

A Monthly Multidimensional Food Index for Indian Villages

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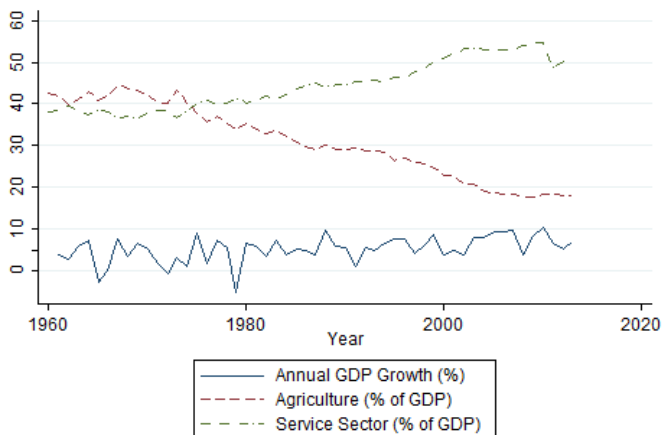
May 6, 2015

Content of Talk

- 1 Poverty Reduction in India
- 2 Idea and own Data
- 3 Monthly Multidimensional Food Index - An application
- 4 Correlations
- 5 Conclusion

Motivation

Who's growing?

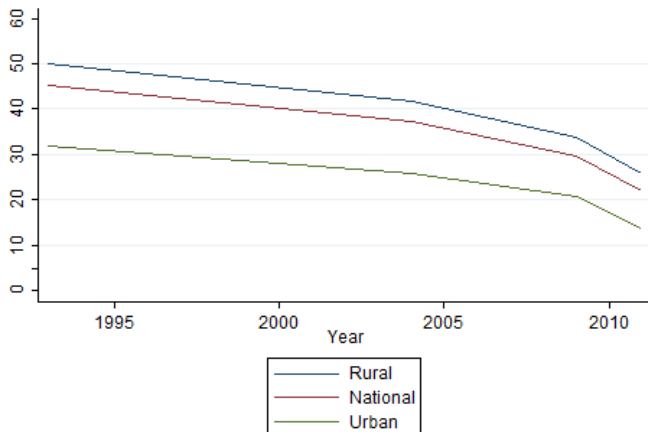


Source: World Development Indicators using Azevedo, J.P. (2011) woopendata: Stats module to access World Bank databases, Statistical Software Components S457234 Boston College Department of Economics.

Poverty Reduction during in India

National Poverty Line

- Huge success claimed as per National Poverty Line



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Poverty in India - Beyond Monetary Headcount Ratios

Education and Health Indicators behind South Asian neighbours

- Jean Drèze & Amartya Sen (Outlook, 2011)



INDIA'S SLIPPING SOCIAL REPORT CARD IN THE NEIGHBOURHOOD

South Asia: Selected Indicators (1990 and latest)

	SOUTH ASIA						
	INDIA	BANGLADESH	BHUTAN	NEPAL	PAKISTAN	SRI LANKA	CHINA
GNI per capita (PPP, current int. \$)	1990 ^a 877	543	1,280	513	1,210	1,420	813
	2010 3,560	1,800	4,950	1,200	2,780	4,980	7,570
Life expectancy at birth (years)	1990 58	54	52	54	61	69	68
	2010 64	67	67	67	67	74	73
Infant mortality rate (per 1,000 live births)	1990 ^c 81	99	96	97	96	26	38
	2010 48	38	44	41	70	14	16
Under-5 mortality rate	1990 ^c 115	143	139	141	124	32	48
	2010 63	48	56	50	87	17	18
Proportion (%) of underweight children	1990 ^c 59.5	61.5	34	-	39	29	13
	2007 ^d 43.5	41.3	12	38.8	-	21.6	4.5

Multidimensional Poverty in India - 1999 and 2006

Sabina Alkire and Suman Seth (2015, World Development, forthcoming)

Using the Alkire-Foster method and dimensions of education, health and living standard (similar to global MPI)

- 56.8 % multidimensionally poor in 1999 (India)
- 48.5 % multidimensionally poor in 2006 (India)

- 68.8 % multidimensionally poor in 1999 (Rural India)
- 60.8 % multidimensionally poor in 2006 (Rural India)

- Certain regions and groups lagging behind in poverty reduction
- Especially Muslims
- Lower Castes & Tribal Communities
- Richer tended to reduce poverty faster

Beyond Income -

Income as a Means to an End

Amartya Sen's Capability Approach:

Income is important but:

Income serves mostly as means to an end.

Instead:

How are we able achieve certain outcomes (ends) in multiple functionings?

- Given that there is income growth or not.

One main functioning: Being well nourished.

Data: 8 villages over 36 months

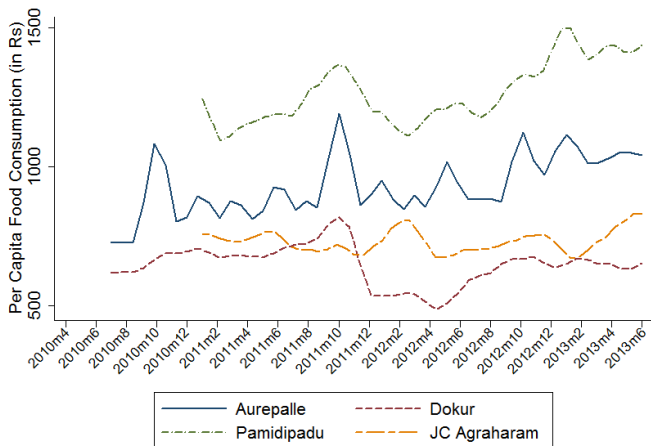
ICRISAT: International Crop Research Institute for the Semi-Arid Tropics, Hyderabad

ICRISAT Village Dynamic in South Asia Panel

- 360 households of 8 villages
- And 2 states: Andhra Pradesh and Maharashtra
- Monthly Panel Data on all Consumption Items - in prices and units
- Time Period: 36 months between July 2010 and June 2013

Summary Statistics I

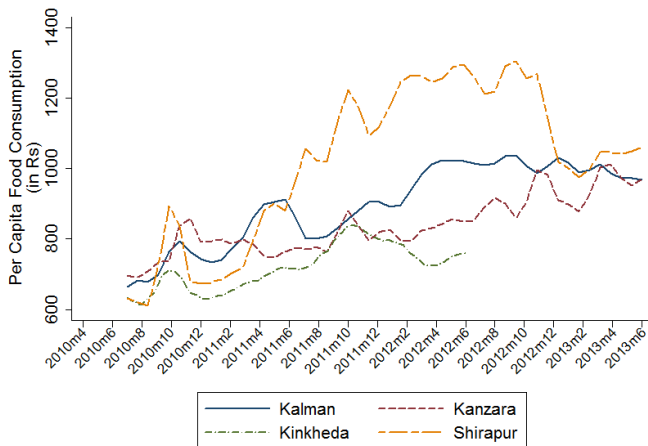
Food Consumption Pattern in 4 Villages of Andhra Pradesh



Based on VLS data; deflated to July 2010 prices using the CPI-AL

Summary Statistics II

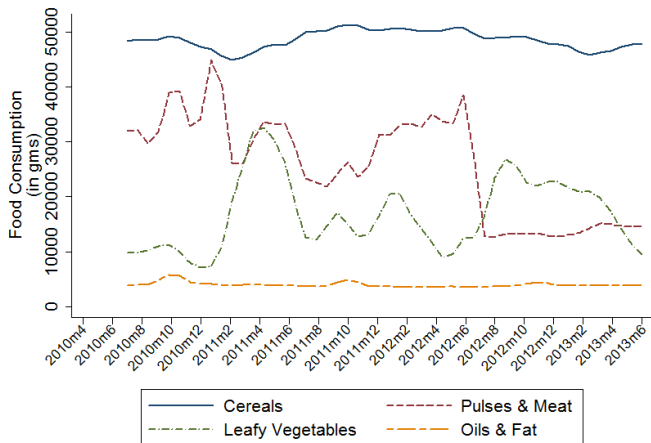
Food Consumption Pattern in 4 Villages of Maharashtra



Based on VLS data; deflated to July 2010 prices using the CPI-AL

Summary Statistics III: Beyond Prices

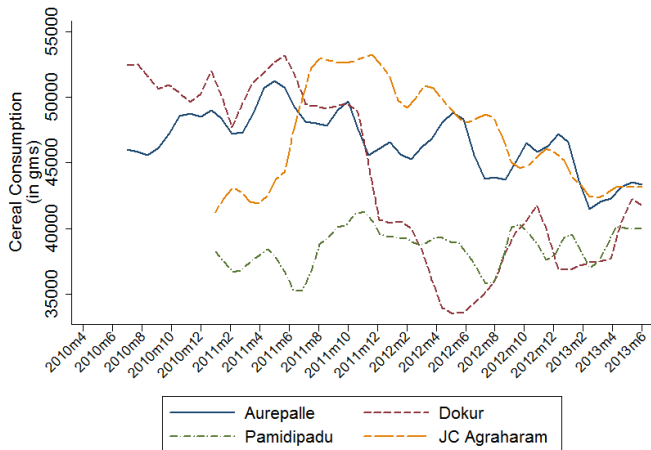
Food Consumption by Type: Average over All 8 Villages



Calculated from VLS data

Summary Statistics IV: Beyond Prices

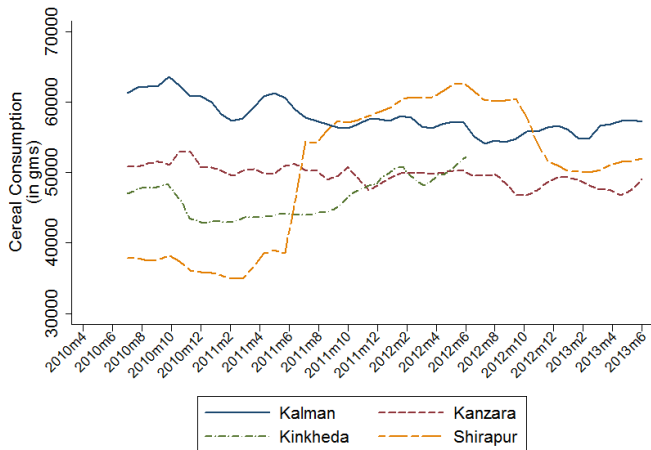
Monthly Cereal Consumption by Type: 4 Villages of Andhra Pradesh



Calculated from VLS data

Summary Statistics V: Beyond Prices

Monthly Cereal Consumption: 4 Villages of Maharashtra



Calculated from VLS data

Beyond Prices

Being Well Nourished

Are households able to meet the minimum requirements of a balanced diet, despite seasonal consumption behaviour?

Functioning: Being well nourished

A Balanced Diet for India as per FAO guidelines

- Recommended Daily Allowance (in grams)

Items	Sedentary		Heavy	
	Male	Female	Male	Female
Cereals	375	270	600	480
Pulses	75	60	120	90
Leafy Veg	100	100	100	100
Oils & Fat	25	20	40	30

Source: National Institute of Nutrition, Hyderabad, 2011, as published by FAO

Idea: A Multidimensional Food Index

4 Categories: Cereals, Pulses, Leafy Veg, Oils

- By household: Minimum Food Requirement in each of 4 categories
- Use Alkire-Foster method to count number of deprivations
- Calculate headcount ratios of food deprivations
- Count number of months a household is food deprived

Idea: A Multidimensional Food Index II

Adding Up by Household - and Household-Wise Thresholds

- Example: 4 member household (Father, mother, 2 children)
- Father and mother work as labourer, children go to school
- To calculate **household-wise minimum item cut-offs**:
- For each Food Item separately:
 - ① Add up: Required gms of food item (e.g.cereals) for male labourer and female labourer
 - ② Add: Required amount for children in respective age group
- Use the Minimum Cut-Offs as Household-wise thresholds:
 - ① Create dummy variable with actual monthly consumption
 - ② Dummy variable: Actual cereal consumption is below/above household cut-off

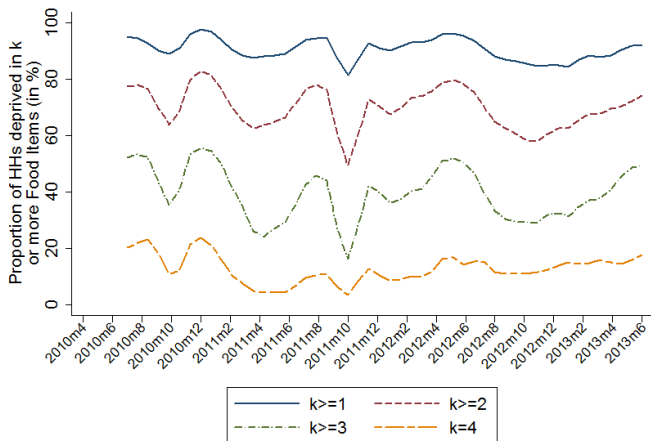
Who and how many live below the Minimum Requirement

Monthly Headcount Ratios of Food Consumption

- Who can meet the daily allowances?
- Who is deprived in, say, Cereal Consumption?
- Who is deprived in Consumption of Pulses, Vegetables and Oils?
- Who is deprived in at least 1,2, 3, or 4 of the 4 categories?
- In which months are households deprived?

Headcount Ratios by k-Value

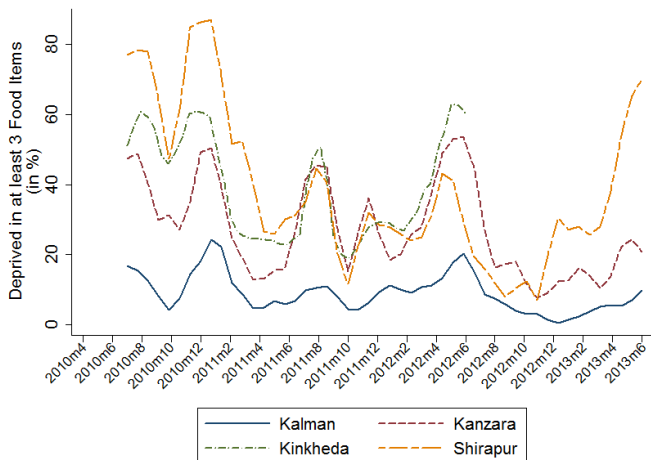
Monthly Variation in Headcount Ratio - Being Deprived in k or More Food Items - All Villages



Calculated from VLS data

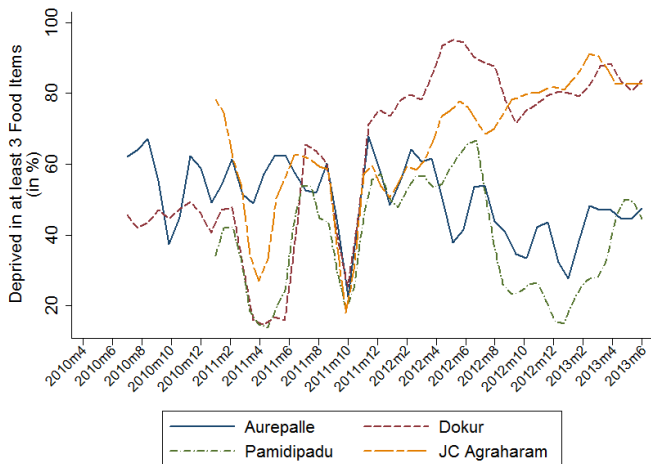
Headcount Ratios by Village

Being Deprived in 3 or more Food Items - Maharashtra



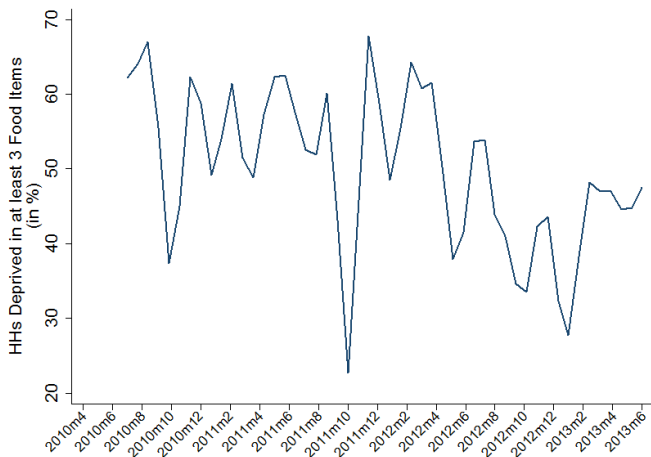
Headcount Ratios by Village

Being Deprived in 3 or more Food Items - Andhra Pradesh



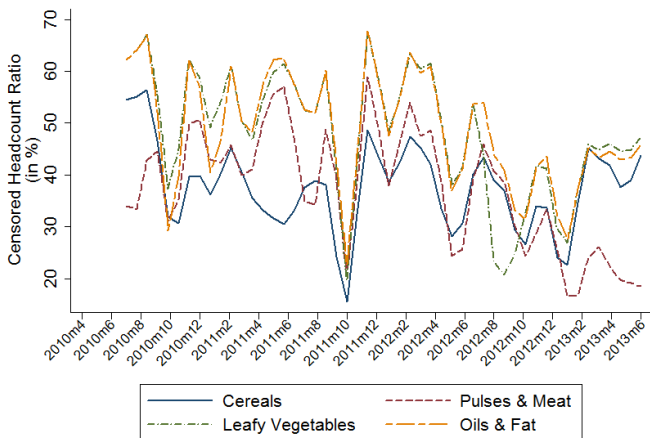
Headcount Ratio: Village Aurepalle, Andhra Pradesh

Being Deprived in 3 or more Food Items



Censored Headcount Ratio: Village Aurepalle

Proportion of Households who are Multidimensionally Food Deprived and Deprived in Food Type X



Calculated from VLS data

Determinants of Monthly Food Poverty

Conditional Logit using Month Fixed Effects: Land Ownership

Table: Monthly Food Deprivations determined by Landholding

	Being Deprived in 3 or more Items
Landholding (in hect.)	-0.040*** (0.004)
Observations	12253
Households	364
Months	36

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Do Health Outcomes correlate with Food Deprivation?

Number of monthly deprivations explains probability of being underweight

Conditional logit using year fixed effects, controls include village dummies, hh-size dummies and landholding:

Table: Every 2nd Member Underweight Correlation with Monthly Food Deprivations

	50 Percent of the HH Underweight
Months being Food Deprived	0.022** (0.011)
Observations	3929
Households	278
Months	36

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Concluding Remarks

Monthly Data as a useful tool to exploit

- Multidimensional Poverty in India decreased between 1999 and 2005
- However, certain regions and sub-groups lag behind. Gap widens
- Community of SC/ST households behind
- Landless and Marginal Landowners particularly vulnerable
- Monthly Multidimensional Food Index can be used to track seasonality
- Useful tool for public policy interventions

Thank you for your attention

... and your comments and ideas.