)	2013	2017
Food Safety and Standards (Packaging and Labelling) Regulations	2011	---
Maternity Benefit Act 1961, dated 12 December 1961. As amended to 2008.	2008	---
United Nations Development Assistance Framework	2008	2012
National Rural Health mission	2005	2012
National Guidelines on Infant and Young Child Feeding	2004	---
Infant Milk Substitutes, Feeding Bottles and Infant foods (Regulation of production, supply and distribution) Amendment Act, 2003 (38 of 2003)	2003	---
Infant Milk Substitutes, Feeding Bottles and Infant Foods ( Regulation of Production, Supply and Distribution) Amendment Act, 2002	2002	---
National Health Policy	2002	2015
National Population Policy	2000	2010
National Plan of Action on Nutrition	1995	2000
Infant Milk Substitutes, Feeding Bottles and Infant foods (Regulation of production, supply and distribution) Act 1992 (IMS Act)	1993	---
National Nutrition policy	1993	2000
Factories Act 1948 as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987), and published by the Ministry of Labour on <a href="http://labour.nic.in/act/acts/mw.doc">http://labour.nic.in/act/acts/mw.doc</a>	1987	---

# Public Distribution System (PDS) Landscape in Himachal Pradesh




## Fair Price Shop Ownership

Ownership Type	Number of Shops
 Cooperative Sector	3,265
 Individuals	1,646
 HPSCSC Ltd	66
 Mahila Mandals/SHGs	20
 Panchayats	14

## Beneficiary Coverage under TPDS

Total Population Covered	73,35,095
Total Ration Cards	19,08,512

## Ration Card Classification

Category	Description
 Antyodaya Anna Yojana (AAY)	Poorest households
 Below Poverty Line (BPL)	Below Poverty Line
 Above Poverty Line (APL)	Above Poverty Line

# The System-Integrated Fortification Model

## Policy & Government Ownership

Government commitment and support for fortification initiatives

## Quality Assurance & Quality Control Systems

Ensuring high standards and consistency in fortified products

## Community Engagement and Demand Generation

Raising awareness and demand for fortified flour within communities

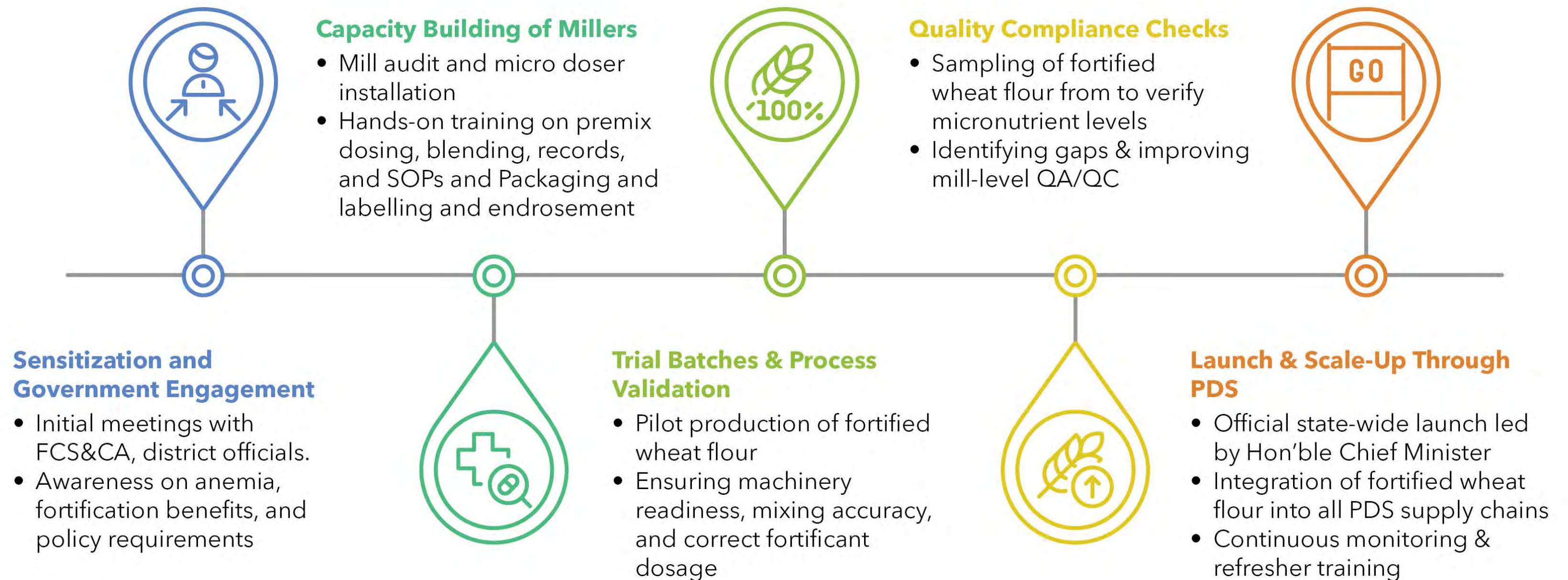


**Mill Strengthening & Capacity Building**  
Enhancing mill

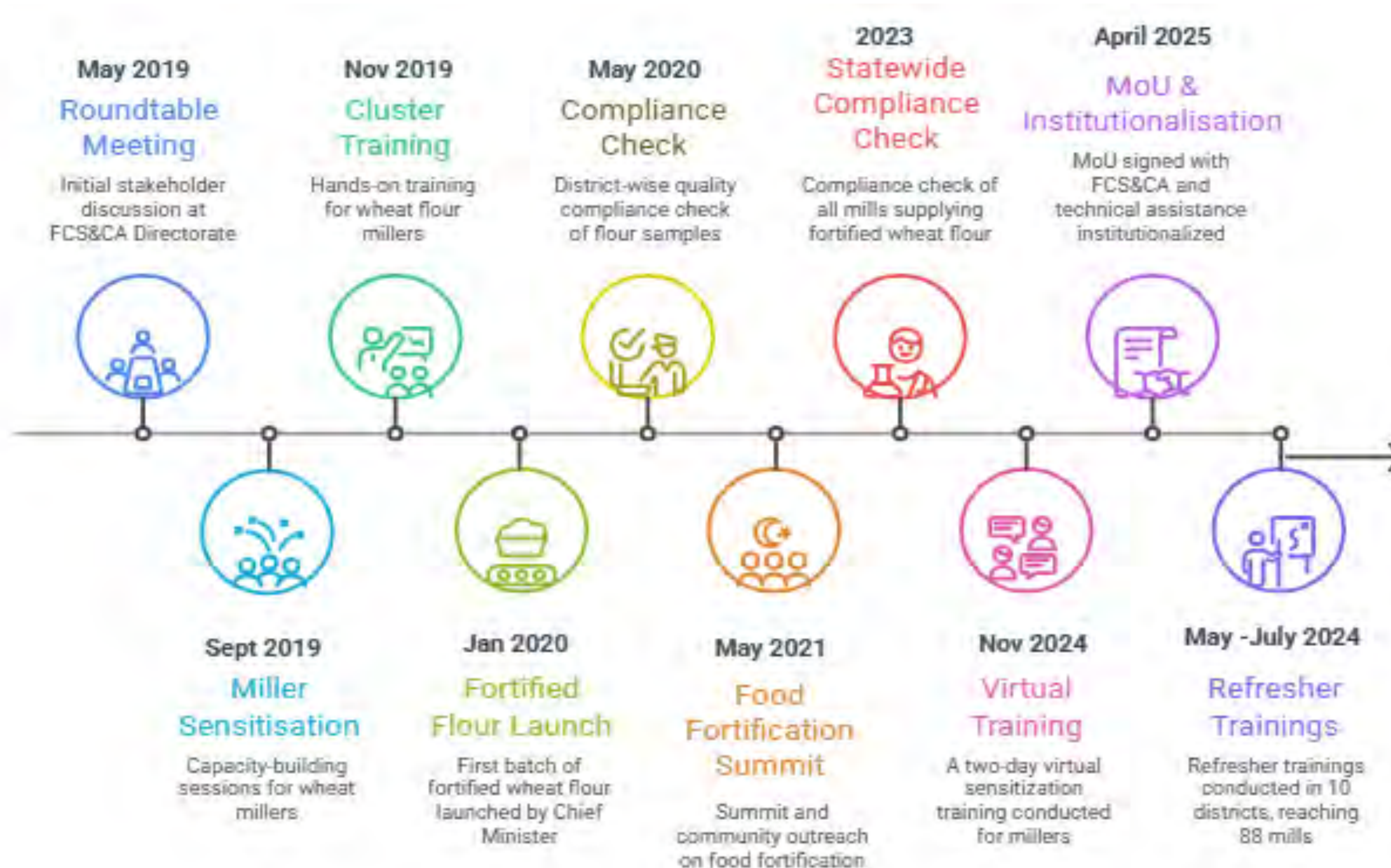
**PDS Integration**  
Seamlessly incorporating fortified flour into the existing public distribution system



# Process: Steps in Implementing Wheat Flour Fortification in PDS



# Key Milestones in Wheat Flour Fortification Program (2019-2025)



# Costing Components

Fortificants	Cost
Cost of Fortificants per kg of Wheat Flour (in Rupees)	10 Paise (INR) (Price from 3 different premix suppliers)
One time Equipment	Cost
Micro Feeder/Dozer	₹ 70,000 to ₹ 2,08,500 (Price from 4 different equipment manufacturers)

Category	Consumer Price	Remarks
NFSA (AAY/PHH/BPL)	1.20 Per KG	Grinding Charges
OTNFSA (APL/APLT)	12 Per KG	

Cost of Fortified Wheat Flour Distributed Through PDS — Himachal Pradesh

## Programme Cost Components:

- Training & capacity building: Builds millers' and officials' skills to ensure correct dosage, processing and compliance.
- Monitoring and quality testing: Regular sampling and lab testing maintain product quality and reinforce system accountability.
- IEC materials: Awareness materials help improve understanding among millers, consumers
- Supply chain integration: Strengthens flow of fortified Wheat Flour from mills to PDS outlets, ensuring consistency and timely distribution.

## Cost Efficient

- Uses existing PDS infrastructure and milling systems, avoiding any major capital investment.
- The only new recurring cost is premix, making the model highly scalable and financially sustainable.

# Continued Efforts in Himachal Pradesh

## District-wise refresher training

- Conducted in-person refresher training sessions across 10 districts to enhance millers' understanding of fortification standards and best practices.



## Pre- and Post-training assessment

- Conducted assessments at the beginning and end of each session to gauge baseline knowledge, measure improvement, and identify areas for further emphasis.

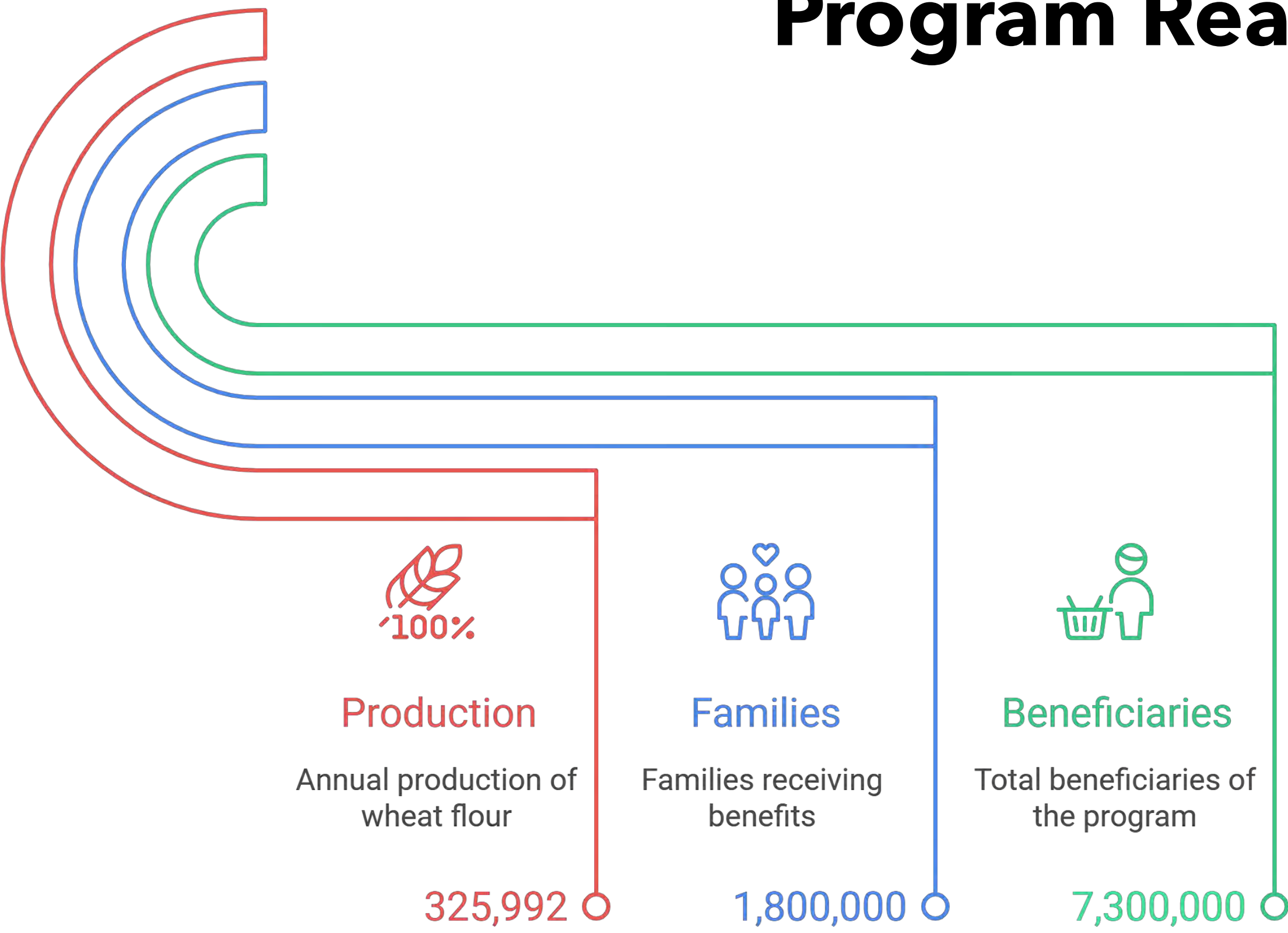


## Post-training sample testing

- Collect and test samples from selected 88 mills after the training to assess effectiveness and ensure quality compliance.



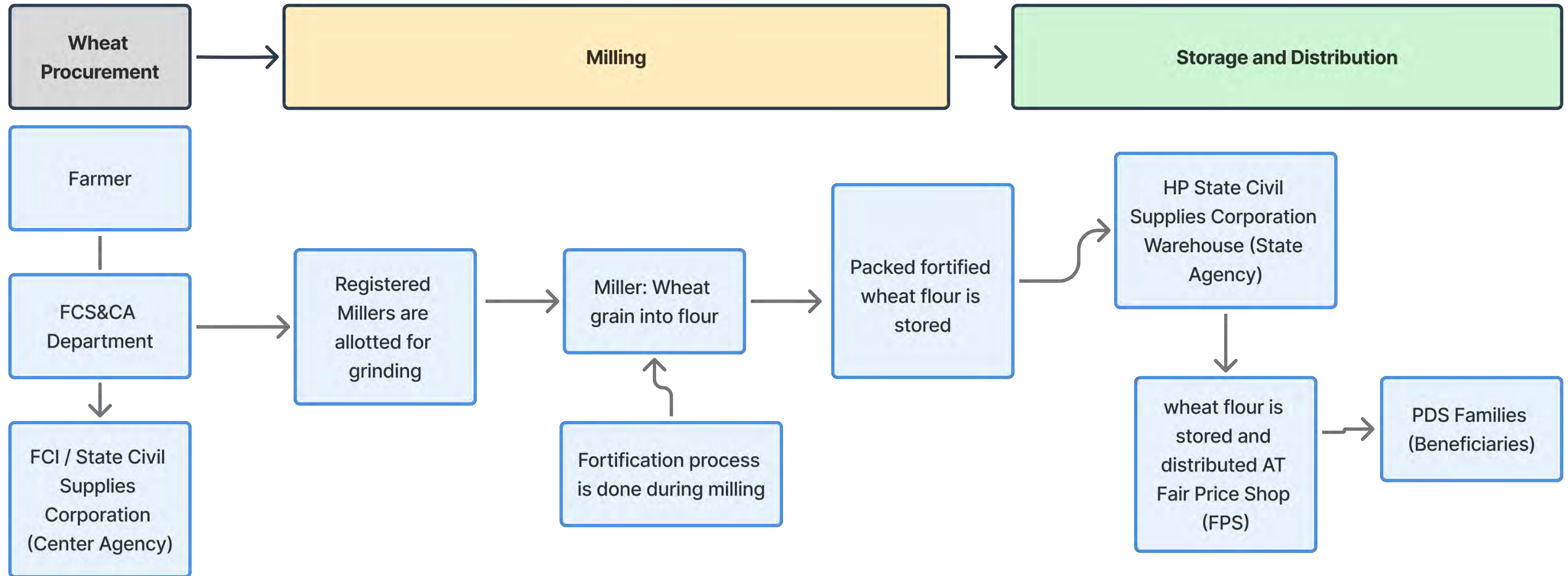
# Program Reach



- The initiative enabled the State to provide quality-assured fortified wheat flour through the PDS since **January 2020**
- Even during COVID, the state continued to provide fortified wheat flour through PDS

Source: Department of Food, Civil Supplies, and Consumer Affairs.

# Public Distribution System Operating Model



# Way Forward



## Impact Assessment

Conduct a structured evaluation to measure improvements.

Enhance state laboratory capacities for micronutrient analysis.

## Strengthen Laboratories



## Surveillance and Monitoring

Systematically map operational challenges across systems.

# IEC Materials Shared by KHPT-GAIN to Industries and District FCS&CA Departments



## WHEAT FLOUR FORTIFICATION MANUAL



### Technical Aspects

#### E Difference Between Roller Mill and Stone-Chakki Mill

A comparison of two flour milling technologies Stone-Chakki Mill and Roller Mill across various operational and performance aspects are provided as follows:

Grinding Process	Roller Mill
Roller mill involves one-time crushing using stone, whereas roller mills involve multiple passes.	Roller mill involves one-time crushing using stone, whereas roller mills involve multiple passes.
Grinding Speed	Roller Mill
Roller mill involves slow grinding, resulting in lower output and more heat generation.	Roller mill involves high-speed grinding, resulting in higher production efficiency and lower heat generation.
Flour Quality	Roller Mill
Roller mill produces flour with better taste, higher moisture absorption, and more stable storage life.	Roller mill produces uniform and fine flour with lower starch damage (less loss).
Nutritional Retention	Roller Mill
Roller mill retains more vitamins, minerals, and nutrients due to lower heat generation during grinding and less bran extraction.	Roller mill may lose some nutrients due to bran extraction during milling.
Applications	Roller Mill
Roller mill is preferred for traditional food and ready-to-eat products, consumer, smaller scale production.	Roller mill is best for industrial processing and large-scale production of flour and vermicelli.
Maintenance	Roller Mill
Roller mill requires regular grinding and replacement of stone, more expensive.	Roller mill lower maintenance with reliable operation, occupies less space.
Power	Roller Mill
Roller mill uses relatively more power.	Roller mill consumes less power.



#### D Requirements for Fortification in Large-Scale Chakkis and Roller Flour Mills

Large scale chakkis (ISC) and roller flour mills (RFM) have continuous operations, and the output of products is nearly uniform every minute/hour. During the milling process, atta, maida or semolina from various passages after grinding and sieving falls through the spouts in the respective screw conveying unit, and travels for a distance before the product is packed or sent for storage. Premix containing fortificants has to be added through a premix feeder into the screw conveyor and it has to travel with flour/product for at least **three meters** to get uniform blending with flour.

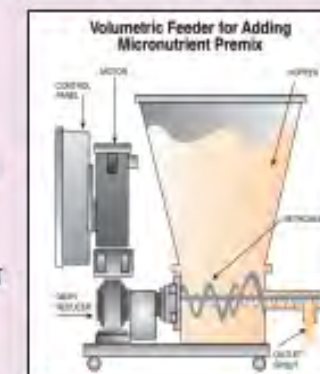
Largely flour mills that add functional ingredients to flour are equipped to undertake fortification.

## गेहूँ के आटे में फोर्टिफिकेशन की प्रक्रिया

गेहूँ के आटे में सुनियंत्रित तरीके से विटामिन प्रीमिक्स मिलाने की प्रक्रिया को फोर्टिफिकेशन कहते हैं। यह प्रक्रिया दो चरणों में की जाती है:

- क. पहला चरण: प्री-ब्लेंड तैयार करना
- ख. दूसरा चरण: गेहूँ के आटे के साथ प्री-ब्लेंड को मिलाना

- पहला चरण: प्री-ब्लेंड तैयार करना
  - 5 kg प्री-ब्लेंड बनाने के लिए गेहूँ के आटे और विटामिन प्रीमिक्स को एक निश्चित अनुपात में लिया जाता है।
  - अनुपात: 4800 ग्राम गेहूँ का आटा और 200 ग्राम प्रीमिक्स।
  - इस मिश्रण को 15 मिनट तक लगातार मि लाया जाता है। इस मिश्रण को प्री-ब्लेंड बोलते हैं।
- दूसरा चरण: गेहूँ के आटे के साथ प्री-ब्लेंड को मिलाना
  - तैयार किए गए प्री-ब्लेंड को अब मुख्य आटे में मिलाया जाता है। यह काम स्वचालित (मशीन द्वारा) या मैनुअल (हाथ से) किया जा सकता है। इसके लिए माइक्रो फीडर, माइक्रो डोजर या वोल्यूमेट्रिक फीडर जैसी मशीनों का उपयोग होता है। आटे की मात्रा, उत्पादन क्षमता और मशीन की सेटिंग के अनुसार प्री-ब्लेंड को सही मात्रा में मिलाया जाता है।



एक मीट्रिक टन आटे को फोर्टिफाई करने के लिए 200 ग्राम माइक्रो-न्यूट्रिएंट प्री-ब्लेंड की जरूरत पड़ती है।

फोर्टिफिकेशन के बाद क्या होता है?

- प्री-ब्लेंड को स्कू कन्वेयर नामक मशीन के माध्यम से आटे में लगातार मिलाया जाता है। यह मिश्रण बाद में मशीन के आउटलेट से बाहर आता है।
- मोटर की गति को कम या ज्यादा करके प्री-ब्लेंड की मात्रा को भी नियंत्रित किया जा सकता है।
- फोर्टिफिकेशन के बाद तैयार आटे के सैपल लिए जाते हैं और उनमें आयर्न की स्पॉट टेस्टिंग (Iron Spot testing) किट से की जाती है, जिससे यह सुनिश्चित हो सके कि फोर्टिफिकेशन सही ढंग से हुआ है।
- फोर्टिफाइड गेहूँ के आटे को फिर पैकिंग के भंडारण के लिए भेजा जाता है।



Micro feeder



For further assistance contact:

khpt.fortification@khpt.org, bksaur@gainhealth.org

+91 80 4040 0200, +91 11-4314 7575



# Glimpse of Himachal Pradesh Wheat Flour Implementation



# Media Coverage



कुल्लू : जिला स्तरीय रिफ्रेशर प्रशिक्षण कार्यक्रम के दौरान जिला भर से आए आटा मिलर्स। (ब्यूरो)

## आटा मिलर्स के लिए फोर्टीफिकेशन पर रिफ्रेशर प्रशिक्षण लगा

कुल्लू, 27 मई (ब्यूरो): जिला नियंत्रक खाद्य, नागरिक आपूर्ति एवं उपभोक्ता मामले कार्यालय द्वारा सूक्ष्म पोषक तत्वों की कमी से निपटने के लिए एक जिला स्तरीय रिफ्रेशर प्रशिक्षण का आयोजन किया। यह प्रशिक्षण के.एच.पी.टी-जी.ए.आई.एन. के सहयोग से कुल्लू जिला के आटा मिलर्स के लिए आयोजित किया गया। प्रशिक्षण का उद्देश्य आटे के फोर्टीफिकेशन (मजबूतीकरण) की प्रक्रिया को बेहतर बनाना, मानकों के अनुसार उत्पादन सुनिश्चित करना और गुणवत्ता निगरानी प्रणाली को सुदृढ़ करना था। कार्यक्रम में खाद्य एवं आपूर्ति अधिकारी नवीन कुमार तथा निरीक्षक अनिल कुमार उपस्थित रहे। तकनीकी प्रशिक्षण का संचालन विनोद कपूर ने किया, जिसमें मिहिका वाखलू, प्रिया भट्टाचार्य और गौरव कुमार भी सहयोग प्रदान किया। प्रशिक्षण में जिले की 6 मिलों से कुल 15 प्रतिभागियों सक्रिय भागीदारी की, उन्हें यह बताया कि गेहूं के आटे का फोर्टीफिकेशन आयरन, फोलिक एसिड विटामिन बी12 की कमी को करने में अहम भूमिका निभाता जो जनस्वास्थ्य के लिए अमूल्यपूर्ण है।

## दैनिक भास्कर

2025-06-21 हिमाचल भास्कर (2)

## आटे में पोषक तत्वों की गुणवत्ता पर मिल संचालकों को किया जागरूक

सार्वजनिक राशन वितरण प्रणाली के तहत प्रशिक्षण कार्यक्रम आयोजित

राशन डिप्यूटी ने उपभोक्तकों को मिलने वाला अटा पोषक तत्वों से युक्त होने के साथ इसकी पोषण गुणवत्ता बरकरार रखेगी। इसके परिणामस्वरूप भविष्य में कुपोषण को दूर करने में सहायता मिलेगी। इन्हीं पहलुओं को लेकर रुकुनगर को औद्योगिक क्षेत्र मैहलपुर जिला खाद्य आपूर्ति व उपभोक्ता मामले विभाग के तत्वाधान में एक दिवसीय जिला स्तरीय रिफ्रेशर प्रशिक्षण कार्यक्रम आयोजित किया। दिल्ली की केएचपीटी-जीएआईएन संस्था के माध्यम से हुए प्रशिक्षण कार्यक्रम में जिला ऊना की पीडीएस अटा मिलों के लिए फोर्टीफिकेशन प्रक्रिया पर बल दिया। इसमें विभिन्न अटा मिल संचालकों ने भाग लिया। कार्यक्रम के अंतिम दिनों में सूक्ष्म पोषक तत्वों की कमी को



दूर करने के लिए ऊना मिलों के अटा मिलर्स को फोर्टीफिकेशन पर गहन जानकारी को विस्तार से बताया। केएचपीटी-जीएआईएन संस्था की ओर से विषय विशेषज्ञ विनोद कपूर (गेन) व मिहिका वाखलू (केएचपीटी) ने जिला की अटा मिल संचालकों को गेहूं पिसाई के दौरान की जाने वाली फोर्टीफिकेशन प्रक्रिया के संबंध में महत्वपूर्ण जानकारी प्रदान की। कुपोषण के खतरनाक ठोस कदम उठाते हुए प्रदेश सरकार की ओर से अटा की गुणवत्ता को बढ़ाने के लिए फोर्टीफिकेशन की प्रक्रिया को आवश्यक किया है। इसके तहत सार्वजनिक वितरण प्रणाली में उचित मूल्य की दूधन के माध्यम से मिलने वाले अटे में पिसाई के दौरान कुछ आवश्यक पोषक तत्व मिलाए जाते हैं। जिला खाद्य आपूर्ति एवं उपभोक्ता मामले विभाग के नियंत्रक राजीव शर्मा ने अटा मिल संचालकों को फोर्टीफिकेशन प्रक्रिया को उपयुक्त रूप से अरन्धने के निर्देश दिए। विभागीय निरीक्षकों को निर्दिष्ट निरीक्षण व सैंपलिंग करने के निर्देश भी दिए।

राजीव शर्मा, नियंत्रक

## सूक्ष्म पोषक तत्वों की कमी को दूर करने के लिए फोर्टीफिकेशन पर रिफ्रेशर प्रशिक्षण आयोजित

एफ. एस.ओ पवन कुमार और खाद्य निरीक्षक देस राज मौजूद रहे।

श्री/ राजन पुंछी: सूक्ष्म पोषक तत्वों की कमी से दुनिया भर में करोड़ों लोग प्रभावित हैं, और इसे दूर करने के लिए विभिन्न उपाय किए जा रहे हैं। इनमें सूक्ष्म पोषक तत्वों को मजबूत करना (फोर्टीफिकेशन), पौष्टिक भोजन को बढ़ावा देना, और विशेष रूप से प्रभावित समूहों के लिए पूरक आहार प्रदान करना शामिल है। उपरोक्त समस्या को लेकर खाद्य, नागरिक आपूर्ति और उपभोक्ता मामले विभाग के.एच.पी.टी-जीएआईएन के सहयोग से मंडी जिले के आटा मिलर्स के लिए जिला स्तरीय रिफ्रेशर प्रशिक्षण आयोजित किया गया। यह प्रशिक्षण फूड प्राइवेट लिमिटेड, भांबला हुआ। इस कार्यशाला का उद्देश्य फोर्टीफिकेशन की प्रक्रिया को मजबूत करना, मानकों के अनुसार उत्पादन सुनिश्चित करना और गुणवत्ता की



तकनीकी सत्रों का संचालन विनोद कपूर (GAIN) ने किया, जिसमें सुश्री मिहिका वाखलू (KHPT), सुश्री प्रिया भट्टाचार्य (GAIN) और श्री गौरव कुमार (KHPT) ने भी योगदान दिया। कुल 16 मिलों से 30 प्रतिभागियों ने इस प्रशिक्षण में सक्रिय भागीदारी की। प्रशिक्षण के दौरान यह बताया गया कि गेहूं के आटे का फोर्टीफिकेशन आयरन, फोलिक एसिड और विटामिन बी12 जैसे जरूरी सूक्ष्म पोषक तत्वों की कमी को दूर करने में अहम भूमिका निभाता है।

## फोर्टीफिकेशन से पोषक तत्वों की कमी की जा सकती है दूर : मिहिका वाखलू

केएचपीटी की प्रतिनिधि ने कांगड़ा में आयोजित प्रशिक्षण के दौरान फ्लोर मिल-चक्कियों प्रतिनिधियों को दी महत्वपूर्ण जानकारी

सबेरा न्यून/यशपाल सिंह धर्मशाला, 25 जून : हिमाचल प्रदेश स्थित आटा मिलों और आटा चक्कियों के प्रतिनिधियों के लिए फोर्टीफिकेशन की प्रक्रिया के बारे में रिफ्रेशर प्रशिक्षण का आयोजन किया जा रहा है। यह बात केएचपीटी की प्रतिनिधि मिहिका वाखलू ने कही। उन्होंने बताया कि यह प्रशिक्षण केएचपीटी, जीएआईएन द्वारा खाद्य, नागरिक आपूर्ति एवं उपभोक्ता मामले विभाग के साथ समन्वय करके दिया जा रहा है। जिला कुल्लू, मंडी, सोलन, सिरमौर, ऊना में स्थित सभी मिलों-आटा चक्कियों के प्रतिनिधियों को प्रशिक्षण दिया जा चुका है। उन्होंने बताया कि इसी कड़ी में 24 जून को जिला कांगड़ा एवं चंबा में स्थित आटा मिलों-आटा चक्कियों के मिल मालिकों, उनके प्रतिनिधियों/उनके



समन्वय करके दिया जा रहा है। जिला कुल्लू, मंडी, सोलन, सिरमौर, ऊना में स्थित सभी मिलों-आटा चक्कियों के प्रतिनिधियों को प्रशिक्षण दिया जा चुका है। उन्होंने बताया कि इसी कड़ी में 24 जून को जिला कांगड़ा एवं चंबा में स्थित आटा मिलों-आटा चक्कियों के मिल मालिकों, उनके प्रतिनिधियों/उनके तकनीकी कर्मचारी के लिए प्रशिक्षण का आयोजन हिमाचल फ्लोर मिल, कांगड़ा के प्रांगण में आयोजित किया गया, जिसमें 18 मिलों के मिल मालिक, प्रतिनिधि एवं तकनीकी कर्मचारी उपस्थित हुए। इस प्रशिक्षण का उद्देश्य फोर्टीफिकेशन की प्रक्रिया को मजबूत करना, मानकों के अनुसार उत्पादन सुनिश्चित करना और गुणवत्ता की निगरानी को बेहतर बनाना है। गेहूं के आटे का फोर्टीफिकेशन आयरन, फोलिक एसिड और विटामिन बी-12 जैसे जरूरी सूक्ष्म पोषक तत्वों की कमी को दूर करने में अहम भूमिका निभाता है, जो जन स्वास्थ्य सुधार के लिए जरूरी है। उन्होंने बताया कि एनीमिया से बचने के लिये इन पोषक तत्वों का योगदान रहता है तथा इसमें मिलर्स को भूमिका भी बहुत महत्वपूर्ण है क्योंकि मिलर्स द्वारा ही आटे में सही मात्रा में इन पोषक तत्वों का मिश्रण किया जाता है। उन्होंने यह बताया गया कि इस प्रकार के प्रशिक्षण का आयोजन शीघ्र ही जिला हमीरपुर व शिमला में भी खाद्य, नागरिक आपूर्ति एवं उपभोक्ता मामले विभाग के समन्वय से किया जाएगा।

## प्रदेश में आटा मिल संचालकों को दिया जाएगा प्रशिक्षण

धर्मशाला। केएचपीटी, खाद्य आपूर्ति विभाग तथा जीएआईएन (गेन) के सहयोग से पूरे प्रदेश में स्थित आटा मिलों तथा आटा चक्कियों को फोर्टीफिकेशन की प्रक्रिया बारे में रिफ्रेशर प्रशिक्षण के एचपीटी द्वारा खाद्य, नागरिक आपूर्ति एवं उपभोक्ता मामले, विभाग के साथ समन्वय करके दिया जा रहा है। केएचपीटी की प्रतिनिधि मिहिका वाखलू ने कहा कि जिला कुल्लू, मंडी, सोलन, सिरमौर, ऊना में स्थित सभी मिलों तथा आटा चक्कियों को प्रशिक्षण दिया जा चुका है। उन्होंने बताया कि इसी कड़ी में मंगलवार

## केएचपीटी की प्रतिनिधि मिहिका वाखलू ने दी जानकारी

को जिला कांगड़ा एवं चंबा में स्थित आटा मिलों तथा आटा चक्कियों के मिल मालिकों, उनके प्रतिनिधियों तथा उनके तकनीकी कर्मचारी के लिए केएचपीटी ने खाद्य आपूर्ति तथा गेन (जीएआईएन) के सहयोग से प्रशिक्षण का आयोजन हिमाचल फ्लोर मिल, कांगड़ा के प्रांगण में जिला नियंत्रक, खाद्य, नागरिक आपूर्ति एवं उपभोक्ता मामले, कांगड़ा स्थित धर्मशाला के

## प्रशिक्षण शिविर में आटा मिलर्स को दिए गुणवत्ता के टिप्स

कुल्लू। जिला नियंत्रक खाद्य, नागरिक आपूर्ति एवं उपभोक्ता मामले की ओर से आटा की गुणवत्ता सुनिश्चित करने के लिए प्रशिक्षण शिविर का आयोजन किया गया। जिसमें जिला भर की छह आटा मिलों के 15 प्रतिभागियों ने भाग लिया। दरअसल, जिला नियंत्रक खाद्य, नागरिक आपूर्ति एवं उपभोक्ता मामले कार्यालय द्वारा सूक्ष्म पोषक तत्वों की कमी से निपटने के लिए एक जिला स्तरीय रिफ्रेशर प्रशिक्षण का आयोजन किया गया। यह प्रशिक्षण बजौरा में हुआ। प्रशिक्षण का उद्देश्य आटे के फोर्टीफिकेशन (मजबूतीकरण) की प्रक्रिया को बेहतर बनाना, मानकों के अनुसार उत्पादन सुनिश्चित करना और गुणवत्ता निगरानी प्रणाली को सुदृढ़ करना था। कार्यक्रम में खाद्य एवं आपूर्ति अधिकारी नवीन कुमार तथा निरीक्षक अनिल कुमार उपस्थित रहे। तकनीकी प्रशिक्षण का संचालन विनोद कपूर ने किया। संवाद

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Delivering for Nutrition in South Asia  
Towards Impact at Scale

December 3, 2025

# From Wages to Well-being:

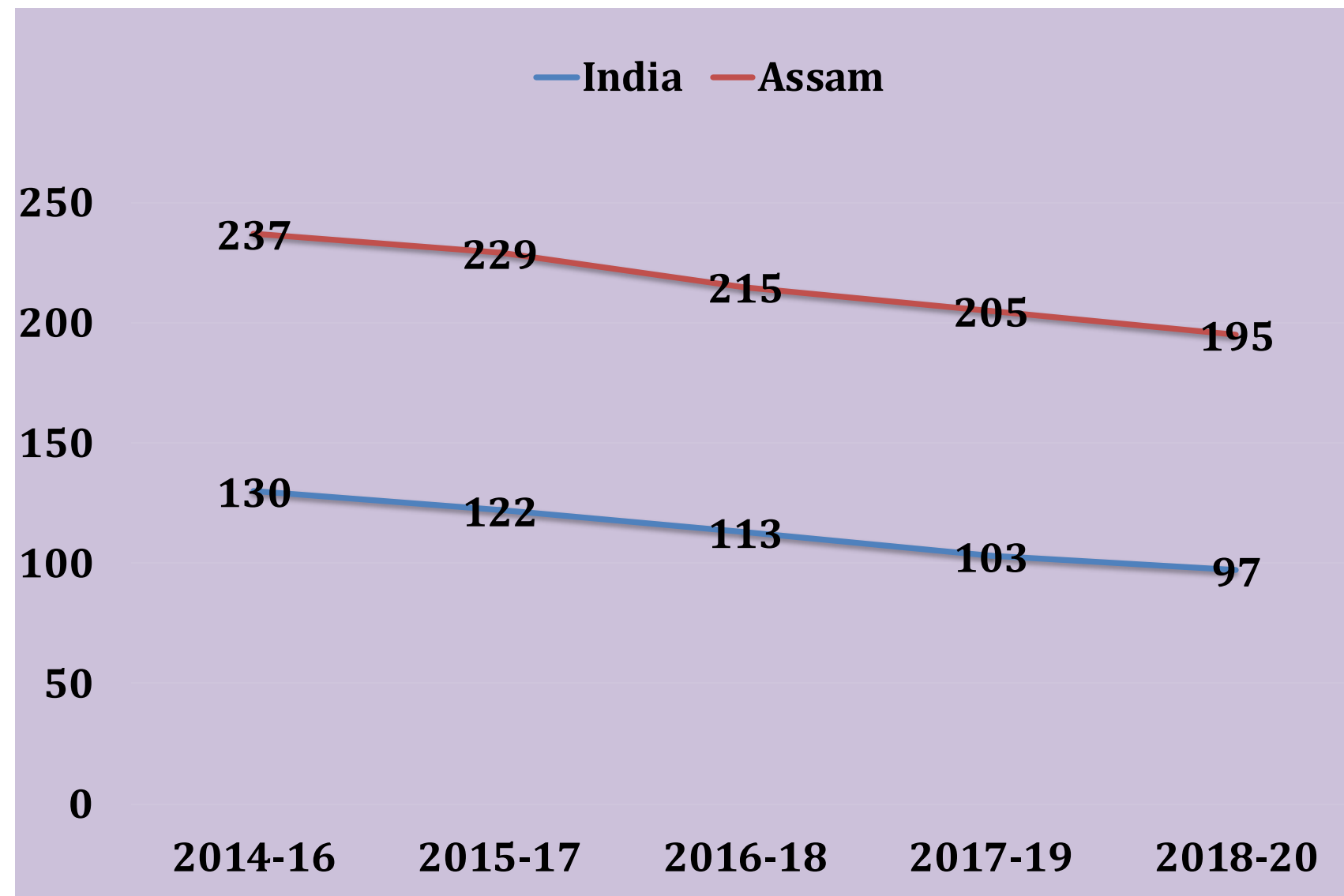
Scaling Maternal and Child Nutrition in Tea Garden Communities through Assam's Wage Compensation Scheme

Pallabi Gogoi

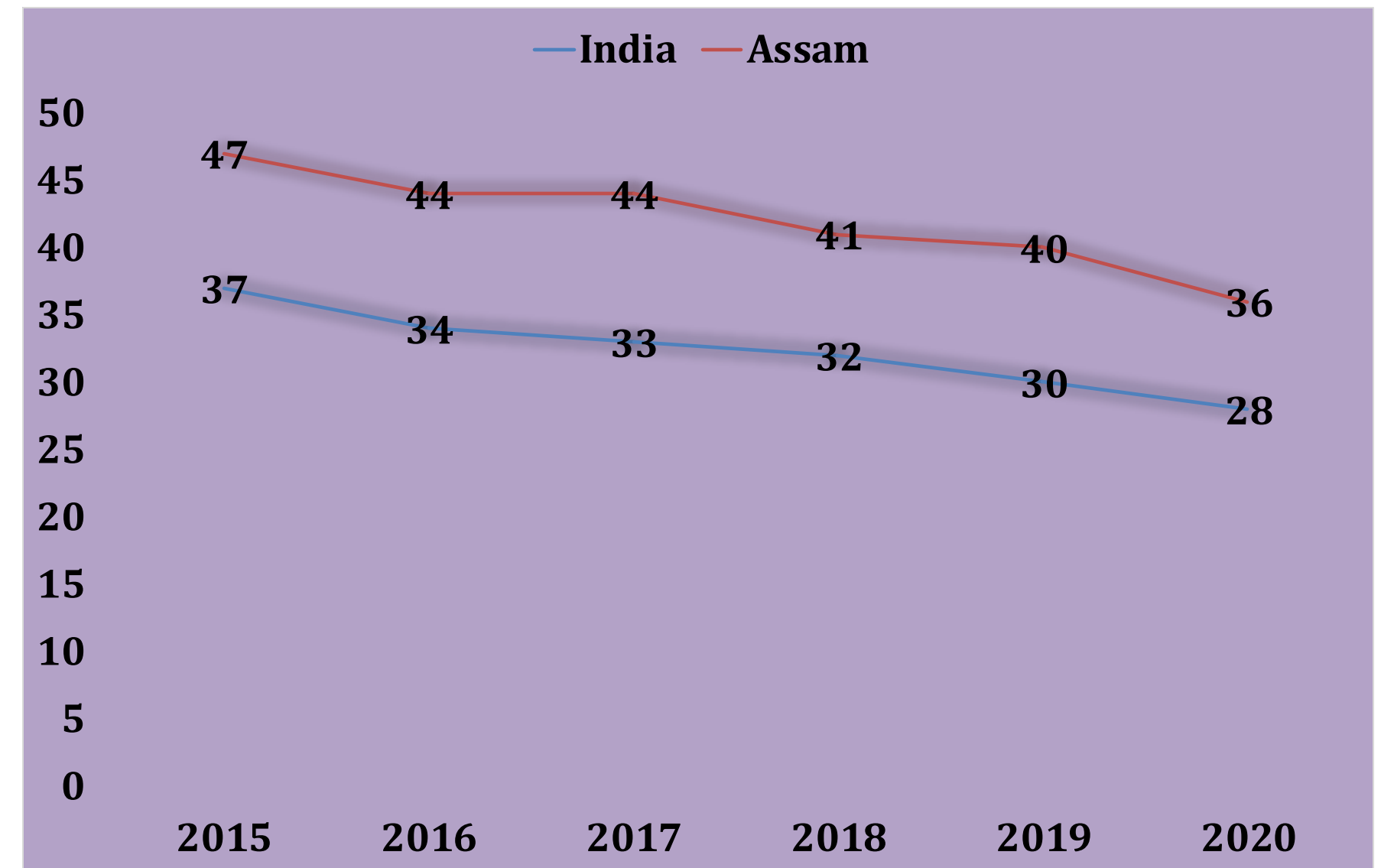
Jawaharlal Nehru University

# Why Assam?

### Trends in MMR in India and Assam



### Trends in IMR in India and Assam



# Maternal and Child Health Status

Indicators	Assam			India		
	Urban	Rural	Total	Urban	Rural	Total
Mothers who had ANC check-up in the first trimester (%)	72.7	62.7	63.8	75.5	67.9	70
Mothers who had at least 4 ANC (%)	62.6	49.2	50.7	68.1	54.2	58.1
Mothers who had received PNC from a doctor/nurse/LHV/ANM/ midwife/ other health professional within 2 days of delivery (%)	76.8	63.8	65.3	84.6	75.4	78
Institutional birth (%)	93.5	82.9	84.1	93.8	86.7	88.6
Births assisted by a doctor/nurse/LHV/ANM/midwife/other health professional (%)	94.9	85.1	86.1	94	87.8	89.4
Children aged 12-23 months fully immunized (BCG, measles, and 3 doses each of polio and DPT) (%)	63.2	66.9	66.4	75.5	76.8	76.4
Children under age 6 months exclusively breastfeed (%)	67.3	63	63.6	59.6	65.1	63.7
Children aged 6-8 months receiving solid or semi-solid food and breastmilk (%)	57.6	51.2	51.7	52	43.9	45.9
Children under 5 years who are stunted (%)	29.8	36	35.3	30.1	37.3	35.5
Children under 5 years who are wasted (%)	19.1	22.1	21.7	18.5	19.5	19.3
Children under 5 years who are underweight (%)	25.9	33.6	32.8	27.3	33.8	32.1
Women whose BMI is below normal (%)	13.9	18.3	17.6	13.2	21.2	18.7
Women who are overweight or obese (%)	23.8	13.6	15.2	33.2	19.7	24

# Why focus on the tea garden

Tea garden communities consistently report poorer MCH indicators compared to the rest of Assam and India.

Upper Assam (Dibrugarh, Jorhat, Sibsagar, Golaghat & Tinsukia) records the highest MMR (~404 per lakh live births) areas with the most tea gardens (AHS 2012-13).

Long working hours and physically demanding labour.

Wage dependence + income volatility

Most households rely solely on daily wages; pregnancy-related absenteeism leads to income loss, pushing women to work late into pregnancy.

Supply side gap



Source: World Bank

## Wage Compensation Scheme

- Introduced in 2018
- In order to improve the MCH in the tea garden areas, the Govt. of Assam has introduced an CCT named WCS in 2018.
- To improve the maternal and child health and nutrition
- Pregnant women resident of the tea garden area and not below 18 years of age
- Up to two live births.

Instalment	Amount	Revised Amount	WCS Conditionalities
1 <sup>st</sup>	Rs. 2000	Rs 3000	Early registration of pregnancy and ANC preferably in 1 <sup>st</sup> trimester
2 <sup>nd</sup>	Rs. 4000	Rs 4000	One ANC should be done preferably by medical officer in 3 <sup>rd</sup> trimester
3 <sup>rd</sup>	Rs. 3000	Rs 4000	Institutional delivery
4 <sup>th</sup>	Rs. 3000	Rs 4000	Birth registration of child & immunization of first cycle of BCG, OPV, DPT, Hepatitis-B or their equivalent

As per NHM Assam, a total of 21,601 PW&LM out of a target 74,308 have availed benefits under the scheme as on 2<sup>nd</sup> Jan 2020.

# Objective and Data

## Objective

- This study evaluates the effectiveness of Assam's Wage Compensation Scheme for Pregnant Women (WCS) in improving maternal and child health (MCH) and nutrition among tea garden workers—a historically underserved group. It examines direct health gains and behavioural pathways to inform scalable, nutrition-sensitive policy models across South Asia.

## Data

- Secondary data: NFHS 5, 2019-21
- Primary survey conducted in the tea garden areas of Assam between September 2021 to December 2022 after taking ethical approval from the IERB, JNU.
- Multistage random sampling method
- Jorhat and Dibrugarh districts were selected based on the concentration of tea gardens
- 6 tea gardens from Jorhat and 9 tea gardens from Dibrugarh are chosen randomly.
- A list of WCS beneficiaries were prepared at each of the tea garden of the respective 2 selected districts with the help of the frontline health workers.
- Similarly, to generate a counterfactual, another list of non-beneficiaries were selected.

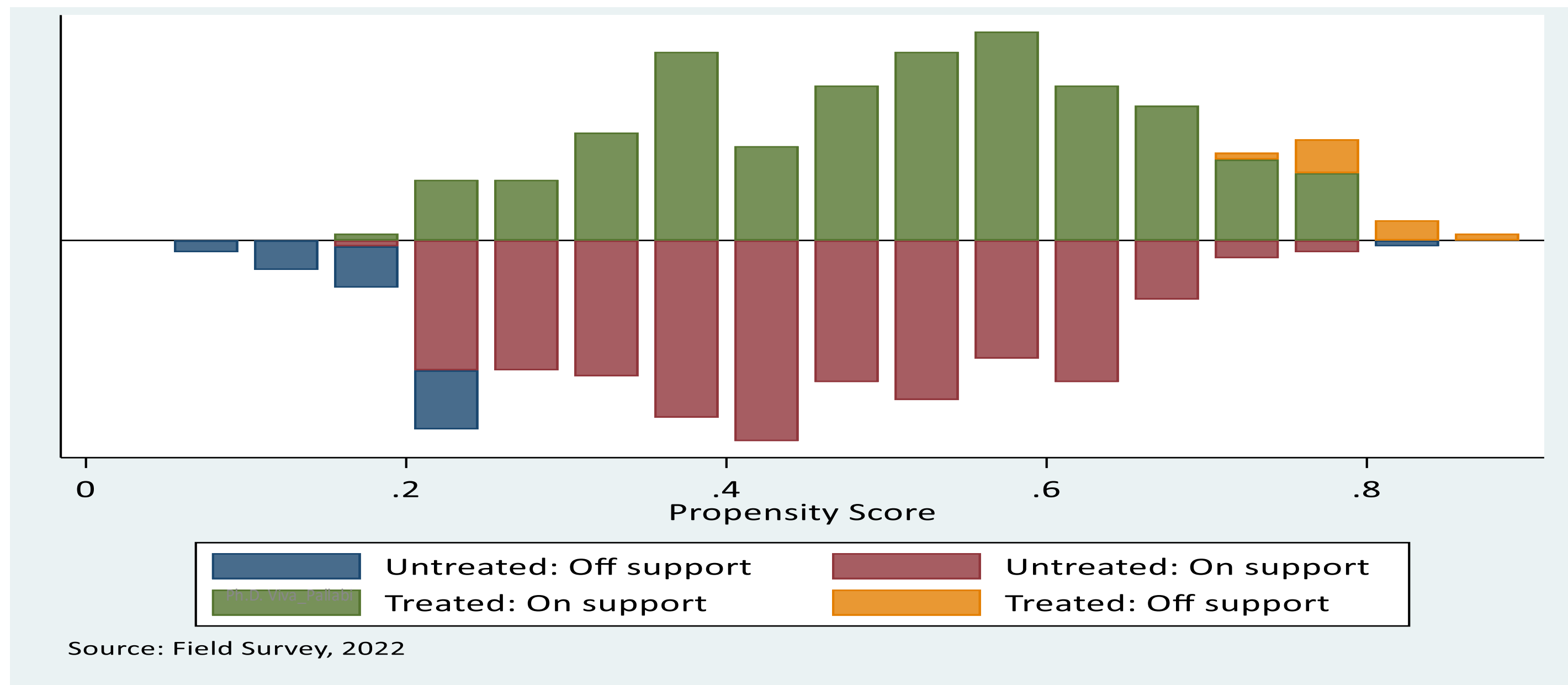
# Analytical Approach

A mixed-methods design integrated secondary and primary data.

NFHS-5 (2019–21) was analysed to compare MCH coverage in Assam's tea garden population with other regions, assessing socio-economic inequality using the Slope Index of Inequality (SII) and Relative Index of Inequality (RII).

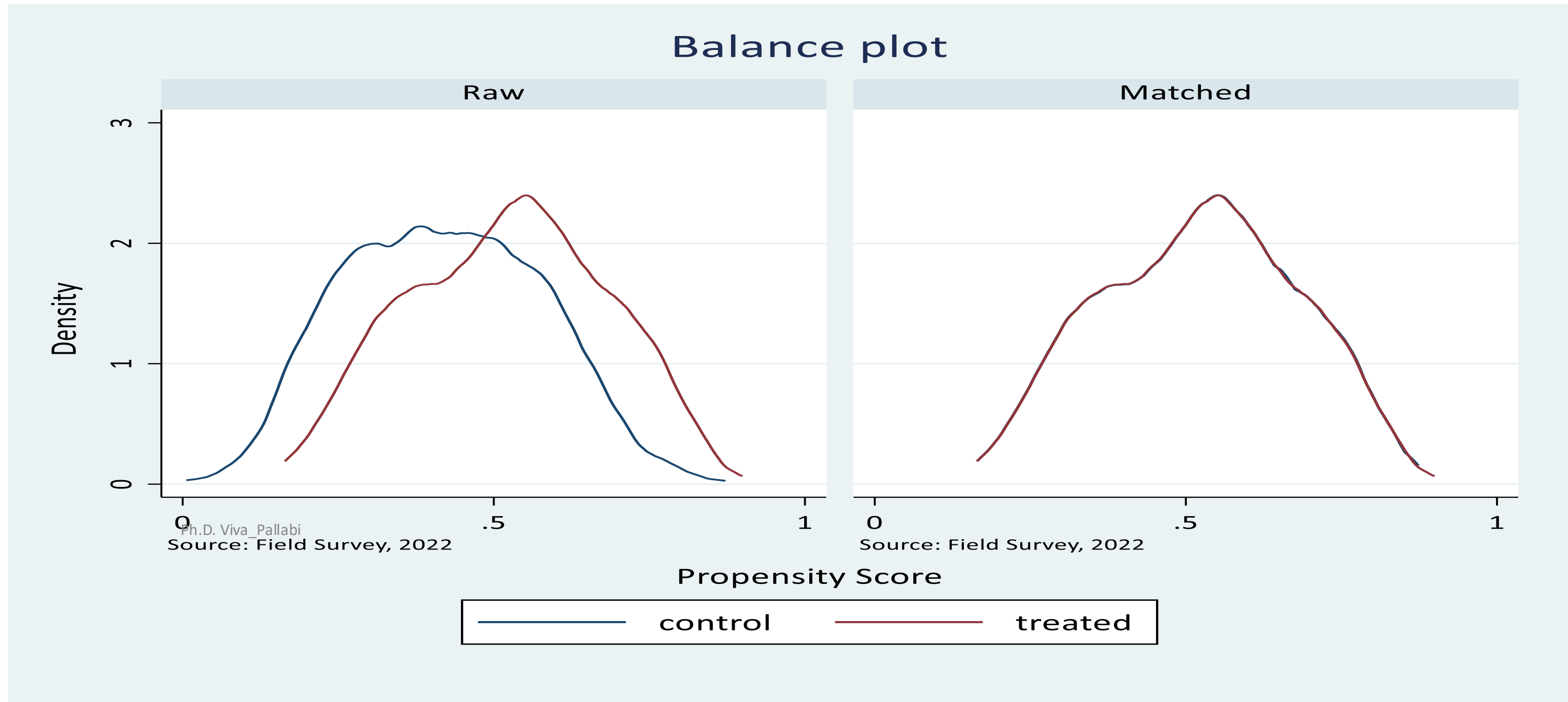
Impacts were estimated using Propensity Score Matching with nearest-neighbour estimators for the Average Treatment Effect on the Treated (ATT).

# Distribution of P-Scores across Treatment and Control Groups



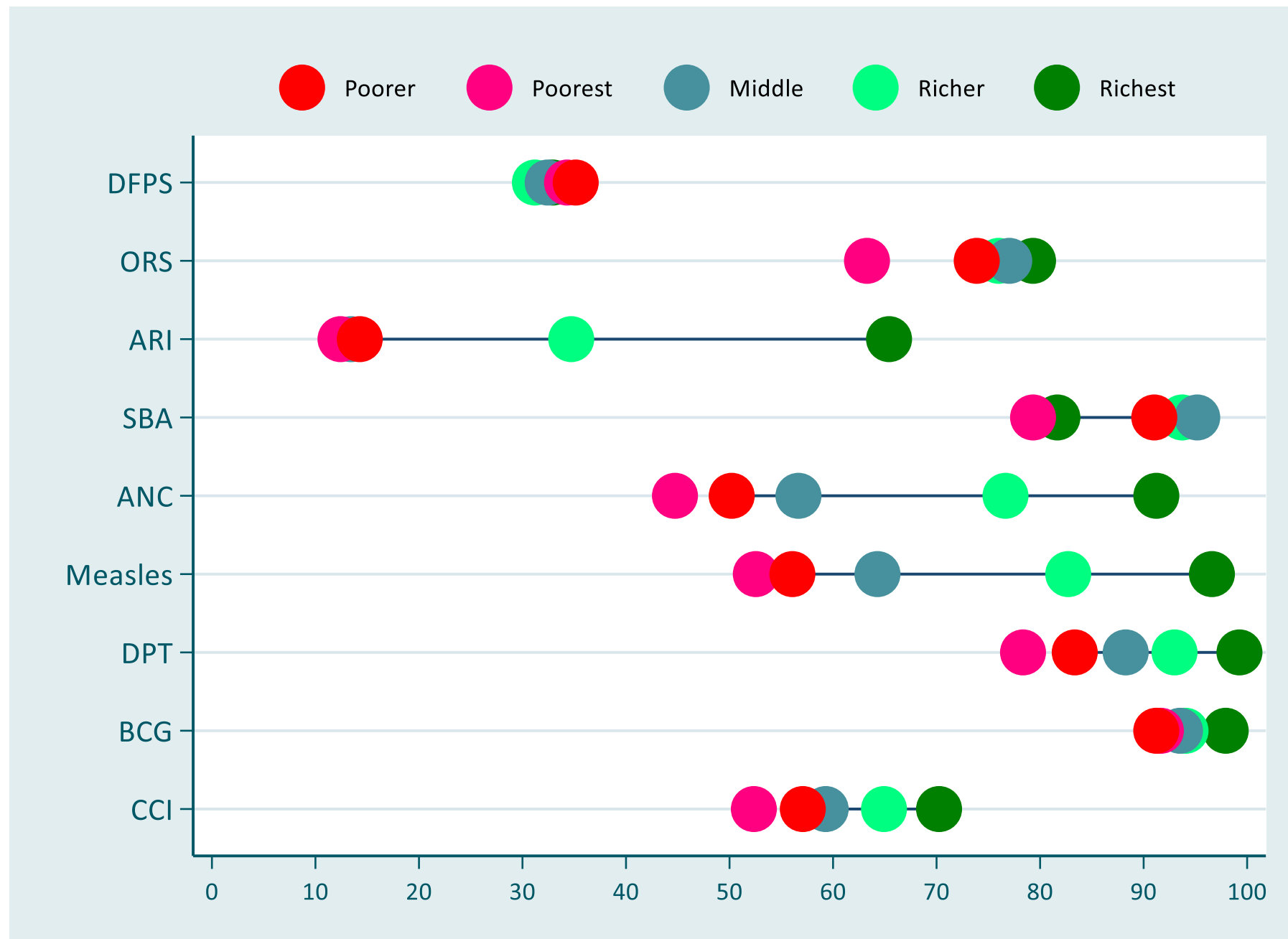
The estimated propensity scores reveal a very high level of common support on the covariates i.e., there is overlap in the range of propensity scores across treatment and control groups (Fig. 1). About 95.61% of the sample beneficiary falls in the common support range [.2110, .8532]. This is critical as the average treatment effects are based on this region of common support. The larger the common support area, the greater the validity of the estimates (Dehejia & Wahba, 2002).

# Distribution of P-Scores across Treatment and Control Groups



The validity of matching is further augmented by the kernel density distributions of propensity scores of WCS beneficiaries (treatment group) and non-beneficiaries (control group) which were different before matching, appears identical after matching in terms of observable characteristics.

# Indicator wise extent of coverage across quantiles for Assam



## ATT Estimates of Impact of WCS on Maternal Health Outcomes

Outcome variable	NN(5)	PSM	NN(1)	IPW
At least one ANC within first trimester	0.321***	0.316***	0.323***	0.298***
	(0.046)	(0.058)	(0.056)	(0.043)
At least four ANC	0.355***	0.329***	0.374***	0.334***
	(0.045)	(0.060)	(0.053)	(0.043)
Full ANC	0.350***	0.415***	0.353***	0.351***
	(0.049)	(0.058)	(0.056)	(0.047)
Institutional Delivery	0.018**	0.026	0.030**	0.035**
	(0.006)	(0.017)	(0.012)	(0.012)
SBA	0.025**	0.043*	0.030**	0.048***
	(0.009)	(0.019)	(0.012)	(0.014)
PNC	0.260***	0.284***	0.256***	0.276***
	(0.040)	(0.048)	(0.046)	(0.040)

## ATT Estimates of WCS scheme on Nutritional Outcomes

Outcome variable	NN(5)	PSM	NN(1)	IPW
BMI	0.085 (0.053)	0.056 (0.066)	0.073 (0.058)	0.068 (0.048)
Exclusive breastfeeding	0.133*** (0.041)	0.038 (0.059)	0.103* (0.048)	0.133*** (0.042)
Birth Weight	0.226 *** (0.047)	0.130** (0.058)	0.259*** (0.055)	0.233*** (0.043)
Stunting	-0.258*** (0.050)	-0.273*** (0.056)	-0.230*** (0.060)	-0.223*** (0.051)
Wasting	0.036 (0.041)	0.058 (0.049)	0.076 (0.048)	0.041 (0.040)
Underweight	-0.088 (0.055)	-0.049 (0.068)	-0.085 (0.062)	-0.105 (0.050)
Dietary Diversity	0.243*** (0.046)	0.233*** (0.059)	0.303*** (0.054)	0.233*** (0.043)

# Conclusionary Remarks

- NFHS-5 analysis showed the Northeast outperforms other regions in MCH coverage, but tea garden communities in Assam face persistent pro-rich disparities. WCS participation significantly improved antenatal care, institutional deliveries, skilled birth attendance, and postnatal care coverage.
- Gains extended to maternal nutrition, exclusive breastfeeding, and family planning awareness.
- The scheme delayed postpartum return-to-work, enhancing maternal recovery and caregiving.
- However, temporary workers remained financially vulnerable due to partial wage loss and inadequate compensation.

## Study Implications

- For South Asia's plantation and remote labour communities, wage compensation can boost MCH access and nutrition. Effectiveness is maximized when schemes expand eligibility, align payments with perinatal needs, and integrate nutrition-specific interventions within existing health systems.

## Systems/Partnerships for Scale-Up

- Scaling in South Asia requires collaboration between health ministries, plantation management, and worker unions. Embedding schemes in national MCH platforms, linking with ICDS and nutrition programmes, and strengthening monitoring can deliver equitable, sustainable maternal and child health gains across similar labour-intensive economies.

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# Scaling Nutrition Resilience in Vulnerable Regions:

Longitudinal Evidence on Social Protection and Livelihood Diversification  
in Rural West Bengal

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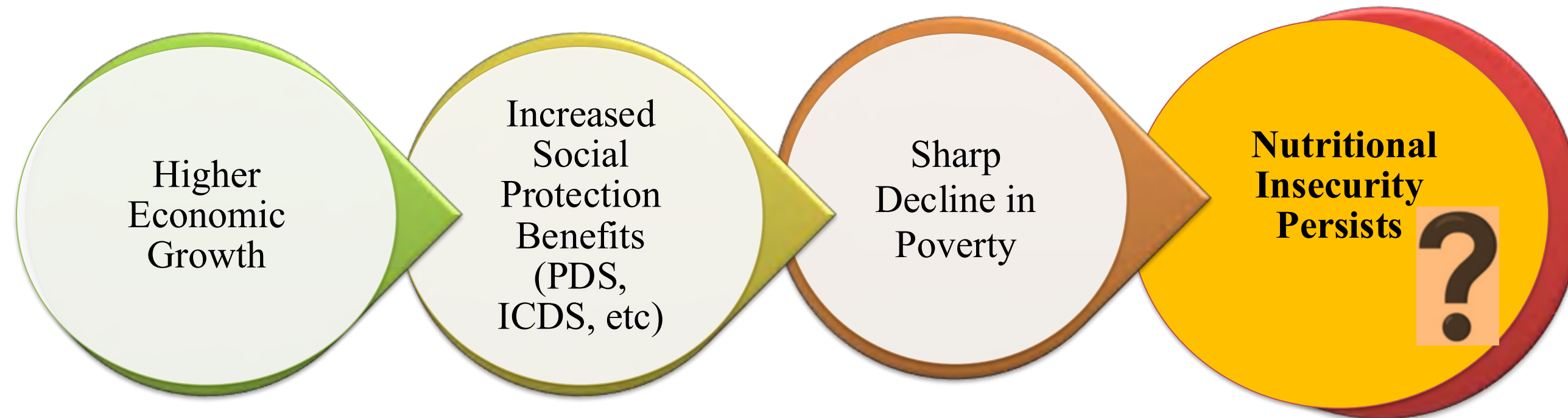
**Coauthors:**

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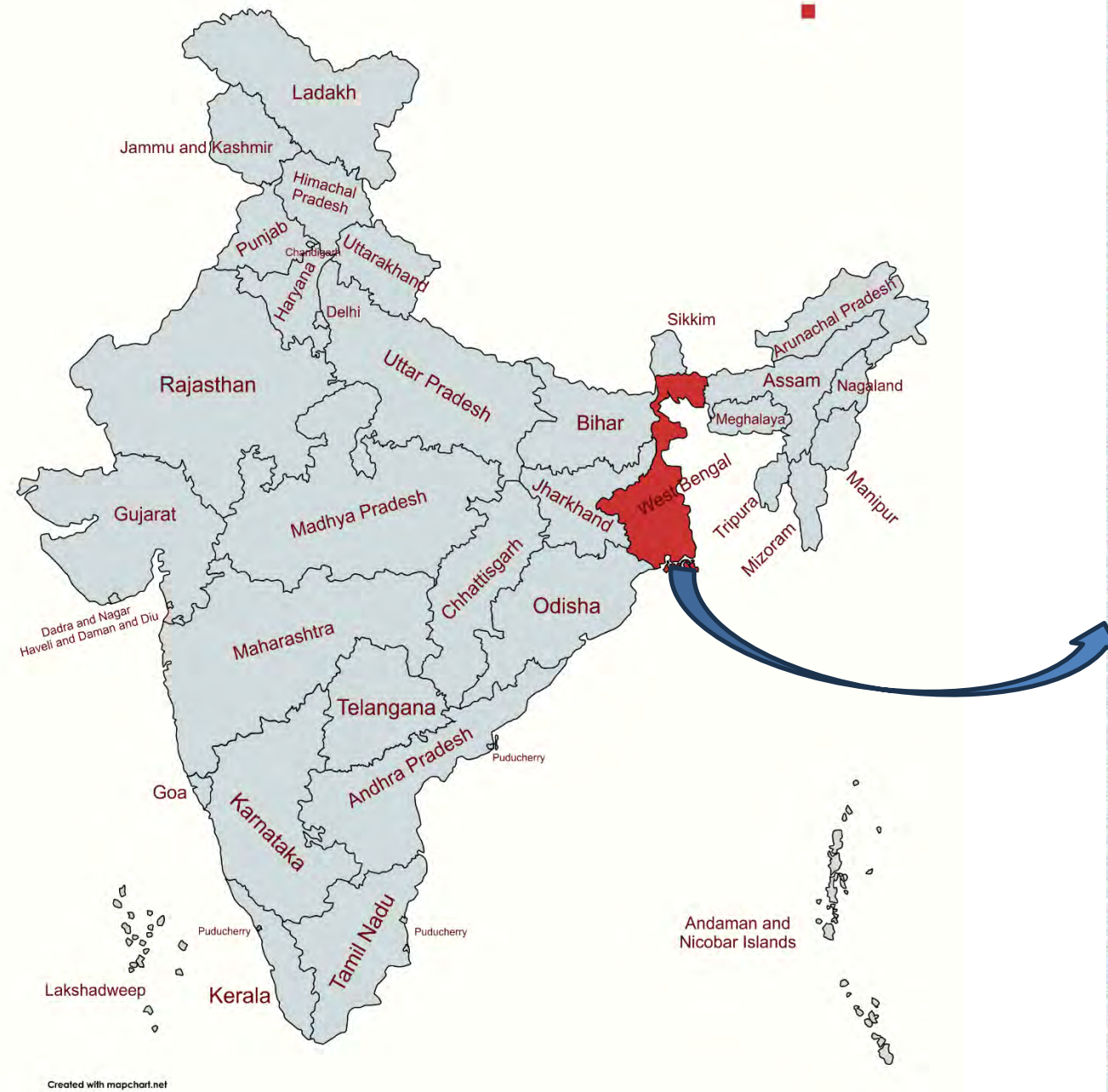
Dr. Akash Dandapat; Dukhulal Nibaran Chandra College, West Bengal, India,

# 1. Why Focus on Nutrition Resilience?

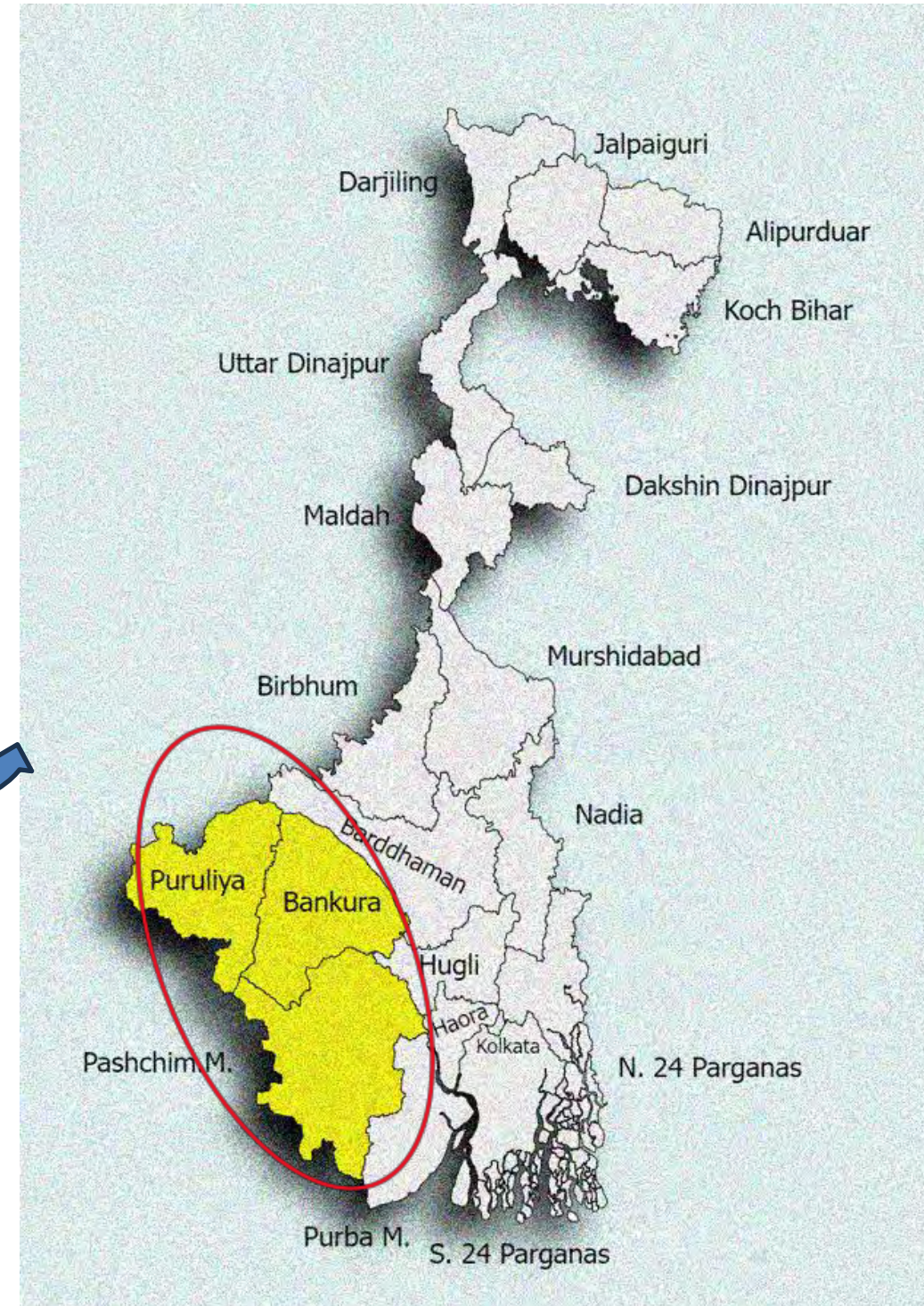
## 1.1 Does nutrition insecurity decline with Economic Growth in India?



## 1.2 Vulnerable, Tribal-Dominated, and Drought-Prone Region: The Study Area



India



West Bengal

The study region consists with three backward districts of West Bengal e.g., ‘**Paschim Medinipur**’, ‘**Bankura**’, and ‘**Purulia**’ which have purposively chosen in the present study. It is characterized by:

- Large tribal population concentration
- Droughts & crop failures
- Seasonal livelihood instability
- Limited dietary diversity
- High dependence on public food systems (PDS, ICDS, MGNREGA, etc)

## 1.3 Literature Review

Identification	Records Identification through database searching: PubMed (n=60), Scopus( n=120), EMBASE (n=20)
Screening	Records after duplicates removed (n=48) Records Excluded in the abstract reporting results or no reviews(n=107)
Eligibility	Full text articles assessed (n=50) Full text articles excluded (n=5)
Included	Studies Includes (n=45)

## 1.4 What Are the Evidence Gaps?

- 1 Lack of longitudinal evidence
- 2 Limited understanding of social protection–diet linkages
- 3 Neglect of livelihood diversification pathways
- 4 Tribal–non-tribal disparities poorly understood
- 5 Nutrition resilience remains under-studied

### 1. Poverty & Food Security (Macro to Household Level)

Rid Out, Seed and Ostry (2006); Akhil and Prasad (2015); Chen et al. (2019); Mitra et al. (2019); Shing & Nayak (2020); Das & Basar (2020); Jatav et al (2022) Sen (2005); Swain (2008); Tendon and Lands (2011); Renuka and Sandy (2014); Akhil, K. (2017); Bhuyan et al. (2020)

- These studies document poverty dynamics and basic food security transitions, but rarely link these to long-term nutrition outcomes.

### 2. Food & Nutrition Insecurity (Diet Quality & Micronutrient Deficits)

Kimberly and Devi (1995); Vyas (2000); Dreze (2004); Rao (2005); Alderman (2005); Schmidhuber and Tupelo (2007); Mittal (2007); Pond and Kumar (2009); Swaminathan (2011); Arimond & Ruel (2004); Basu & Basole (2012); Brahmanand et al. (2013); Mishra (2013); Hendriks (2016).

- These works show persistent dietary diversity deficits and micronutrient gaps, but lack panel data and shock-resilience analysis.

### 3. Poverty, Nutrition and Hidden Hunger

Kannan et al. (2000); Swaminathan (2003); Basu (2011); Sinha (2013) and Dreze & Khera (2013); Karhad (2014); Deaton and Drèze (2009); Radhyakrishna (2005); Ghosh (2006) and Dasgupta et al. (2012); Mark et al. (2012); Drèze and Khera (2013); Himanshu (2013) and Sen & Himanshu (2013); Aguayo and Badgaiyan (2014); Jose and Hari (2015); Jha and Acharya (2016); Song and Imai (2019).

- Shows income growth does not guarantee nutrition gains, yet does not analyse tribal regions or program interactions.

## 2. Objectives

### 1. Entitlement Status and Livelihood Diversification

To analyse household access to major social protection programs and patterns of livelihood diversification over a decade.

### 2. Nutrition Security Dynamics and Sustainability Over Time

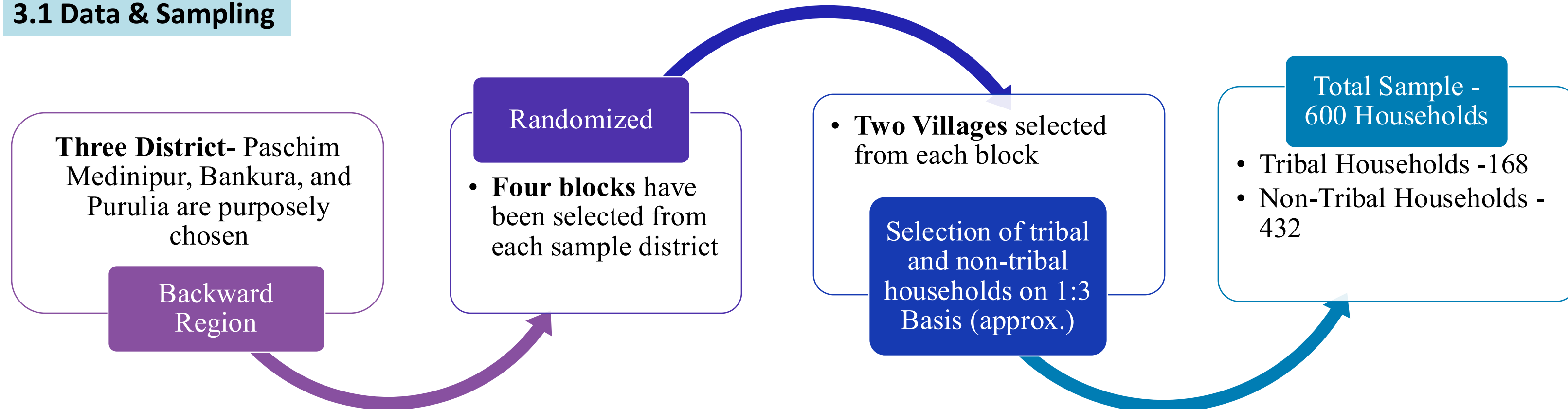
To analyze how nutrition security evolves over time by examining changes in dietary diversity, calorie adequacy, and the incidence–depth–severity of nutrition insecurity, and to evaluate the sustainability of these outcomes.

### 3. Compare Nutrition Outcomes of Poor vs Non-Poor Households

To analyse hidden hunger by examining how households with similar economic status experience different nutrition outcomes.

## 3. Methods & Study Design

### 3.1 Data & Sampling



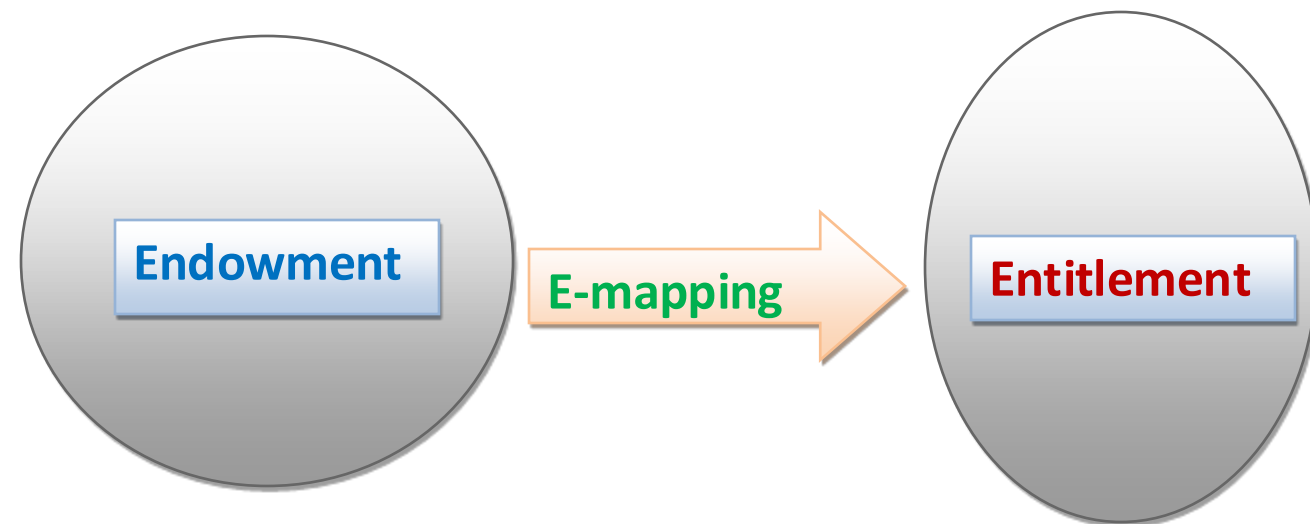
### Areas of Inquiry

- *General information of households*
- *Entitlement, Occupation and earnings of the households*
- *Social Protection Schemes of Government*
- *Consumption Pattern and Expenditure of the Households*
- *Nutritional Outcomes*

### Three-Wave Longitudinal Household Panel (2013–2022)

- **Sampling Technique:** Employed a multistage stratified random sampling method for primary data collection.
- **Baseline Survey (2012-13):** Data from 600 households was collected as our foundational reference.
- **Follow-up Surveys:** Revisited the same 600 households for primary data collection in 2017-18 and 2021-22.
- **Data Preparation:** Compiled a micro panel dataset of these 600 households for analysis.

## 3.2 Sen's Entitlement Approach



combinations of goods and services that a person can legally obtain by using the resources of his endowment set.

### *Endowment Set*

- Tangible assets such as land, equipment, animals, etc., and
- Intangibles such as knowledge and skill, labour power, membership of a particular community, etc.

### *Entitlement Sets*

- **Own-labour**  
Working for Food & Non-food
- **Production-based**  
Growing Food & Non-Food
- **Trade-based**  
Buying Food & Non-Food
- **Transfer**  
Food & Non-Food by Others (SP Benefits)

### A. Transfer Entitlements

- ✓ PDS card type & monthly rice/wheat pulses
- ✓ ICDS take-home rations & hot cooked meals
- ✓ MGNREGA workdays, wages
- ✓ Access to health & maternal services
- ✓ Subsidies, insurance, and safety nets

### B. Livelihood Diversification

- ✓ Employment patterns
- ✓ Agriculture vs non-farm income share
- ✓ Migration (seasonal/permanent)
- ✓ Livelihood shocks (crop loss, price shocks)

### C. Nutrition Outcome Indicators

- ✓ Dietary Diversity
- ✓ Calorie Adequacy (Nutritive Values of Indian Foods)
- ✓ Nutrition Security Status
- ✓ Cross-classification of nutrition over time (sustainability matrix)
- ✓ Hidden Hunger Identification

**Estimation**

**3.3 Methodology**

**Poverty**

Upgradation of Poverty Line for West Bengal in 2023-24

Consider their Monthly Per Capita Consumption Expenditure in Rs.

Status of poverty is measured by FGT Method (1984) as

$$p_{\alpha} = \frac{1}{N} \sum_{i=1}^q \left( \frac{z - e_i}{z} \right)^{\alpha};$$

$\alpha = 0, 1, \text{ and } 2$

**Nutrition Security**

Estimation of Average Nutrition Intake considering "Nutritive Values of Indian Foods" (Das & Basar, 2020)

Consider average recommended calorie norms by ICMR (i.e. 2155 kcal/person/day for rural areas and 2090 kcal/person/day for urban regions.

Status of nutrition Insecurity is measured by FGT Method

$$NI_{\alpha} = \frac{1}{N} \sum_{i=1}^q \left( \frac{\bar{C} - C_i}{\bar{C}} \right)^{\alpha};$$

$\alpha = 0, 1, \text{ and } 2$

**Attrition Correction**

- Inverse Probability Weighting (IPW)
- Heckman two-step selection correction
- Validates robustness of panel estimates

Entitlement  
Livelihood diversification  
Index (LDI)  
Social Protection Index  
(SPI)  
Nutritional Outcomes

**Methods of Analysis**

**Multinomial Logit**  
Dynamics of poverty and nutritional insecurity over time

**Diet Diversification**

Cereal share  
Protein food share  
Micronutrient-rich food share  
Diversification Index

## 4. Results

### 4.1 Social Protection Participation & Equity

#### Key Findings (SPB & SPI Analysis)

##### •Programme Reach:

Food and housing have highest coverage; employment and farm-income schemes remain limited.

##### •Equity Gaps:

ST households cluster in the lowest benefit tier, while non-STs access higher-value benefits, revealing structural inequity.

##### •SPI Outcomes:

SPI = 0.33 overall; Non-STs: 0.416 vs STs: 0.21 → lower breadth & depth of entitlements among STs.

##### •Scheme Orientation:

75–90% of the SPI comes from poverty-relief schemes; nutrition- and productivity-enhancing schemes contribute very little.

<b>Food and Nutrition</b>		<b>Housing</b>	
1a) TPDS for BPL Ration Card Holders		14) Pradhan Mantri Awas Yojana (PMAY)	
1b) TPDS under Antyodaya Anna Yojana (AAY)		<b>Employment and Income</b>	
1c) TPDS under Annapurna Yojana (AY)		15) Employment Guarantee Programme (MGNREGA)	
1d) TPDS for APL Ration Card Holders		16) Swarna Jayanti Gram Swarozgar Yojana (SGSY)	
2) Integrated Child Development Services (ICDS)		17) Procurement of Non-timber Forest Produces (NTFP)	
3) POSHAN (National Nutritional Mission)		18) Pradhan Mantri Mudra Yojana (PMMY)	
4) Mid Day Meal (MDM)		<b>Social Assistance</b>	
<b>Health</b>		19) Lakshmi Bhandar	
5) Rural Primary Health Care		20) Krishak Bandhu,	
6) Janani Suraksha Yojana (JSY)		21) PM Kisan Samman Nidhi	
7) Swachh Bharat Mission (SBM)		22) Crop Insurance (PMFBY)	
<b>Education</b>		23) National Old Age Pension Scheme (NOAPS)	
8) Sishu Siksha Karmasuchi (SSK)		24) National Family Benefit Scheme (NFBS)	
9) Madhyamik Siksha Karmasuchi (MSK)		25) National Widow Pension Scheme (NWPS)	
10) Books and Book Grant		26) National Disability Pension Scheme (NDPS)	
11) Other Grants		27) Indira Gandhi Matritya Sahayog Yojana (IGMSY)	
12) Kanyashree			
13) Bi-Cycle for School Children			

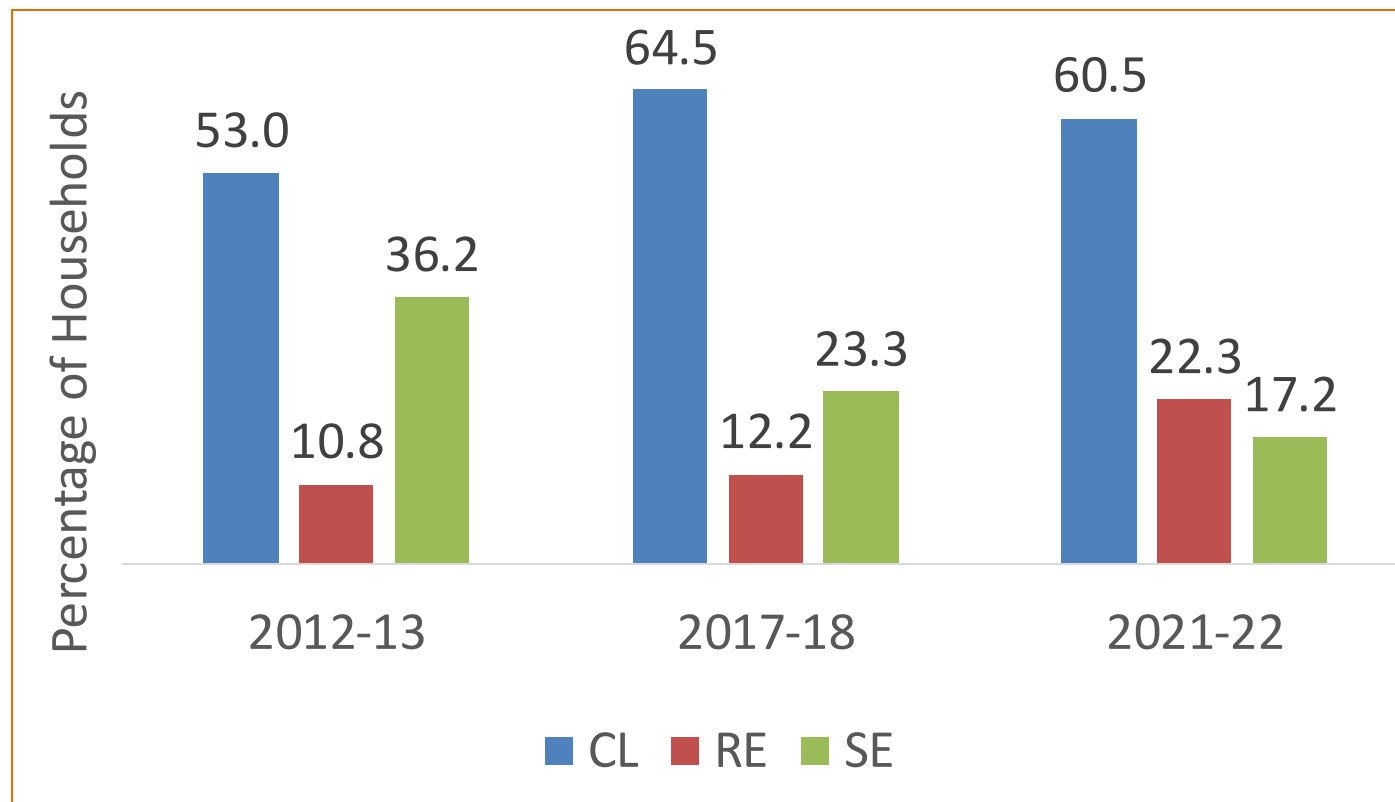
#### Implication for Nutrition Resilience:

Limited depth of nutrition-sensitive schemes weakens households' ability to sustain dietary diversity during shocks, especially among STs.

# 4. Results

## 4.2 Entitlements and Livelihood Diversification

Changing Employment Structure of Households



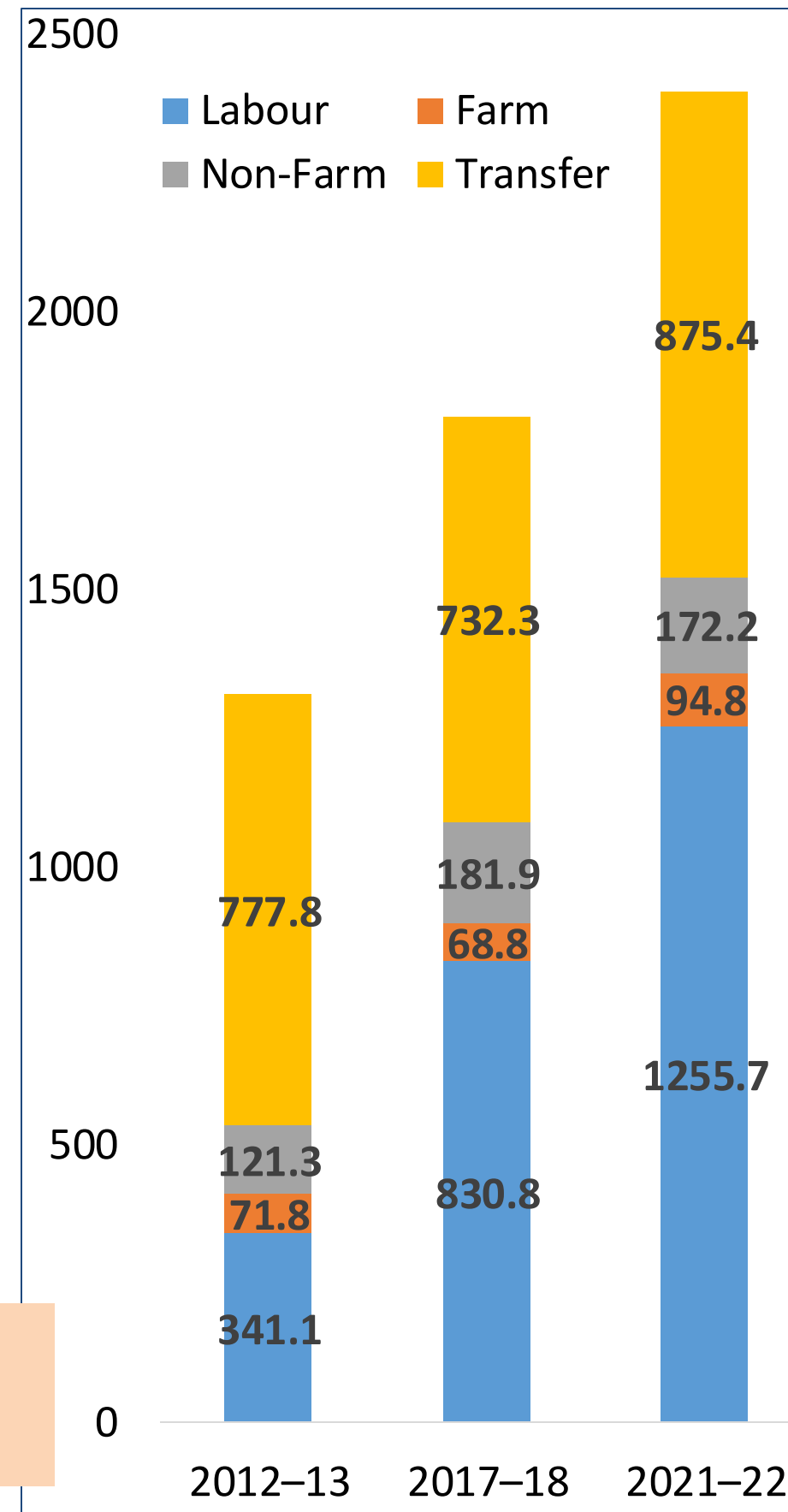
### Livelihood Diversification Index (LDI):

- Overall LDI: **0.37**, moderate diversification. ST households less diversified than non-STs (0.37 vs 0.40).
- Forest resource access, livestock, and higher social protection benefits positively influence diversification; asset-poor households diversify through low-cost activities.

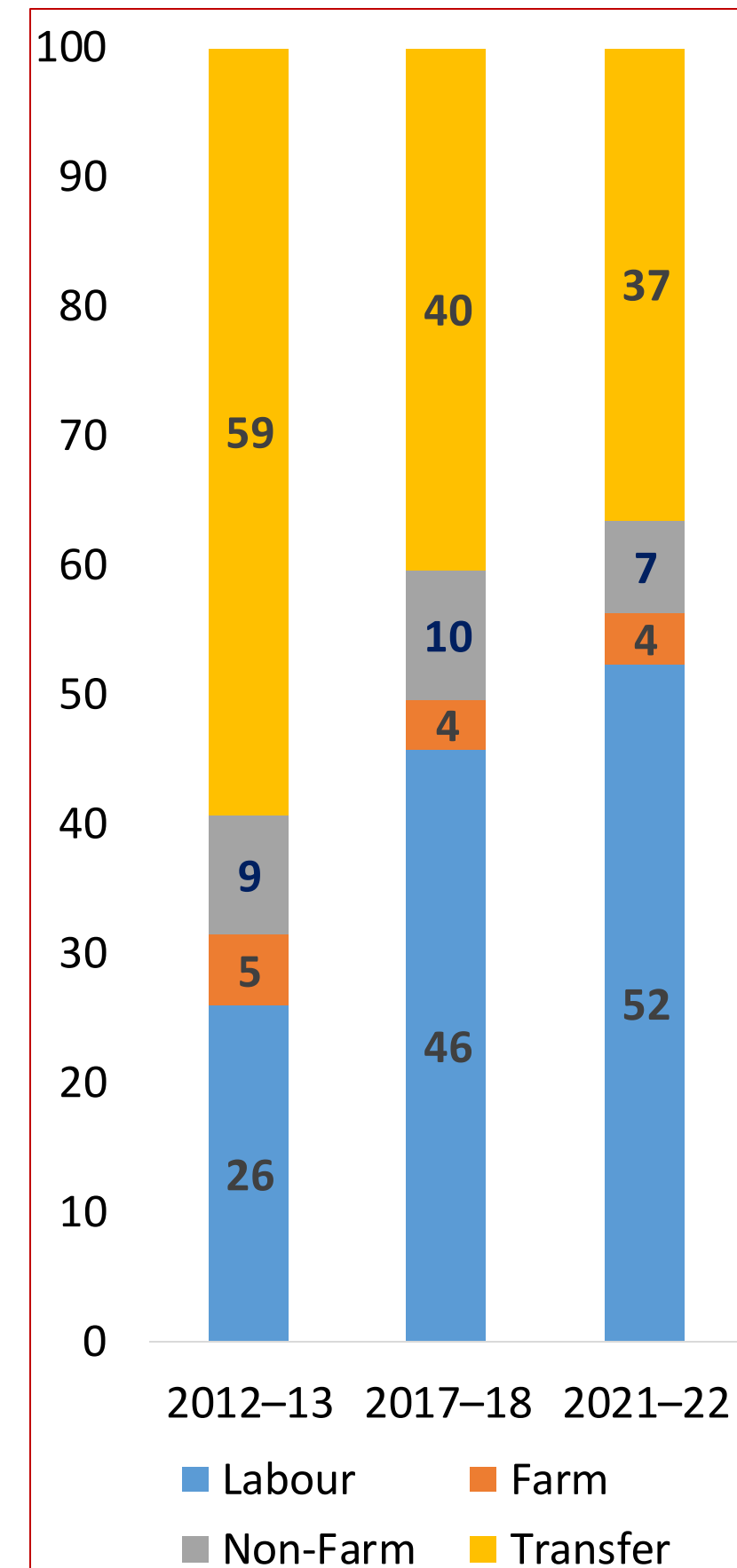
### •Implication:

Low livelihood diversification constrains households' ability to maintain nutrition security during income or entitlement shocks.

4.2 a) Trends in Household Income (Rs) by Source

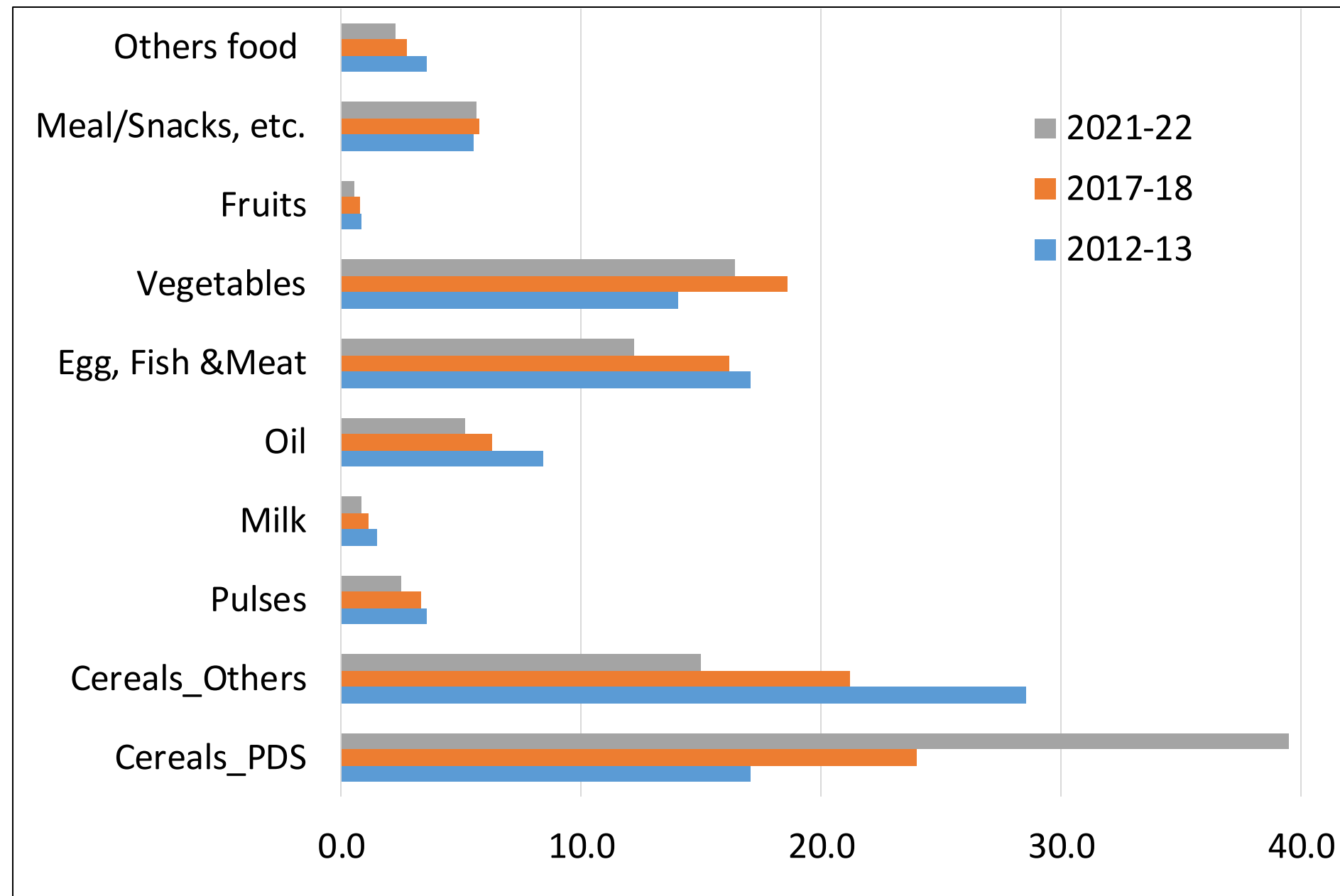


4.2 b) Share of Income from Different Sources (%)

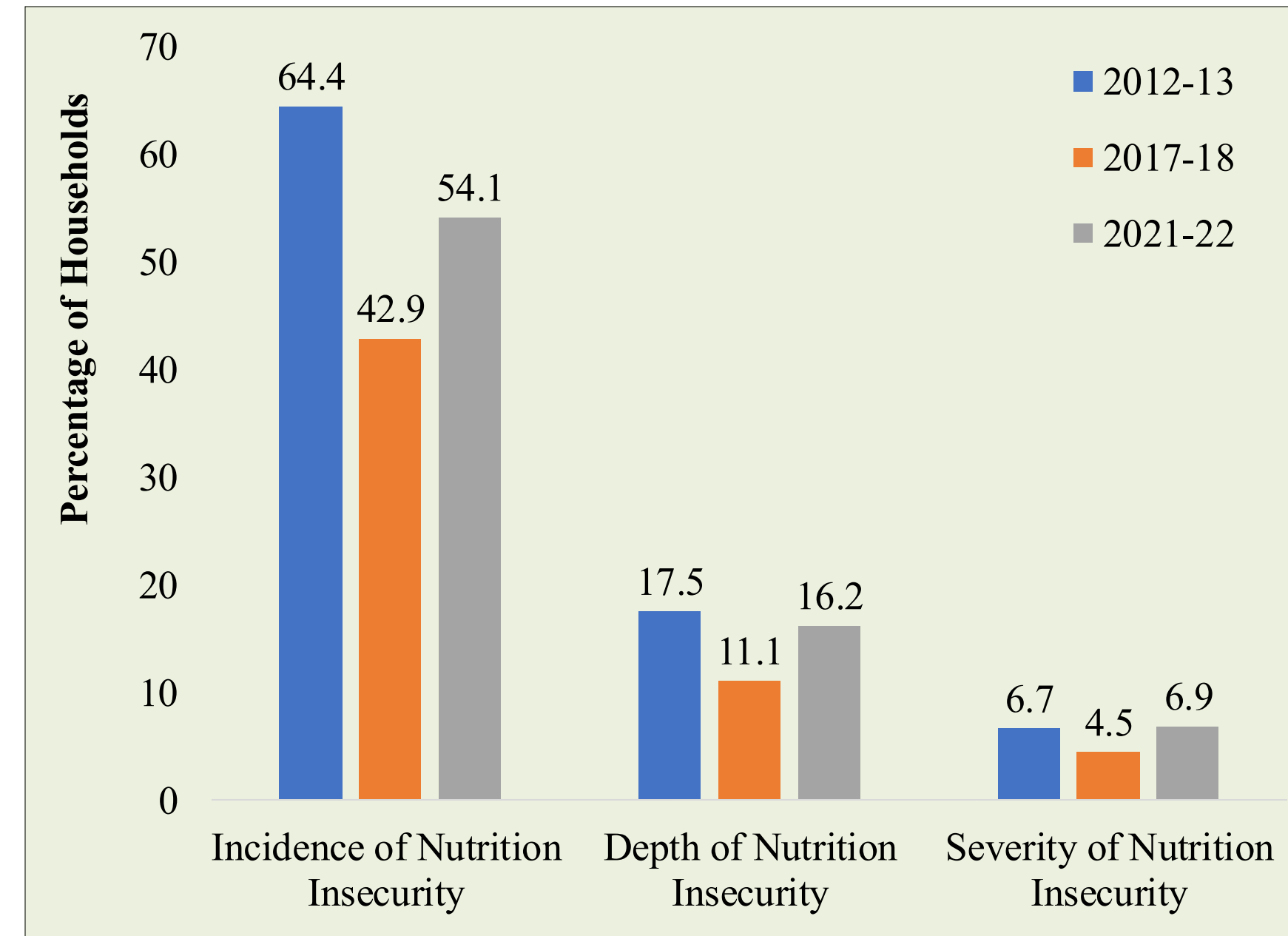


## 4.3 Consumption Pattern and Nutritional Outcomes

### 4.3.1 Food Consumption Patterns Over a Decade



### 4.3.2 Incidence, Depth, and Severity of Nutrition Insecurity



### 4.3.3 Determinants of Nutrition Insecurity: Heckman Two-Step Estimation

Notation	Specification
<b>Dependent Variables</b>	
D_INI	Whether the household is nutrition insecure (yes=1, no=0)
NIG	Depth of Nutrition insecurity
<b>Independent Variables</b>	
<b>A. Treatment Factor</b>	
FSNP	Average monthly income from food safety net programmes (in Rs.)
<b>B. Control Factors</b>	
<b>Cultural Factors</b>	
YED	Average education level of the households
<b>Social Factors</b>	
SC & ST	Whether the household belongs to ST community (yes=1, no=0)
OBC	Whether the households belong to OBC Community (yes=1, no=0)
<b>Demographic Factors</b>	
HSIZE	Size of the households
<b>Economic Factors</b>	
LE	Average monthly income from labour entitlement (in Rs.)
FE	Average monthly income from farm-based activity (in Rs.)
NFE	Average monthly income from non-farm-based activity (in Rs.)
PCCLD	Per Capita Cultivable Land of Households (in decimal)
CL	Whether the households are casually employed (yes =1, no=0)
<b>Time Dummy</b>	
D1	Time Dummy takes '1' for 2017-18, Otherwise '0'
D2	Time Dummy takes '1' for 2021-22, Otherwise '0'

Dependent Variable	Independent Variable	Coefficients	Z stat	P>z	
Nutrition Insecurity Gap (NIG)	FSNP	-0.0151	-1.48	0.140	N = 1800 Censored N = 934 Uncensored N = 866 Wald chi2(11) = 27.72 Prob > chi2 = 0.0036 mills lambda = 0.376 (0.126) rho = 0.98647 sigma = 0.3766
	YED	0.0020	0.38	0.703	
	SCST	-0.1201	-2.66	0.008	
	OBC	-0.1172	-3.17	0.002	
	HSIZE	0.0643	3.03	0.002	
	Labour	-0.0460	-1.75	0.079	
	Non-Farm	-0.0014	-0.04	0.969	
	PCCLD	-0.0017	-1.71	0.087	
	CL	-0.0071	-0.29	0.775	
	D2	-0.3360	-3.35	0.001	
	D3	0.1116	2.07	0.038	
	Constant	-0.3398	-1.45	0.146	
	Whether the households are nutritionally insecure or not (D_INI)	FSNP	-0.0508	-1.82	
YED		-0.0172	-1.30	0.194	
SCST		-0.3499	-4.02	0.000	
OBC		-0.1624	-1.61	0.107	
HSIZE		0.2258	12.02	0.000	
Labour		-0.0002	-4.52	0.000	
Farm		-0.0002	-0.69	0.488	
Non-Farm		-0.0130	-1.51	0.132	
PCCLD		-0.0702	-0.21	0.832	
CL		-0.0379	-0.54	0.588	
D2		-0.9506	-11.15	0.000	
D3		0.3890	4.08	0.000	
Constant		-0.9968	-6.59	0.000	

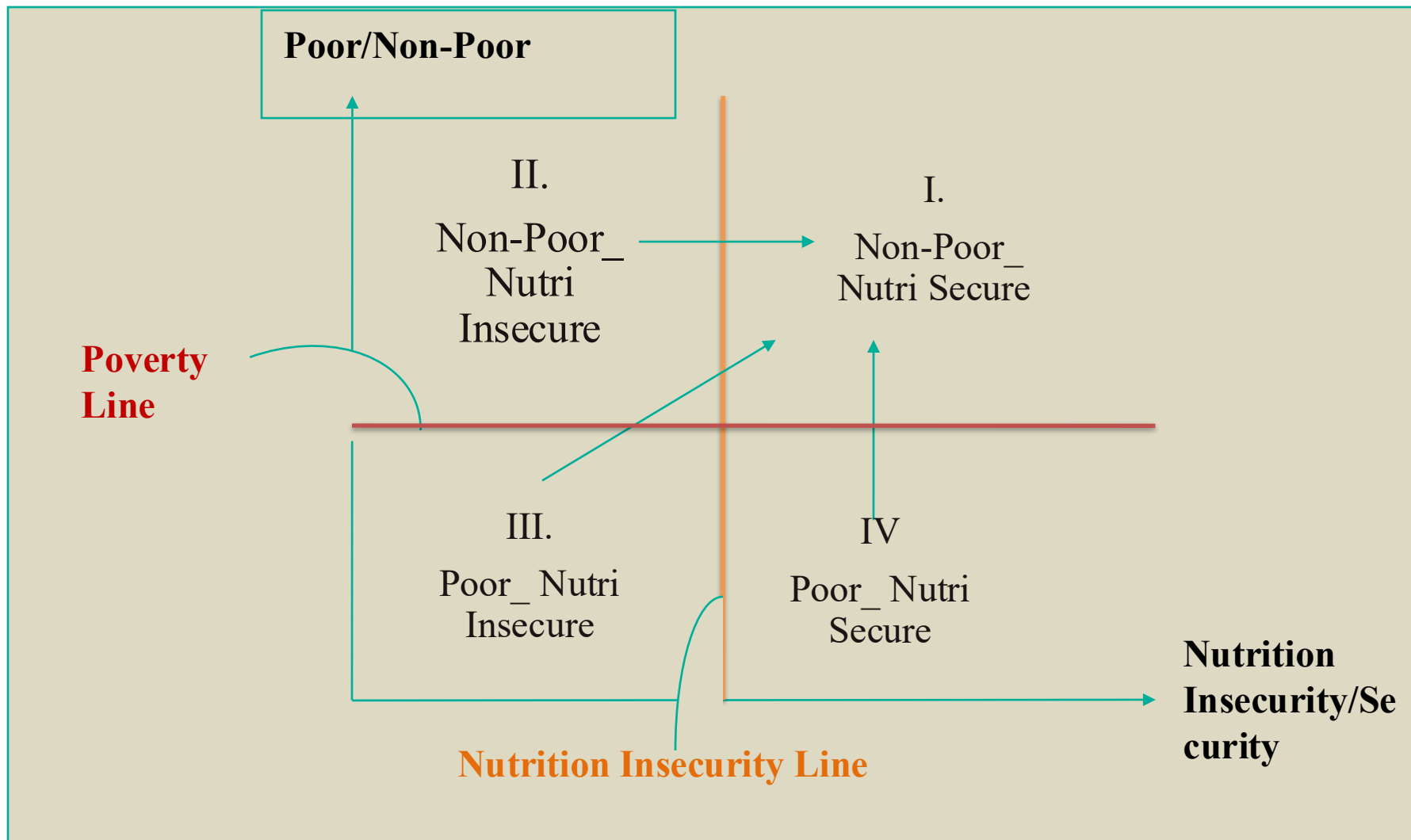
#### 4.3.4 Sustainability of Nutrition Security

		2017-18					2021-22		
		Nutritionally Secure HHs	Nutritionally Insecure HHs	Total HHs			Nutritionally Secure HHs	Nutritionally Insecure HHs	Total HHs
2012-13	Nutritionally Secure HHs	27.7	12.5	40.2	2017-18	Nutritionally Secure HHs	43.8	19.2	63.0
	Nutritionally Insecure HHs	35.3	24.5	59.8		Nutritionally Insecure HHs	13.2	23.8	37.0
	<b>Total HHs</b>	<b>63.0</b>	<b>37.0</b>	<b>100</b>		<b>Total HHs</b>	<b>57.0</b>	<b>43.0</b>	<b>100</b>

#### Key Findings

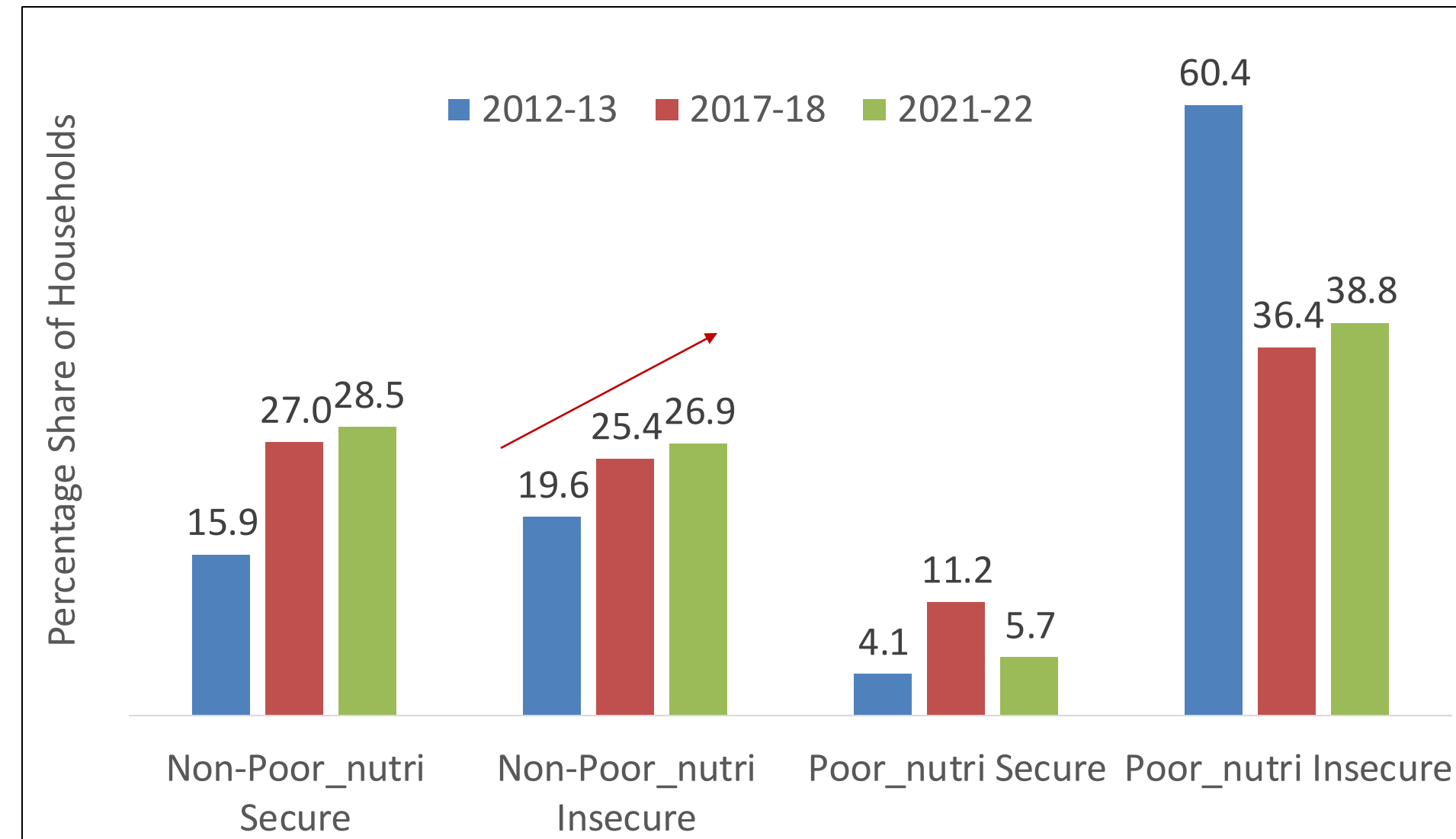
- **Nutrition security is not stable:** Only **27.7%** of secure households in 2012–13 remained secure in 2017–18.
- **High relapse rate:** **35.3%** of initially secure households slipped into nutrition insecurity by 2017–18.
- **Partial improvement in recent period:** From 2017–18 to 2021–22, **43.8%** of secure households remained secure.
- **Persistent vulnerability:** **13.2%** of households that were insecure in 2017–18 became secure, but **23.8%** remained insecure.
- **Overall insight:** Nutrition resilience is **fragile**, with substantial movement between secure and insecure states across survey years.

## 4.4.1 Household's Nutrition Insecurity in relation to Poverty



**Poverty–Nutrition Insecurity Quadrant Framework**

### Distribution of Households by Poverty–Nutrition Security Status



## 4.4.2 Determinants of Nutrition Insecurity among Poor and Non-Poor Households: Multinomial Logit Model

Number of observations = 1800

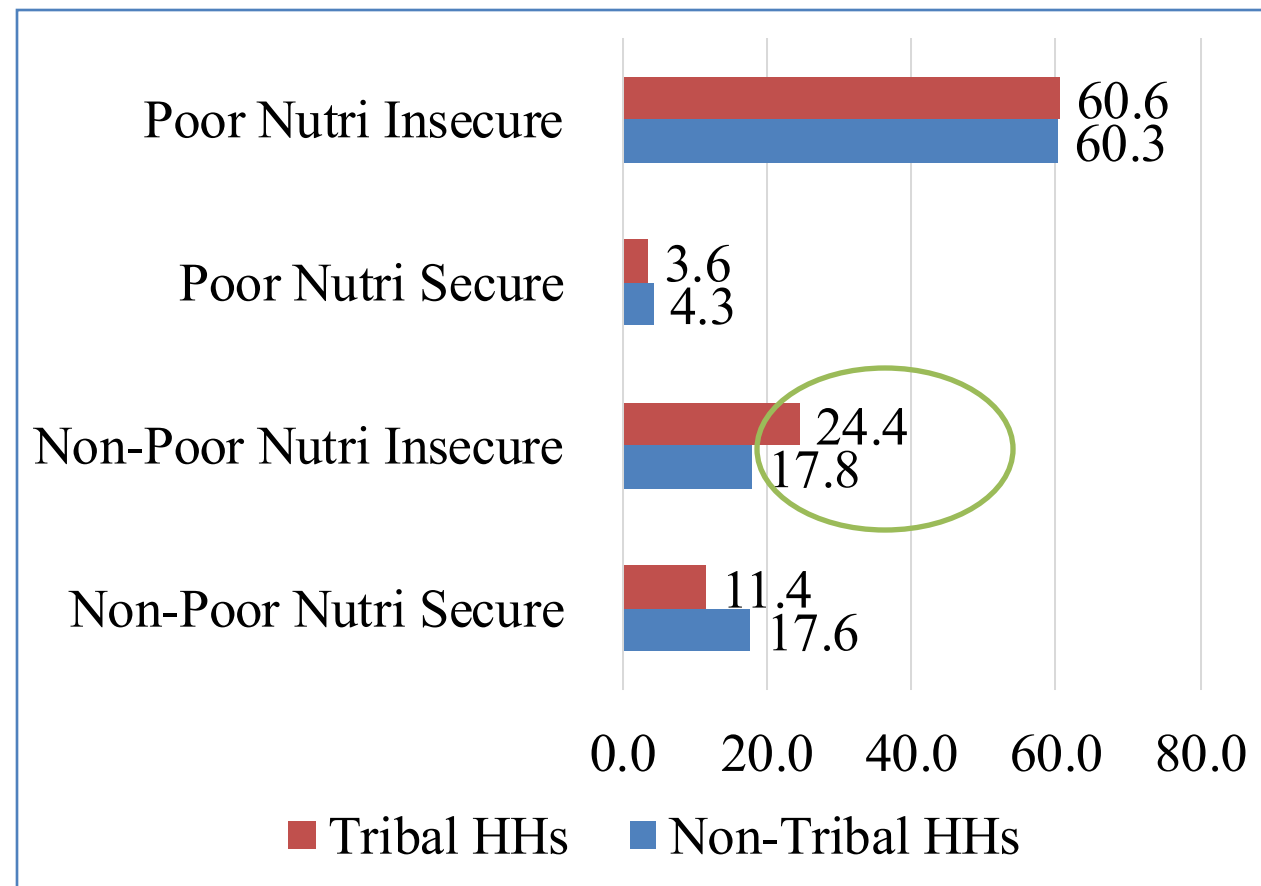
Wald chi2(39) = 401.92; Prob > chi2 = 0.0000

Log pseudolikelihood = -1573.0257; Pseudo R2 = 0.2873

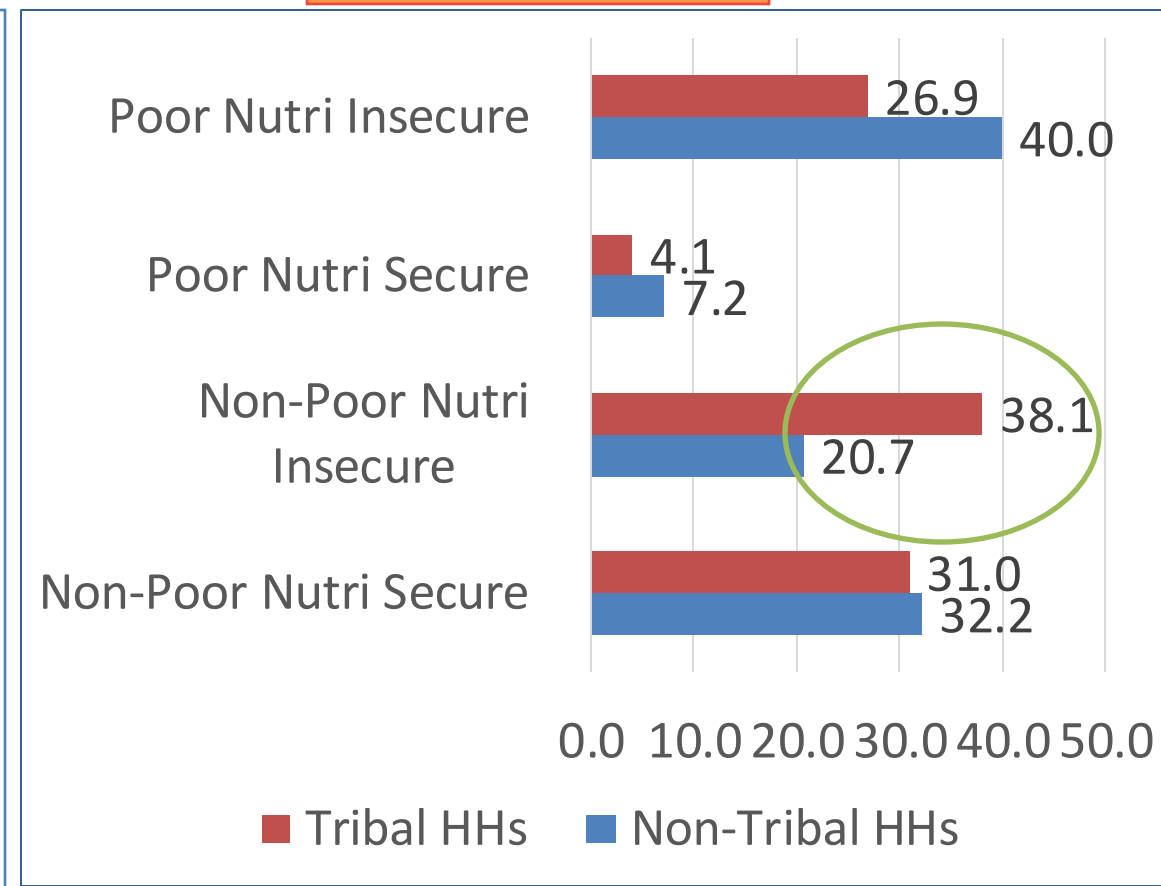
Base outcome =0(non-poor_nutri secure)	1= poor _nutri secure			2= non-poor _nutri insecure			3= Poor _nutri insecure		
	Coef.	Std. Err <sup>®</sup>	p	Coef.	Std. Err <sup>®</sup>	p	Coef.	Std. Err <sup>®</sup>	P
MPC labour income (in Rs.)	-0.005	0.001	0.000	0.001	0.004	0.887	-0.003	0.001	0.004
MPC income from farm activity (in Rs.)	-0.006	0.004	0.175	-0.001	0.007	0.932	-0.007	0.005	0.193
MPC income from non-farm activity (in Rs.)	-0.004	0.002	0.045	-0.004	0.002	0.007	-0.003	0.002	0.159
MPC income from transfer payment (in Rs.)	-0.05	0.007	0.002	-0.016	0.008	0.041	-0.013	0.008	0.103
Average years of education level of the households	-0.204	0.043	0.000	-0.011	0.040	0.007	-0.250	0.039	0.000
Households belongs to ST & SC families (Yes =1, No=0)	0.032	0.047	0.493	-0.028	0.072	0.699	0.038	0.004	0.001
Households belongs to OBC families (Yes =1, No=0)	-0.300	0.226	0.185	-0.135	0.345	0.696	0.597	0.258	0.021
Household's size (i.e., number of family members)	0.109	0.065	0.095	0.184	0.097	0.058	0.308	0.065	0.000
Per Capita Cultivable Land of Households (in Decimal)	-0.233	0.190	0.219	-0.166	0.274	0.544	-0.197	0.209	0.346
SC&ST family are Regularly-employed (yes=1, No=0)	-0.103	0.027	0.019	0.009	0.133	0.945	-0.169	0.063	0.007
SC&ST households are self-employed (yes=1, No=0)	-0.004	0.001	0.000	-0.003	0.001	0.000	-0.008	0.001	0.000
Time Dummy ('1' for 2017-18 and '0' for Others)	0.801	0.273	0.003	-0.409	0.275	0.078	-0.928	0.306	0.002
Time Dummy ('1' for 2021-22 and '0' for Others)	-1.059	0.325	0.001	0.567	0.313	0.005	1.552	0.356	0.000
Constant	3.669	0.554	0.000	0.268	0.869	0.758	6.013	0.576	0.000

### 4.4.3 Nutrition Insecurity in relation to Poverty for Tribal and Non-Tribal Households

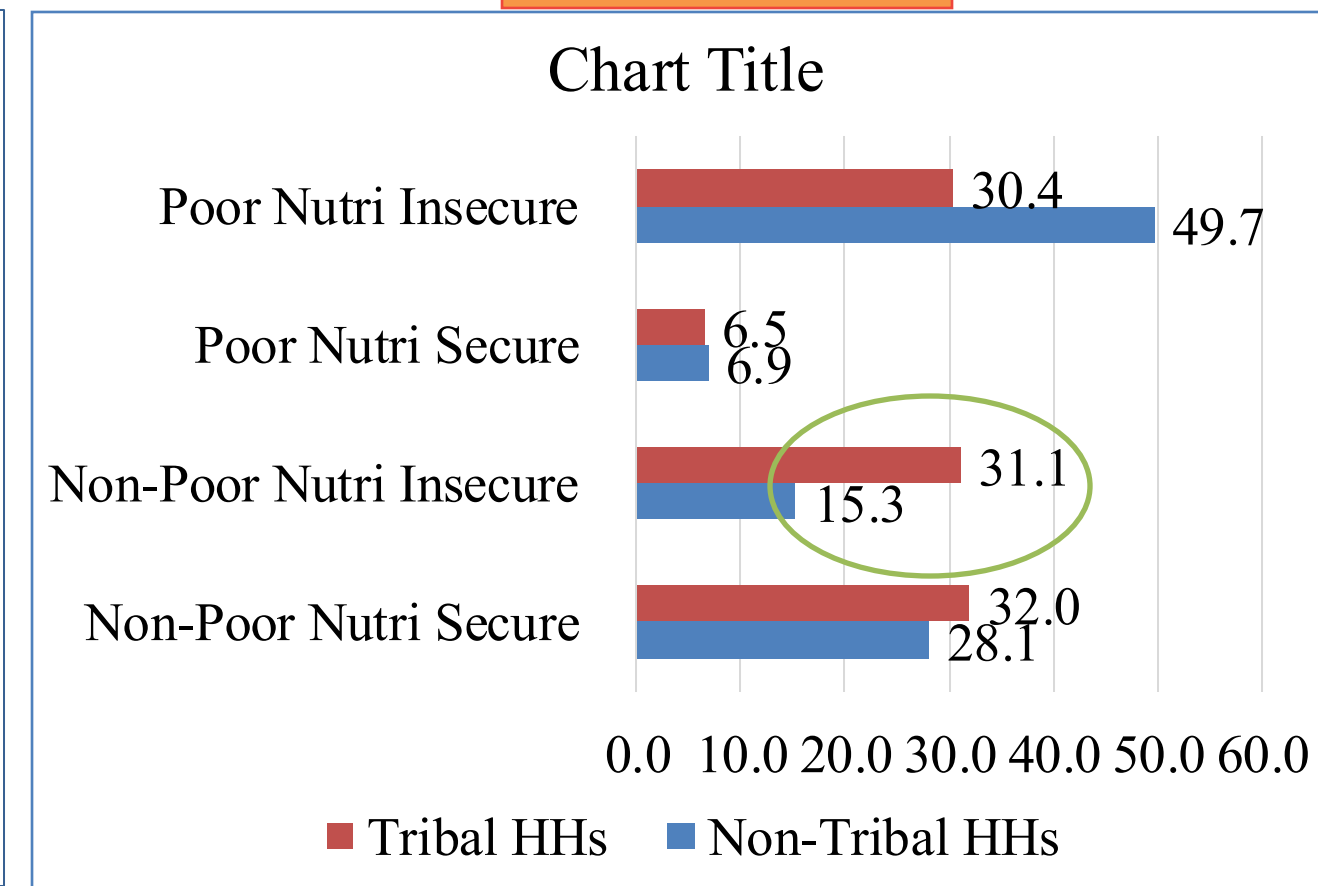
**(a) 2013-14**



**(b) 2017-18**



**(c) 2021-22**



**A significant portion of non-poor households remain nutritionally insecure revealing persistent hidden hunger across all years.**

## 5. Policy Implications for Strengthening Nutrition Resilience

### 1. **Make Social Protection Nutrition-Sensitive**

- Reform PDS from cereal-heavy to diverse, fortified baskets (pulses, millets, iron-rich foods).
- Improve ICDS continuity & THR quality, especially in remote tribal areas.
- Ensure timely MGNREGA wages for consumption smoothing.

### 2. **Build Income Pathways for Dietary Stability**

- Promote non-farm skill development and micro-enterprises (SHG-linked, digital payments).
- Support nutrition-linked value chains (millets, pulses).

### 3. **Target Tribal Vulnerability**

- Provide culturally appropriate nutrient-rich baskets.
- Strengthen last-mile delivery via mobile ICDS units and tribal youth volunteers.
- Implement localized nutrition behaviour campaigns to address hidden hunger.

### 4. **Strengthen Community Nutrition Literacy**

- Promote dietary diversity, micronutrient awareness, and healthy food choices.

#### **Core Takeaway:**

**Nutrition resilience demands better entitlement quality + stable, diversified livelihoods + tailored support for vulnerable households.**

## 6. Systems & Partnerships Needed for Scaling Nutrition Resilience

### 1. Convergent Nutrition-Resilience System

- Joint planning across **PDS–ICDS–MGNREGA–Agriculture–Health**.
- Promote **nutrition-sensitive assets** (kitchen gardens, irrigation, fodder banks).
- Use **decentralised monitoring**: village tracking + block dashboards.

### 2. Empower Panchayats & Community Platforms

- Panchayats as **convergence hubs** for entitlements and local food systems.
- Engage **SHGs, FPOs, tribal councils, VHNCs** for delivery & monitoring.

### Partnerships for Scale-Up

**Government Departments:** Food & Supplies, WCD, RD, Tribal Affairs, Health etc. with **IFPRI**

**Community Institutions:** SHGs, FPOs, tribal youth volunteers (“Poshan Sathi”)

**Civil Society/Development Partners:** WFP, UNICEF, GAIN, PRADAN

### Nutrition Literacy Platforms

Use SHGs, Education Institutes, and ICDS centres as platforms for community-led nutrition education and behaviour change campaigns in collaboration with NGOs and development partners.

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