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Nutrition Security in India: Composition, Sources and Intersections

Background

India has had a complex history of food security- on the one hand there is a hunger problem

- 111 rank out of 125 countries in the GHI
- Overall average calorie/protein intake decline – increase in fat intake
- Low Dietary Diversity and high chronic energy deficiency (about 1 in 5 adult women/men)

But there is also a mixed performance on other pillars of food security in India.

- Food availability conditions have seen improvement with surplus production and increased distribution
- Food access conditions in rural areas have seen challenges due to
  - Sharp increases in real food prices (Sasmal 2015)
  - Low security against food price inflation due to the absence of a risk market making credit or insurance unavailable (B. Ramaswami and Balakrishnan 2002; Bharat Ramaswami 2002) and
  - Shift away from food productions through continuous diversification towards non-farm occupations (Desmarais 2007), increasing commoditization of agriculture (Clapp, Fuchs, and Eds. 2009), increasing landlessness (Rawal 2008)
- Recent disruptions such as the lock down post COVID19 (Pothan, Taguchi, and Santini) which resonates the global worsening of food security since the COVID19 pandemic and continuous economic crises (UN 2020; Mardones et al. 2020; Workie et al. 2020; Swinnen and Mcdermott, n.d.; Laborde et al. 2020).

Recent studies highlight:

- Policy interventions must distinguish between supply-side constraints to food availability and demand-side factors that affect household access and utilization.
- Nutrition and food security must be studied from the lens of intersectionality – especially empowerment of women – however results may vary with how women's empowerment are measured.
- There are spatial and societal inequalities –
  - Regions that are food insecurity hotspots.
  - Marginalized population such as migrant workers and urban poor – who are less covered by food security programs
- Overall increase in investment on making health/nutrition accessible is more effective that focusing only on distributive policies
- Other than programs, family support and access to insurance emerge as essential for an individual's state of wellbeing and access to health/nutrition.

Dev S. Mahendra, Ganesh-Kumar A., Pandey Vijay Laxmi (Ed.) (2024), Achieving Zero Hunger in India: Challenges and Policies, Springer Singapore

Food Security Concerns Manifested in

Availability

- Nutrition imbalanced food systems
- Agriculture as livelihood – not as source of food
- Climate change, soil quality decline and water crisis

Access

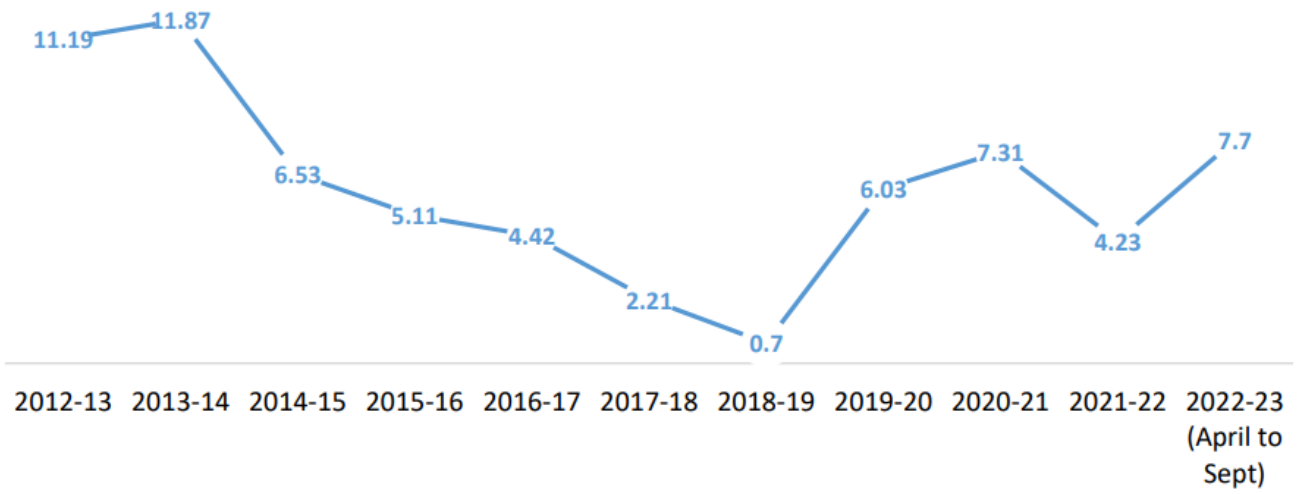
- With 233.9 Million people classified as undernourished (FAO 2023) India is the largest contributor of undernourishment in South Asia.
- High prevalence (24%) of severe food insecurity (SOFI 2020)
- Indication of poor distribution during COVID – gap in the issue of new ration cards to new members of eligible households
- High demand for the PDS post-COVID period – increased off-take

Utilization

- About 1 in 3 of India's under-five childre
- More than 1 in 3 are stunted (low height
- About 1 in 5 are wasted (low weight-for-l

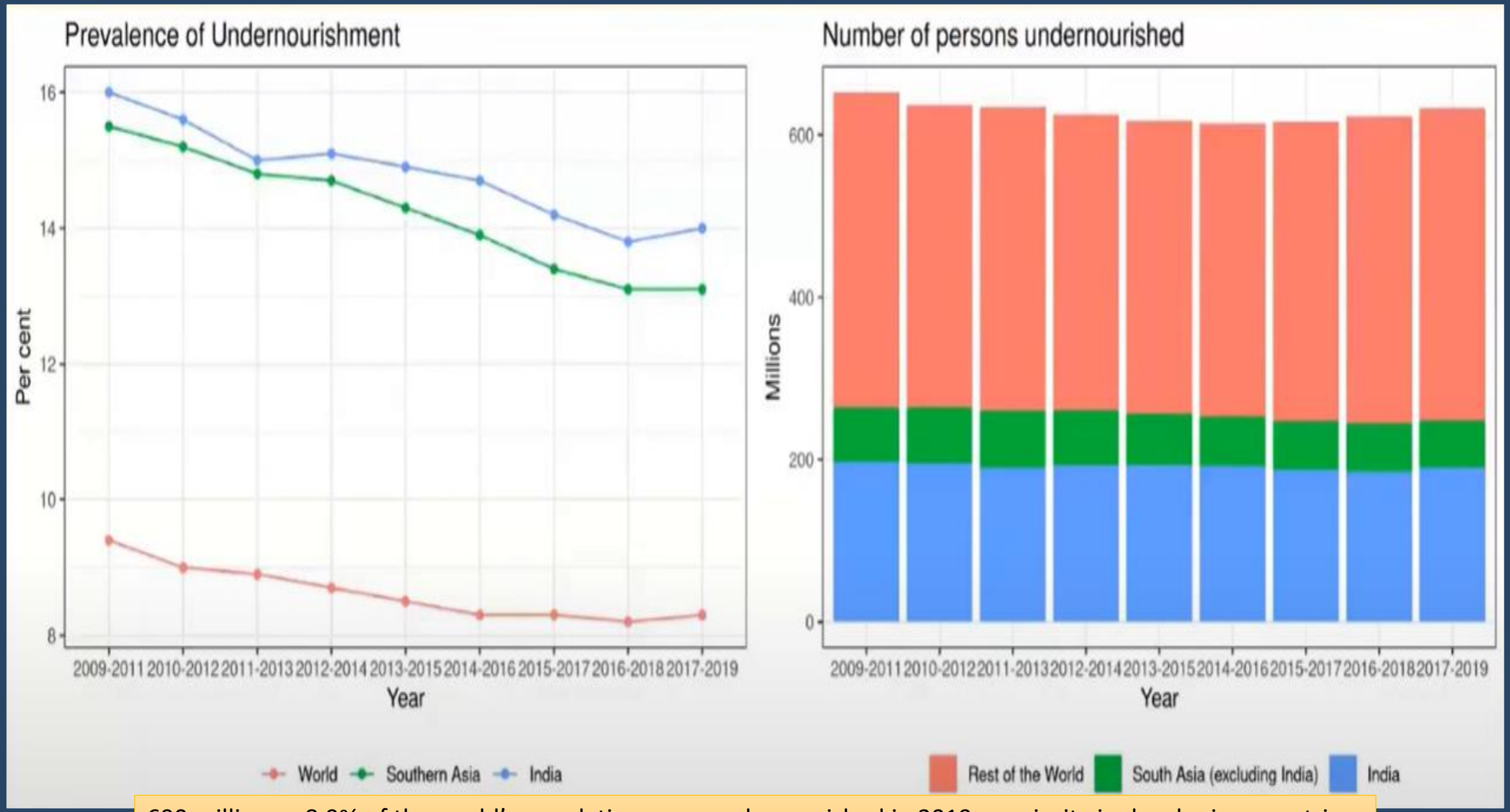
Stability

- High food inflation of 6.2% in fiscal years Times of India) – peak inflation in July 2
- Poor Anganwadi and school meal perforr COVID19 lockdown, reports of inadequa



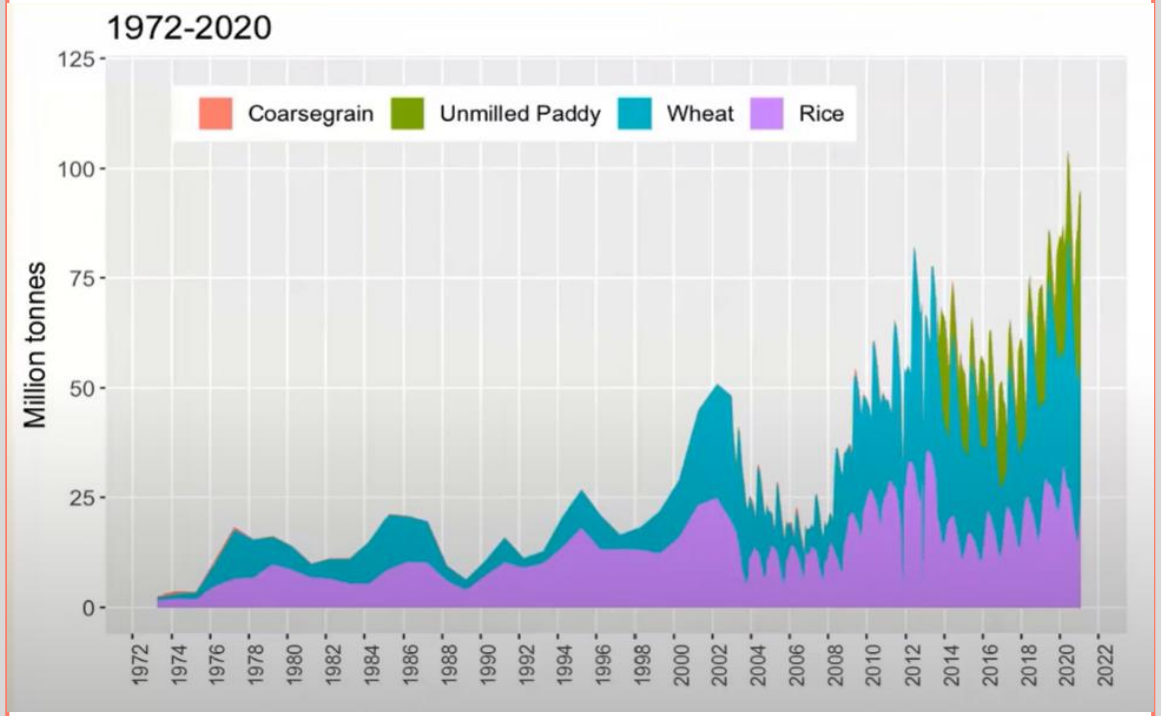
Scope of Discussion of Changing Nutrition/Food Security Conditions

- Concerns on shifting focus from barriers to food access and equity (demand side barriers) to technical solutions such as creating nutrition sensitive agro-ecological systems or changing production pattern (supply-side barriers).
- Before delving into the merits of these concerns, understanding the changes in India's food security conditions is required.
- This will need a retrospective approach. This presentation will
  - Discuss the production, consumption and social protection using existing qualitative and quantitative evidences.
  - Limit the discussion of structural changes in nutrition sources to rural macro-nutrient intake in India to enable a deeper rather than a wider discussion
  - Show the evidence of changing Source and Composition of Indian Household Level consumption: Using the NSSO data from 1993-2011 this presentation will show that there has been a structural shift in India's food access conditions and the shift is visible for both composition of diet as well as source of food
  - Explore the intersection of this structural shift with other social/demographic indicators

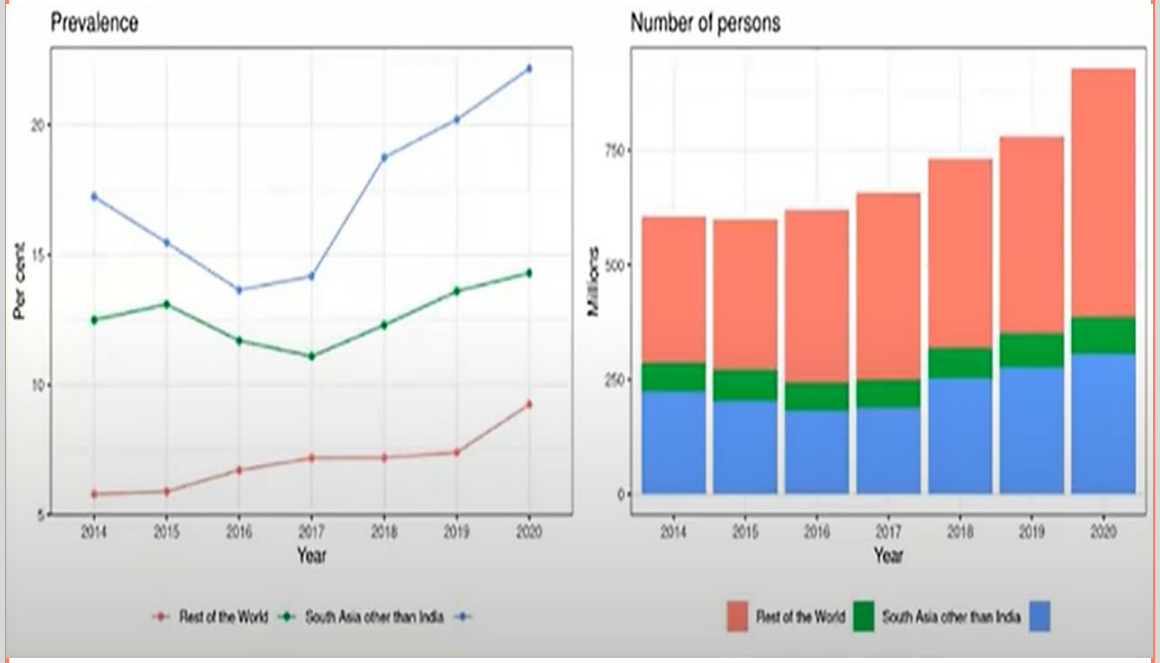


690 million or 8.9% of the world's population were undernourished in 2019 – majority in developing countries.

Quantity of Food Stocks in India

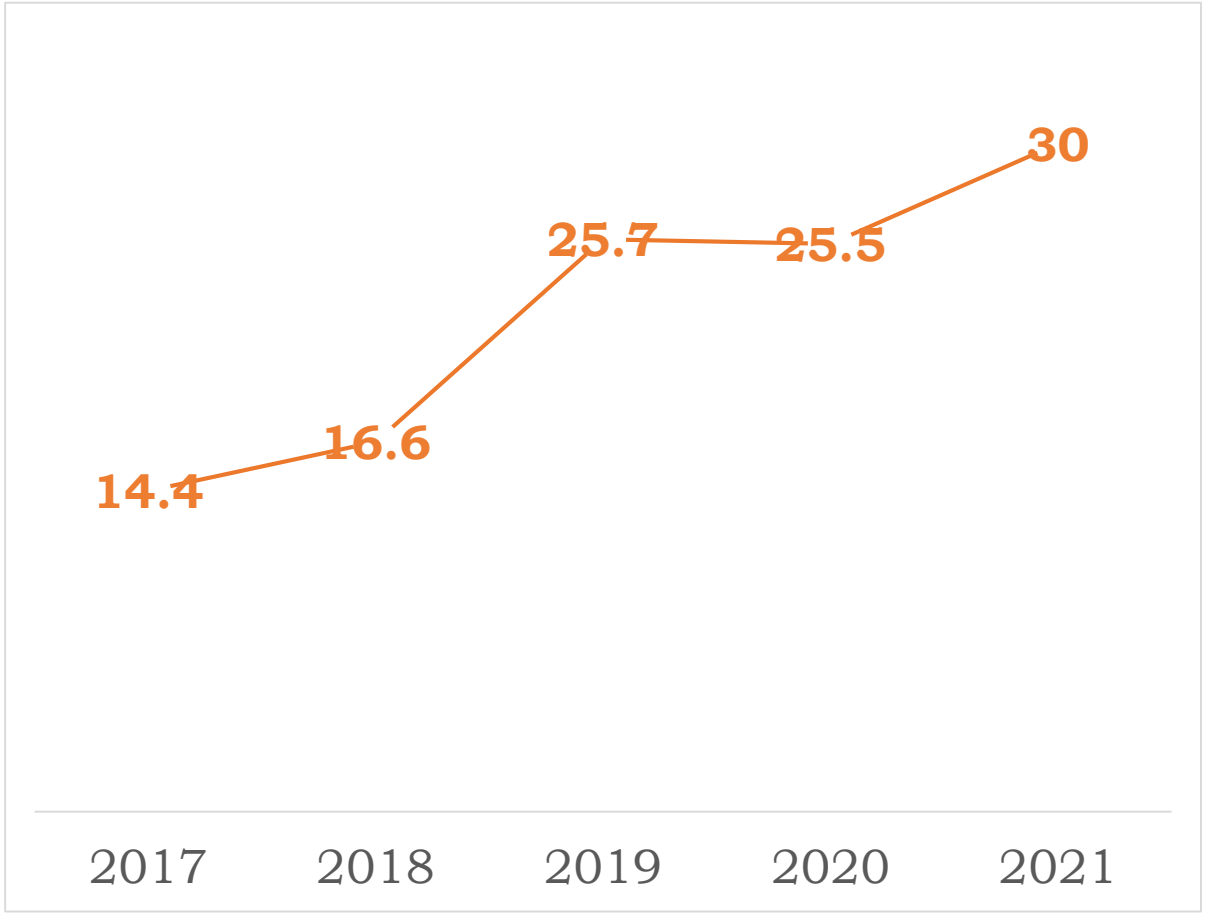


Experience of Food Insecurity (FIES)

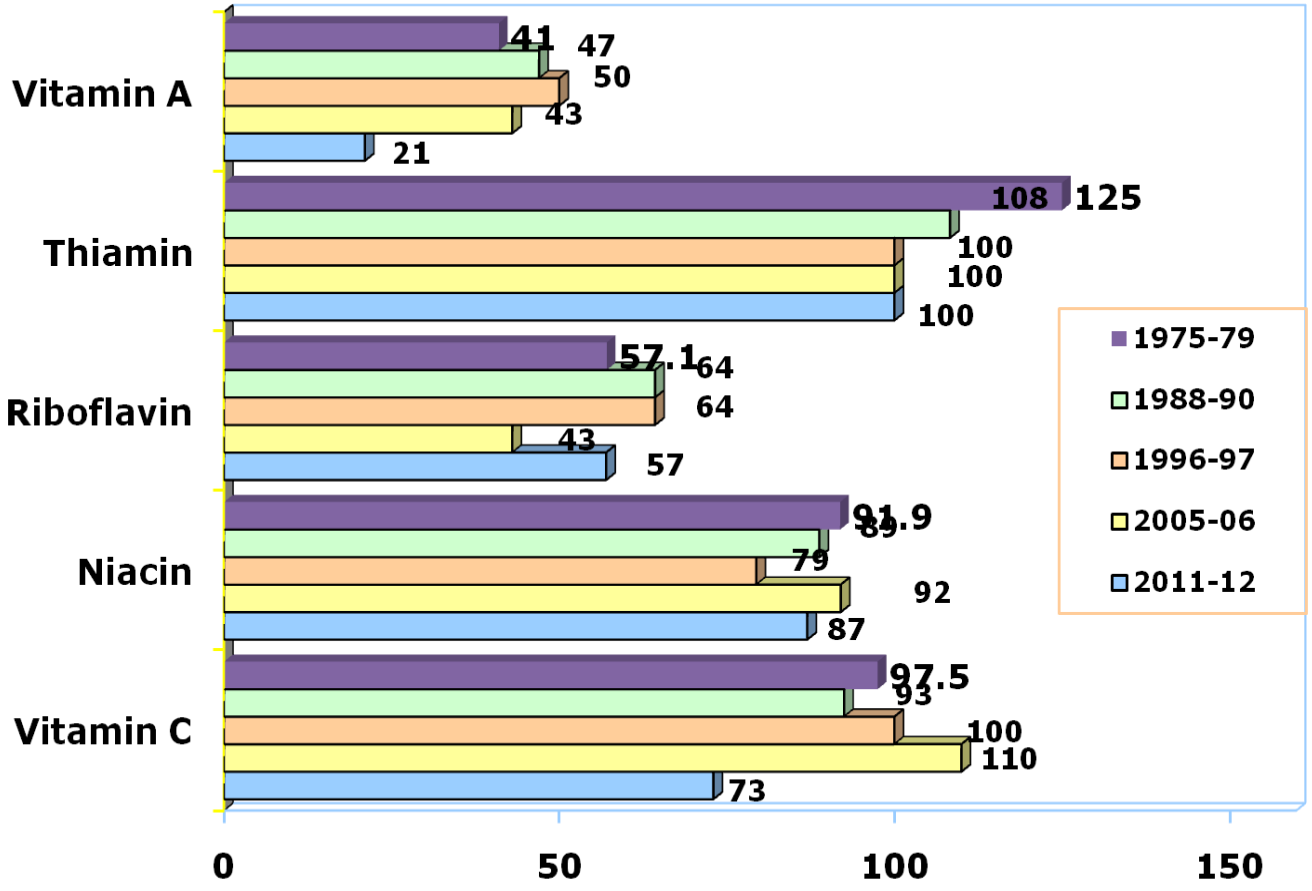


Contradiction of Stocks and Food Insecurity Experience.

India: % of People Unable to Afford a Healthy Diet



Changes in the Average Intake of Micro-Nutrients (per CU/day) as % of RDI by Period of Survey 1975-9 to 2011-2

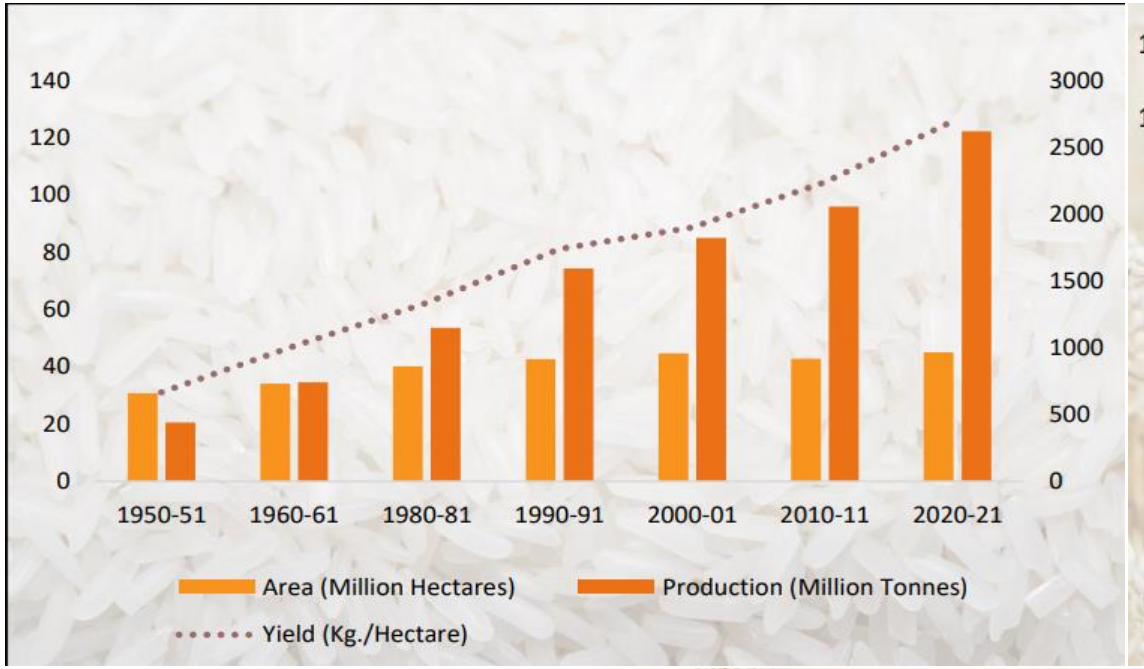


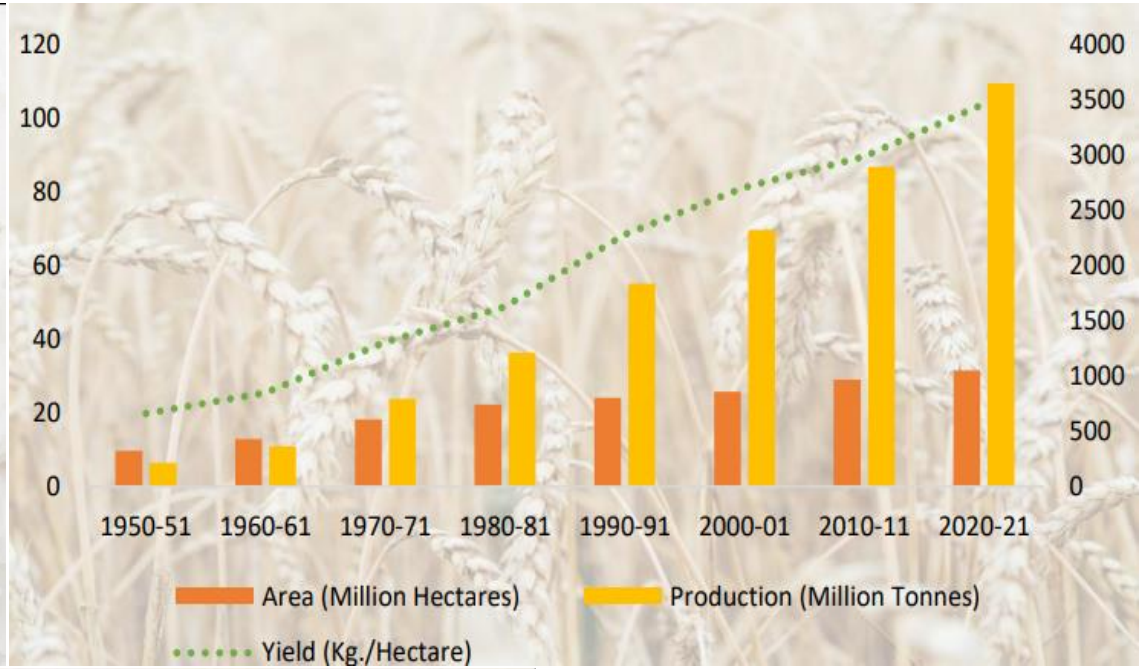
Continued deficiencies in nutrient access and consumption.

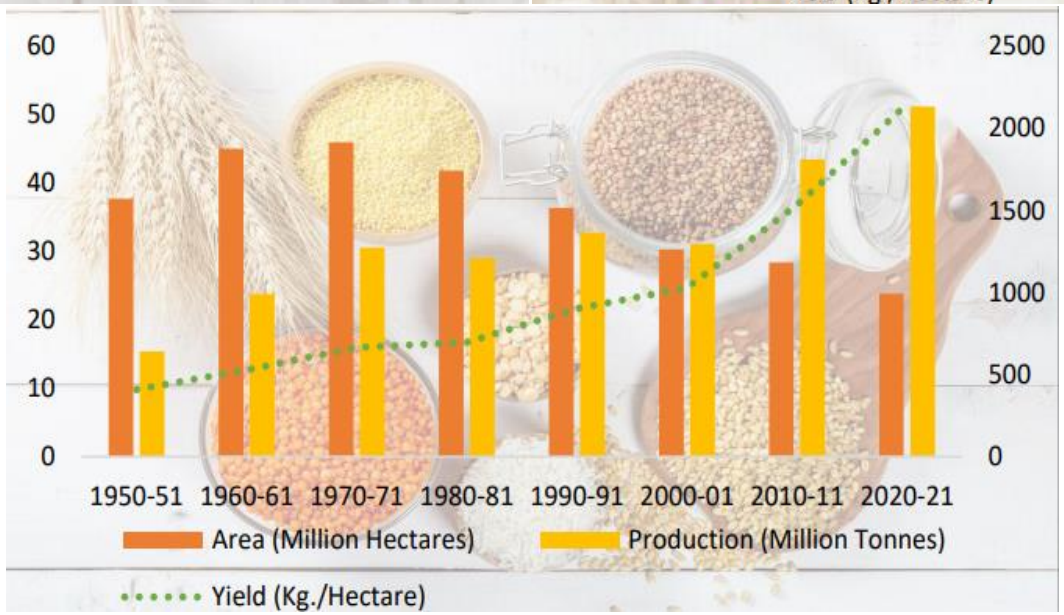
Structural changes in Macro-nutrient Access Conditions: Rural India – NSSO data (1993 to 2011)

- Reduced proportion of calorie/protein consumption from the home-grown sources (own agriculture/kitchen garden/in-kind wages)– higher from the PDS.
- Reduced protein/calorie intake and increase in fat intake.
- Pulses, legumes and products – increased supplier of fat, decreased as a supplier of protein from 1993-2011.
- Shift from agriculture to non-farm in the economy mirrored in shift away from home grown sources to the other sources.

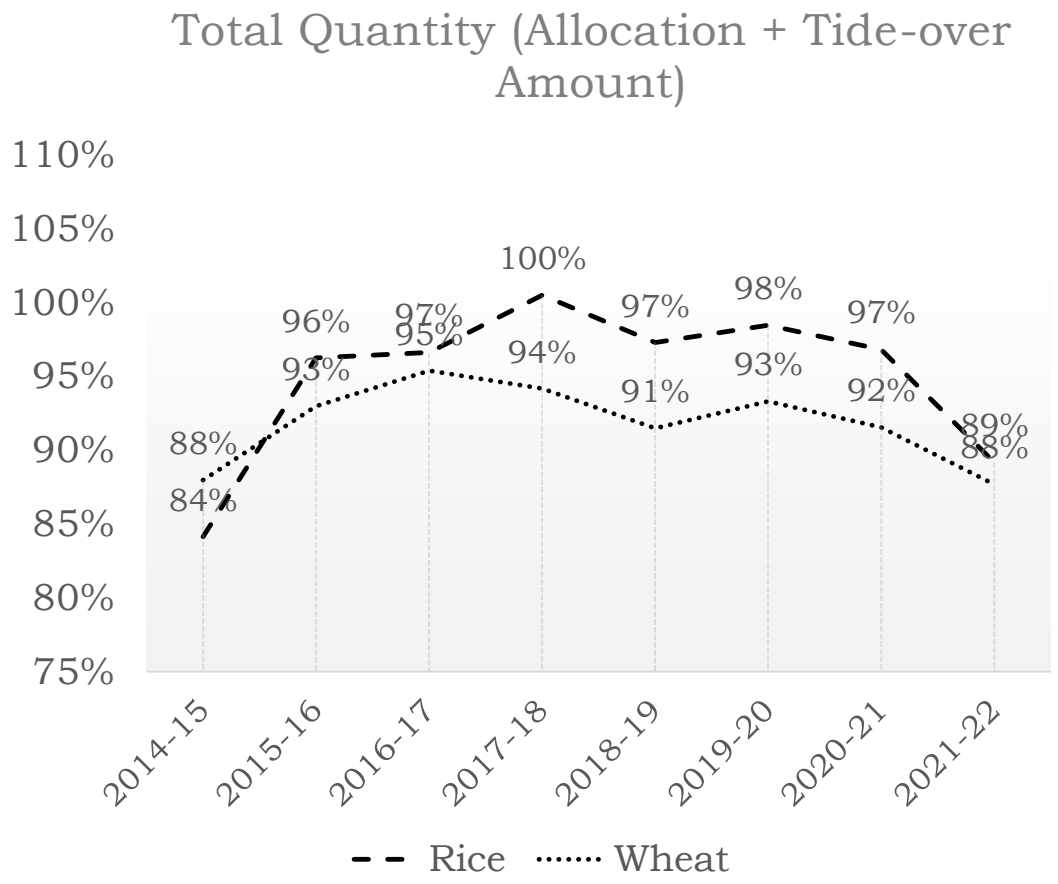
Rice/Wheat grown as primary crops

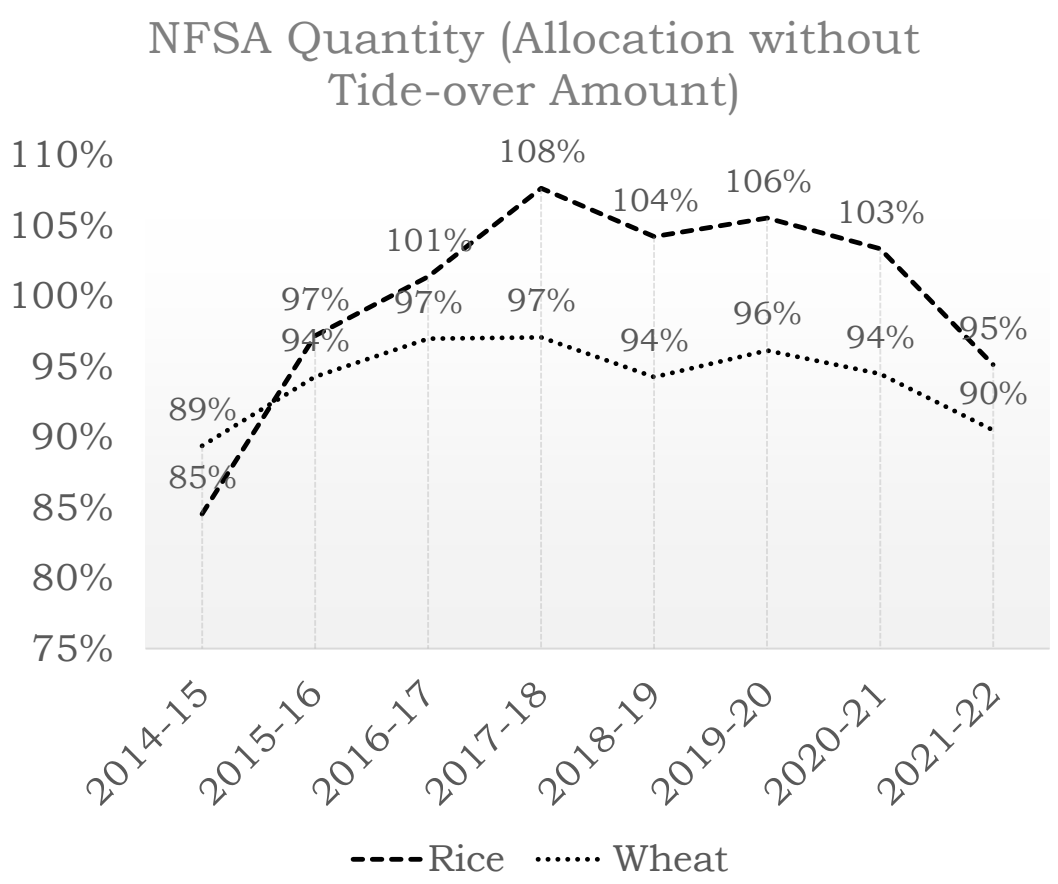






OBTAINMENT FROM SOCIAL PRTECTION (PDS)
Total Offtake to Total Allocation 2014-2022

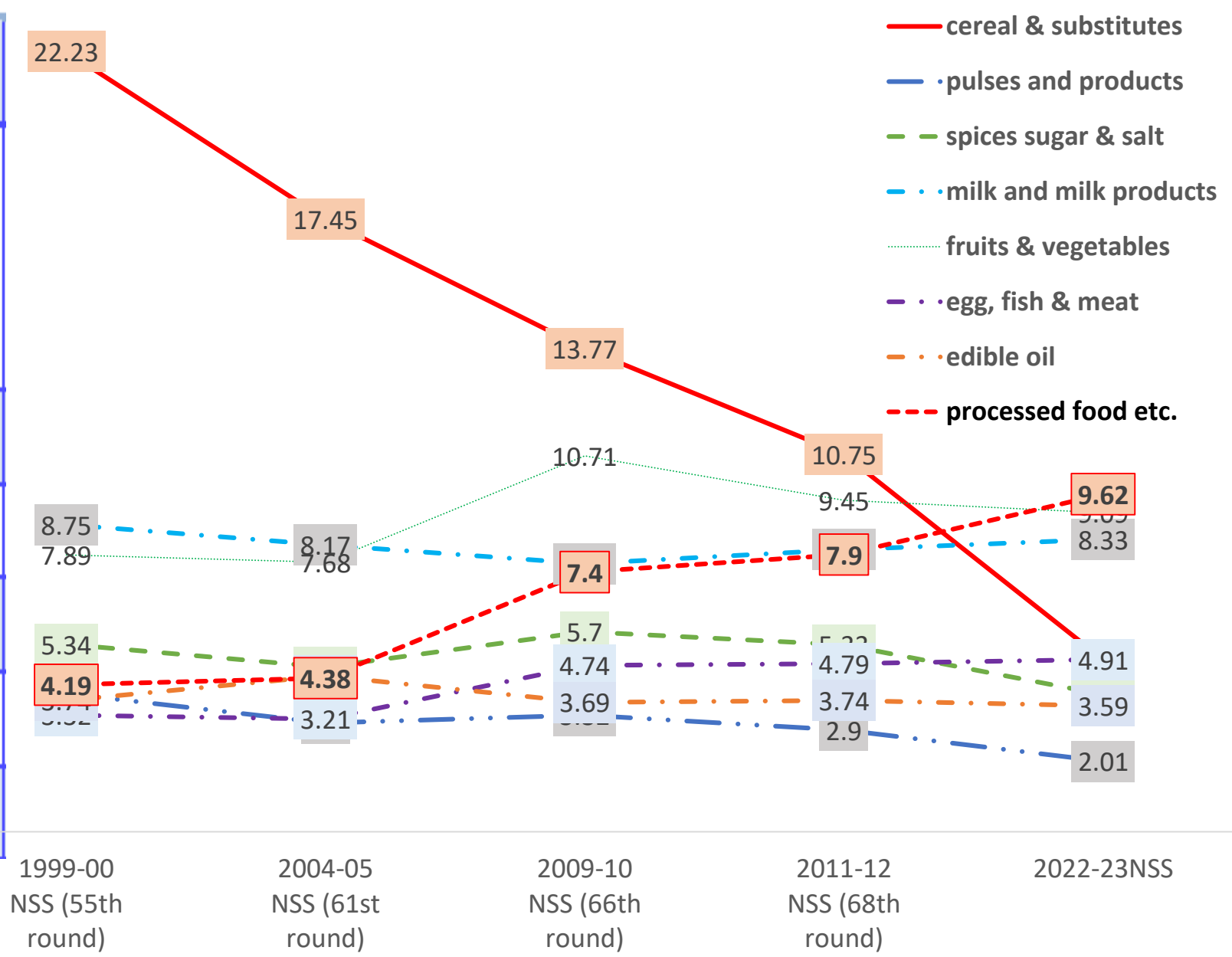




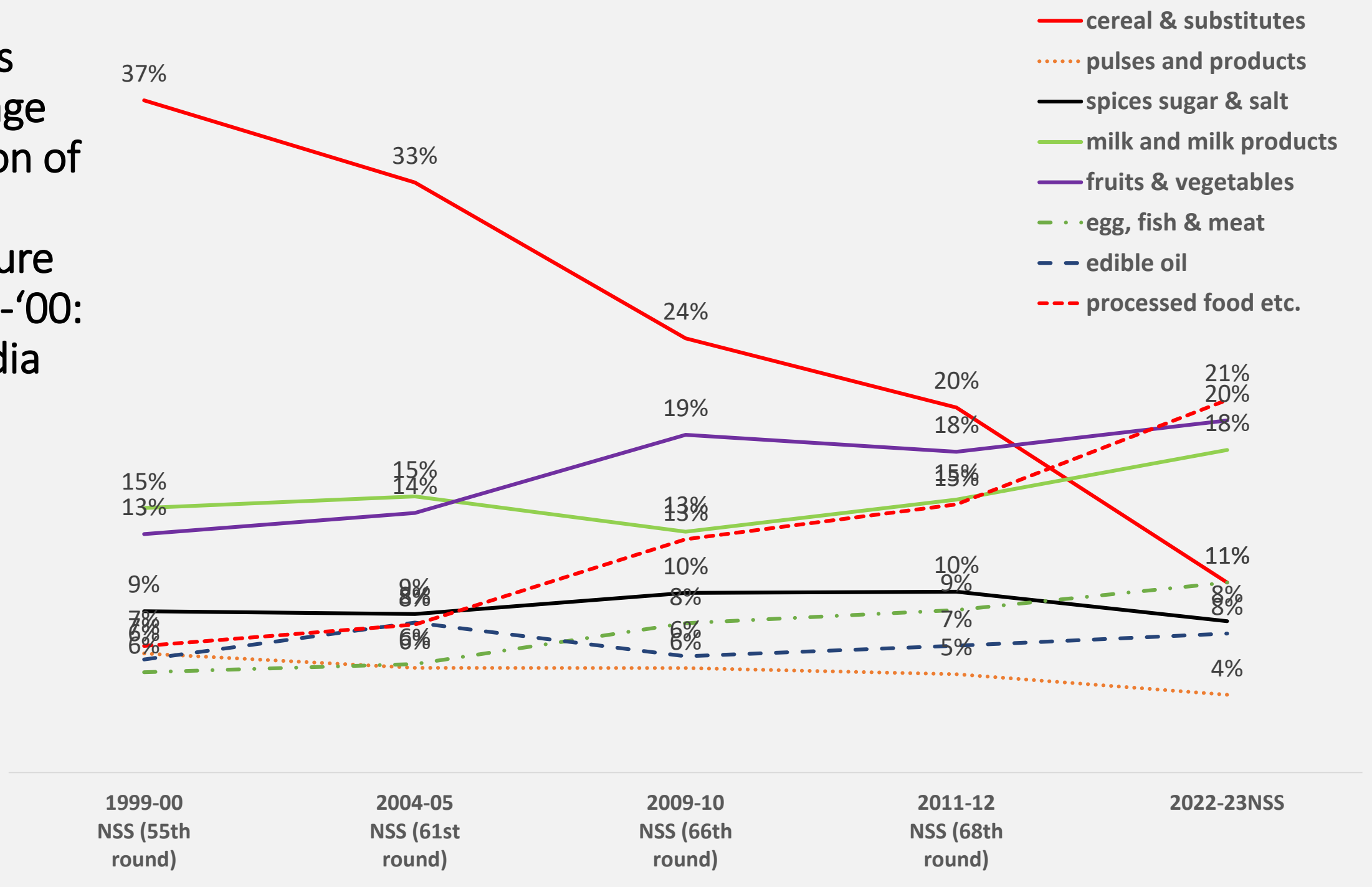
Post NFSA Rice consumers have higher PDS consumption than wheat consumers

Food Consumption As per the 2022-23 NSSO CES Data

Period	Rural	
	% share of cereals in avg. MPCE.	% share of food in avg. MPCE
1999-00	22.23	59.40
2004-05	17.45	53.11
2009-10	13.77	56.98
2011-12	10.75	52.90
2022-23	4.91	46.38

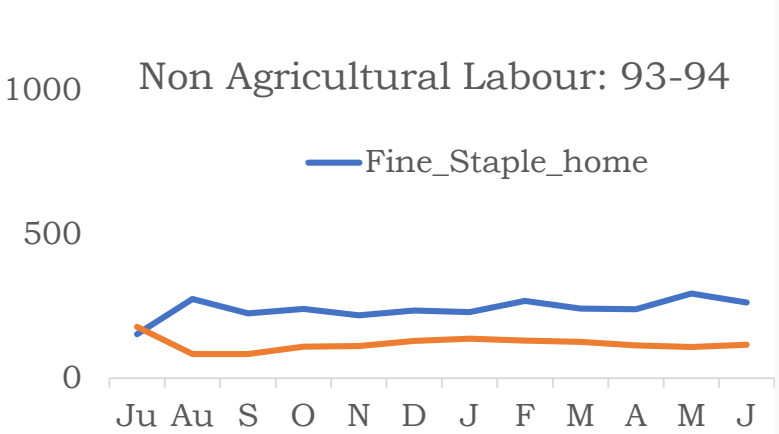


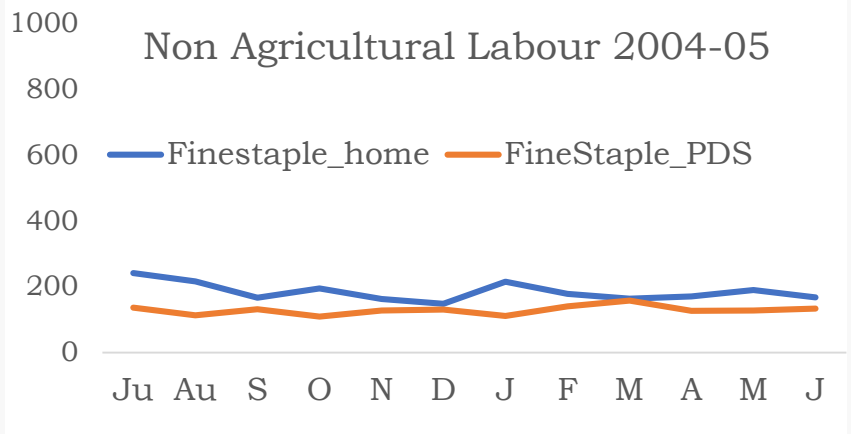
Food as percentage composition of Food Expenditure since 1999-‘00: Rural India

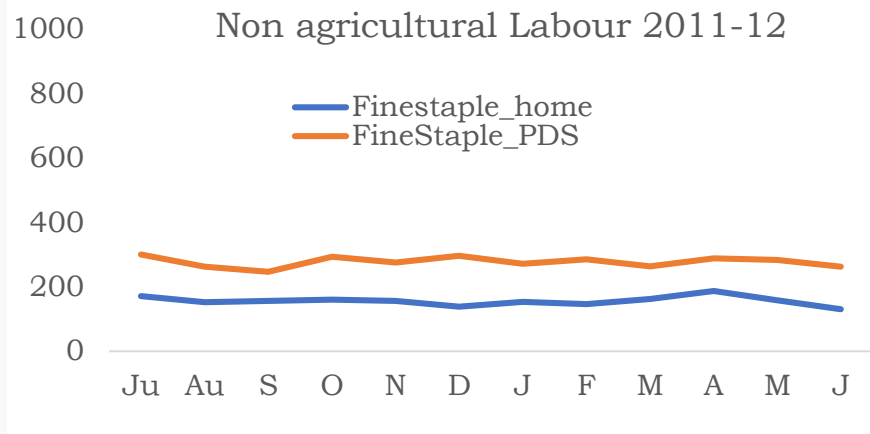


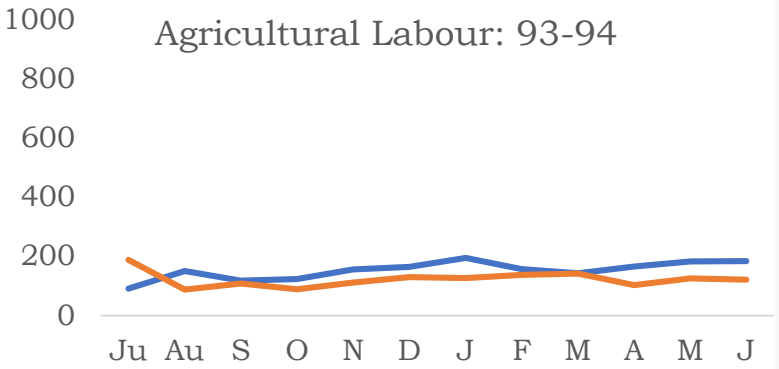
Intersection of Source of Consumption with Social Indicators

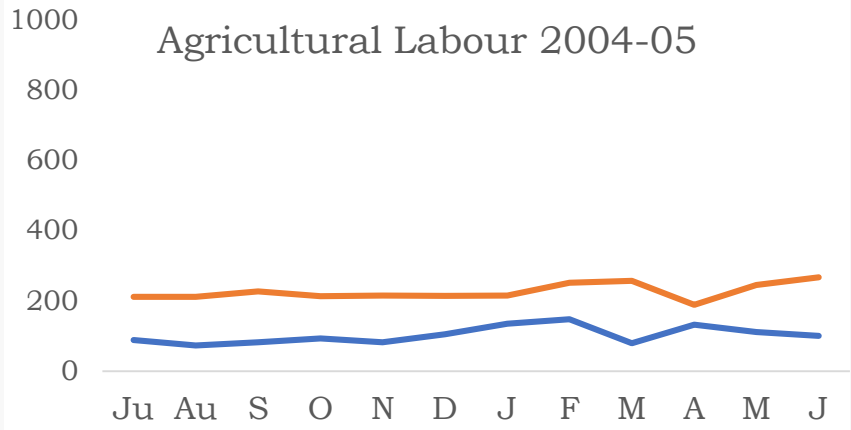
Household Types (primary livelihood)

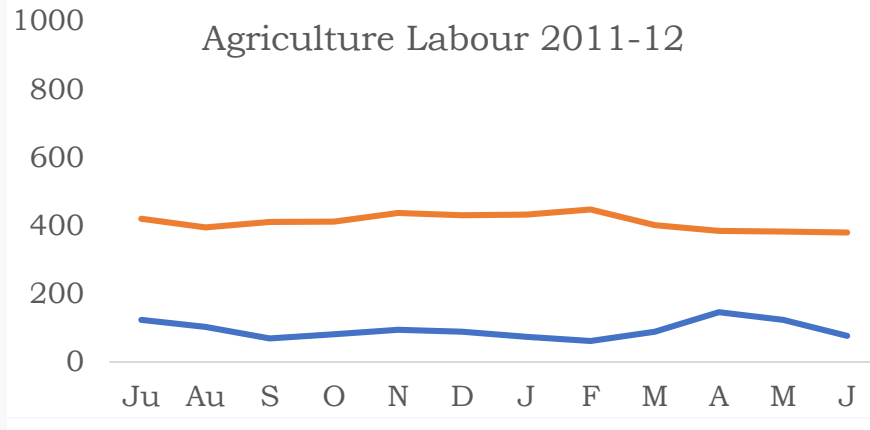


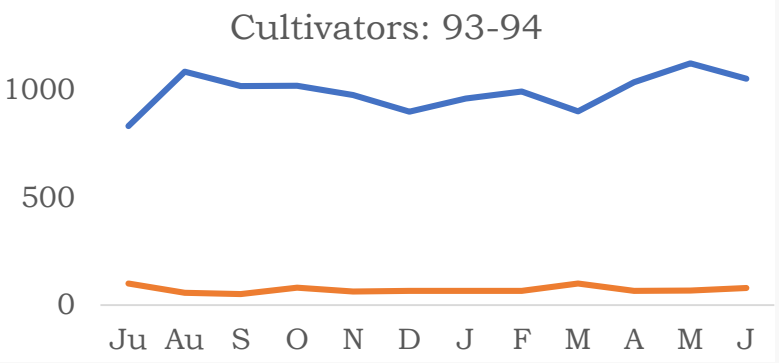


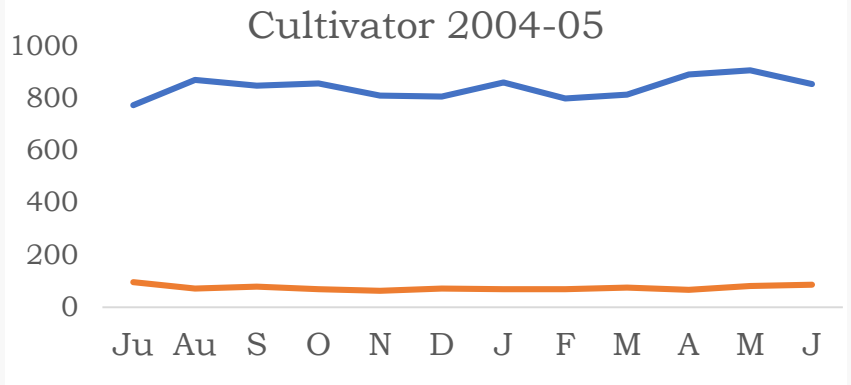


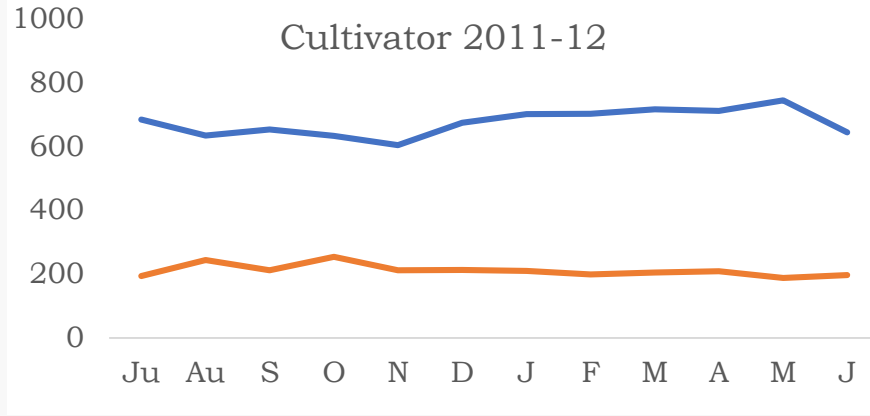












Elasticity of the Calorie-to-Price Ratio of the PDS and the Market Consumption to the Key Predictors: 1993 & 2011

- Decrease in Price ratio (PDS to Market) quantifies the depth of subsidies
- Groups that lose in terms of calorie intake with lesser subsidy
  - Agricultural labourer households
  - Rainfed rice producers

Indicators	Details	β^{α}
	Price Ratio PD/Market	-0.014***
	Share of calorie from home	0.002***
Price Ratio X HH type	Non-agriculture Labour	Reference
	Agricultural Labour	-0.026***
	Cultivator	-0.011
Price Ratio X Region	No Food Crop Production	Reference
	Rain fed Rice Production	-0.041***
	Rain fed Coarse Grains and Pulses	0.001**
	Rain fed No Food grain Production	0.007***
	Rain fed Partly Staple	0.001**
	Irrigated Rice Production	0.024***
	Irrigated Pulses and Cotton	-0.019
	Irrigated No Food grain production	-0.013
	Irrigated Partly Staple	-0.009
	Rain fed Wheat	-0.025
	Irrigated Wheat	0.013

With Gender

- Gender inequality is a major cause and effect of hunger and poverty: it is estimated that 60 percent of chronically hungry people are women and girls. (Source: WFP Gender Policy and Strategy.)

- The incidence of malnourishment is abysmally higher in Indian women. Every 2nd woman in reproductive age India are anaemic.
- NFHS III to NFHS IV gender gap has remained stagnant with % malnourished women more than malnourished men.
- Almost all the **starvation deaths** reported in recent times are of women or adolescent girls. Women and girls are often last and least to eat.
- Girls more likely to be thin and more prone to stunting. Mother's education, incomes and geography have a strong influence on stunting
- Gender inequalities exist along the **entire food production chain**, "from farm to plate" impede the attainment of food and nutritional security.

Experience and Impact of Hunger is Gendered

Women influence nutrition in many pathways

- As producers of food - 33% of cultivators and about 47% percent of agricultural laborers are women – agriculture is heavily leaned towards low-nutrition crops or low-income crops
- As consumer of food – higher chances of hunger and malnutrition
- As provider of nutrition and influence on children's nutrition
  - **Low BMI**: In India, almost 20% children were observed to be born with low birth weight and the major predictors were mother's BMI being <18.5, short stature of mother and lack of antenatal care (Subarnalata et al. 2006, Kader and Perera, 2014)
  - **Number of Pregnancies**: Short pregnancy interval and multiple pregnancies have been observed to create adverse nutritional outcome in women (Villar et al. 2003).
  - **Age at marriage and age at first pregnancy**: Studies from low and middle income countries suggested that children of younger mothers are at disadvantage in terms of nutrition (Fall et al. 2015).
  - **Lack of knowledge about child care:** Lack of knowledge about care giving practices and negligence and ignorance on the part of mother and other care givers for children result in inadequate nutrition and bad health among children (Engle, Menon and Haddad, 1999).
  - **Taboos on Breastfeeding**: Inadequate and infrequent breastfeeding up to four months from birth, and lack of supplementary food after four months results in low weight among children (Engle et.al, 1999; Ramalingaswami, 1996).

So far, we observed

- Shift in food access conditions – lesser dependence on own production stark in non-cultivating households
- Consumption of calorie from PDS increased for the bottom 40% from 1993-2011.
- After 2013 NFSA, evidence of increased demand for the PDS
- Increasing PDS share show an effect on protein consumption – households shift from home-grown to the PDS – grains – which are poor source of protein
- Decline of home grown supplanted by the PDS for staple and sugar – in other sources of macro and micro-nutrients increased dependence on the market
- Shifting source of food relates to households' livelihood as cultivators continue to access home grown stock while other groups don't.
- Nutrition/Food security in India is characterized by
  - Changes in food access conditions – source and composition
  - Contradictions in nutrition requirements and nutrition transfer through social protection
  - Contradictions in high experience of food insecurity and poor distribution of food stocks
- As cultivators consume steadily from non-market as compared to non-cultivators who shift towards marker and wherever possible, the PDS, it can be inferred that the changes in food access conditions(home-grown stock to market and the PDS) mirror the structural change in rural economy (farm to non-farm shift).

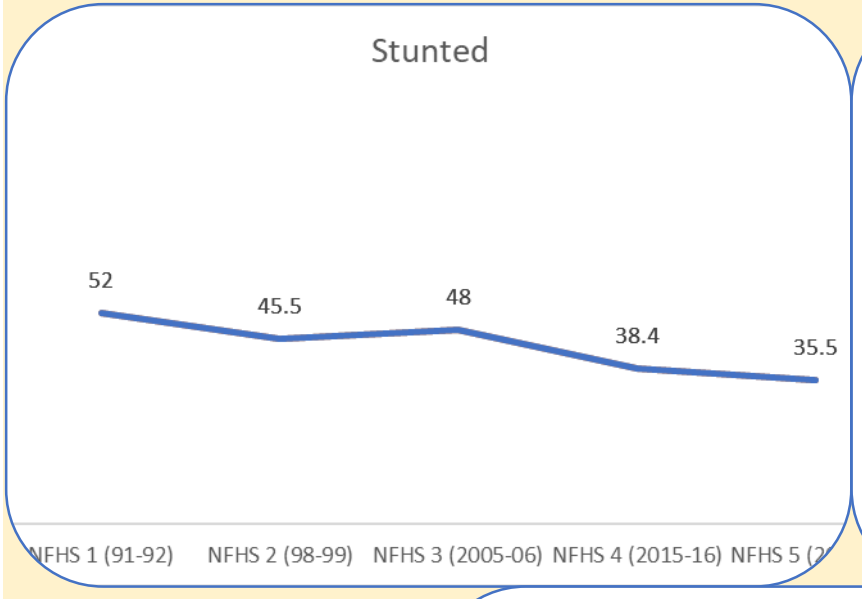
Can we Leverage Agriculture for Nutritional Security?

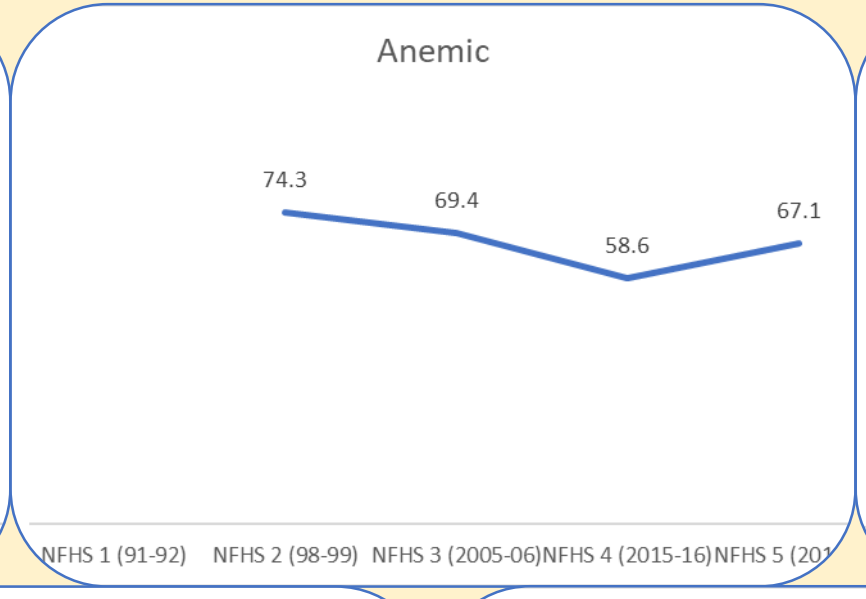
- Starting from a food deficit situation, developments and innovation in agriculture brought food security to India in terms of providing affordable Staple grains (Rice and Wheat) - but is the impact of lower staple food prices overcome by higher prices or deficit for non-staple/micro-nutrient rich foods?
- In the past few decade, a number of research has proved that developing resilient food systems; using community empowerment and awareness as an instrument and changing agro practices towards conservation have a long term impact on leveraging agriculture for nutrition
- Growing consensus now on developing resilient farm systems by adopting crops that put lesser pressure on the environment and provide high nutrition to the consumers – such as Millets.

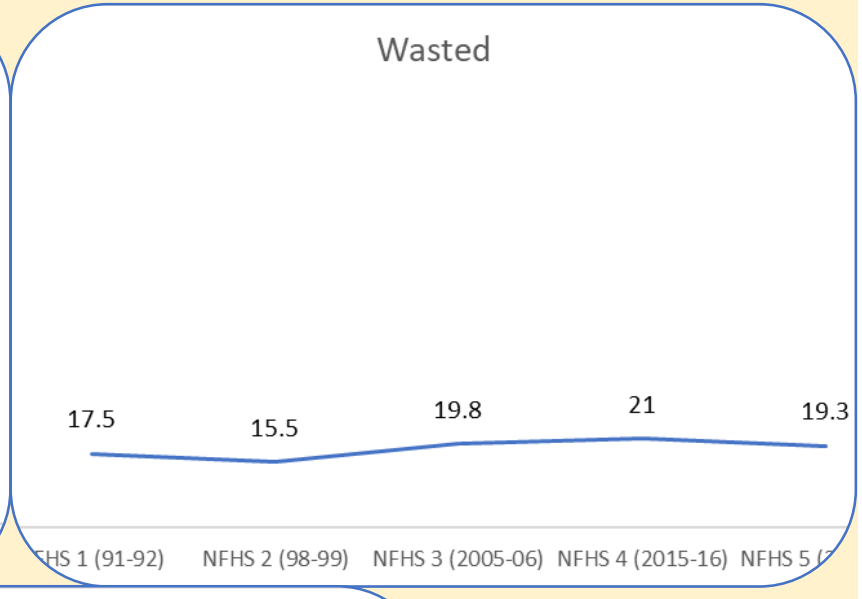
Where are we in terms of Utilization?

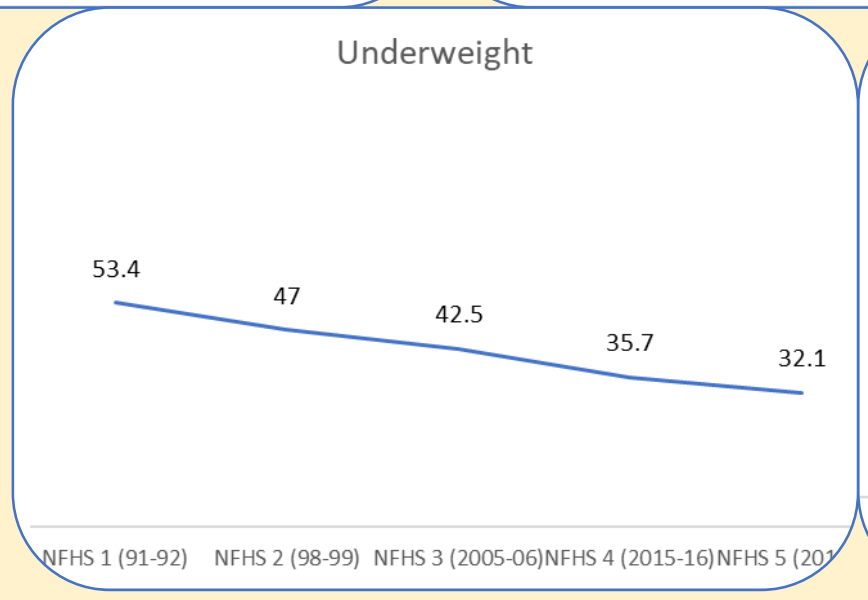
Anthropometric Outcomes and Correlates

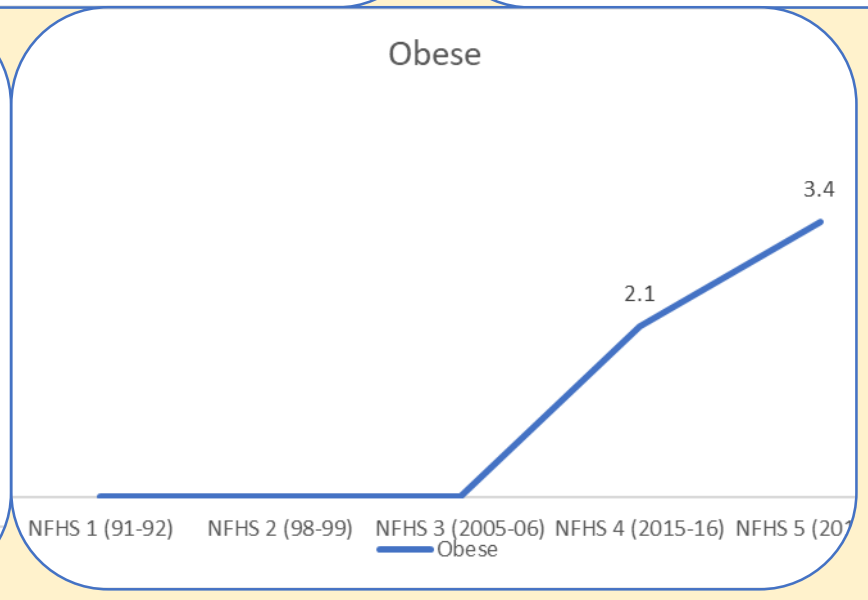
Malnutrition in Children



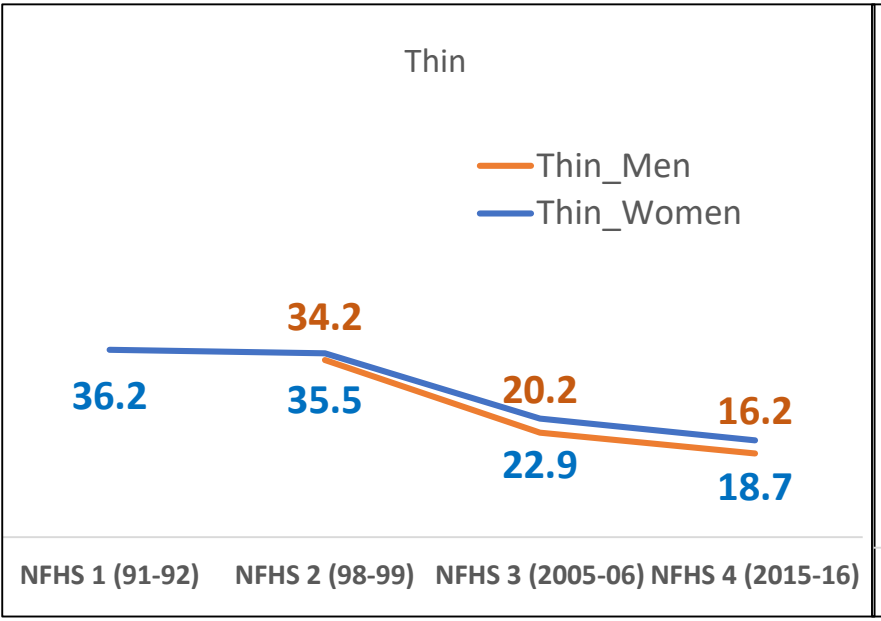


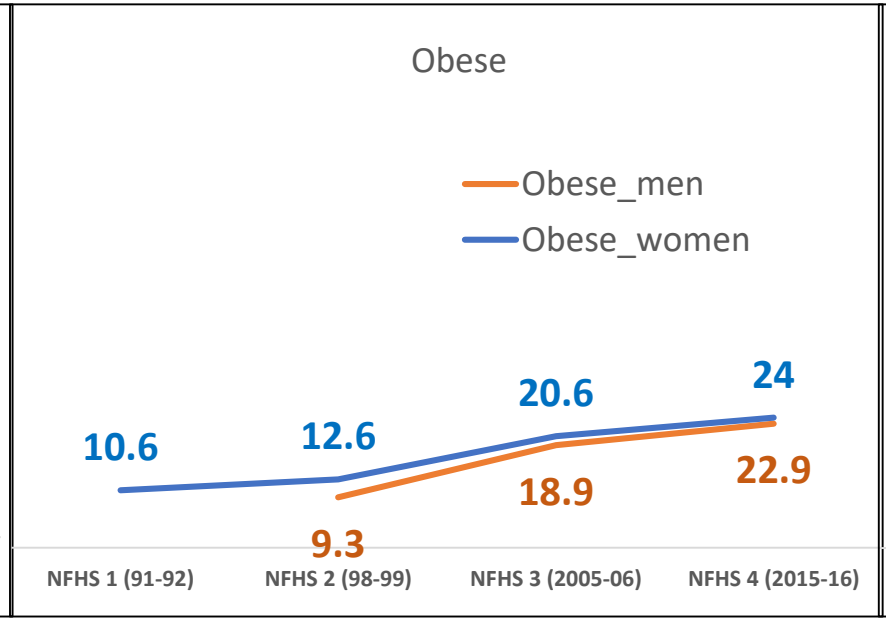


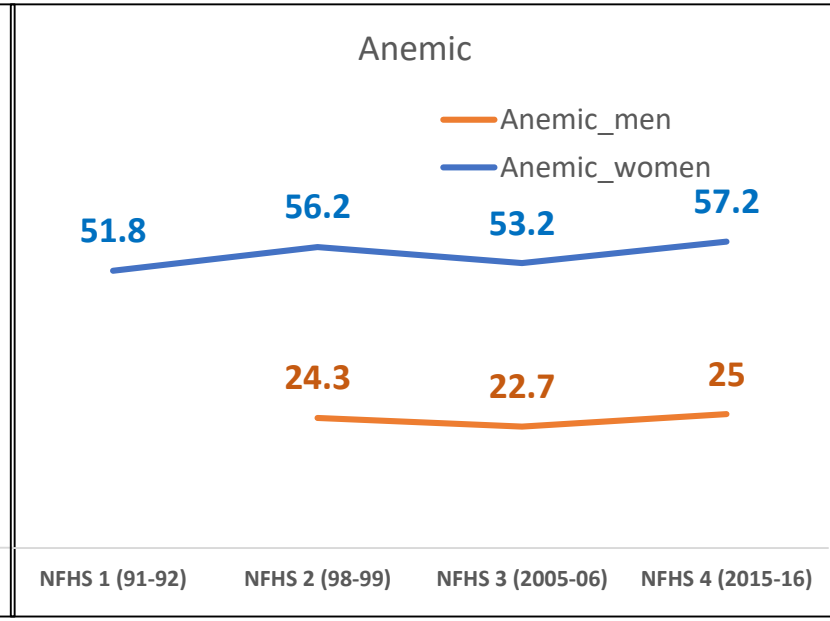




Adult Malnutrition

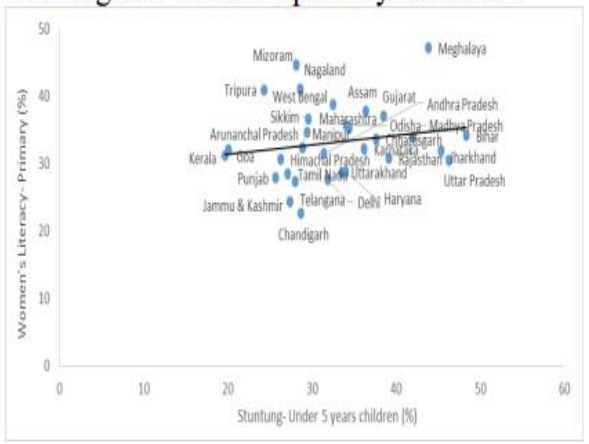




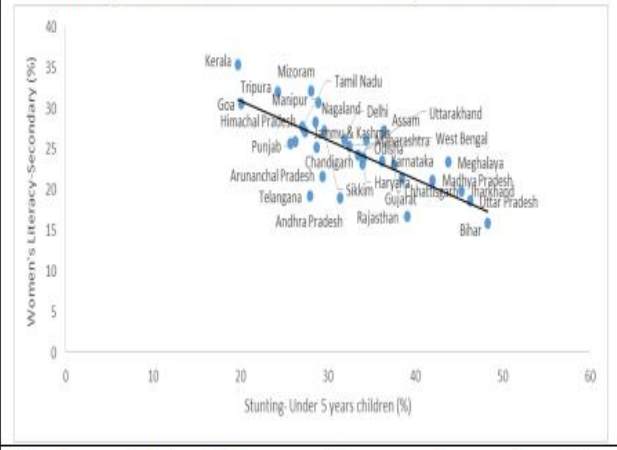


Intersection of Women's Education and Outcomes (NFHS 2015-16)

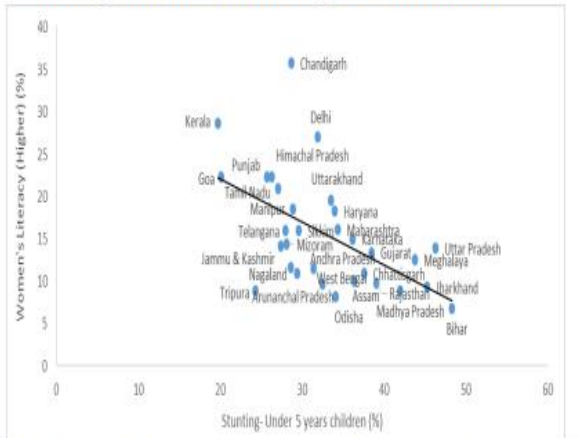
Stunting and women's primary education



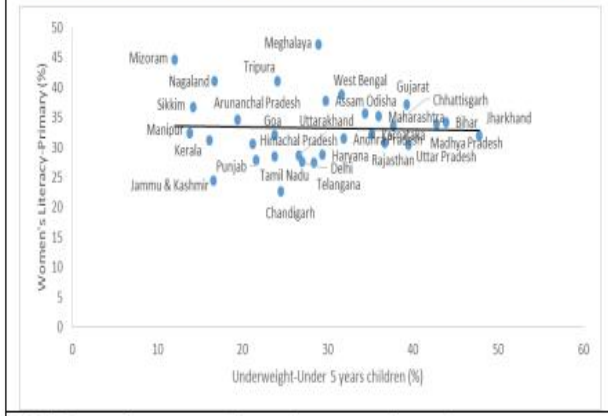
Stunting and women's secondary education



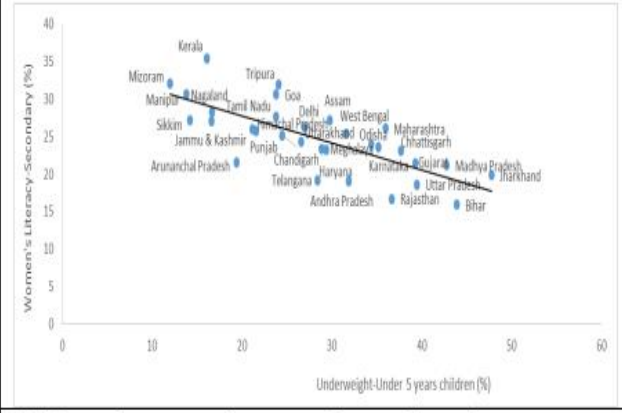
Stunting and women's higher education



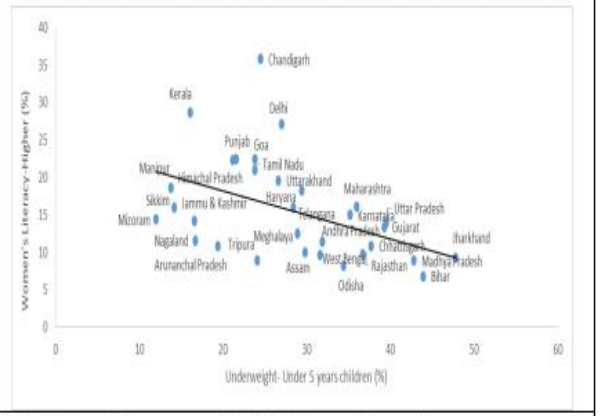
Underweight and women's primary education



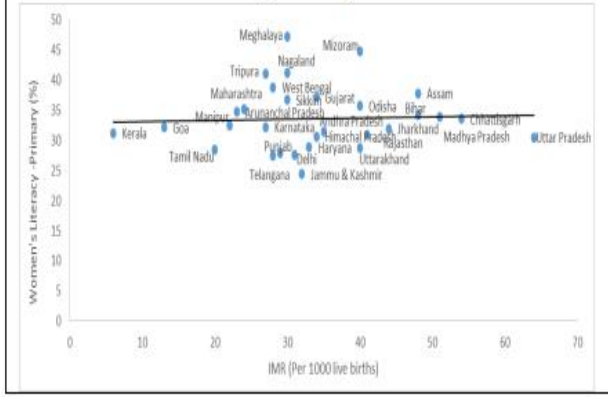
Underweight and women's secondary education



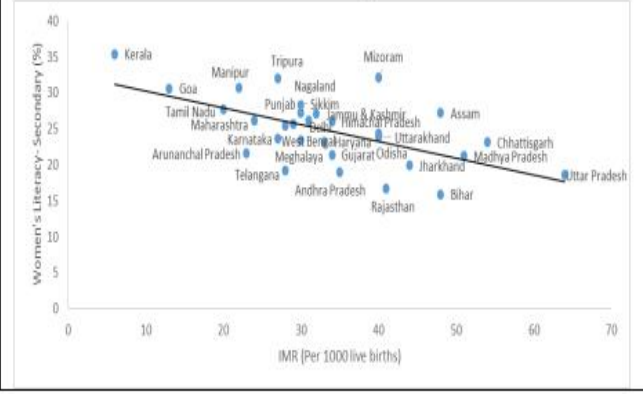
Underweight and women's higher education



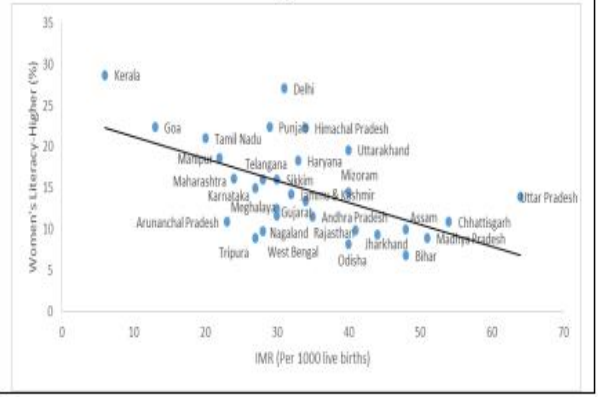
IMR and women's primary education



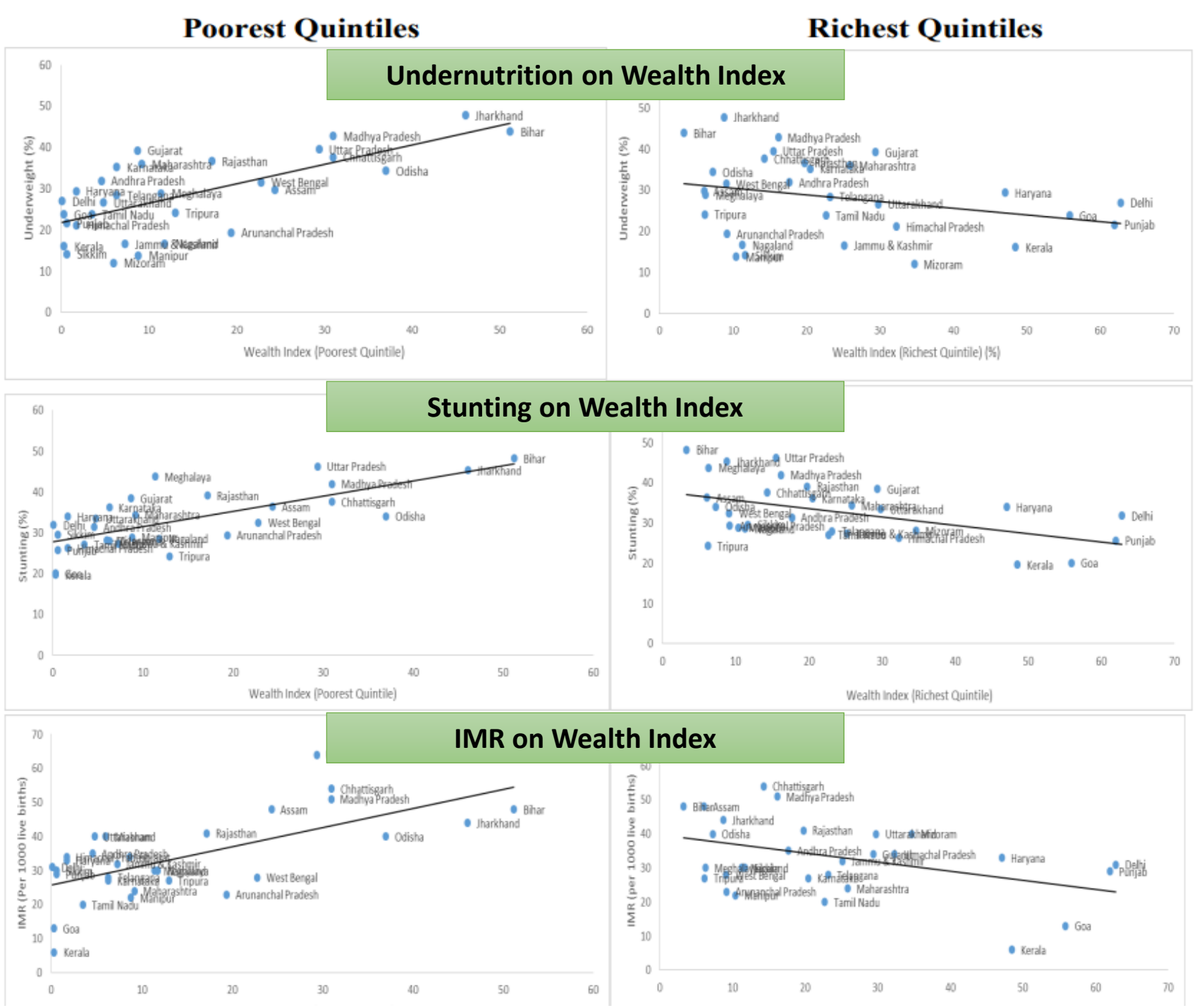
IMR and women's secondary education



IMR and women's higher education



Intersection of Wealth and Outcomes (NFHS 2015-16)



Intersections observed in other datasets (IHDS 2004-05 – 2011-12

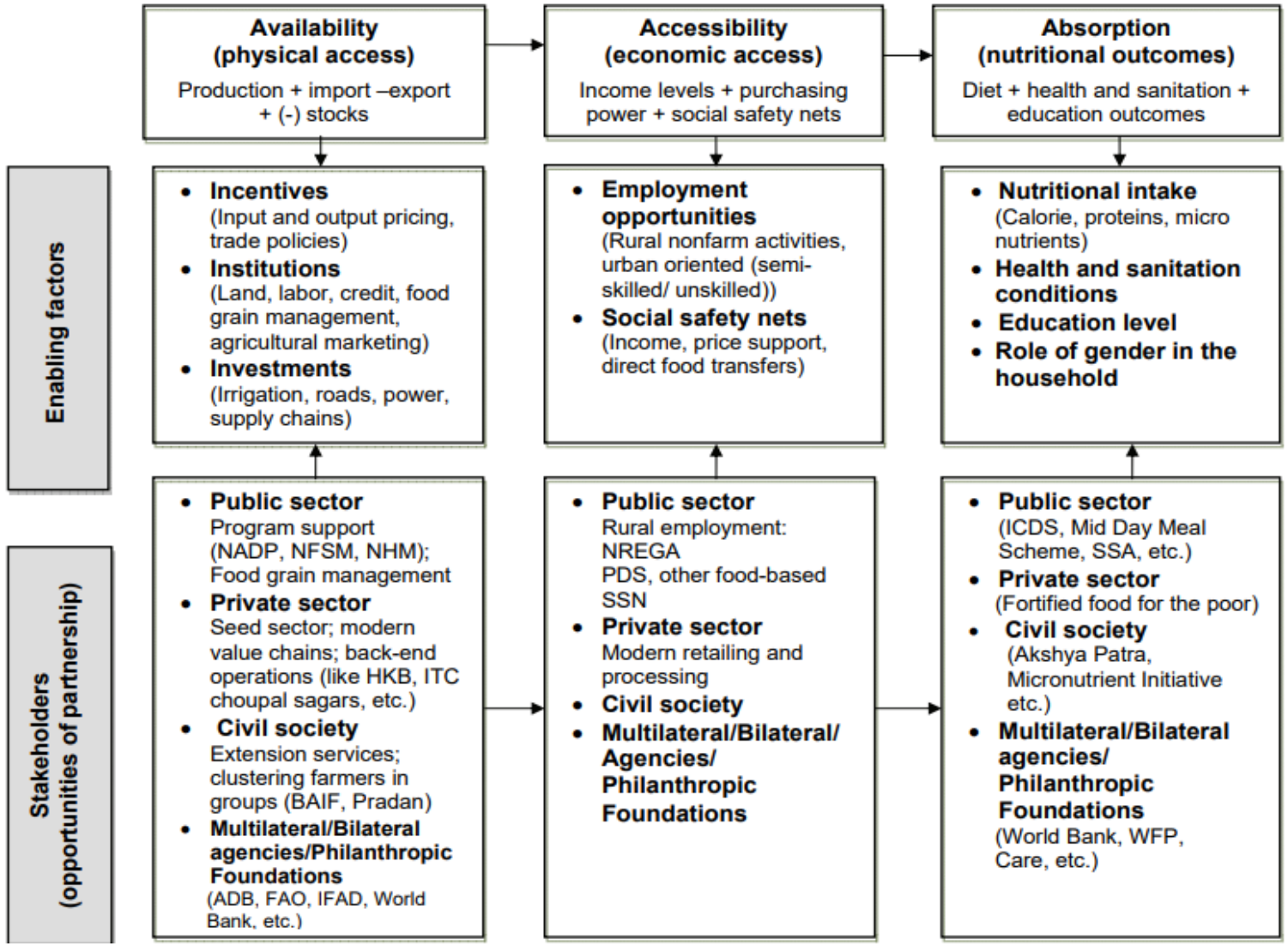
- 65% of the sample with anthropometric outcome showed improvement from 2005 to 2011, having shifted from CED to non-CED status
- Women showed lowest CED mobility
- Dalit women improved least (41%) – in fact, the proportion of individuals reporting a decline from a no-CED to CED status between 2005 and 2011 was highest among the Dalit women (6.9%)

Social groups	CED status 2005	CED status 2011[a]	
		No CED (%)	CED (%)
All India			
Rural[b] (100%)	No CED	18.2	2.8
	CED	65.0	14.1
By groups			
Gender			
Men	No CED	0.7	0.1
	CED	85.7	13.5
Women	No CED	35.2	5.5
	CED	44.7	14.6
By caste			
Non-Dalit	No CED	18.7	2.5
	CED	66.4	12.4
Dalits	No CED	17.0	3.5
	CED	61.9	17.7
By gender and caste			
Non-Dalit: men	No CED	0.6	0.1
	CED	87.4	11.9
Dalit: men	No CED	0.9	0.1
	CED	82.1	16.9
Non-Dalit: women	No CED	36.3	4.9
	CED	46.0	12.8
Dalit: women	No CED	32.9	6.9
	CED	41.9	18.4

Institutional Changes Needed for Stability

Convergence and Long-term Vision

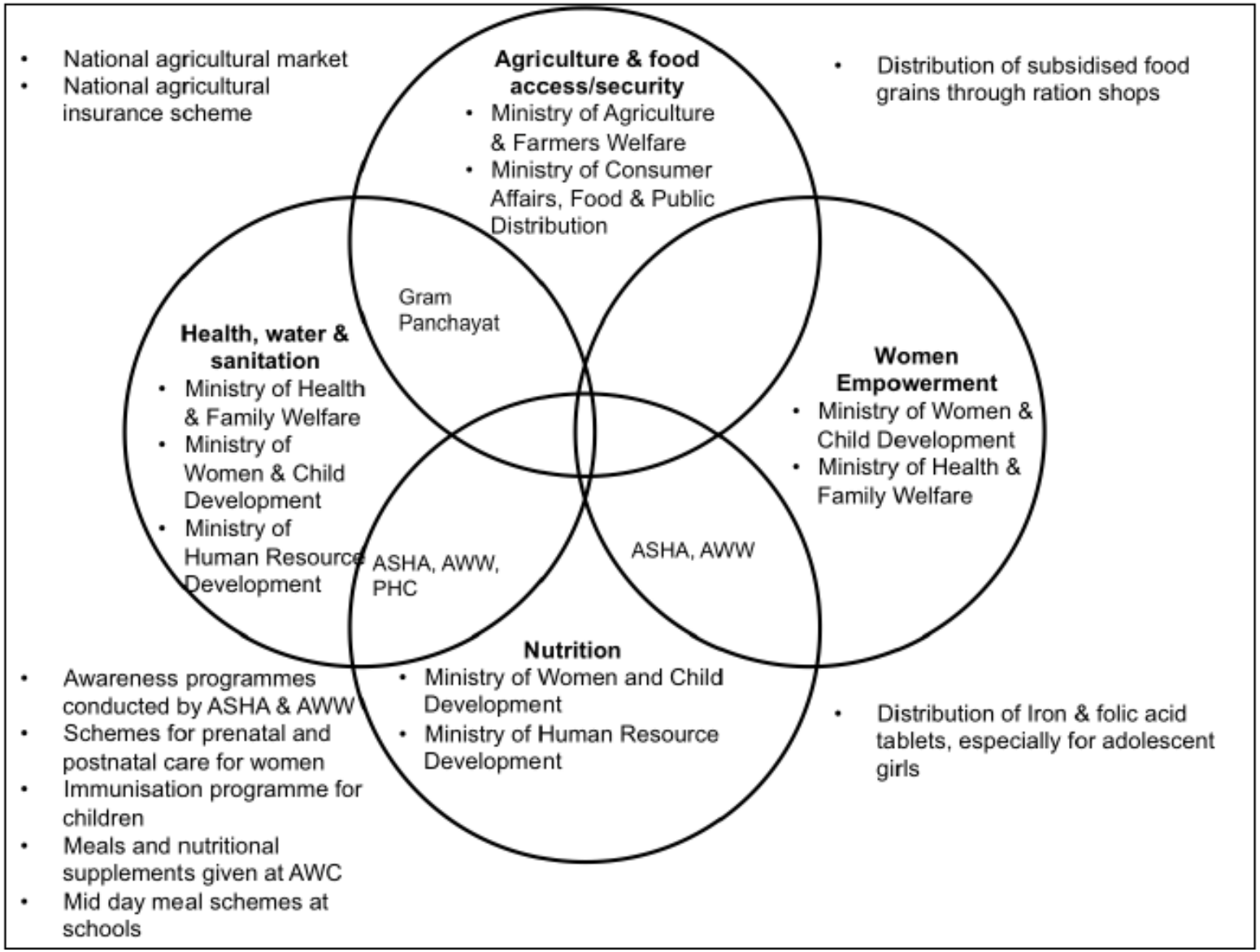
Conceptual Framework: Food and Nutrition Security: Opportunities for Partnerships



Abbreviations

ADB Asian Development Bank
BAIF Bharatiya Agro Industries Foundation
EX imports
FAO Food and Agriculture Organization
HKB Hariyali Kisaan Bazaar
ICDS Integrated Child Development Scheme
IFAD International Fund for Agricultural Development
IM imports
ITC Indian Tobacco Company
NADP National Agriculture Development Program
NFSM National Food Security Mission
NHM National Horticulture Mission
NREGA National Rural Employment Guarantee Act
PDS Public Distribution System
SSA Sarva Shiksha Abhiyan
SSN Social Safety Nets
WFP World Food Programme

Convergence for Nutrition



Challenges to Convergence at Different Levels

Level	Main role/action	Convergence degree and key mechanism	Salient factor: (+) facilitators and (–) barriers
State	-Establish state-wide programs and initiatives -Provide guidelines -Monitor and assess data -Allocate resources	*Collaboration*: -Developing guidelines -Meetings to discuss topics and plan and review programs and initiatives	(+) Shared motivation/goals (+) Recognized leadership for coordination (–) Different priority actions (–) Little data sharing (–) Lack of accountability and feedback mechanisms
District	-Prioritize services and activities -Plan annually/monthly -Monitor data reports -Allocate resources -Train block staff and FLWs	*Coordination*: -Planning and review meetings -Data sharing -Joint training sessions	(+) Clear leadership (+) Mutual understanding of roles (–) Narrow priority topics related to health and disease (–) Low participation/poor attendance (–) Limited supervision
Block	-Plan annually/monthly -Gather data records and registers and report -Supervise and feedback -Train/orient FLWs	*Cooperation*: -Planning and supervision	(+) Shared motivation (–) Lack of direction or guidelines (–) Heavy workload (–) Inadequate resources (–) Poor communication
Village/Frontline	-Schedule and implement services and activities -Record/register and report -Build rapport and demand creation in community	*Collaboration*: -Delivery of services, through VHND and home visits	(+) Shared motivation (+) Close inter-personal communication and vicinity (+) Understanding of roles and responsibilities (–) Unbalanced incentives

We need to continue discussing