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UNDERNUTRITION AND PUBLIC POLICY IN INDIA

Despite substantial economic growth, India has one of the highest undernutrition rates in the world; it is home to almost 40 per cent of the world's stunted children. This volume assesses the status and causes of undernutrition in the country, and examines the effectiveness of policies designed to address undernutrition. The chapters tackle wide-ranging themes and challenging issues including nutrition; water, sanitation and hygiene (WASH); maternal, neonatal and child health; Integrated Child Development Services (ICDS); Public Distribution System (PDS); crop procurement; and the National Food Security Act 2013.

With contributions from leading academic researchers, policymakers and civil society representatives, this volume will be indispensable to scholars, teachers and students of public policy, development economics, development sociology and Indian economy. It will also be useful to government institutions, think tanks and NGOs.

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UNDERNUTRITION AND PUBLIC POLICY IN INDIA

Investing in the future

*Edited by Sonalde Desai,
Lawrence Haddad, Deepta
Chopra and Amit Thorat*

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FOREWORD

Nothing is perhaps more of an urgent public policy challenge in India than undernutrition. According to the latest report on the State of Food Insecurity in the World (FAO, IFAD, WFP 2015), despite some progress made towards the Millennium Development Goal 1, India still has the second highest estimated number of undernourished people in the world, predominantly children under five years. How and why is this possible some 68 years after independence in a country which has seen relatively stable growth and a decline in the rate of poverty? These are the questions posed by the contributors to this impressive edited volume which critically examines the magnitude of undernutrition in India and assesses a range of interdependent structural factors that have sustained policy inertia, a lack of accountability, social discrimination and poor nutrition surveillance, particularly of children under five years.

At the heart of this debate, but a footnote in most policy discussions, is gender inequality. The links between women's triple burden of work, limited access to and control over productive resources, and the implications for her health status and that of her children is well established. Despite the plethora of public programmes in India that seek to address maternal and child well-being, enabling women's agency is not considered a *sine qua non* for successful implementation. Improving girls' and women's access to education, facilitating women's participation in decision making at home or in the community, and strengthening her access to markets and livelihoods, while challenging all forms of gender violence, is critical to better nutrition outcomes.

On a related front, emerging global empirical evidence suggests a strong co-relation between access to safe water, sanitation and improved hygiene behaviour, and indicators of malnutrition such as stunting. Not only is India home to the largest number of stunted

FOREWORD

children in the world, the majority of its population continues to practice open defecation. However, while access to WASH infrastructure and services are important in themselves, most WASH interventions are not designed to protect children in the first 1,000 days window from ingestion of faecal bacteria. Working with community-based animators, building ownership for WASH infrastructure and educating caregivers on the faecal-oral route of transmission are key to ensuring early child survival.

The links between agriculture, food and nutrition security are well established, yet little attention in terms of research or resources has been paid to rain-fed agriculture, the lifeline of millions of small and marginal farmers in this country. Supported by Canada's International Development Research Centre (IDRC), this book complemented research on finding innovative solutions to food and nutrition security under the first phase of the Canadian International Food Security Research Fund (CIFSRF) launched in 2009. Research in India focused on small millets which once accounted for nearly 30 per cent of the area devoted to grain cultivation, but now cover less than 18 per cent. With growing recognition of their health benefits, improved access to drudgery reducing small-scale technologies, particularly post-harvest and sustainable value chains for millet-based products, cultivation of millets is gradually increasing. But millets are only part of a diversified diet – kitchen gardens, fish ponds, farmyard poultry and goat-rearing are providing farmers with alternative sources of nutrients, proteins and livelihoods.

As researchers look to scale up successful solutions in a second phase and as several of the authors in this volume emphasise, it is imperative to understand policy challenges in a changing political environment. Coalition building or learning alliances are instrumental for civil society actors seeking to address convergence across key sectors and institutional terrains engaged in a range of nutrition interventions. Data accountability, timely nutrition surveillance, monitoring of public expenditure and improving service delivery are all integral to good governance for better nutrition outcomes. The contributors to this book have been associated with public policy debates in India for long and they bring their learning, experience and analytical skills to a volume which will be indispensable for decision-makers, researchers and development professionals. On behalf of IDRC, I would like to thank all the authors, and particularly the lead editors, for their considerable efforts in pulling together this valuable book.

Dr Sara Ahmed

FOREWORD

Note from the authors

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ABBREVIATIONS

A&N Islands	Andaman and Nicobar Islands
AAV	Antyodaya Anna Yojana
ABM	Atal Bal Arogya Evam Poshan Mission/Atal Bal Mission
ANC	ante natal care
ANM	auxiliary nurse-midwives
AP	Andhra Pradesh
APL	above poverty line
APMC	Agricultural Produce Market Committee
ARSH	Adolescent Reproductive Sexual Health
ASER	Annual Status of Education Report
ASHA	Accredited Social Health Activists
AWCs	Anganwadi centres
AWW	Anganwadi workers
BJP	Bhartiya Janta Party
BMI	body mass index
BPL	below poverty line
CACP	Commission for Agricultural Costs and Prices
CAG	Comptroller and Auditor General of India
CCT	Conditional Cash Transfer
CDC	Child Development Centres
CDMO	Chief District Medical Officer
CDPO	Child Development Project Officer
CFSA	Chhattisgarh Food Security Act
CI	confidence interval
CMR	custom milled rice
CSSM	Child Survival Safe Motherhood
CU	consumption unit
DALYs	disability-adjusted life years
DCP	Decentralised Procurement Scheme

ABBREVIATIONS

DFID	UK Department for International Development
DFS	double fortified salt
DGHS	Directorate of Health Services
DHFW	Department of Health and Family Welfare
DHS	Demographic and Health Survey
DLHS	District Level Household Survey
DSWO	District Social Welfare Officer
DWCD	Department of Women and Child Development
EDD	expected date of delivery
EE	Environmental Enteropathy
EPW	<i>Economic and Political Weekly</i>
FAO	Food and Agriculture Organisation
FCI	Food Corporation of India
FLEd	family life education
FPS	fair price shop
FYP	Five Year Plan
GDP	gross domestic product
gm	gram
GOBI	growth monitoring, oral rehydration, breastfeeding and immunisation
GOBI-FFF	growth monitoring, oral rehydration, breastfeeding and immunisation – family planning, food supplementation, female literacy
GoC	Government of Chhattisgarh
GOI	Government of India
HAZ	height-for-age Z score
HDPI	Human Development Profile of India
HMIS	health management information system
HUNGaMA	hunger and malnutrition
ICDS	Integrated Child Development Services
ICMR	Indian Council of Medical Research
IDD	iodine deficiency disorders
IFA	iron folic acid
IGMSY	Indira Gandhi Matritva Sahyog Yojna
IHDS	India Human Development Survey
IMR	infant mortality rate
IQ	intelligent quotient
IT	information technology
IUGR	Intra Uterine Growth Retardation
IYCF	infant and young child feeding
IYCFP	infant and young care and feeding practices

ABBREVIATIONS

JSSK	Janani Shishu Suraksha Karyakram
JSY	Janani Suraksha Yojana
kcal	kilo calories
kg	kilogram
KVK	Krishi Vighyan Kendra
LBW	low birth weight
MP	Madhya Pradesh
MCHTS	Maternal and Child Health Tracking System
MCP	Mother and Child Protection
MCTS	Mother and Child Tracking System
MDGs	Millennium Development Goals
MDM	midday meal
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MHFW	Ministry of Health and Family Welfare
MHR	Ministry of Human Resources
MIS	management information system
MKSY	Mukhyamantri Khadya Sahayta Yojana
MMR	maternal mortality rates
MOHFW	Ministry of Health and Family Welfare
MOWCD	Ministry of Women and Child Development
MPCE	monthly per capita expenditure
MSP	minimum support price
MUAC	mid-upper-arm circumference
MWCD	Ministry of Women and Child Development
NAC	National Advisory Council
NCAER	National Council of Applied Economic Research
NCCS	Nutritional Care and Counselling Centres
NFHS	National Family Health Survey
NFSA	National Food Security Act
NFSB	National Food Security Bill
NGCP	National Goitre Control Programme
NHED	Nutrition and Health Education
NIC	National Informatics Centre
NIDDCP	National Iodine Deficiency Disorder Control Programme
NIN	National Institute of Nutrition
NNMB	National Nutrition Monitoring Board
NNP	National Nutrition Policy
NPAG	Nutrition Programme for Adolescent Girls
NRC	Nutrition Rehabilitation Centre
NRHM	National Rural Health Mission

ABBREVIATIONS

NSS	National Sample Surveys
NSSO	National Sample Survey Organisation
NTD	neurological tubular defects
OD	open defecation
OLS	ordinary least squares
PDS	public distribution system
PHC	Primary Health Centre
PMNS	Pune Maternal Nutrition Study
PRI	Panchayati Raj Institution
PSU	Primary Sampling Unit
PUCL	People's Union for Civil Liberties
RCT	randomised, controlled trial
RDA	recommended dietary allowance
RGSEAG	Rajiv Gandhi Scheme for Empowerment of Adolescent Girls
RMNCH	Reproductive, Maternal, Newborn, Child & Adolescent Health
Rs	rupees
RTE	ready to eat
RTFC	Right to Food Campaign (India)
SC	Scheduled Caste
SHG	Self Help Group
SN	supplementary nutrition
SNP	supplementary nutrition provisioning
ST	Scheduled Tribe
THR	Take Home Ration
TINP	Tamilnadu Integrated Nutrition Project
TPDS	Targeted Public Distribution System
TSC	Total Sanitation Campaign
TT	tetanus toxoid
TV	television
UNICEF	United Nations International Children Emergency Fund
UNU	United Nations University
US	United States
UTs	Union Territories
VCDC	Village Child Development Centre
WASH	water, sanitation and hygiene
WAZ	weight for age Z scores
WFP	World Food Programme
WHO	World Health Organization
WIFS	weekly iron-folic acid supplementation

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INVESTING IN THE FUTURE

Public policy opportunities to end undernutrition in India

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India is home to approximately 40 per cent of the world's stunted children under the age of five (Black et al. 2013; von Grebmer et al. 2013). Despite rapid economic growth in the past 15 years, the proportion of stunted children declined very slowly, from 51 per cent in 1998–99 to 45 per cent in 2005–06. For children under five in 2005–06, proportion of stunting was 48 per cent.¹ Recent but as yet unsubstantiated estimates put stunting rates at 38 per cent (Global Nutrition Report 2014).

By most estimates, India seems unlikely to meet her own Millennium Development Goal of reducing the proportion of under five children who are underweight from 52 per cent in 2000 to 26 per cent by 2015 (Central Statistical Organisation 2011). At the same time, economic growth over the past decade has ranged between 7 per cent and 9 per cent and even during challenging times of 2013–14; it has grown at 5–4.7 per cent rate.² While inequality has risen (Weisskopf 2011), families at the bottom of the income distribution have gained substantially with poverty rate falling from 37 per cent in 2004–05 to 22 per cent in 2011–12 (45 per cent in 1993/94 to 37 per cent in 2004/05³).

Why has economic growth and poverty decline not translated into a commensurate decline in undernutrition and what can be done about it? These questions lie at the heart of the chapters in this volume.

There is a substantial amount of debate on reliable statistics about malnutrition, with a range of surveys claiming different figures. As Thorat and Desai (in this volume) note, the last credible large survey to collect nationwide data on child malnutrition was conducted in 2005–06. Since then, several attempts have been made to obtain

estimates of malnutrition for selected states but no nationwide data child malnutrition are available, as of writing this volume. Desai and Thorat (in this volume) summarise statistics from available surveys over the past decade. As they note, whichever survey is used, what is clear is that despite economic growth, a large proportion of India's children remain malnourished.

This is not to say that there has been no progress in kerbing malnutrition in the country. Available estimates from smaller surveys like India Human Development Survey (IHDS) or surveys with limited geographic coverage such as National Nutrition Monitoring Board (NNMB) surveys and District Level Health Survey (DLHS-IV) suggest a modest decline in some indicators of undernutrition in India. An NNMB survey conducted in rural areas of 10 large Southern and Western states, for example, notes a decline in underweight among pre-school children from 48.6 per cent in 1997–98 to 41.1 per cent 2011–12 (National Nutrition Monitoring Bureau 2012). IHDS with a much smaller sample size finds a decline in underweight from 41.9 per cent in 2004–05 to 37.2 per cent in 2011–12 for India as a whole (Thorat and Desai, in this volume).

However, there is not much cause for celebration due to modest improvements, as both absolute and proportional numbers of malnutrition remain high. How do we reconcile this modest decline in child undernutrition with a sharp decline in the poverty rate? And how can India respond to the challenge of malnutrition through public policy interventions, especially at this large scale?

This book concludes that there is no single answer to these questions. The book identifies several factors that shape undernutrition in modern India and reviews the evidence on the attempts of Indian public policy to address them to reduce undernutrition. It puts forth ideas and recommendations for the design and implementation of a range of public policies to address this challenge.

The drivers of undernutrition that we investigate in this volume are: (1) The extent of calorie consumption; (2) diet composition; (3) the disease environment; and (4) the distribution of resources within household, including gender differences. These cover the three underlying determinant areas in the conceptual model of nutrition (Black et al. 2013).

Trends in calorie consumption

Hunger and protein-energy deficiency form the first driver of undernutrition. One of the most striking aspects of the Indian nutritional scenario lies in the fact that average caloric consumption has declined

even as incomes have grown. National Sample Surveys (NSS) document a decline in average caloric consumption. Average per-day per capita caloric consumption was estimated at 2,020 kcal in 2004–05 for urban areas and declined to 1,946 in 2009–10; rural caloric intake declined from 2,047 in 2004–05 to 2,020 in 2009–10. This is not a new observation, as a similar trend was also observed between 1999–2000 and 2004–05. This has led some researchers to argue that rising inequality over this period combined with higher food prices has pushed a large segment of the Indian society in nutritional vulnerability (Patnaik 2010). Others argue that it is related to the statistical artefact of the NSS not collecting accurate data on calories eaten away from home (Smith 2013). Others, noting that much of the decline in calorie intake is located at the upper end of the income distribution, suggest this phenomenon may well be due to changes in dietary requirements rather than growing prevalence of hunger (Deaton and Drèze 2009). The NSS reports calculate caloric intake per consumer unit, adjusting for age composition of the population and age-specific nutritional demands. Comparing the NSS reports for 2004–05 and 2009–10, we find that most of the decline is located in rural upper income households (National Sample Survey Organisation 2012) where a move away from agricultural work may have reduced caloric needs.

Much of the drop in caloric intake comes from decline in cereal consumption and is balanced by some increase in consumption of other items such as milk, dairy and fat along with increase in meals eaten away from home. A similar decline in cereal consumption is also seen by NNMB surveys⁴ (National Nutrition Monitoring Bureau 2012). The International Food Policy Research Institute's latest Global Hunger Index puts the number of hungry and malnourished people in India at over 230 million people (see Mander in this volume).

Whether or not calorie consumption is declining or increasing, it is safe to say that it is not increasing robustly. If it were, it would help to reduce undernutrition.

Dietary composition

Dietary composition is the second driver of the malnutrition puzzle. The Indian diet has been changing over time with declining proportion of calories coming from cereals and rising proportion from fat, dairy and other items (National Sample Survey Organisation 2012). However, dietary diversity in India remains low with relatively low

consumption of fruits and vegetables (National Nutrition Monitoring Bureau 2012) and income growth has not had a substantial impact on improving dietary diversity (Gaiha et al. 2013).

Prema Ramachandran (in this volume) notes that over the past four decades, the NNMB surveys show a consistent dietary shortfall of micronutrients such as Vitamin A, Iron, Riboflavin and Vitamin B3. Anaemia testing of women and children in National Family Health Survey (NFHS-III) reveals that 70 per cent of children under five and 56 per cent of women of reproductive age suffer from some form of anaemia. Indian diets vary across regions and are governed by local food preferences and belief systems hence it is striking that in spite of this variation, anaemia is so widespread.

Moreover, anaemia is not simply a function of household food security. Even when mothers are not anaemic, 61 per cent of the children are anaemic (International Institute for Population Sciences and Macro International 2007). The NNMB surveys also reveal a similar relationship. As Ramachandran notes, a substantial proportion of Indian households consist of adults who are getting adequate nutrition but contain children who are not. This suggests that dietary patterns, particularly habits and knowledge regarding young child and infant feeding may play an important role in shaping children's nutritional outcomes.

A focus on child undernutrition is particularly relevant since children experience growth faltering in the first two years of life and this growth faltering cannot be completely recovered later in life (International Institute for Population Sciences and Macro International 2007). Inadequate and improper feeding as well as infectious diseases are the main causes leading to retardation in child growth. This observation strengthens the argument by Satish Agnihotri (in this volume) that community-based programmes that empower families to improve diets can have an important role to play in reducing malnutrition.

Persistently low-diet diversity at the infant, child and adult level is undoubtedly a contributor to the persistence of nutrition indicators such as stunting, wasting and anaemia.

Disease environment

The chapters in this volume suggest that a high prevalence of gastrointestinal diseases is a critical driver of undernutrition. While the pathways linking disease environment and nutrition are diverse, several deserve particular attention. Increased prevalence of diarrhoea is associated with loss of appetite and inadequate dietary intake; it is also

associated with increased loss of water and electrolytes leading to direct loss of nutrients as well as decreased absorption of nutrients (Dangour et al. 2013).

Poor water quality, lack of sanitation and poor hygiene, on top of a weak health system are associated with high levels of disease prevalence. Lack of water and sanitation poses tremendous challenges to the Indian public health system. Open defecation remains widespread in India in both rural and urban areas. Although Census data show that proportion of households with access to a latrine increased from 37 per cent in 2001 to 47 per cent in 2011, this implies that half of the Indian households do not have an access to toilet. Ironically, more Indian homes have cell phones than toilets. Access to improved water sources also remains a problem. As of 2005, only 37 per cent households had access to piped water for three or more hours per day (Desai et al. 2010), thus leading to reliance on unsafe water and perpetuating the problem of diarrhoea and other water-borne diseases.

Cronin et al. (in this volume) note a strong link between water and sanitation and health and nutritional outcomes around the world, both using observational data and randomised control trials. An interesting randomised control trial in Maharashtra showed that toilet construction was associated with substantial increase in children's height (Hammer and Spears 2013). However, in spite of the massive sanitation programmes undertaken by Total Sanitation Campaign and now *Swaccha Bharat Andolan* (Clean India Movement), many households are unwilling to build and/or use toilets. Dean Spears (in this volume) argues that large scale sanitation interventions would amount to very little unless it is simultaneously accompanied with behavioural changes.

Intra-household inequalities

Inequalities within households – especially by gender – tend to exacerbate the causes of undernutrition. For example, the IHDS of 2004–05 records that in 34 per cent of the households, men eat first, in 2 per cent women eat first and in 49 per cent men and women eat together (Desai and Andrist 2010). Social norms that encourage women to eat last also encourage a culture of sacrifice and self-effacement and tend to ensure that women – frequently pregnant and lactating daughters-in-law – receive less food and less nutritious food instead of the extra nutrition they require. NFHS-III collected data on food consumption habits of men and women. A comparison of figures on the consumption of

specific items shows that men are advantaged over women in a variety of food groups. Men are 12 percentage points more likely to consume milk and curds than women at least once a week. Comparable figures for male advantage are 8 percentage points for fruits, 9 percentage points for eggs and 10 percentage points for chicken and fish (International Institute for Population Sciences and Macro International 2007).

Not surprisingly, women are far more likely to be anaemic than men. Although menstruation and pregnancy demands play a role, household neglect also makes women more vulnerable. NFHS-III records that 24 per cent of men aged 15–49 are anaemic compared to 56 per cent of women in the same age group. Vir (in this volume) argues that maternal malnutrition is the primary cause of child malnutrition in India. Several factors are responsible for maternal malnutrition – amongst them are poor dietary intake and lack of health facilities. One of the most insidious factors is the volume of household work that women (and girls) are expected to do in the family. Domestic responsibilities such as cooking, fetching water from far-off sources, collecting firewood for cooking – all of these activities constrain not only women's time for rest (and other activities), but also are a drain on their energy – thereby causing a double imbalance in nutritional status. Not only is there inequity in the dietary intake of women (and girls), but there is also little recognition of the energy that they expend, thereby furthering the impact on gender inequalities in undernutrition levels.

A discussion on gendered inequalities in undernutrition brings to the fore the interconnected nature of these various determinants of undernutrition – a message that various authors emphasise in this volume. Poor dietary intake is linked not only to poverty levels, but also to societal prejudices and gender norms in intra-household division of responsibilities and resources. Lack of piped water facilities perpetuate both water-borne diseases which drain away precious nutrients, and also add to the drudgery of household work that make women more susceptible to increased maternal malnutrition. Finally, lack of health facilities and infrastructure to cater to the disease burden of both women and children makes them more susceptible to a continued intergenerational cycle of undernutrition.

Policy responses

There are some promising policy developments that may turn out to be critical in addressing undernutrition. The passage of the umbrella National Food Security Act of 2013 (NFSA) could prove to be a

significant turning point (Haddad et al. 2012). However, ensuring that the component policies of this Act are effectively implemented remains a mammoth challenge (Mehrotra this volume). Chapters in this volume differ in their optimism regarding potential success of these policies within the present administrative structure. This is mainly because of critical failures in governance that are adversely affecting the effectiveness of policy responses.

In the past, the Government of India has been complacent on the issue of undernutrition. Governance is about leadership, commitment, transparency, accountability and responsiveness (Gillespie et. al. 2013). Until very recently the Government has come up short in these areas.

On leadership, in 2008 the prime minister called undernutrition a 'national shame' and a 'curse' and established the PM's Nutrition Council (Haddad 2009). However, the Council has rarely met, and no nutrition strategy has been developed (Haddad 2011). This depicts a lack of commitment to addressing the issue of undernutrition. A further reflection of this lack of commitment is that no single high-profile administrator or politician was publicly tasked with addressing the issue. India has also declined to become a member of the Scaling Up Nutrition. On transparency, we rely on nutrition data that are truly ancient – from 2005 to 2006. Finally, the disconnect between income growth and stagnant undernutrition rates has not generated much urgency to act, thereby showing a lack of responsiveness to the urgency of kerbing the undernutrition problem.

Because India has many programmes that have great potential to reduce undernutrition at scale (e.g. ICDS and the PDS), the lack of effective governance of those resources so that they are convergent, coordinated and focused on nutrition, especially the first 1,000 days after conception, is a tragic missed opportunity.

In addition, the governance of individual programmes is weak. Although leakages are declining in the PDS, they remain significant (Kishore and Chakrabarti 2014). The filling of frontline vacancies in Integrated Child Development Services (ICDS) is improving, but still many posts remain vacant. Rigorous evaluations of public policies such as the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and WatSan programmes do not examine the impact of these interventions on nutrition, showing that this issue is under-recognised as a critical problem that India faces, and as an issue that results from a range of factors rather than just lack of food.

States like Maharashtra have shown the way forward by establishing a State Nutrition Mission, increasing spending in nutrition, filling

frontline vacancies and improving the coverage of nutrition-specific interventions. Combined with economic growth and poverty reduction, these changes have resulted in a decline in stunting from 36 per cent to 24 per cent between 2005–06 and 2012 (Haddad et al. 2014). However, such initiatives are yet to be recognised, lauded or taken up at a national scale in combating the problem of undernutrition.

The national level policy response has been primarily through the NFSA, which relies on two pillars: (1) Provision of practically free food to 67 per cent of the Indian population via the Targeted Public Distribution System (TPDS) and (2) Provision of food supplementation to all pregnant and lactating women and children under six via ICDS. While NFSA expands TPDS coverage and seeks to strengthen ICDS, these programmes have been in effect for several decades, allowing us to explore both successes and challenges of the existing programmes.

Public distribution system

Although a very weak form of Public Distribution System (PDS) existed in India during the second world war, it emerged in the form we now see in 1960s (Kumar 2010), following increased availability of grains via US government's foreign assistance programme known as PL-480 as well as the institution of price support programme to stabilise agricultural prices. A large network of PDS shops, also known as Fair Price Shops, was established: local traders were enrolled as owners and households were issued a PDS card with monthly per capita entitlements of food staples.

The PDS has changed both qualitatively and quantitatively since the 1970s. At first, the PDS was confined to urban areas and regions with food deficits. The main emphasis was on price stabilisation. Private trade was considered 'exploitative,' and the PDS was considered a countervailing power to private trade. Since the early 1980s, the welfare role of the PDS has gained importance. Nevertheless, the PDS was widely criticised for its failure to reach those living below the poverty line for which the programme was intended. Although rural areas were covered in many states in the 1980s, the PDS had an urban bias and large regional inequalities in its operation. An effort was made, therefore, to streamline the PDS by introducing the TPDS in June 1997 (Kumar 2010).

TPDS operates through allocation of ration cards to households in which households either classified as being Above Poverty Line (APL) and expected to pay economic costs of food grains or Below

Poverty Line (BPL) and provided subsidised food grains. While this is a centrally sponsored scheme, it is administered by state governments, which are free to add other items to the list and to reduce prices or to increase quantities. Typically, most states provide at least wheat and rice in PDS shops in addition to sugar and kerosene.

As Mander (in this volume) notes, TPDS in the pre-NFSA period faced a number of challenges. Beneficiary identification and efficient operation were perhaps the greatest. While expansion of the eligible beneficiary pool reduces the identification challenge, it does not eliminate it. The Government of India periodically undertakes national census of households to identify BPL households. Four BPL censuses have been conducted to date, the last being in 2011–12. However, as of this writing, the results from 2011 to 2012 census are not being used to identify poor households. These BPL censuses have been widely criticised (Dreze and Khera 2010), since they frequently exclude the poor (exclusion) and may also include the non-poor (leakage). Although some states have used innovative criteria (e.g. the Kudumbashree scheme in Kerala), on the whole few observers are optimistic about the potential for coming up with an effective scheme (Alkire and Seth 2013). The NFSA, by expanding the eligible pool of recipients, reduces this constraint considerably, but does not eliminate it entirely.

Over the years, the PDS has reached more and more Indian households. A recent study using NSS data finds that proportion of households purchasing cereals from PDS shops has doubled between 2004–05 and 2011–12, from 25 per cent to 51 per cent in rural areas and from 15 per cent to 31 per cent in urban areas (Himanshu and Sen 2013). In this analysis, the programme appears to be both better targeted and more efficient in recent years. As Patnaik and Sinha (in this volume) note, this may be due to successful local innovations in states like Chhattisgarh.

While expansion and increasing the effectiveness of PDS has formed the core of the right-to-food campaign in India, in spite of the passions it has excited, little is known about its nutritional effectiveness. NFSA has left the door open for future provision of cash benefits in lieu of food subsidies. With increased policy interest in direct benefits transfer in order to reduce leakages, we expect that this provision will be explored more carefully over the years to come. Kaul (in this volume) examines the nutrient impact of subsidising food grains. She finds that in areas where there is higher subsidy, as reflected by local cereal prices and PDS prices, holding other factors constant, households tend to consume more calories but with a caloric elasticity of

only about 0.114. This low elasticity added to low nutritional impact of PDS access on child nutrition recorded in other studies (Desai and Vanneman 2014; Tarozzi 2005), suggesting that we may need to look beyond PDS for improving nutritional outcomes. However, whether cash transfers are more likely to be effective than food subsidies is not clear and we may need to wait for the results from some of the ongoing experiments with cash transfers (e.g. Bihar cash transfers programme by Oxford Policy Management) to evaluate the potential role of cash transfers in improving nutrition.

Integrated Child Development Scheme (ICDS)

The second pillar of NFSA, Integrated Child Development Scheme (ICDS), was established in 1975. Early in its history, this programme was geared towards children under 5 from BPL households. However, following an order of the Supreme Court, it has now been universalised. It operates through community-based Anganwadi Centres operated by an Anganwadi worker, who is now supposed to receive help from a helper. ICDS programme is supposed to provide the following services:

- Supplementary nutrition to children below six, pregnant and lactating mothers, and adolescent girls.
- Immunisation to children under six and pregnant women.
- Health check-up to children under six and pregnant and lactating mothers.
- Referral to children under six, pregnant and lactating mothers.
- Health and nutrition education to women ages 15–45 and adolescent girls.

The reach and effectiveness of ICDS and its potential for reducing child malnutrition is a subject of lively debate in the chapters in this volume. The chapters by Agnihotri and Avula et al. are optimistic about potential innovations in the ICDS programme. Avula et al. suggest that ICDS programme can gain tremendously by building multi-sectoral synergies and linking frontline health workers with Anganwadi worker and show these synergies operating in Rajasthan. In contrast, the chapters by Mehrotra and Saxena are far more pessimistic about the potential of ICDS as a vehicle for reducing malnutrition and note the stranglehold of bureaucratic structures on a system that makes it less responsive.

Recent studies show that in spite of supposed universalisation, ICDS still does not reach a vast proportion of Indian children, at least in terms of utilisation (Desai and Vanneman 2014). Use of ICDS services has grown substantially between 2004–05 and 2011–12. The IHDS of 2004–05 found only 22 per cent of the women took any advantage of ICDS services for their last birth; this proportion has grown to 54 per cent in 2012 after universalisation. However, when we look at the details of the services provided (using the 2011–12 survey), their uptake remains limited. For the last child born (within the prior five years) among IHDS respondents, respondents report availing of ICDS services with the following frequency:

- Percent of mothers who received any services (56 per cent).
- Percent of children who received any immunisation from/via ICDS workers (47 per cent).
- Percent children who received any health check from Anganwadi (28 per cent).
- Percent children who receive any growth monitoring (38 per cent).
- Percent children who receive pre-school education (21 per cent).
- Percent children who receive take-home food rations (39 per cent ever, 14 per cent in prior month).

Commenting on both the potential and limitations of ICDS, Ahuja (in this volume) notes the challenges administrators face when dealing with competing demands in a resource-constrained environment. In keeping with both systemic pessimism and positive regional stories in this volume, she suggests that the potential for successful reforms may lie at the state level, such as Odisha and Maharashtra. This emphasis on greater potential for reforms at state level seems to be a constant theme throughout various policy discussions in this volume. Patnaik and Sinha (in this volume) focus on success story of PDS reform in Chhattisgarh and Veena Rao (in this volume) refers to success stories from Karnataka Nutrition Mission.

The National Rural Health Mission (NRHM) was launched on 12th April 2005, to provide accessible, affordable and quality health care to the rural population, especially the vulnerable groups. ICDS now fall under its larger mandate.

The NRHM mandate states that the Anganwadi Centre under the ICDS at the village level will be the principal hub for health action. Likewise, wherever village committees have been effectively constituted for drinking water, sanitation, ICDS etc. NRHM will attempt

to move towards one common Village Health Committee covering all these activities.

Since Anganwadis have the responsibility for children under 6, pregnant women and adolescent girls, there is a need for additional space for the ICDS centre that may be used as a health care room. Resources can come from existing rural development programmes under which ICDS centres are being constructed and provided for.

The way forward

The chapters in this volume are a sobering reminder that the forces that lead to high prevalence of undernutrition in India are complex, intertwined and need to be addressed simultaneously through multiple interventions. But little progress is possible if there is no commitment to solving this problem in a multifaceted way. Knowing the full magnitude of the problem and recognising the interconnectedness of the various drivers of undernutrition will yield policy solutions that are sustainable and effective.

Several things need to be done, as mentioned below.

First, at the national level, there is a need for regular, reliable data on undernutrition to track the success of various policy initiatives. Sporadic data collection through uncoordinated mechanisms (e.g. Annual Health Survey done by Registrar General's Office in some states and DLHS-IV in other states done by International Institute of Population Sciences) does not help in creating a solid evidence base – in fact, it sows confusion and creates opportunities for inaction. At the local level there is need for individual-specific data so that undernourished individuals can be identified and treated. Without data, we don't know how much progress is being made and where problems persist. Without data, civil society has less leverage to put pressure on those entrusted with improving public nutrition.

Second, large-scale food policy and programmes under the NFSA need to become more nutrition sensitive. There is some doubt as to whether these programmes, such as PDS, can improve the food security of the poorest, but even if they do, this is not the same as improving nutrition status. For maximum nutrition purchase, these programmes need to focus on the first 1,000 days after conception and on the nutrition status of adolescent girls. They also need to make strategic choices with nutrition in mind. PDS would become far more nutrition sensitive by, for example, including pulses, which provide additional nutrient diversity. In addition, complementary public

policies minimising nutrient loss during storage and transport are also needed to bolster the efforts that the NFSA can make in addressing the problem of malnutrition.

Third, other key interventions need to become nutrition sensitive. For example, new government initiatives such as the Swachha Bharat Abhiyan are a welcome move, the mere construction of toilets will not be able to effect a change in the prevalence of diseases that cause stunting and undernutrition. Behaviour change in the use of latrines is a key issue to address as are toilet designs which ensure that grey water run-off does not pollute ground water. However, this behaviour change cannot simply be directed at women – a more nuanced view of gender dynamics in terms of household division of responsibilities and resources and their effects on undernutrition, and patriarchal structures that keep women and their children in a cycle of undernutrition is required in order to address this problem cohesively.

Fourth, programmes that do have an explicit nutrition focus, such as ICDS, need to be implemented properly, with frontline staff positions filled with nutrition workers who have been trained and are incentivised to do the right thing at the right time with the right children – all in coordination with other health workers.

Finally, it is in understanding the governance arrangements around tackling undernutrition that most impact can be made on the scale of this challenge. As noted above, there are positive public policy initiatives that are already in place. What is needed is a strong commitment by the government and policy actors to operationalise these initiatives in a nutrition-sensitive manner.

At the time of writing this book, preparations for the establishment of a National Nutrition Mission were underway (Times of India, August 12, 2014). This is an important opportunity for the Government of India to provide leadership, data, focus, coordination and the determination required to address undernutrition at scale to bring this critical social indicator in line with India's strong economic performance. Indeed, without doing so, future economic growth and India's status – and stature – in the twenty first century will be undermined.

Notes

- 1 IIPS NFHS-3 Report, p. 273.
- 2 World Bank Estimates.
- 3 Planning Commission Estimates 2011–12.
- 4 NNMB Report, Page-162, Table 7.2.1.

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THE ASSESSMENT OF NUTRITIONAL STATUS IN INDIA DURING THE DUAL NUTRITION BURDEN ERA

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Introduction

When India became independent in 1947, the country faced two major nutritional problems: one was the threat of famine and the resultant acute starvation due to low agricultural production and the lack of an appropriate food distribution system; the other was high prevalence of chronic energy and micronutrient deficiencies due to poverty, food insecurity, low dietary intake, high infection rates and resultant nutrient loss. Initially the focus was on improving food production so that the country can become self-sufficient in food production. Data from agriculture showed that thanks to the green revolution, the country attained self-sufficiency (which was then used globally as the index for food security) in food production by 1970; famines and severe food insecurity were no longer a threat but seasonal food insecurity was seen in large pockets.

In spite of spectacular growth in agriculture (a sector in which majority of Indians were working), NSSO data showed that in the 1970s, majority of Indians continued to be poor; expenditure on food constituted more than 70 per cent of their total expenditure but most of them were food insecure. National Nutrition Monitoring Bureau (NNMB) data indicated that over 70 per cent of children were undernourished. India therefore concluded that food grain security at national level does not translate into food security at household level or reduction in undernutrition. The country, therefore, intensified programmes to combat poverty and provided subsidised food grains to the poor through Public Distribution System (PDS) to improve household food

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security. The documentation that even in food-secure households, pregnant and lactating women and pre-school children were not receiving adequate food, led to the initiation of supplementary feeding to the vulnerable segments of the population. Health and nutrition professionals showed that infections can lead to deterioration in nutritional status; and so efforts were made to improve access to health care to enable early detection and effective management of infections to prevent deterioration in nutritional status. These efforts preceded redefinition of food security by the World Food Summit by two decades.

India is currently undergoing economic, social, demographic, health and nutrition transition. While undernutrition and micronutrient deficiencies persist, overnutrition is also emerging as a public health problem. The systems built up to assess progress in improvement in food security, dietary intake and reduction in undernutrition, enabled the country to track the impact of these interrelated transitions and identify the emerging problem of overnutrition very early. The country also embarked on efforts to put together data from different sectors to assess factors associated with the ongoing nutrition transition. Initially persistent undernutrition was seen mainly among poorer segments of population and emerging problem of overnutrition seen mostly among the urban affluent segments. The pace of nutrition transition and current levels of under- and overnutrition varies between states, districts, urban rural location, segments of population and within members of the same family. Currently both under- and overnutrition are seen in all segments of population; micronutrient deficiency, especially anaemia, being common both in under- and overnourished persons.

This manuscript reviews how India's systems to monitor food security and nutritional status have provided data on the dimension and determinants of undernutrition, enabled early detection of the emerging problem of overnutrition, evolved appropriate indicators for assessing nutritional status in the dual nutrition burden era and enabled the formulation of appropriate intervention to combat the dual burden. The manuscript also highlights areas where these systems need to be strengthened in the future to address the double burden of malnutrition.

Food production

Agriculture and allied sectors hold the key to food security of the country and its citizens; therefore high priority was given to improving food grain production in the country and food grain production was closely monitored as a parameter for assessing national food security.

During the first two decades after independence, the country embarked on multipronged interventions with focus on increase in food grain production. The major policy initiative was land reforms to enable the farmers to invest their money, time and labour in improving the farm yield. Policy cum investment decisions included building dams and irrigation canals to improve area under cultivation and reduce impact of vagaries of monsoon on food production. In this enabling environment, the technology of high-yielding varieties of rice and wheat and investment in lab-to-land agriculture extension education provided the necessary impetus for the green revolution. The farmers responded, and there was a rapid increase in food grain production. The country achieved transition from 'ship to mouth existence' to self-sufficiency in food grain production in (which was then used globally as the index for food security) in a decade. Data on the food grain production monitored and reported by the Department of Agriculture showed that India remained self-sufficient in food grain production since 1970s in spite of population growth.¹ The country is projected to remain self-sufficient in food grain production till 2030 when it will become the most populous country in the world.

But while food grain production is important for generating income for farming families, for improving food security at national level and preventing hunger in the population, they by themselves cannot provide a balanced meal needed for optimal nutrition and health. For example, pulse production has been stagnant since 1960² and per capita availability has fallen. Pulses are major source of protein in Indian diets and a balanced diet consisting of cereals, pulses and vegetables should be consumed in adequate quantities for optimal nutrition and health. Emphasising that what is good for soil nutrition and health is also good for human nutrition and health, the National Food Security Mission (2007)³ gave an impetus to improve pulse production. The farmers responded to the inputs from the Mission and the prevailing high cost of pulses. Data from agriculture department showed that over the last three years there has been an increase in pulse production at the rate of 2 million tonnes/year.⁴ It is expected that the country will achieve self-sufficiency in pulse production by 2017 and will remain self-sufficient in pulse production till 2030.

Low vegetable intake has been the major factor responsible for the high micronutrient deficiency in the country. On the supply side, there are problems of low production due to variable and seasonal demand and distress sale during glut due to lack of infrastructure for storage, transport and marketing; the demand side problems include

unpredictable availability and high cost due to high wastage of the perishable vegetables and fruits. With the demonstration in many areas in the country that vegetable production is more remunerative to the farmer with small land holding, vegetable production is increasing.⁵ If the efforts of the National Horticultural Mission in improving cultivation, sorting, grading, storage and marketing of horticultural products succeed, the nutritionists' dream of reduction and later elimination of micronutrient deficiencies through increased intake of vegetables due to improved availability of region-specific micronutrient-rich vegetables at affordable cost in urban and rural areas right through the year can become a reality.

Economic access to food

During the last decade, India was the second fastest growing large economy in the world and the Planning Commission had reported that there has been some acceleration in poverty reduction. In most developing countries, rapid economic growth is associated with a concurrent increase in total energy intake and consumption of animal foods by the population. This does not appear to be the case in India (Ramachandran 2008; FAO 2008).

Time trends in Gross Domestic Product (GDP) growth factor between 1972-73 and 2009-10 and the per capita energy intake of both urban and rural households over this same period (based on NSSO data) are given in Figure 1.1.

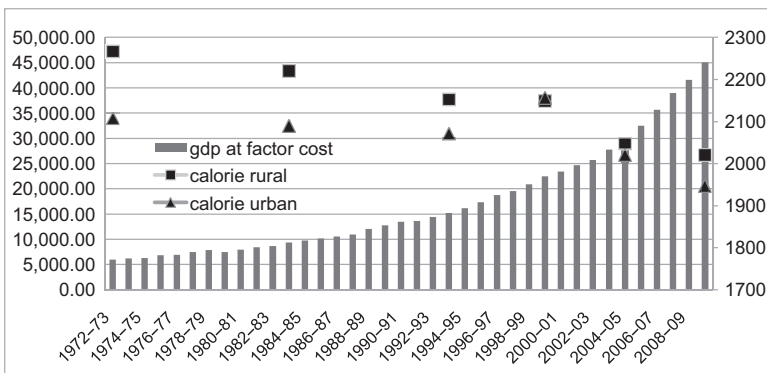


Figure 1.1 Relationship between per capita GDP and energy intake

Source: NSSO surveys and Economic Survey of India.

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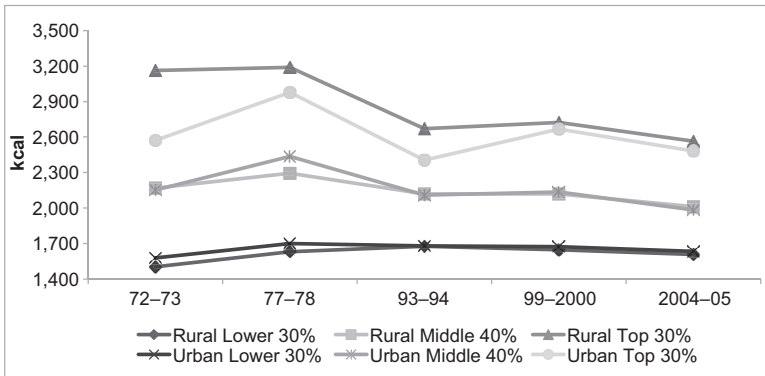


Figure 1.2 Time trends in average per capita intake of energy by expenditure classes

Source: Ramachandran, Prema. 2008. 'Nutrition Transition in India 1947-2007', <http://wcd.nic.in/research/nti1947/NTI1947CONTENT.htm>, accessed on 28 March 2014.

The increase in GDP was accompanied by a progressive reduction in per capita energy consumption in both urban and rural areas. This was generally viewed as a worrisome trend by many economists and policy makers. However, analysis of data from NSSO⁶ on time trends in computed energy intake in low, middle and high expenditure groups shown in Figure 1.2 indicate that: (1) There has been small increase in per capita energy consumption by both urban and rural poor. This is perhaps because cereals which are the major source of energy in Indian diets are readily available, accessible at subsidised cost to the poor. (2) There has been a sustained decline in per capita energy consumption among the urban and rural high and middle income groups. This reduction occurred at a period of high GDP growth and preceded the high food inflation and is therefore unlikely to be due to economic constraints. It coincided with a period of increase in mechanisation of the occupational, transport and household activities and consequent reduction in physical activity. Data from NNMB⁷ surveys where actual dietary intake at home and elsewhere over the last 24 hours confirm the findings of the National Sample Survey Organisation (NSSO) consumer expenditure surveys.

Food grains are being procured at cost fixed by the Government of India and this mechanism had kept the food grain prices at relatively low level. Poorer segment of population can access food grains at

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subsidised cost through PDS. As a result of these interventions, hunger rates (defined as not having two square meals a day is low) in India are relatively low.⁸ Food insecurity, mostly seasonal, is however seen in poorer segments of population living in remote areas. India's global position regarding food insecurity as assessed by hunger rates is comparable to other developing countries.⁹

Food price inflation is emerging as a new threat to household food security not only among the poor but also the middle income groups. Food inflation was lower than the GDP growth rate till 2008–09 but thereafter has surpassed it. Continued increase in food inflation coupled with slower economic growth is likely to have an adverse impact on food security, particularly on diet diversity and micronutrient intake.¹⁰

Consumption expenditure on food

The NSSO has been providing data on consumer expenditure on food and non-food items since 1973 (rounds 27 in 1972–73, 32 in 1978, 38 in 1983, 43 in 1987–88, 50 in 1993–94, 55 in 1999–2000, 61 in 2004–05, and 66 in 2009–10).¹¹ Time-series data of proportion of expenditure on food and non-food items from NSSO surveys (1973–2009) is given in Figure 1.3.¹² In this period, the share of food

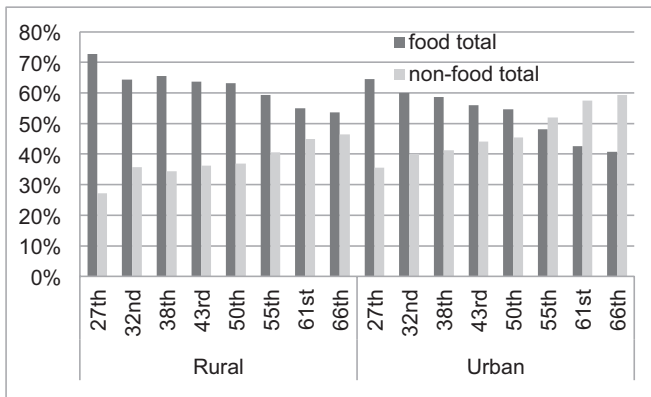


Figure 1.3 Food and non-food items as percent of total consumer expenditure (1973–2009)

Source: Ramachandran, Prema. 2008. 'Nutrition Transition in India 1947–2007', <http://wcd.nic.in/research/nti1947/NTI1947CONTENT.htm>, accessed on 28 March 2014.

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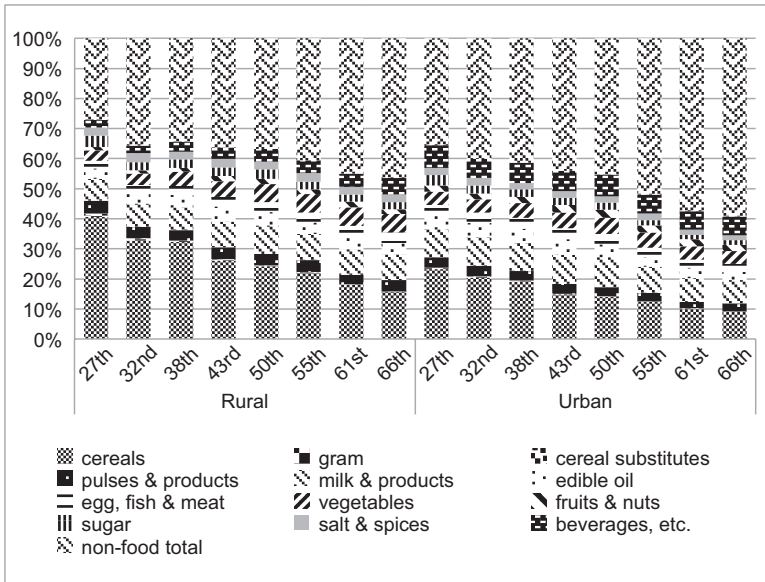


Figure 1.4 Time trends in consumption expenditure on food items (%)

Source: Ramachandran, Prema. 2008. 'Nutrition Transition in India 1947–2007', <http://wcd.nic.in/research/nti1947/NTI1947CONTENT.htm>, accessed on 28 March 2014.

as proportion of total consumer expenditure fell from 73 per cent to 55 per cent in rural areas and from 64 per cent to 42 per cent in urban areas. This is mainly due to steep reduction in expenditure on cereals (Figure 1.4).¹³ This could largely be due to cereals being provided at heavily subsidised cost to the people below poverty line through PDS. Considered in this context, the PDS has enabled the people especially the poor to spend relatively low proportion of their expenditure on cereals without any reduction in the quantity of cereals consumed.

Based on the expenditure on the food stuffs and the cost of food stuff, NSSO calculates per capita consumption of the quantity of the food stuff. Over the years, there has been a narrowing of the urban rural and interexpenditure group differences in cereal consumption and energy. In spite of progressive reduction in the proportion of expenditure on cereals, there has been a progressive increase in the cereal consumption in the lowest fertile expenditure classes. This is to a large extent attributable to poorer segments having improved access

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to subsidised cereals in PDS. There has been a fall in cereal consumption among the middle and high income groups.¹⁴ This might be partly attributable to increase in dietary diversity and partly due to these population groups curtailing their energy intake because of reduced physical activity.

Dietary intake of Indian

Recognising the need for good quality data for monitoring dietary intake and nutritional status, Indian Council of Medical Research (ICMR) in 1972 established the NNMB in the National Institute of Nutrition (NIN), Hyderabad. Since 1973, NNMB has been conducting diet and nutrition surveys in 10 major states, namely Andhra Pradesh, Kerala, Karnataka, Gujarat, Maharashtra, Madhya Pradesh, Odisha, Tamil Nadu, Uttar Pradesh and West Bengal.¹⁵ Surveys conducted by NNMB are the only source of data on dietary intake and nutritional status of all members of the household; based on these data, intra-family differences in dietary intake and nutritional status can be computed.

Data from NNMB rural areas' repeat surveys on dietary intake in the last four decades in terms of food stuffs as percentage of the recommended dietary allowance (RDA) for Indians is shown in Figure 1.5. Over these four decades, there was reduction in intake of cereals (137g), roots and tubers (6g), milk and milk products (21ml), sugar and jaggery (9g), and other vegetables (6g). Pulse intake underwent a

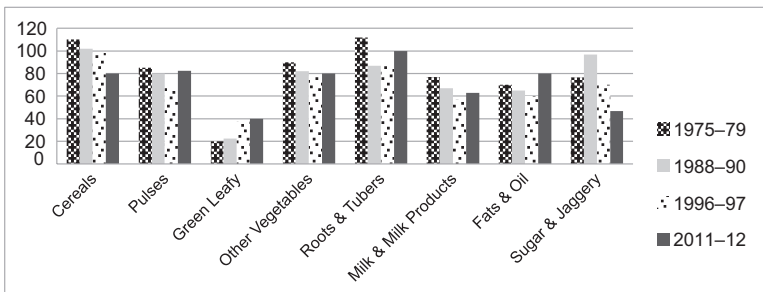


Figure 1.5 Time trends in food intake (NNMB)

Source: National Nutrition Monitoring Bureau (NNMB). ninindia.org/nnmb.htm, accessed 15 March 2015.

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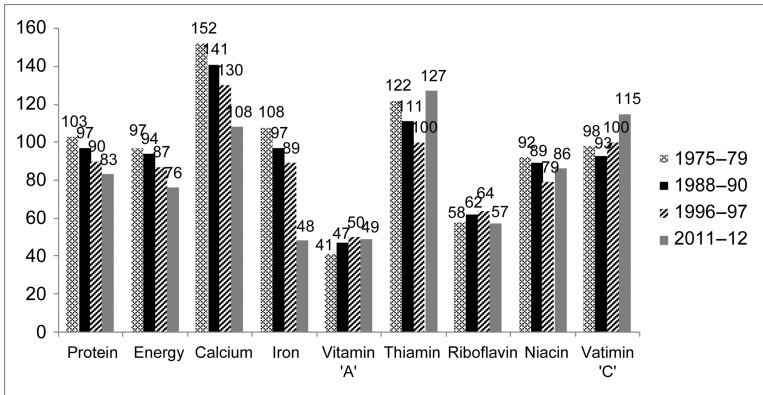


Figure 1.6 Time trends in nutrient intake (NNMB reports)

Source: Technical Reports of the NNMB. <http://nnmbindia.org/downloads.htm>, accessed 15 March 2015.

reduction in the period between 1975 and 1996–7, but increased to almost 1975 levels in 2011–12. There was some increase regarding intakes of green leafy vegetables (8g) and fats and oils (2g). The repeat survey in urban areas showed a similar trend.¹⁶ The data from NNMB surveys using 24-hour dietary recall on household's and individual's dietary intake confirms the finding from the NSSO survey data based on consumer expenditure that over time there has been a decline in cereal intake. The continued low vegetable intake is the major factor responsible for the high prevalence of micronutrient deficiencies in India.

Computed nutrient intake over the last four decades is shown in Figure 1.6.¹⁷ There has been a reduction in the intake of all the nutrients over a period of four decades. The average intake of energy declined by about 500 Kcal/CU/day over the period, mainly due to reduction in the intake of cereals (which are major source of energy) in Indian diets. These data from NNMB surveys confirm the findings from NSSO data that there has been a reduction in energy intake of Indians over the last four decades. There has not been much change in the intake of micronutrients such as iron, vitamin A and riboflavin which remain well below the RDA.¹⁸ This is the reason for the widespread prevalence of micronutrient deficiencies especially anaemia among Indian population.

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Changes in physical activity patterns

Indians in the 1970s had to spend a lot of energy in occupational activities, domestic chores and getting from one place to another without mechanised transport. During the last two decades, there was a steep increase in the mechanisation of the occupational, transport and domestic work domains (Table 1.1).

This has resulted in substantial reduction in physical activity in all groups of population both in urban and rural areas. NNMB surveys showed that even in rural areas over one-third of men and two-thirds of the women were sedentary (Table 1.2).¹⁹ The impact of mechanisation and reduction of physical activity was even higher in urban areas.

Data from NSSO and NNMB surveys and other smaller in-depth studies suggest that unlike many developing countries undergoing

Table 1.1 Proportion of households with vehicles and household appliances

	<i>Rural</i>	<i>Urban</i>
Average monthly income	1,860	12,674
Transport		
Motorised two-wheelers	7.9	78.2
Car	0.2	12.2
Household appliances		
Washing machine	0.1	44.4
Kitchen mixie	4.5	95.2
TV	24.9	98.2

Source: NSSO surveys. 'Nutrition transition in India 1947–2007', <http://wcd.nic/publications.htm>, accessed 10 March 2015.

Table 1.2 Physical activity levels in rural population (NNMB)

<i>Activity status</i>	<i>Men</i>		<i>Women</i>		<i>Total</i>	
	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>
Sedentary	1,349	33.3	2,765	62.7	4,114	48.6
Moderate	2,650	65.5	1,632	37.0	4,282	50.6
Heavy	48	1.2	14	0.3	62	0.8

Source: Technical Reports of the NNMB. <http://nnmbindia.org/downloads.htm>, accessed 15 March 2015.

economic transition, Indians have not by and large increased their energy intake or invested in improving dietary diversity by consuming animal products.²⁰ The reduction in energy expenditure due to lower physical activity and relatively unchanged energy intake appear to be the major factors leading to rising overnutrition rates in India. Moderate physical activity is essential for health. If majority of the population follow the recommendation that there should be increase in discretionary physical activity (such as walking for 30 minutes a day), the projected steep increase in overnutrition and associated health hazards can be prevented. It is important to note that the surveys developed for tracking the progress in improvement in food security and reduction in undernutrition rates have provided the data for identifying factors responsible for the emerging problem of overnutrition and potential intervention for combating overnutrition.

Recommended dietary allowances for Indians

India is a pioneer in exploring human nutrient requirements and has contributed substantially to the global research in this area. The expert committees of World Health Organization (WHO)/Food and Agriculture Organisation (FAO) periodically review the data on human nutrient requirements reported from research studies using newer technologies and changing life style of the populations, and draw up revised recommendations regarding human nutrient requirements. FAO/WHO/UNU revised the human nutrient requirements in 2004 (FAO 2004). India undertook a similar exercise and revised Recommended Daily Allowances (RDA) for Indians in 2010 (ICMR 2010). Right from the beginning, India had computed the requirements for 'reference persons' who are having the optimal stature and weight which is appropriate for that stature. The reference man weighs 60 kg and reference women weighing 55 kg; the reference weight for all other groups is taken as the 97th centile of weight for all groups as per NNMB survey. This formula was used in order to ensure that the recommendations were for the normal persons and not for the undernourished persons.

As long as the major problem was only undernutrition, this approach was fine as it allowed additional energy for the undernourished to overcome undernutrition. But with the emergence of overnutrition, the fact that excess energy intake can lead to overnutrition and its adverse consequences have to be taken into account. Therefore, while undertaking the exercise of evolving RDA for Indians during the dual nutrition burden era, the expert committee provided the energy

Table 1.3 Energy requirement for actual weight

<i>Group</i>	<i>Actual weight</i>	<i>Requirement for actual wt</i>	<i>Act Intake</i>	<i>Gap</i>
Men	51	1,989	2,000	11
Woman	46	1,656	1,738	82
Pregnant woman		1,906	1,726	-180
Lactating woman		2,155	1,878	-277
Children				
1-3yrs	10.5	840	714	-126
4-6yrs	14.6	1,095	978	-117
7-9yrs	19.7	1,379	1,230	-149
Boys				
10-12yrs	26.6	1,729	1,473	-256
13-15yrs	36.8	2,208	1,645	-563
16-17yrs	45.7	2,514	1,913	-601
Girls				
10-12yrs	26.7	1,469	1,384	-85
13-15yrs	36.9	2,030	1,566	-464
16-17yrs	42.6	2,130	1,630	-500

Source: Author computations from the RDA for Indians. <http://icmr.nic.in/final/RDA-2010.pdf>, accessed 15 March 2015.

requirement for the reference population and also provided energy requirements per kg for the population so that computation of nutrient requirements based on the current actual weight of the population groups can be made. Computed energy intake for the average Indians of varying age, sex and physiological status based on their current average weight is given in Table 1.3.

Taking into account their current stature and weight and the lower level of physical activity, the current average energy intake by and large meets the revised RDA for adults. However there are energy deficits in children, adolescents, pregnant and lactating women. Bridging the energy gap in pregnant and lactating women is a priority not only because of the implications of maternal undernutrition for the mother's health, but also because maternal undernutrition can adversely affect intrauterine growth and growth during infancy. Efforts are being made to bridge the gap in energy intake of pre-school and school children through food supplementation programmes (ICDS and mid-day school meal programmes), but often these end as substitute for home food rather than additions to home food.

Intra-family differences in dietary intake and nutritional status

In India, efforts have been focused on improving household access to food with the assumption that food will be shared within the household on the basis of need. NNMB Survey data since mid-1990s showed that this may not be the case (Figure 1.7). Energy intake was adequate in both adults and children in one-third of the families both during the 1975–80 and 1996–97 surveys. During this period there was fall (from 19.1 per cent to 7.2 per cent) in the households where all the members had inadequate energy intake. This might be due to reduction in poverty and better access to subsidised food in the 1990s.

During the same period the proportion of families, where adults have adequate energy intake but children did not, increased from 25.4 per cent to 42.9 per cent. Subsequent NNMB surveys have shown that in the current decade there has been a further increase in the proportion of the families where adults are getting adequate energy but children do not.²¹ Initially when these data on intra-family differences in dietary intake and nutritional status from NNMB surveys were presented, it was received with a lot of scepticism. However, confirmation of these findings came in 2006 with the data from the National Family Survey 3 which showed that there were substantial differences in nutritional status between mother and the under-five child in the same household (IIPS 1995, 2002, 2009), (Figure 1.8). In families where the mother is overnourished, it is unlikely that poverty and household

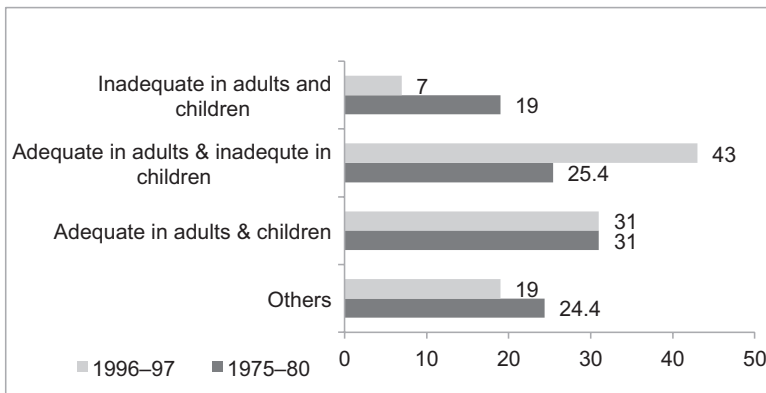


Figure 1.7 Intra-family differences in dietary intake

Source: NNMB surveys.

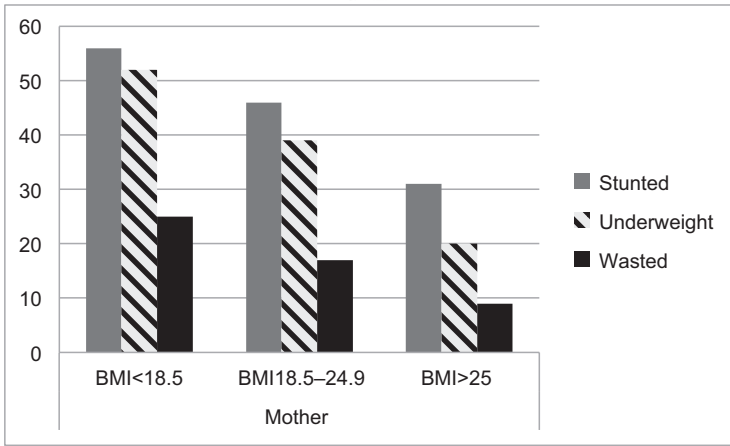


Figure 1.8 Differences between mother and child nutrition status

Source: NFHS 3.

food insecurity be reason for inadequate energy intake and undernutrition among children. Poor child feeding and caring practices might be a major factor responsible for the problem; nutrition education holds the key for correcting this problem.

Anthropometric assessment of nutritional status

Three anthropometric indices (weight, height and body mass index) have been widely used to assess nutritional status in children and adults. Stunting in children due to poor growth is an important indicator of cumulative impact of past undernutrition. Improvement in dietary intake can prevent further stunting but even early childhood stunting cannot be reversed. Weight (weight for age in growing children) indicates the cumulative impact of past and current undernutrition; because of ease of measurement, weight has been the most widely used indicator for assessment of nutritional status. Underweight due to current energy deficiency can be reversed and the reversal can be monitored by improvement in weight. Height of the person is one of the major determinants of weight. If chronic undernutrition has led to stunting, stunted persons with appropriate weight for their height will continue to be underweight as compared to persons with normal height. With the emergence of dual nutrition burden, it became essential to distinguish between these two types of underweight.

Taking into account the massive differences in height in adult in the same country and between countries and the fact that adults' height cannot be altered, Body Mass Index (BMI) [weight kg/height in metre (IIPS 1995, 2002, 2009)] has always been used to assess nutritional status in adults. However, BMI has not been used widely for assessment of nutritional status in children. WHO had provided the standards for BMI for children of 0–5 years in 2006²² and the 6–18²³ years in 2007. WHO has recommended that BMI for age which provides information on current nutritional status should be used as the indicator for defining under- and overnutrition in children. Association between increased risk of infections with low BMI for age (Ramachandran and Gopalan 2009) and increased risk of cardiovascular diseases with high BMI²⁴ or rapid increase in BMI in childhood has been demonstrated in India.

In India, stunting rates are high. Over 40 per cent of Indian pre-school children are stunted and underweight. But majority of the short children have weight appropriate for the height and age and only about 17 per cent are thin. Infants and children who are short and have weight appropriate for their height and age get misclassified as being underweight and undernourished. Short children may have high BMI for age and be still underweight because they are short (Figure 1.9).

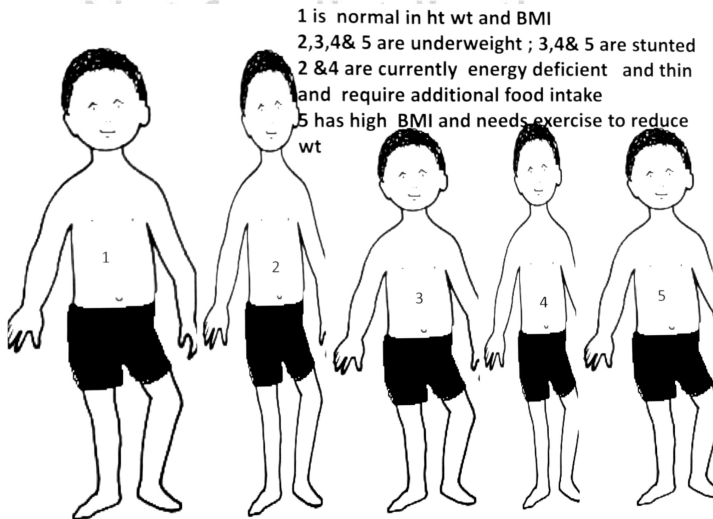


Figure 1.9 Graphic representation of BMI for 7-year-old boy

Source: Author.

Use of BMI for age will reduce the risk of misclassifying short children. BMI for age which takes into account weight for the current height and age is now being accepted and used as an important indicator for assessment of current nutritional status in children especially in countries with high stunting rates and dual nutrition burden.

Nutritional status of children and adults

In India, NNMB surveys provide data on nutritional status of all members of the household since mid-1970s. National Family Health Surveys (NFHS) provide state level estimation of nutritional status. NFHS-1 conducted in 1992–93 provides data on nutritional status of pre-school children, NFHS-2 conducted in 1998–99 on nutritional status of pre-school children and women in reproductive age group, and NFHS-3 conducted in 2005–06 on nutritional status of men as well (IIPS 2009). Data from these two national surveys provide some very interesting information on time trends in nutritional status of Indians.

Nutritional status of pre-school children

Data from NNMB surveys on prevalence of undernutrition by stunting, underweight and low BMI are given in Figures 1.10 and 1.11. Right through all the years stunting rates are higher than the underweight rates and wasting rates are the lowest. Over the last four decades stunting rates have declined by roughly 1 per cent per year; the reduction in underweight rate is lower: less than 1 per cent per year; reduction in wasting rates is about 0.2 per cent per year.

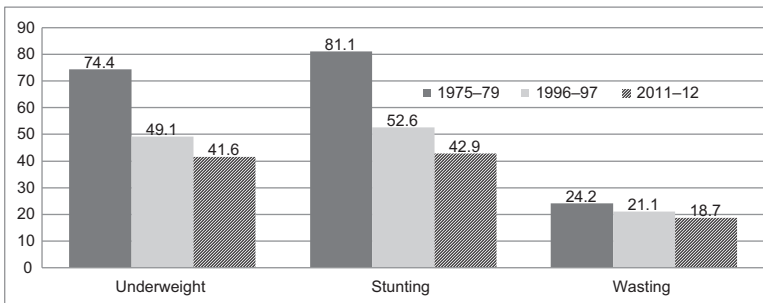


Figure 1.10 Time trends in undernutrition, 1–5-year-old girls

Source: NNMB; WHO 2006.

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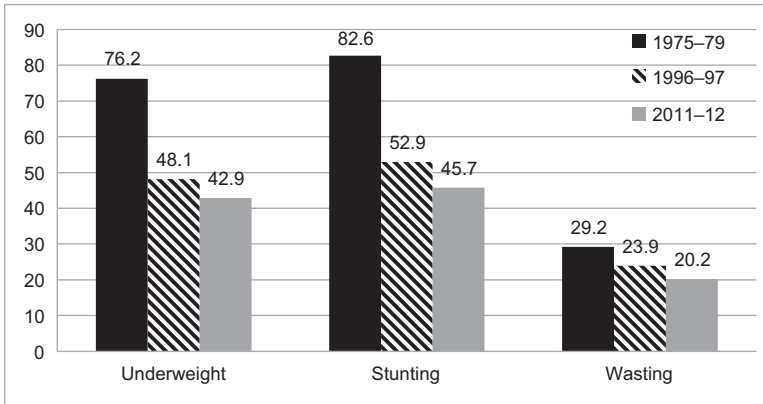


Figure 1.11 Time trends in undernutrition, 1-5-year-old girls

Source: NNMB; WHO 2006.

The rates of decline in all the indices were faster in the period 1975-96 as compared to the period 1996-2012. Major improvement in access to health care occurred in the period 1975-96 but coverage under supplementary nutrition programmes under ICDS was quite low.²⁵ So the majority of the decline in undernutrition in children in this period might be attributable to improved access to health care and consequent reduction in the nutrition toll of infection. The reason for the lower rate of decline in the undernutrition rates in the last 15 years is not clear. This could possibly be due to the following two factors:

- 1 In the period 1996-2012 the geographic coverage under the ICDS programme has improved substantially; but NFHS3 data indicate that less than one-fifth of the eligible children are receiving food supplements (IIPS 2009). The policy and programme guidelines that there should be universal screening of children and underweight children should get double rations²⁶ is not yet operationalised universally in the ICDS programme.
- 2 The law of diminishing returns may be operating in health sector programmes in the southern states covered by NNMB surveys.

Data from the three National Family Health Surveys provide data on prevalence of undernutrition in pre-school children during the

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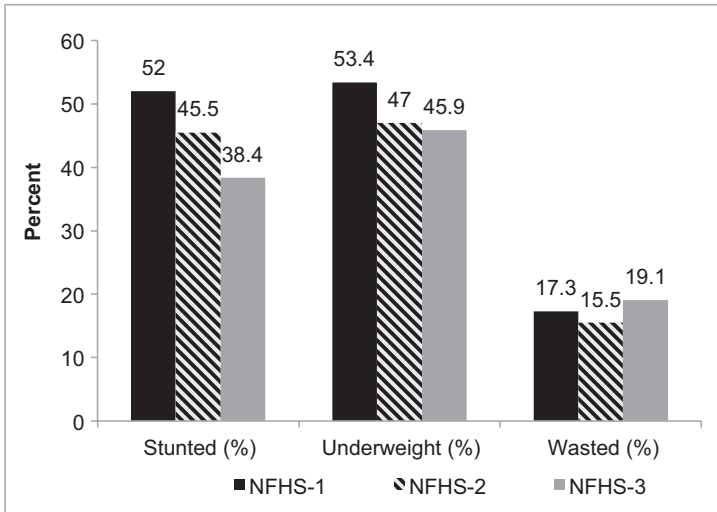


Figure 1.12 Nutritional status of children in India

Source: NFHS 1, 2 and 3.

period 1995–2006 showed that there has been sustained reduction stunting roughly about 1 per cent per year (Figure 1.12).

Sustained reduction in stunting rates is an indication that over these years there has been an improvement in nutritional status of children. Reduction in underweight between NFHS-2 and 3 was of a smaller magnitude as compared to reduction in stunting. As a result, there was a rise in wasting rates. The rise in wasting rates occurring when there is a sustained decline in stunting rate should not be interpreted as deterioration in nutritional status. If wasted children are identified and provided with appropriate intervention (treatment of infection, correction of IYCF or supplementary feeding), wasting will be reversed. If wasting is reversed, the linear growth will continue normally and stunting will be prevented. Over the last decade, all policy and programme documents have been emphasising the importance of screening of pre-school children, identification of undernourished children and providing them IYCF counselling, take-home rations, health care and monitoring improvement (Planning Commission 2002, 2008, 2013). When these programmes get fully operationalised, there will likely be a substantial reduction in wasting and stunting will be prevented.

Long-term follow-up studies of the Delhi cohort (Bhargava et al. 2004) showed that though one-third of infants in the cohort were born with low birth weight and nearly half remained underweight till 12 years of age; but, by the time they were 30 years of age, over half were overnourished (BMI >25). In this cohort the prevalence of hypertension and diabetes (and impaired glucose tolerance) was 16 per cent. Infants and children who gained BMI more than the group average were at greater risk of developing hypertension and diabetes. These data suggest that in the dual nutrition burden era, children and adolescents who were undernourished and stunted may be at greater risk of becoming overweight adults.

Nutritional status of school-age children

Data on prevalence of under- and overnutrition in pre-school children and adults from the NFHS-3 survey showed that if BMI is used as the indicator for assessment of nutritional status, both under- and overnutrition are lowest in the pre-school children and highest in adults (IIPS 2009). Data from NFI's studies (Figure 1.13) (unpublished data) and NNMB surveys indicate that school-age children have undernutrition and overnutrition midway between the pre-school children and adults.

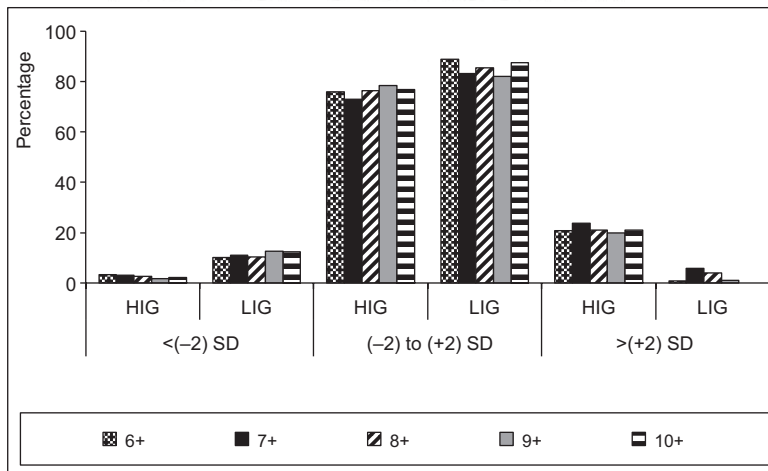


Figure 1.13 Prevalence of under- and overnutrition in boys using BMI (NFI)
 Source: NFHS 1, 2 and 3.

Computed gap between RDA and actual intake from NNMB diet surveys indicate that there is a large energy gap in the adolescents (Table 1.3) (ICMR 2010).²⁷ Adolescent growth spurt offers the final period when nutrition interventions can modify the linear growth. In this context the extension of the midday meal (MDM) to the upper primary school offers a new avenue to combat energy deficit and undernutrition in adolescents (Planning Commission 2013). If school health system undertakes height and weight measurements and computes BMI to identify the school children with wasting and the MDM provides additional food supplements to them, there can be substantial reduction in wasting. This in turn will enable accelerated linear growth during adolescence and improvement in adult height.

Over the last decade, many research studies have reported high over-nutrition rates in urban affluent children especially adolescents. This is a major area of concern. Two factors often acting in combination has been shown to be responsible for the spurt in overnutrition in adolescents: one is the consumption of energy dense food stuffs; the second is the very low physical activity level. Many of these children are short; if weight for age is used as the index for assessment of nutritional status they will get misclassified as normal or even undernourished. Identification of these overnourished children and adolescents is possible by using BMI for age. Once identified, they should be advised to increase physical activity; if they are consuming energy dense food these, should be curtailed and then eliminated. The change in lifestyle if achieved during adolescence can become the lifestyle even in their adult life and prevent recurrence of overnutrition and its adverse health consequences.

Nutritional status of adults

Adults vary in stature and these variations in height cannot be modified. Therefore BMI has always been used as the indicator of nutritional status in adults. NNMB data on time trends in prevalence of undernutrition and overnutrition in adults (men and women) is given in Figures 1.14 and 1.15.²⁸

There has been a 20 per cent decline in undernutrition over the last four decades. The reduction in wasting in adults is of much higher magnitude than the reduction in wasting in pre-school children. This might be mainly attributable to decline in poverty, improved access to subsidised food and improved access to health services. However, it is a matter of concern that about one-third of men and women in India are still undernourished (BMI < 18.5). The National Food Security Act may

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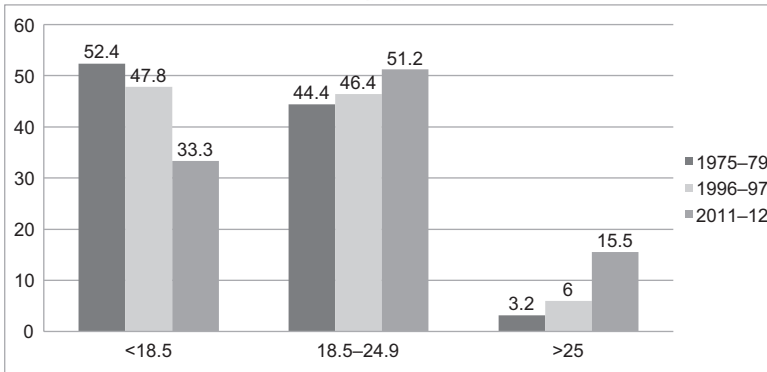


Figure 1.14 Distribution of adult women by nutritional status according to WHO standards (%)

Source: NNMB Data.

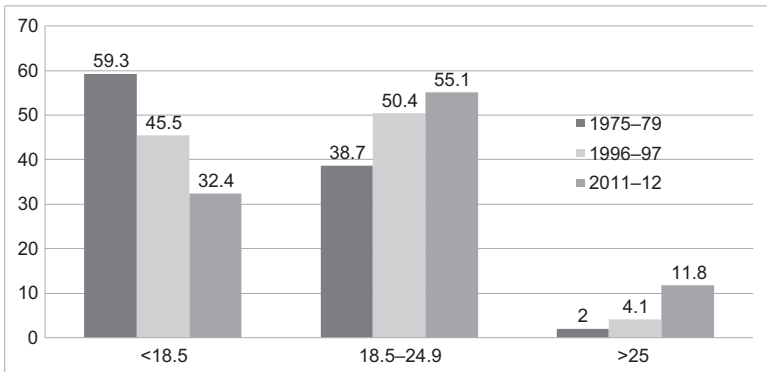


Figure 1.15 Distribution of adult men by nutritional status according to WHO standards (%)

Source: NNMB Data.

provide the needed impetus to improve the energy intake and nutritional status of the wasted adults from poorer segments of population.

The rise in overnutrition rates over the decade between 1976 and 1986 was relatively small about 2-3 per cent. In contrast the last 15 years witnessed an increase in overnutrition rates of about 7-9 per cent. When compared to other developing countries undergoing similar economic

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transition, the rise in overnutrition rates in adults is relatively lower (FAO 2006). This might be partly due to the observed reduction in energy intake in the population. The rise overnutrition rates are largely due to steep reduction in physical activity. Current efforts to promote awareness about the need to physical activity for normal health and nutrition may pay good dividends in terms of reducing or halting the projected increase in overnutrition rates.

Data from NFHS-3 (IIPS 2009) indicate that prevalence of both under- and overnutrition is higher in women rendering them at higher risk of adverse health consequences of both. Data from NFHS-3 (IIPS 2009) also indicate that prevalence of undernutrition in women is high in younger women; this has adverse impact on reproductive performance. Prevalence of overnutrition increases with age and in some urban areas in some developed states almost a third of women beyond 40 years are overnourished rendering them more prone for non-communicable diseases.

Micronutrient deficiencies

Micronutrient deficiencies referred to as 'hidden hunger' are the most common nutritional problems in the world affecting one-third of global population. While undernutrition is due to insufficient quantity of food consumed, micronutrient deficiencies reflect the poor quality of food consumed. Iodine deficiency disorders, vitamin A deficiency and anaemia were recognised as major public health problems in India and public health interventions programmes were initiated to combat all these three micronutrient deficiencies.

Iodine deficiency disorders (IDD)

Iodine deficiency disorder (IDD) is due to deficiency of iodine in water, soil and foodstuffs and affect all socioeconomic groups living in a defined geographical region. Although the prevalence of IDD in India is lower than in most South Asian countries, the problem is ubiquitous. In the eighties the data from DGHS/ICMR surveys indicated that IDD is not a problem confined to the sub-Himalayan regions; there are pockets of iodine deficiency in all the states (Planning Commission 2002).

Salt fortification with iodine has been used worldwide for prevention of IDD for nearly a century. National Goitre Control Programme (NGCP) was launched by the Government of India in 1962 and the focus of intervention was in the sub-Himalayan goitre belt. Following

Table 1.4 Progress in salt iodisation (UNICEF)

<i>Iodine content of salt</i>	2009
Adequate (≥ 15 ppm)	71.4%
Inadequate (<15 ppm)	19.3%
No iodine	9.3%

Source: UNICEF India report on IDD.

the demonstration that there are pockets of IDD in all states it was decided to iodise the entire edible salt for human consumption in the country. NGCP was revamped and re-named as National Iodine Deficiency Disorders Control Programme (NIDDCP). There has been progressive improvement in access to iodised salt in the country and as of 2009, over 90 per cent households access iodised salt (Table 1.4). The goal of the NIDDCP is to ensure universal household access to iodised salt by 2012 and reduce the prevalence of IDD below 10 per cent in endemic districts of the country (Planning Commission 2002). This goal is likely to be achieved soon.

Vitamin A deficiency

Vitamin A is an important micronutrient for maintaining normal growth, regulating cellular proliferation and differentiation, controlling development, and maintaining visual and reproductive functions. Diet surveys have shown that the intake of Vitamin A is significantly lower than the RDA. In spite of the fact that there has not been any significant improvement in the dietary intake of Vitamin A and coverage under Massive Dose Vitamin A programme has been low, there is a decline in clinical vitamin A deficiency in under-five children in the country. This could perhaps be due to increase in access to health care, consequent reduction in severity and duration of childhood morbidity due to infections and infection-related vitamin A loss but, biochemical deficiency continues to be common. Coverage under massive dose vitamin A improved with the biannual administration (Planning Commission 2002, 2008, 2013). Advocacy for improved vegetable intake with focus on green leafy and orange vegetable coupled ready access to these at affordable cost throughout the year can go a long way to improve improving vitamin A dietary intake in the population and may enable the country to discontinue medicinal supplementation.

Proof Anaemia

India is among the countries with highest prevalence of anaemia in the world. As India is a population billionaire, the country accounts for the largest number of anaemic persons in the world. Over the last six decades, there has been a reduction in severity of anaemia and some of the adverse consequences associated with it but there has not been any substantial reduction in the prevalence of anaemia. The high prevalence of anaemia is due to the following reasons:

- Low dietary intake, poor iron and folic acid intake in habitual diets low in vegetables
- Poor bio-availability of iron in phytate fibre-rich Indian diet
- Chronic blood loss due to infection such as malaria and hook-worm infestations.

Anaemia begins right from infancy and childhood, increases in severity during adolescence in girls, antedates pregnancy and gets aggravated during pregnancy. Prevalence of anaemia is high even in high income groups and among well-educated pregnant women (Figure 1.16).²⁹

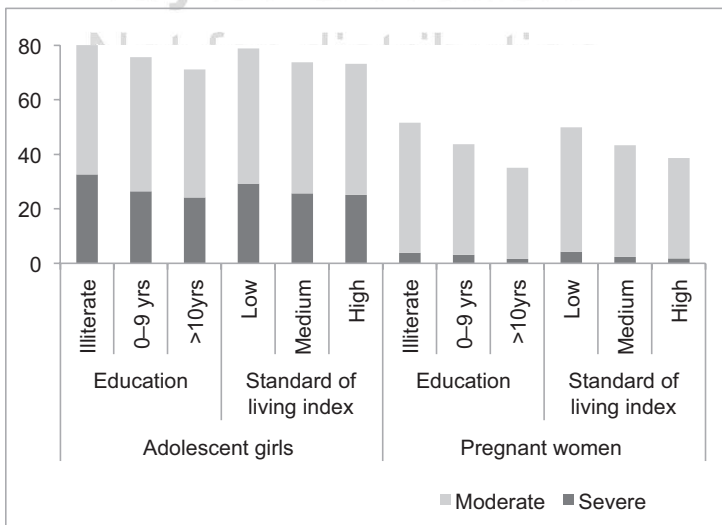


Figure 1.16 Prevalence of anaemia in adolescent girls and pregnant women by education and standard of living index

Source: DLHS 2.

Prevalence of anaemia is high not only among undernourished persons but also in normal and overnourished individuals.

The major intervention strategies for prevention of anaemia in billion plus Indians are as follows:

- Health and nutrition education to improve overall dietary intakes
- Dietary diversification ensuring inclusion of iron and folate-rich foods as well as food items that promote iron absorption
- Food fortification, especially introduction of iron and iodine-fortified salt (Planning Commission 2002, 2008, 2013).

In view of the wide prevalence of anaemia it is not possible to screen and treat all persons with anaemia. Currently the national programmes aim at screening for early detection of anaemia among vulnerable groups such as pregnant women and children and providing anaemic persons appropriate management of anaemia depending upon its severity, chronicity, physiological status of the individual and the time available for correction of anaemia (Planning Commission 2002, 2008, 2013).

Conclusions

Sixty five years ago India faced major challenges in providing food security and improving nutrition and health status of its citizens. Immediate focus after independence was on increasing food production to achieve self-sufficiency at the national level, so that the country is not dependant on imported food grains for meeting the needs of the citizens. In the sixties and seventies the term 'food security' was used to assess country's ability to assure adequate food grain supply for its current and projected population. By this yard stick, India became food secured in the 1970s.

But this did not result in immediate improvement in economic access to food, household food security or nutritional status. India therefore intensified programmes to combat poverty and provided subsidised food grains to the poor through PDS to improve household food security, food supplementation to pregnant and lactating women and pre-school children and improved access to health care. The country invested in building up systems of third-party monitoring and evaluation of all these interventions.

Data from sectoral monitoring provided important inputs for mid-course correction of programmes in each of the sectors. For instance

National Agricultural statistics not only provided information about the adequacy of food grain production but also provided warning about the stagnant pulse production and inadequate vegetable production to meet the needs of the population. The Tenth Five Year Plan (Planning Commission 2002) articulated the need for 'nutrition orientation of food production policies and programmes' and enabled formation of the National Horticultural Mission and National Food Security Mission to increase vegetable, pulse and food grain production. This preceded the FAO advocacy for 'nutrition sensitive agriculture' by a decade.

Monitoring systems for assessing progress in combating undernutrition provided the data on slow but steady decline in undernutrition but also gave the early warning about the emerging problem of overnutrition and unaltered high rates of anaemia. The Tenth Five Year Plan recommended made appropriate strategies and programmes to combat these, and the programme interventions are getting operationalised. Studies from India highlighted the need for the country to use BMI for assessment of nutritional status not only in adults but also follow the recommendation of WHO to start using BMI for age for assessing under- and overnutrition in children.

When data from different sectors were put together and analysed many important finding emerged. For instance there is a direct relationship between food availability, affordability and access and hunger. Food and nutrition are closely linked. But over the last two decades Indian nutrition scientist have been documenting the fact that ready access to affordable food grains and absence of hunger does not necessarily translate into normal nutrition or freedom from micronutrient deficiencies. The dichotomy between low dietary intake and undernutrition in countries with shorter population is now acknowledged by FAO (2014).

When data on GDP growth when plotted against energy consumption, it became obvious that unlike other developing countries, high GDP growth in India was associated with steady decline in energy intake in middle and high expenditure groups. This was not due to economic constraints as the food inflation was low till 2008. Research studies showed that there was a steep reduction in physical activity due to mechanisation during this period. Putting all these data together it appeared that the population realised that they are becoming sedentary and voluntarily reduced their energy intake; this might be an important factor in the relatively slow increase in overnutrition rates. But moderate physical activity is essential for

optimal health; so the advocacy for increasing discretionary physical activity for maintaining optimal nutrition and health status was initiated.

Parameters for assessment of food security and nutritional status remain the same whether the country is facing undernutrition or has to cope with dual nutrition burden. Clearly large scale, the third-party monitoring systems built up decades earlier for assessing improvement in food security and nutrition have served India well both for monitoring the progress and for providing early warning about emerging problem of overnutrition. This strategy of well-structured third-party monitoring of a wide variety of parameters used for assessing food security and nutritional status may continue to provide useful leads during the future too. Special emphasis has to be on putting data from economic, social and demographic sectors along with the data from food production, distribution, consumption and nutritional status so that both the change and the factors responsible for the observed change could be identified. Based on the findings appropriate interventions to combat adverse consequences and accelerate the pace of favourable trends can be formulated and implemented. The same systems would also enable the country to monitor impact of these interventions and undertake midcourse corrections.

Notes

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48

THE ELEPHANT IN THE DARK

Finding ways to end India's hunger
and malnutrition*Harsh Mander and Ashwin Parulkar¹*

The discourse around the pathways for ensuring sufficient and assured food and nutrition for all children, women and men in India has been rich, vigorous and diverse. These discussions, to which scholars, policymakers, activists and the lay public have energetically contributed, have been sometimes fractious and even occasionally bitter and adversarial. But we will argue in this paper that a much greater problem than the occasional antagonism between scholars in each of these areas is that many participants in the food and nutrition discourse in India tend to operate in separate silos with little interaction and learning from one another, positing their diverse positions as oppositional rather than complementary truths.

We are reminded of an ancient Indian fable – rooted in Jain, Buddhist, Sufi and Hindu traditions – about five blind men trying to understand what an elephant looks like. Some versions talk of sighted men in a dark room, and we prefer this rendering because in our experience we have found blind persons frequently very insightful about their surroundings despite their impairment. (Strangely, women never figure in any versions we could find of this story.) These sighted men in the dark room try to understand what an elephant looks like by feeling various parts of it. One touches the legs and is convinced it is like a pillar; another strokes the belly, certain that it is like a wall; a third the tail, confident that it is like a rope; a fourth the ear, positive that it is like a hand fan; and a fifth the tusk, sure that the elephant is a hard cone. The men argue long, bitterly and inconclusively, unable to brook or understand what they see as the obvious fallacy of all the other observers. The point that each of them misses is that all are right, but

all incompletely so. It is our conviction that most of the competing Indian narratives around food sufficiency and nutrition are likewise true, but each taken alone is *incompletely* true.

This paper will try to map some of the major debates exploring the ‘elephant’ of India’s failure to end hunger and malnutrition. This ‘elephant’ is one of modern India’s most complex riddles: why such high levels of hunger and malnourishment stubbornly persist in a country with the wealth, food production, democratic institutions and state capacities to ensure food and nutrition for all? This question has been variously described as the Indian food security enigma (Pritchard et al. 2013), India’s great paradox (Mander 2012) and India’s nutritional emergency (Dreze 2003). We will argue in this paper that the major fallacy is to view the alternate explanations as mutually exclusive, or as competing, absolute truths (as its proponents often tend – overtly or tacitly – to present them). Instead, each are complementary but in themselves incomplete truths. Only when taken together can they provide a more complete picture to understand both what causes such stubborn levels of hunger and malnutrition to persist, but also suggest pathways to end this unfortunate perpetuation of avoidable human suffering.

The paper will identify five major streams of these competitive treatises, or if one carries forward the metaphor of the elephant, five distinct body-parts of the ‘elephant’ of India’s hunger and malnutrition enigma.

Body-part one: Food security

One very large body of scholarship and policy conversations focuses on the broad area of what is called ‘food security’. There are in the literature more than 200 different definitions of food security (FAO 2003), but what all of these definitions have in common is the understanding that hunger can never end unless we have in place policies, technologies and strategies to ensure that we grow enough food for every mouth.

In a country in which the economy was enfeebled by two centuries of colonial rule and which was humiliatingly and precariously dependent on food aid to feed its vast populations, it was not surprising that national food security was a dominant policy preoccupation in the early decades after Independence. ‘Grow More Food’ became a national campaign, state officials were immersed in agricultural extension, agricultural universities were awash with new technologies, and Prime Minister Lal Bahadur Shastri’s slogan *Jai Jawaan Jai Kisaan*²

resonated with people across the country: the farmer (along with the soldier because of a series of wars with Pakistan and China) became the country's heroes. With the aid of new high-yielding technologies, India made spectacular leaps in its food production to become fully self-sufficient in just 10–15 years (Chand 2010).

But the seeds for the current crisis in Indian agriculture were already laid in the strategy of the Green Revolution, which placed its bets on a few agriculturally prosperous regions, and on technologies which required levels of investment and risk-taking which were not feasible for small farmers. The impoverishment of the small farmer in rain-fed agricultural regions was aggravated by the subversion of land reform laws and the sluggish growth of the non-farm sector. Worries about the sustainability of these food production strategies led M. S. Swaminathan, widely regarded as the father of India's Green Revolution, to call for a transition to an 'Evergreen Revolution' (2006). He recognised the grave dangers created by indiscriminate application of chemical fertilisers and pesticides, irrigation without drainage, leading to land degradation, and ground water and forest depletion.

However, the crisis deepened with the policies of structural adjustment initiated in the 1990s, which many felt integrated the farmer with the global economy too quickly and without sufficient protections or preparation; this was accompanied also by a decline in public investment in agriculture. Annual agricultural growth decelerated from 3.5 per cent during 1981–1997 to 2 per cent during 1997–2005. Agriculture employs nearly 58 per cent of India's total workforce and generates more than 55 per cent of rural income (Kadiyala et al. 2012). Despite this, agriculture's share in the country's Gross Domestic Product (GDP) fell to 15 per cent compared to the corporate sector, which employs less than 1 per cent of the workforce, and the services sector, employing 9 per cent of the workforce, which account for 33 per cent and 55 per cent of GDP, respectively (Right to Food Campaign 2010). Public investment in agriculture fell to as low as 5 per cent. And much of this investment again benefited disproportionately the large farmer, with high subsidies on chemical fertilisers, pesticides and electricity.

And while India remains a food surplus nation (FAO 2011), agricultural production began to fall short of population growth rates in the early part of the first decade of the twenty-first century. Production lags have recently recovered but the sustainability of agriculture in India remains a worry – since the 1991 economic reforms, farmers have experienced declines in farm income, consumption, employment and credit availability (Pal and Ghosh 2007). Additionally, high

incidences of farmer suicides and the below subsistence-level food expenditure of farm households across India has forced even the Government of India to admit that the country faces an agricultural crisis (Bello 2007; Sainath 2012; NSSO; Singh 2006).

Trying desperately to cope with the double whammy of globalisation and a retreating state, middle and small farmers fell more and more into debt from unregulated, mainly private creditors, and over-exploiting ground water and chemical inputs in ways that pushed down ground water to alarming levels and gravely compromised soil fertility. This led to bad debts and an epidemic of farmer suicides. Jayati Ghosh (2005) argues that agriculture in India was hurt by trade policies that favoured large farmers and overall economic policies that scaled back the state, but also because no specific agricultural reforms accompanied the dramatic policy shifts of the early 1990s.

India's crisis in agriculture is therefore linked to its crisis of hunger, which has resulted in the growing realisation that the revival of the agrarian sector is a key to economic growth as well as food security (Himanshu 2012). Specifically, critics argue that to achieve food security, it is imperative to assure farmers inviolable and equitable access to land, water and affordable inputs required to meet India's food requirement (Sinha 2011). But this goal will remain elusive if farmers continue to suffer from unemployment, displacement, landlessness, and chronic hunger (Ghosh 2005). Each of these problems has increased since the post-reform era as a result, in part, of decreased public investment in agriculture and corporate incursion into all aspects of the food supply chain (Pal and Ghosh 2007).

Body-part two: Food sovereignty

Closely related to the food security discourse are discussions around food sovereignty, the second body-part of the elephant of India's hunger riddle. Its proponents believe, like advocates of food security, that the revival of agriculture is at the heart of the solution of hunger and malnutrition. But unlike many (but not all) food security advocates, they are convinced that the answers lie alone in establishing local food production systems, with local self-sufficiency insofar as inputs and markets are concerned. They believe that the food security of people will be best secured if they produce and consume their own food, relying primarily on local markets, and if they depend locally also for the inputs of their agriculture: local indigenous seeds and local organic fertilisers. The food sovereignty position is a 'discourse and strategy

about food that prioritises local over non-local, biologically diverse agro-ecologies over mono-cropping systems, and local control over agricultural rhythms over systems attached to corporate interests and intellectual property' (Pritchard et al. 2013: 54).

A charismatic and globally influential proponent of this position is Vandana Shiva. Many elements of her critique of the Green Revolution are now accepted even by those who do not accept her full rejection of modern agricultural technologies. Not many disagree with her declaration that the Green Revolution has created a form of agriculture plagued by 'reduced genetic diversity, increased vulnerability to pests, soil erosion, water shortages, reduced soil fertility, micronutrient deficiencies, soil contamination, [and] reduced availability of nutritious food crops for the local population' (Shiva 1991: 57). She rightly argues that the apparent 'high-yield' of these new technologies is ephemeral, because the estimates of high yields ignore the grave social costs of ecological damage caused by these technologies. They result in reduced biomass for animals and soil. The Green Revolution, she believes, is premised on the creation of surpluses through destruction of systems: 'The strategy for creating a fictitious abundance has become a means for creating real scarcity by destroying the quiet ways of nature's work, peasants' work and women's work' (Shiva 1988). She calls for 'seed sovereignty' as the foundation of food sovereignty. 'If farmers do not have their own seeds or access to open pollinated varieties that they can save, improve and exchange, they have no seed sovereignty – and consequently no food sovereignty. The deepening agrarian and food crisis has its roots in changes in the seed supply system, the erosion of seed diversity and seed sovereignty' (<http://blogs.worldwatch.org/nourishingtheplanet/whoever-controls-the-food-system-controls-democracy-vandana-shivas-take-on-the-profit-driven-food-system/>).

There is today a wide body of empirical research which supports her broad claims about the ecological damage of Green Revolution technologies. Illustratively, studies confirm (as noted in Pritchard et al. 2013) grave declines in groundwater (Vaidyanathan 2006; Rodell et al. 2009), the loss of soil micronutrients from intensive cropping (Baker and Jewitt 2007: 330) and the unsustainable situation whereby global agriculture contributes one-third of world greenhouse gas emissions (Harvey and Pilgrim 2010).

The problem that several commentators have with arguments made by food sovereignty advocates is their outright rejection of modern agriculture, which entails a full-scale return to pre-Green Revolution

farming techniques. Studies by Akhil Gupta (1998), Kathleen Baker and Sarah Jewitt (Baker and Jewitt 2007) suggest that small and middle farmers themselves do not reject new technologies entirely. They only seek greater caution in applying them to diverse local situations, which could be aided by public investment into agricultural research and extension services. Swaminathan (2006) likewise believes that rejecting modern science is not an option as more and more mouths have to be fed with finite availability of land and water. It is also unclear how urban populations will establish and survive with local food systems.

The problem with the food sovereignty perspectives is not with their findings or the cautions they espouse, it is with the absolutism of their policy conclusions, their dismissal, even denunciation, of alternative positions which do not reject their conclusion but seek to nuance them. Shiva believes that the root of hunger and malnutrition is in the 'ecologically non-sustainable and socially unjust food and agriculture system.' There is much evidence which supports the belief that unsustainable agriculture has aggravated food availability. But the argument neglects the other body-parts of the 'elephant' of the food and nutrition enigma which needs to be understood in its totality, and that hunger and malnutrition are located in an unjust and unequal society of which the unjust food system is one part, not the whole. Therefore rebuilding sustainable agricultural systems are critical to food security, but this is not by itself a full or complete answer to the enormous human, socio-economic and policy challenge of feeding all people.

We recognise that there are three ways that a person can secure food with dignity. One is to grow the food, the second to earn sufficient money to purchase the food, and the third is through state provisioning. Of course we aspire and need to collectively work to reach the day when people either grow enough food, or have decent waged work or self-employment sufficient to enable them to feed themselves and their families. For reaching that day, the insights of the food sovereignty community are invaluable, but we stress that these insights – indeed as all single-themed set of insights – are inadequate to illuminate all pathways to end hunger.

Body-part three: Non-food determinants of nutrition

It is now widely understood and accepted that intake of sufficient food is necessary, but not in itself sufficient to guarantee good nutrition. It is possible – and this is indeed often found to be the case – that even if

a person is well-fed, she may still be malnourished. Her body may be unable to absorb the food due to repeated infections caused, in part, by living in an unsanitary environment. Or she may not have access to a diversified diet with adequate nutrients required to both grow into a healthy and strong adult and fight off disease. The former, particularly, underlines the importance – when trying to unravel the mystery of the full ‘elephant’ of malnutrition and hunger – of the vital elephant body-parts of ‘non-food’ determinants of nutrition. The latter underscores the importance of the access to a diversity of necessary nutrients in the food she does eat, sometimes overlooked in the discourse on food security.

The rates of malnutrition amongst Indian children and adults are amongst the worst in the world. 46.7 per cent of India’s children are underweight and about 35 per cent of adults are malnourished (World Development Indicators 2007). Despite access to adequate quantity of food, a person may succumb to malnutrition if her food does not have adequate amounts of calories, protein and micronutrients such as vitamins. People may also fall prey to malnutrition despite being able to access adequate quantities of nutritious food. This happens when they are unable to absorb the nutrients in their food, because of infectious diseases such as diarrhoea³ and other infections. Malnutrition in turn makes the body more susceptible to infectious diseases, thereby triggering a vicious cycle, especially amongst children (WHO 2009). Unsanitary living conditions and unclean water lead to repeated infections which result in malnutrition (Ghosh 2006). Inadequate access to health care prolongs the duration and/or severity of the infections, which exacerbates the inability of the body to absorb nutrients.⁴

There has recently been an important contribution to understanding the paradox of high persisting malnutrition in India by stressing the major contribution of lack of sanitation. Robert Chambers and Gregor von Medeazza (2013) write that ‘The puzzle of persistent undernutrition in India is largely explained by open defecation, population density, and lack of sanitation and hygiene’. They rely on a study by Dean Spears (2012), which analyses 140 demographic and health surveys to conclude that open defecation accounts for much of the excess stunting in India, where 53 per cent people defecate in the open. This exposes children to faecally transmitted infections, and not just the diarrhoeas, which have attracted at least some attention so far. They conclude that sanitation has been a ‘blind spot’ in understanding malnutrition in India, and believe that

‘in hygienic conditions much of the undernutrition in India would disappear’.

These insights are invaluable for illuminating neglected aspects of public action in tackling the complex beast of malnutrition. But the problem is when these interventions are seen as pitted *against* other aspects of the problem of hunger and malnourishment. Pravir Srinath (2013) for instance writes acerbically that the Food Security Bill is ‘treating the wrong problem. . . . Could it be, that people are losing their health, not because of the lack of food but because of recurring bouts of dysentery, diarrhoea and an infection from a host of parasites? Could the problem here be a lack of sanitation and not food insecurity?’

We believe that it is valuable to look at evidence about the close connections between bad sanitation, fouled drinking water and malnutrition, but it is incorrect to claim that this is the ‘silver bullet’ to the exclusion of all other interventions. It is also misleading to suggest that insignificant numbers of persons lack adequate food intakes. The International Food Policy Research Institute’s latest Global Hunger Index puts the number of hungry and malnourished people in India at over 230 million people. Critics on the other hand refer to the National Sample Survey Organisation (NSSO) 2005 findings on self-reported hunger, which they calculate to be only two million persons. But NC Saxena has brought attention to the fact that method used in official NSSO surveys of hunger in India – referred to as ‘self-reported hunger’, which involves asking people if they’ve had two square meals a day – has resulted in severe underestimates. Based on this, there was a ‘drastic decline in self-reported hunger in India from 16.1 to 1.9 per cent’ (Saxena 2008). Saxena points out that while this may reflect a significant improvement in the number of people that live with the most severe forms of hunger, the data does not include the conditions of people who live with chronic hunger that involve the lack of adequate and nutritious food over time required to live a healthy life.

In summary, it is clear that because of the extremely high incidence of malnutrition in India, it is imperative for the country to focus not just food security, but also nutrition security, which comprises access to adequate amounts of nutritious food, clean drinking water, sanitation, maternity support, child care services, and public health care. But while each of these interventions is vital, they do not exclude the need for simultaneous action on other fronts as well.

Body-part four: Poverty and social discrimination

If one reflects on what leads to inadequate access to sufficient quantities of nutritious food, clean water, sanitation, health care and child care services, the answers point to structural problems related to political priorities and power, poverty, unemployment, and caste, communal and gender discrimination.

Let us begin with the problems of poverty, linked to too few or the complete lack of productive assets (except labour power), uncertain, low-paid and unprotected work, and lack of adequate and comprehensive social protection for those unable to work. The obvious, often forgotten fact, is that people go hungry, lack lean water, sanitation and health care most of all because they are desperately impoverished and either unemployed or inadequately employed. There are 269 million people below the extremely low official poverty line, which we believe is actually a starvation line. Significant numbers of households in rural India are landless or have unviable small or marginal rain-fed holdings. Other rural poor households include nomads, livestock rearers, fisherfolk and artisans. At the margins of even these communities are people of stigmatised castes, bonded and child workers, the uncared aged, the disabled and single women and their dependents. Migrants to cities are also trapped in low-end, low-paid and casualised work, as daily wagers, rag-pickers, rickshaw pullers and domestic workers. It was expected that the period of rapid economic growth would yield both wealth and jobs. But the evidence is that the period of high growth has been one also of nearly jobless growth, and the employment that is generated is largely contract-based and casual, with reliance also on home-based work which disguises child labour and denials of minimum wages. India has a plethora of more than 200 labour laws, but these are defied openly, routinely and with impunity, resulting in the exclusion of people from their right to decent work.

It is possible to argue that India's enigma of widespread malnutrition in the era of high growth can be explained substantially by the failures both of the growth strategy and the regulatory regimes to ensure decent work for all, assured employment at legal wages. If households lack sufficient food, clean drinking water, sanitation, decent housing, access to health care and good-quality education, one paramount reason is simply because they are poor and poorly employed. If women were less poor, they could rest and eat well during pregnancy, access institutional health care, stay at home to exclusively breastfeed the child, afford child care when she goes back to work, and feed and send

her children to school instead of work. It is possible to make the case for ending hunger and malnutrition through ensuring decent work for all, combined with adequate social protection for those outside work.

Still another factor for hunger amongst poor, marginalised groups is discrimination. Let us consider the case of gender-based discrimination. One of the consequences of the unequal status of women, both in the larger society and within families, is their inability to access adequate nutritious food, education, health care, clean drinking water and sanitation required for their nutrition security. Their nutritional vulnerability is enhanced because pregnant and lactating women have enhanced nutrition requirements because of their physiological conditions and single women are much more food insecure than their married counterparts, because of their extremely low status in society. It is not surprising that the proportion of anaemia among women in the age group 15–49 years was more than double that of men in 2004–2005.

Women's food denials are more ironical because they play a crucial role in guaranteeing their families' nutrition security. Because of the various forms of discrimination faced by females, such as those within the family, in owning land and other means of production and in accessing livelihood opportunities, a large proportion of women and girls are highly vulnerable to food insecurity (Krishnaraj 2005). Women and girls also face barriers relative to their male relatives in accessing education, health care, clean drinking water and sanitation. In families where food is scarce, women and girls often not only get less food to eat, but may also be forced to eat food which is inferior in quality and nutrient content (Mukherjee and Mukherjee 1994; IFPRI, Bangladesh Institute for Development Studies and the Institute of Nutrition and Food Science 1998; Choudhury and Parthasarathy 2007). Studies also observe a growing trend of 'feminisation of poverty': not just is there higher incidence of poverty amongst women than men, but the *severity* of poverty is also higher amongst women (Supreme Court Commissioners 2008). Out of 1.3 billion people considered to be living in poverty worldwide, over 70 per cent are believed to be women.⁵

Besides direct discrimination against members of vulnerable groups, there are complex forms of exclusion of such groups – on the basis of gender, caste, tribe and religious identity – from access to basic rights and services that lead to poor group health and nutrition outcomes relative to the rest of the population. There is considerable evidence that the burdens of poverty, and its consequences including of

poor nutrition, are borne disproportionately by Dalit or Scheduled Caste (SC), tribal or Scheduled Tribe (ST) and Muslim households. Several scholars have found a close relationship between SC, ST and Muslim identities and the incidence of malnutrition. Mamgain and Diwakar (2012) collate many studies such as Thorat and Sabharwal (2011), Sabharwal (2011), Baru et al. (2010), Baraik and Kulkarni (2006) and Roy et al. (2004), which establish that the incidence of malnutrition is significantly higher among poor households, mothers of children without any education and those belonging to SC and ST social groups. Thorat and Sabharwal (2011) find that malnutrition is higher among STs (56.1 per cent) and SCs (50.6 per cent) than 'others' (36.3 per cent). Sabharwal (2011) finds further that SC children are at least 1.4 times more in danger of being malnourished than of children belonging to other social groups.

The reasons for this close association between membership of SC, ST and Muslim identities, poverty and malnutrition, can be found in the greater social barriers faced by people of these communities in owning and retaining land and other productive assets (especially forest in the context of STs), in accessing employment in non-stigmatised, safe and relatively well-paid occupations, and in accessing formal credit. For Muslims, it is the 'development deficits' that a majority of them face that underscores their poverty and state of malnutrition. The landmark Sachar Committee Report in 2006 drew attention to the extent of deprivation that Muslim communities encounter in all aspects of development – education, livelihood and access to public services, such as power, piped water supply and sewerage. It found worryingly low enrolments and high dropouts (amidst popular aspirations of Muslims of every class and gender for education), high prevalence of home-based work and extremely low incomes; and discrimination faced by young Muslim men and women in government as well as private recruitment, resulting in widespread unemployment (Centre for Equity Studies et al. 2011).

The barriers to owning and accessing productive assets and remunerative work faced by these vulnerable communities come in the way of the first two ways that a household can access food with dignity: namely growing one's food requirements (or collecting these from forests, rivers or the seas); or earning enough to purchase this food. These also are barriers in accessing the other key requirements of nutrition: clean water, sanitary environments, health care and education. These socially discriminated identities are in addition barriers to the third way that households can theoretically access food: by government food provisioning.

The barriers faced by these groups also extend to accessing government institutions and services. The 2006 report of perhaps the first and largest national survey of the continued prevalence of untouchability, jointly authored by Ghanshyam Shah, Sukhadeo Thorat, Satish Deshpande, Amita Baviskar and one of the authors of this paper, finds untouchability a social barrier for SCs in all local state institutions (Mander 2006). A number of studies map a series of discriminatory and exclusionary practices in ICDS and school meal programmes, against children from disadvantaged groups (Thorat and Lee 2005, Ramchandran 2005, Mander and Kumaran 2006, Jan Sahas 2009, Thorat and Lee 2010, IIDS-UNICEF 2012, Mamgain and Diwakar 2012, Swain and Kumaran 2012). These include separate seating and separate plates. This discrimination was also found to extend to service providers from these communities. One of the authors of this paper found in an extensive field study in four states (Mander and Kumaran 2006) various forms of exclusion: geographic by locating the services in habitations in which low-caste children do not feel welcomed, social by ill-treatment and humiliation of children from disadvantaged communities, and economic such as the pressures of working women to not be able to carry the children to the centre and the unwillingness of ICDS staff to fetch these children.

There is in addition to these broad categories of the poor, and of groups disadvantaged by gender, caste and religious identity, the special need to recognise for special policy focus the most marginalised categories of people within these who are at all or most times most vulnerable to the danger of imminent hunger. These are paradoxically also groups which tend to be forgotten in public provisioning and even political organisation.

Body-part five: State provisioning of food

We return here once again to the three main ways that a household may access sufficient food: by growing it, by earning the money for it or by state provisioning. The last section established that inequalities and discrimination based on gender, class, caste, ethnicity and religion act as formidable barriers to all three forms of accessing sufficient food with dignity. For the rest, in the first three sections, we have so far looked mainly at failures in the first two ways of feeding oneself, and also the consequences of eating enough food but falling prey to infections due to insanitary conditions of water and defecation, or the lack of health care. In this section, we will

turn to state duties to provision food to people insufficiently able to feed themselves.

The state may provide food in many ways: by subsidising raw food such as through ration shops or cooked food through soup kitchens; by free meals such as in schools, small-child feeding centres or destitute feeding; by public employment works; or by cash transfers, such as welfare doles, pensions for the aged and disabled, and maternity benefits. The Indian government has long provisioned food in many of these ways: through PDS ration shops, school meals and ICDS feeding centres for children below 6 years, public employment works and old age pensions. But until recently none of these – except the public employment programme – were guaranteed by law. This has changed firstly by a series of rulings by India's Supreme Court, then by the passage of the National Food Security Act (on 26 August 2013), India's first ever right to food legislation.

The years between the Indian Supreme Court's conversion of eight public food, nutrition and work programmes into 'rights to food' in 2001 and Parliament's passage of the National Food Security Act in 2013, brought forth diverse and vigorous debates on pathways in law and policy for ensuring sufficient food and nutrition for all children, women and men in the country. The National Food Security Act addresses issues of food access. It ensures the right of 66 per cent of Indians (75 per cent rural India and 50 per cent urban India) to subsidised grains from government shops. The law also provides children below the age of six and pregnant and lactating mothers free meals through local Anganwadis. Yet, the provisions of the bill as well as the context behind hunger and malnutrition in India that led to its drafting and passage was met with criticism from many proponents of food security. These debates, rooted in food security, food sovereignty, nutrition, the linkages between poverty and social exclusion and hunger, and the merits of the state provisioning of food were both robust and divisive, and are the subject of earlier sections of the paper. There were also disagreements and debates about the content and mechanisms for state food provisioning.

Public opinion in India remains deeply divided about the merits of this law which guarantees public provisioning of food by the state. One set of commentators – which include the writers of this paper – cautiously view it as a long-delayed, though beneficial, potentially historic statute; for the first time, legal duties on the state are in place which guarantees large populations of hungry and malnourished people access to food. Still, our concern is that the law does not go far

enough: it is not universal, neglects agriculture, does not include provisions for the starving and destitute, and ignores cohering dimensions of food and nutritional security, such as water, sanitation and health care. It also fails to establish a robust and independent enforcement mechanism critical for the implementation of any rights-based law.

Many other proponents of food security, however, are profoundly dismayed by the law. One argument raised by most critics of the food law is that 'doles' by the government are no answer to hunger and malnutrition. We have already in this paper heard critics who fear that this will create dependencies, and divert attention from the urgent need variously to revive an ecologically sustainable agriculture, or ensure universal sanitation and drinking water. We would add at this stage of the paper a number of further policy imperatives that are also required to ensure food for all, including ensuring decent work for all, land reforms, programmes for gender, caste and communal equity, crèches and child care services, universal maternity entitlements, universal health care, among others.

The case in favour of public provisioning of food to children and households which are food and nutritionally insecure centres firstly on India's Constitution, and Supreme Court rulings which expand the fundamental right to life with dignity to include the right to food and all that is necessary to make such a life possible. One of the writers of this paper has separately described the decade-long case in the Supreme Court which affirmed and explicated the right to food through over a hundred court rulings, and an independent mechanism of Supreme Court Commissioners (Mander 2012a, 2012b). There are also developments in the international framework of human rights, reflected in a series of international covenants which recommend a legally enforceable right to food and a scaffolding of social protection for all persons.

But there are also pressing moral and practical grounds cited in favour of food provisioning in the context of India's failure to end hunger and malnutrition, even as growth creates unprecedented wealth and the agricultural revolution in the decades after Independence ensures that country produces enough food to feed all persons. As Varshney (2013) points out, 'India has the fifth largest concentration of listed dollar billionaires (after the US, Russia, China and Germany); the third largest middle class (after China and the US); the single largest concentration of the poor'. That every malnourished child in the world is Indian should be morally – and politically – unacceptable. Varshney, urging us to consider the 'costs of no food security, asks: How long can a poor democracy fail to be a welfare state?'

But for instance, Devendra Sharma rejects all measures for state food provisioning including the PDS as mere ‘doles’ to keep the majority of the population dependent for all time. ‘Hunger and malnutrition’, he also declares ‘grew at a time when we had more anganwadis set up, and more schools being provided with mid-day meals’. Suman Sahai also characterises state food provisioning as doles. ‘We should be shocked that the government is willing to put so many people on dole to win an election but is not willing to take steps to support farmers, strengthen agriculture and food production and make people self-reliant (<http://devinder-sharma.blogspot.in/2013/07/food-security-bill-why-it-is.html>).’

We regard it as unfortunate that measures for state food provisioning to meet the imperative of addressing immediate and avoidable human suffering are being framed as constituting a mutually exclusive and opposed pathway to measures for addressing the ‘basic causes’ of hunger, and indeed then somehow subordinating the former to the latter, or to rejecting the former altogether. We agree emphatically that fundamental solutions are required to address hunger and malnutrition. But the performance of the state to address the problem has not been uniformly inspiring or successful. In such a situation, we ask if it is responsible and humane to dub the school meal which a child gets, or the supplementary feeding to infants and expectant and lactating mothers as mere wasteful ‘doles’ which need to end? I have in the course of my work both in district governments and as Special Commissioner of the Supreme Court interacted with several thousands of people, both rural and urban, who live with hunger or the threat of falling into hunger. For them, state provisioning is crucial to their struggles for survival, far from being inessential ‘doles’.

Our point is that we fully agree that action is needed on all these fronts: much has been accomplished on many of these, but not enough and a great deal remains to be done. As long as we fail on any of these diverse imperatives, hunger and poor nutrition will remain. Millions of people in the meanwhile will be trapped to live with the consequences of these failures; with weakened bodies and minds, easy prey to infection and even disease mortality, and the enormous suffering of living with hunger (Mander 2012). It is not our claim that provisioning of food by the state is an *answer* to the problems of hunger and malnutrition. It is not. But it is an essential means to mitigate the enormous human, social and economic consequences of what Dreze (2003) describes as ‘the catastrophic nature of the nutritional situation in India’. These are not doles; they are essential even if admittedly

shorter-term essential medicines of public policy to enable people to survive without avoidable suffering and loss of productivity even as we work to achieve permanent solutions. There is no disagreement that for poverty to end, far more needs to be done than simply feeding people. But while all of this is being done, the child's brain and body is forming today, and it is the duty of a caring state especially in a rapidly growing economy to ensure that while more lasting solutions are crafted and implemented, people today do not suffer from preventable hunger.

Some critics believe that economic growth is the solution to poverty, not food provisioning. The Sen-Bhagwati debate pertains to state provisioning versus a growth led approach. At the heart of the Sen-Bhagwati argument was the critical debate about their radically different approaches to tackling India's current poverty and nutrition challenges. A champion of globalisation and free trade, Bhagwati opposes state subsidisation in the hope that the rising tide of economic growth will help overcome poverty, while Sen chiefly argues in support of state provisioning as a necessary redistributive measure to provide basic services to the poor, who, one may say, have been cast ashore and marginalised by this rising tide of market-led growth. And Varshney strikes a middle ground by saying that pursuing the two paths, of welfareism and economic growth, is necessary and inevitable in the context of India. Neither Sen nor the authors of this paper would disagree.

Sadanand Dhume (2013) witheringly describes India's food law as akin to 'something cooked up by a Soviet planner on a bad day . . . created by a gaggle of leftist intellectuals who never encountered a government hand-out they didn't like'. But Haddad et al. (2012) welcome the food law, believing that with it 'India stands on the threshold of potentially the largest step toward food justice the world has ever seen . . . because Indian food security and nutrition levels are not being swept up in the tide of gross domestic product per capita growth – they remain rooted to the seabed'. Varshney (2013) affirms that social and food protection is not a substitute for market growth but it's essential complement: 'India is moving towards a rights-based conception of development, along with the promotion of market forces. It is not one or the other. This two-legged approach is not only desirable, but also more or less inevitable. The hunger and emaciation that one sees all around is embarrassing and must go down. It is also hurting economic growth. Markets can ignore the hungry, but poor democracies cannot do so beyond a point. India's democracy appears to be reaching that

point. Food security is the price India's rising capitalism might have to pay for functioning in a low-income democracy'. He adds: 'Democratic politics cannot easily be envisioned without the idea of winning power' and expanding political (or regime) legitimacy through welfare policies has historically been a part and parcel of democratic politics.

Those who worry that the law is wasteful and populist suggest that this scale of public money would far better be invested in public infrastructure, education and health care than distributing cheap food to large populations. Gurcharan Das feels not only that cheap food would disincentivise work, but that the money which will go into financing the food provisioning guaranteed by the law could have been far better 'spent in providing public goods – roads, schools, power, and law and order – it would . . . encourage entrepreneurs to start businesses, which would create sustainable jobs and raise the state's tax revenues. These taxes, in turn, would make it possible to invest in more public goods. Thus, a virtuous circle would be created and lift the society's standard of living'. But we believe that spending on food is not a populist dole but an investment in India's greatest economic resource: its vast young population in the productive age group, imperative for consolidating the gains of India's demographic dividend. Every second child in India is malnourished, which means that the brains and bodies of every second young adult are not developed to their full potential. Again quoting Varshney (2013), 'The bottom third of India does not get enough calories per day . . . Being underfed, the bottom third is also routinely sick. The hungry and the sick can't be productive workers, even if they want to. Markets can't help them all that much. The poor, if fed or nourished better, also do better in the marketplace. They lift themselves and contribute to society'. Sabina Alkire (2013) argues: 'Across the political spectrum in Asia, which in general has much lower rates of malnutrition than India, governments invest more in social protection. Perhaps parties of many stripes recognise that healthy workers with strong bodies and brains are essential for sustained economic growth – as well as human development.'

Then there are those whose unease stems from the high costs of the food law: an estimated annual burden of 1.25 lakh crore rupees, they argue, is profligate, and will inflate deficits and fuel inflation. Firstly, what is relevant is not the total but the marginal increase in public expenditure that the food law entails. This is 25,000 crore rupees, which seems a more reasonable expansion if we are convinced that what the law offers is a useful public investment. Secondly, we can manage public deficits if we are willing to tax more. As Sabina Alkire

(2013) notes, 'These dire warnings (of unaffordability) seem to overlook the fact that additional expenditures can be offset by cuts elsewhere. It is, as always, a question of priorities.'

India's tax to GDP ratio is lower than most industrialised market economies, and it relies excessively on indirect taxes rather than direct, which burdens the poor disproportionately. India also gives tax holidays amounting to over 5 lakh crore rupees every year to the corporate sector, and this is justified as necessary for wealth and job creation. But the overwhelming evidence from the high growth years is that this has been a period of virtually jobless growth, which underlines that there is no substitute for public investment to enhance livelihoods. There is also a need to enhance the integrity of India's tax efforts.

All of this suggests that there is considerable scope for taxing the rich to ensure investments in the nutrition, health and education of the working poor. And finally, we need to weigh the costs of *not* making these investments, the enormous costs of hunger, preventable diseases and deaths on the morale and productivity of several hundred million working people and growing children. Sabina Alkire (2013) offers a telling global comparison. In lower middle income countries, expenditures (on social insurance, social assistance and labour market programmes), are, on average, 3.4 per cent of GDP. India's is a mere half of that at 1.7 per cent, and even this low level is reached largely because of Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), not existing food security costs. The average for upper middle income countries is 4 per cent of GDP, and high income countries 10.2 per cent. Japan spends 19.2 per cent and China 5.4 per cent. Even Singapore spends more than twice as much as India, at 3.5 per cent of GDP. She adds: 'India has a higher proportion of stunted children than nearly any other country on earth, yet spends half the proportion of GDP that lower middle income Asian countries spend on social protection and less than one-fifth of what high income countries in Asia spend. The costs of NFSB are not the making of a nanny state'.

Another cluster of criticisms of the food security law is that it is not implementable, that state administrations demonstrably lack the capacity to actually deliver the promises of the law, evidenced by even official studies which confirm enormous leakages of subsidised PDS grains into the black market. There is no doubt that runaway corruption and inefficiencies greatly cripple state's capacity. But it is important to remember that both corruption and its debilitating impacts on governance are not restricted to programmes for the poor. They

apply also to defence deals, for instance, or to urban infrastructure development (as the CWG Games scandal demonstrated), or to the allocation of natural resources like coal mines. But it is no one's case that because of corruption, we should place an embargo on defence purchases, or on developing our cities, or on mining coal. Then why should we selectively apply corruption as a reason to veto investing public resources only for programmes for the poor?

It is hoped that the pressures created by the food security law, and democratic mobilisation around it, will place pressure for incremental improvements in the PDS over time in all states, in the way that the MGNREGA, RTE and RTI laws have done. It can be no one's case that states are still fully geared up to deliver the rights to work, education or transparent governance, but the creation of legal rights by statutes generated unprecedented pressure on and central and state administrations to greatly improve their delivery systems over time. The same can reasonably be expected to happen with regard to the right to food. The experience of states as diverse as Chhattisgarh and Tamil Nadu demonstrates that, given political will, the leaky and creaky PDS can be credibly fixed. Legal rights create a normative framework of what people should rightfully expect from their governments, and it enhances expectations, and through it democratic pressures for change.

The enormous reservoirs of continued preventable suffering of millions of the poor should convince even those convinced about the efficacy of markets to ultimately end poverty that at least in the medium term, there is no substitute for large state investments to ensure that all people have work, food, education and health care.

Conclusion

In this paper, we acknowledge that hunger and malnourishment cannot end until the other range of deficits and challenges outlined in all the streams described above are not adequately combated. In other words, there is little hope for the end of hunger until India's small farm sector is protected and revived, until sustainable technologies are advanced, until there is universal clean water, sanitation and health care; until decent work for all is ensured; until social protection, maternity entitlements and child care services are universally available; and above all until the gendered, social and class-based inequalities of one of the most historically unequal societies in the world are at least partly overcome.

Many of these battles are underway, but most need much greater strength, energy, imagination and political will, as well as adequate resourcing. But what happens in the meanwhile to children whose brains and bodies are being formed today, to people who sleep hungry today? Do we ask them to wait decades, maybe centuries longer, until their hunger ends? The greatest suffering on the planet today is caused by hunger, disease and hate. Famines have receded in most parts of the planet, but not endemic hunger and malnourishment. In the end of this paper, we try to build not just an economic but also a democratic and an ethical case for guaranteeing public provisioning of food through the instrument of a right to food law, requiring states to provision food to people denied it. In doing so, we made no claim at all that this presents a final or complete solution to hunger: it does not. But still we are convinced that in a world of plenty, ending the intense and preventable suffering associated with hunger and malnourishment is a foremost moral duty of people and governments the world over.

The fable with which we started this essay has a Sufi version as well, retold by the great thirteenth-century Persian Sufi poet and teacher Rumi as 'The Elephant in the Dark'. He writes of sighted men in a dark room trying to understand what an elephant imported from India looks like. He ends his poem with the words: 'If each had a candle and they went in together, the differences would disappear.'

Notes

- 1 We are grateful for extensive research coordination and support by Agrima Bhasin.
- 2 Literally 'Hail Soldier, Hail Farmer'.
- 3 In diarrhoea, the frequent stools prevent the adequate absorption of nutrients.
- 4 Ibid.
- 5 http://www.fao.org/waicent/ois/press_ne/presseng/h5f.htm.

COMMENTARY

Recent evidence shows slow
improvement in undernutrition in India*Amit Thorat and Sonalde Desai***MDG goal of 26 per cent underweight by 2015**

As a signatory to the Millennium Development Goals, India was supposed to reduce the proportion of underweight children below 3 years to 26 per cent by 2015 from a high of 52 per cent in 1990. At the current rate of reduction, which is quite slow, India will only be able to achieve a target of 33 per cent by 2015.¹ In 2013, India ranked 63rd out of 120 in the Global Hunger Index. This index is based on proportion of people who do not get sufficient calories, proportion of children who are underweight and mortality rate for children under five (von Grebmer et al. 2013). Much of this low ranking is driven by very high proportion of underweight children in India. National Family Health Survey (NFHS) of 2005–2006 shows that 43 per cent of children under five are underweight compared to WORLD HEALTH ORGANIZATION (WHO) global standards and 48 per cent are too short for their age (have moderate to severe stunting).

Undernutrition features large on the national agenda. For example, it received considerable attention in the 2014 election manifesto of the ruling Bharatiya Janata Party and lies at the heart of the National Food Security Act. Nonetheless, absence of credible and regularly collected data makes it impossible to ascertain current status of undernutrition in India or to monitor the progress in reducing it.

Policies without data

Getting national data on child anthropometry is quite difficult because not only does it involve measuring children, it also involves collecting

accurate data on their age, since children grow rapidly and a few months' difference in age could make a large impact on their placement on the growth chart. India has the following three major sources of data on nutrition (Desai and Vanneman 2015):

- 1 National Family Health Surveys (NFHS) of about 100,000 women conducted in 1992–1993, 1998–1999 and 2005–2006 are the most frequently used sources of nutrition data. This survey was organised by International Institute of Population Sciences which also conducted District Level Health Survey (DLHS-II) of 2002–2004 of about 200,000 households. District Level Health Survey (DLHS-IV) of 2011–2012 was carried out for only selected states but offers the latest data on undernutrition with large samples. The DLHS-IV was carried out in all but nine large north-central states where Annual Health Survey (AHS) is conducted by Registrar General of India. Unfortunately, as of this writing, no anthropometric statistics from AHS are available.
- 2 Periodic surveys conducted by National Nutrition Monitoring Board (NNMB) covering anthropometric outcomes and dietary intake for rural areas of 10 states in 1975–1979, 1988–1990, 1996–1997 and 2011–2012. The sample size for these surveys is about 24,000 households. NNMB also carries several other special purpose surveys including those in tribal areas.
- 3 Some of the special surveys with anthropometric data include the Hunger and Malnutrition (HUNGaMA) survey of 2011–2012 in rural areas of 100 poorest districts of seven states carried out by the Nandi Foundation for over 100,000 children and India Human Development Surveys (IHDS) (2004–2005 and 2011–2012) of about 42,000 households.

Sadly, none of the large nationally representative surveys are recent. NFHS, the bedrock of anthropometric data in India, has been mired in a political quagmire and a tug of war between different data-collection systems makes it difficult to combine information.

Available evidence points to slow decline in undernutrition

Table 3.1 summarises available statistics on proportion of children under five who are underweight using the WHO standards from four data sources. Trends from India Human Development Survey (IHDS)

SLOW IMPROVEMENT IN UNDERNUTRITION IN INDIA

Table 3.1 Children under five classified as underweight (%)

	<i>Underweight <-2SD</i>			
	<i>DLHS-4 (2012–2013)</i>	<i>NFHS-3 (2005–2006)</i>	<i>IHDS-II (2011–2012)</i>	<i>IHDS-I (2004–2005)</i>
All India		42.5	37.8	41.9
Jammu and Kashmir		25.6	18.2	10.9
Himachal Pradesh	28.5	36.5	26.6	28.4
Uttarakhand		38.0	32.8	45.6
Punjab	25.2	24.9	21.4	20.1
Haryana	36.2	39.6	28.5	29.6
Delhi		26.1	31.9	48.5
Uttar Pradesh		42.4	39.6	45.0
Bihar		55.9	41.4	54.8
Jharkhand		56.5	51.5	48.8
Rajasthan		39.9	34.4	33.5
Chhattisgarh		47.1	38.7	27.6
Madhya Pradesh		60.0	49.5	50.9
Northeast		NA	20.4	28.1
Assam		36.4	46.6	50.3
West Bengal	37.4	38.7	32.1	47.5
Odisha		40.7	39.3	44.0
Gujarat		44.6	37.5	49.9
Maharashtra, Goa	38.7	37.0	39.1	38.2
Goa	29.5	25.0	–	–
Andhra Pradesh	28.1	32.5	40.1	33.4
Karnataka	29.7	37.6	32.6	34.7
Kerala	20.9	22.9	23.2	24.5
Tamil Nadu	32.5	29.8	29.7	32.5

Source: DLHS-4 figures from DLHS-4 fact sheets NFHS-3 from (IIPS and Macro International 2007), IHDS-1 and 2, authors' calculation.

Note: IHDS state-level samples are very small and hence state-level estimates should be treated with caution.

1 and 2 as well as NFHS-3 and DLHS-4 point to a slow decline in proportion underweight. While NFHS and DLHS surveys are more reliable due to larger sample sizes, DLHS-IV is not nationwide and omits states which have higher levels of undernutrition (e.g. Uttar Pradesh, Bihar and Jharkhand).

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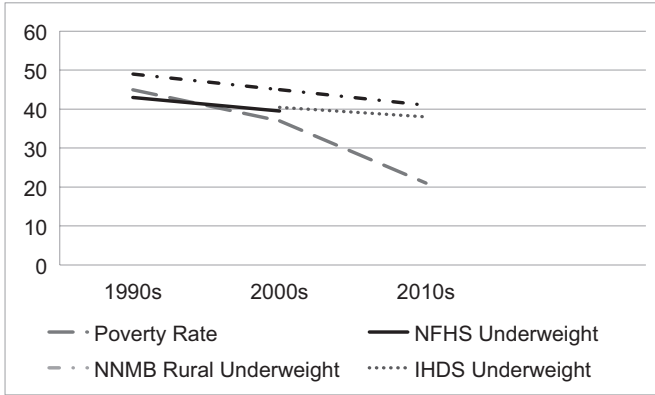


Figure 3.1 Decline of children under five being underweight has not kept pace with poverty decline (%)

Source: Based on NFHS, NNMB and IHDS surveys.

Figure 3.1, based on NFHS, National Nutrition Monitoring Board (NNMB) and IHDS surveys, paints a picture of modest decline in proportion of children underweight during an era when poverty dropped sharply. The Hunger and Malnutrition (HUNGaMA) survey suggests a sharper decline when compared to the DLHS-2 survey for the same districts using the same reference standards, from 53 per cent children being underweight in DLHS of 2002–2004 to 42 per cent underweight in HUNGaMA survey of 2011–2012; but these comparisons are somewhat difficult due to different survey design and focus on 100 poorest districts.

Nonetheless, in our judgment, decline in proportion of children who are underweight in India is modest. IHDS-2, the only nationwide survey, points to about 38 per cent children being underweight, a modest decline from 41.9 per cent in 2004–2005. Simple average of larger states between NFHS-3 and DLHS-4 also points to similar trend, decline from 32.5 per cent to 30.6 per cent underweight for some of the better off states.

Controversies around standards

Globally, the issue of appropriate reference standards has more or less been resolved in favour of using WHO standards developed from Multi Centre Growth Study, containing children from a range of

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countries including India. However, in recent years there has been some controversy regarding whether international norms are appropriate for India (Panagariya 2013). In spite of this periodically re-emerging debate, studies of Indian population overseas shows that children from Indian subcontinent who are raised in developed countries do not suffer from biological disadvantage (Tarozzi 2008).

Need for regular, believable data for informed policy

The above discussion suggests tremendous vacuum when it comes to evaluating the nutritional status of Indian children. It is impossible to develop sensible policy without regular nationwide data. When we try to piece together information from diverse surveys, differences in data-collection procedures have tremendous impact on our inference. Moreover, unless these data are collected under the sponsorship of government data-collection agencies, they will not be credible and will not be of use in policy formulation. Thus, building a nationwide repository of data on undernutrition that is updated every 2–3 years is a first step towards developing sensible policy interventions.

Note

- 1 Millennium Development Goals: India Country Report 2011.

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Part II

IDENTIFYING THE
POLICY GAPS

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4

IMPROVING SANITATION IS A POLICY PRIORITY FOR CHILDREN'S HUMAN CAPITAL IN RURAL INDIA

Lessons from recent literature
and the IHDS¹

*Dean Spears**

Taylor & Francis

Why are Indian children so short and, given the policy importance of height as an indicator of human capital, what can be done about it? Stunting – that is, being too short for age – is commonly referred to as an indicator of ‘malnutrition’, suggesting to many that the problem is a deficiency of food. However, height and human capital are shaped by early life *net* nutrition, which includes important effects of the disease environment. In addition to having high rates of stunting by international comparison, India also is home to well over half of all people who defecate in the open, a particularly threatening contribution to children’s epidemiological environment in the context of high population density.

The first part of this chapter reviews evidence from the literature of a large effect of open defecation on child height that can account for important international differences. The second part of the chapter presents new empirical results using the rural part of the India Human Development Survey (IHDS). This cross-sectional evidence is not individually conclusive, but presents useful suggestive evidence because the IHDS combines in one survey anthropometric and cognitive measurements, information on sanitation and economic details that are not available in Demographic and Health Surveys’ data about India. Taken together, the converging evidence

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suggests that reducing open defecation by promoting safe latrine use will be a necessary and important component of a multi-sector policy effort towards reducing stunting in India and improving the economic productivity, cognitive achievement and health of future generations.

Introduction

Why are Indian children so short and, given the policy importance of height as an indicator of human capital, what can be done about it? Stunting – that is, being too short for age – is commonly referred to as an indicator of ‘malnutrition’, suggesting to many that the problem is a deficiency of food (Waterlow 2011). However, height and human capital are shaped by early life *net* nutrition, which includes important effects of the disease environment (Bozzoli et al. 2009; Hatton 2014; Smith et al. 2013). In addition to having high rates of stunting by international comparison, India also is home to well over half of all people worldwide who defecate in the open (UNICEF and WHO 2012), a particularly threatening contribution to children’s epidemiological environment in the context of high population density (Spears 2013).

The first part of this chapter reviews evidence from the literature of a large effect of open defecation on child height that can account for important international differences. The second part of the chapter presents new empirical results using the rural part of the India Human Development Survey (IHDS) (Desai et al. 2009). This cross-sectional evidence is not individually conclusive, but makes a useful suggestive contribution to this literature because the IHDS combines in one survey anthropometric and cognitive measurements, information on sanitation and economic details that are not available in Demographic and Health Surveys’ data about India. Taken together, the converging evidence suggests that reducing open defecation by promoting safe latrine use will be a necessary and important component of a multi-sector policy effort towards reducing stunting in India and improving the economic productivity, cognitive achievement and health of future generations.

Review of evidence in the literature

Literature linking open defecation and faecal pathogens to child height follows two disciplinary strands.² The first and oldest, although still active today, is a medical and epidemiological literature combining

observational and intervention studies, as well as studies documenting biological mechanisms as an effect. A second, more recent, literature by economists studies the child height–open defecation gradient using large-scale survey data sets, often applying econometric identification strategies for causal identification.

Medical, epidemiological and nutritional literature

Children in India suffer from at least two mechanisms linking environmental open defecation to poor health and early life human capital accumulation: diarrhoea and chronic enteropathy. At least since the time of John Snow's investigation of the cholera epidemic in London in 1853, researchers have documented a statistical effect of public infrastructure on diarrhoeal disease. Many people are aware of the long-documented pathway through diarrhoea to stunting due to loss of consumed nutrients (e.g. Guerrant et al. 1992). Ingestion of faecal pathogens as a result of living near poor sanitation is well known to cause diarrhoea (Esrey et al. 1991). Checkley et al. (2008) use detailed, high-frequency longitudinal data from five countries to demonstrate effects of childhood diarrhoea on subsequent height.

Another mechanism of sanitation's effect on stunting that has recently been documented in detail in the medical literature but may be potentially quantitatively more important is the mechanism of chronic but subclinical 'environmental enteropathy' (Humphrey 2009), also historically known as 'tropical sprue'. Environmental enteropathy is caused by repeated faecal contamination which, through an inflammatory response, increases the small intestine's permeability to pathogens while reducing nutrient absorption. Such malabsorption could cause malnutrition of various forms, stunting and cognitive deficits, even without necessarily manifesting as diarrhoea or otherwise observable illness (*see also* Korpe and Petri 2012; Mondal et al. 2011; Petri et al. 2008).

Two very recent studies are recommended to readers interested in assessing the potential burden of enteropathy in India. Lin et al. (2013) show that children in Bangladesh who are exposed to more faecal environmental contamination are more likely to exhibit biological markers of enteropathy, and in turn suffer impaired growth. In longitudinal data from field sites in eight countries, Kosek et al. (2013) show that environmental enteropathy is associated with subsequent deficits in growth.

Other medical or epidemiological studies look at reduced-form associations between sanitation and nutritional status. Fink et al. (2011)

pool many Demographic and Health Surveys and document an average within-country gradient between poor sanitation and child stunting. Very recently, Dangour et al. (2013) have released a Cochrane review documenting an effect of WASH interventions on child growth, although they do not focus directly on sanitation.

This all makes sense, given the weight of the literature that food- and feeding-oriented nutrition programmes are alone insufficient to eliminate child stunting. Bhutta et al. (2013) found that if 10 core nutrition-specific interventions were scaled up to 90 per cent, it would only reduce child stunting by about a fifth. But none of this should be interpreted to claim that the importance of sanitation suggests that food security is not also important: children need to eat food, *and* absorb it, and put it to good use. As Menon et al. (2013) notes, sanitation and nutrition interact, so that breastfeeding and improving sanitation, for example, both do more to improve child height when working together.

It is important to emphasize that the Cochrane review cited above is a meta-analysis of *intervention* studies only. Finding a large effect of sanitation in an intervention study requires two steps: first achieving a change in sanitation behaviour, and then that change in sanitation having an effect on health outcomes. These correspond to the ‘first stage’ and ‘second stage’ in economists’ instrumental variables terminology. If this is difficult to do because it is difficult to achieve a first-stage change in sanitation behaviour, then this is no evidence that improving sanitation would not improve outcomes. Moreover, it is entirely possible that the effects of sanitation are different in different places, because of population density (Hathi et al. 2014). It would be particularly misleading if the population density made India a place with an especially large effect, but no intervention study could document it because sanitation behaviour there is so stubborn; recent evidence suggests that the policy challenges of sanitation behaviour change in India are indeed profound (Barnard et al. 2013; Coffey et al. 2014). More broadly, if we can only learn about what would be important to change from what shows large effects in impact studies, we will never learn the potential importance of problems that we do not know how to solve.

Economics literature

The economics literature linking poor sanitation to child height presents converging evidence from a range of empirical strategies. The literature includes two recent randomized field experiments. Cameron et al.

(2013) report a randomized field experiment in Indonesia. They find an effect of a sanitation programme on child height, and particularly on children living in households that did not have sanitation facilities before the programme. Hammer and Spears (2012) report a RCT by the Maharashtra government, in which children living in villages randomly assigned to a treatment group that received sanitation motivation and subsidized latrine construction subsequently grew taller than children in control villages. Interestingly, in this case the Maharashtra government conducted a field experiment only within one district, despite original plans to have an experiment in three districts. Because data was nevertheless collected on the other two districts, the study presents an unusual opportunity to analyze consequences of the selection of the set eligible for randomization into the treatment and control groups. Randomization was *within* districts, so there is no threat to internal validity, but it is notable that the district which received the experiment had the highest human development along a range of dimensions; the authors estimate that the experiment might not have had a statistically detectable effect in the other districts, suggesting that the contexts chosen for randomized experiments may shape the set of impact estimates available in the literature.

Other econometric studies use large data sets and observational strategies to identify effects of sanitation on child health. Watson (2006) studies heterogeneous timing of public health investments – including sewer connections and septic tanks – at U.S. Indian reservations, and find that a 10 percentage point increase in the fraction of homes receiving improved sanitation reduced American-Indian infant mortality by 2.5 per cent. Similarly, Cutler and Miller (2005) document a large effect of water filtration and chlorination on mortality in major U.S. cities in the early twentieth century. Although not about sanitation *per se*, Galiani et al. (2005) show that privatisation of water supply in Argentina reduced child mortality by 8 per cent.

Spears (2012a) studies a government sanitation programme in rural India. From 1999 until its replacement with a new programme in 2012, the Indian central government operated a ‘flagship’ rural sanitation programme called the Total Sanitation Campaign (TSC). Averaging over implementation heterogeneity throughout rural India, Spears finds that where the TSC was more active, it reduced infant mortality and increased children’s height by more, on average. The paper also exploits a discontinuity in a prize to local governments for eliminating open defecation in order to identify comparable effects of the programme on mortality and human capital.³ Using a similar strategy of

studying heterogeneity in change over time, Kov et al. (2013) estimate effects of open defecation on child height in Cambodia by analyzing changes within rural and urban parts of provinces between the 2005 and 2010 rounds of the Demographic and Health Survey. This fixed-effects strategy finds a quantitatively similar effect of sanitation to what Lin et al. finds in Bangladesh; the authors conclude that the improvement in sanitation can account for much or all of the improvement in child height over this five-year period.

Another recent paper studies the “Asian Enigma” of shorter children in India than in sub-Saharan Africa, even though people are on average richer in India than in sub-Saharan Africa (Deaton 2007; Ramalingaswami et al. 1996). Spears (2013) finds that heterogeneity across developing countries (specifically, across collapsed DHS survey rounds) in open defecation can alone linearly account for over half of the variation in average child height-for-age, and more than 60 per cent of the variation if population density is accounted for. This fact highlights that Indian children face a double threat: with high levels of open defecation and high population density (such that they are likely to encounter neighbours’ faecal pathogens), it is no surprise that Indian children are among the shortest in the world.⁴ In an individual-level decomposition analysis in the spirit of Oaxaca-Blinder, Spears finds that differences in the distribution of exposure to open defecation can fully statistically account for the Indian-African child height gap.⁵

Oddly, some commenters have recently suggested in policy debates that Indians are genetically short. This, of course, does not square with evidence that the Indian international height difference can be completely accounted for by observable differences in factors important for height. Moreover, with only 200–300 generations of humans having lived in India, it is difficult to imagine sufficiently quantitatively strong selective pressures whereby reproductive fitness is associated with genetic shortness in India by more than elsewhere worldwide; and the present-day tendency of taller people to have fewer surviving children is a product of very, very recent demographic trends (in evolutionary time), and much of the heterogeneity of height observed within the Indian population is due to early life environmental differences, not genetics. In any event, Ghosh et al. (2014) recently compared the height of children living in Bangladesh and the Indian state of West Bengal, surely belonging to genetically comparable partitions. Children in Bangladesh are taller than children in West Bengal at the same level of economic well-being, but this

difference can be completely accounted for by differences in sanitation and female literacy.

Other econometric studies show an effect of open defecation or sanitation-related disease on outcomes related to nutritional status and lasting human capital. In a follow-up study to the TSC paper, Spears and Lamba (2012) find that early life exposure to improved rural sanitation due to the TSC additionally caused an increase in cognitive achievement at age 6, as measured in ASER tests. Earlier, Bleakley (2007) documented that eliminating hookworm in the American South led to an increase in literacy and average incomes. Relatedly, Coffey (2013) finds that reductions in open defecation are associated with increases in average haemoglobin levels, suggesting that poor sanitation – and resulting malabsorptive disease or parasites – could be one cause of anaemia. Baird et al. (2011) show effects on adult labour supply of childhood randomisation into a deworming treatment in Kenya. Finally, preliminary results from Lawson and Spears (2014) suggest that Indian men in the 2005 IHDS who were born into district-years with better sanitation earn significantly but plausibly higher wages as adults.

Evidence from the India Human Development Survey

This section presents evidence on a quantitatively robust association between sanitation and child well-being – especially net nutritional outcomes – from the rural sample of the 2005 IHDS. To be especially clear: the purpose of this section is not to use econometric exogeneity to identify a causal effect of anything on anything else. I believe that the existing literature – in its totality of randomised, instrumental, discontinuity-based and fixed-effects strategies – has already done that. But although ‘Review of evidence in the literature’ section has documented a range of evidence existing in the literature, it is useful to replicate these findings in the further data set of the IHDS for two reasons. First, the IHDS is one of the very few large-scale data sets on child height available in India, where a DHS survey has very unfortunately not been conducted for almost a decade. Second, the IHDS is an unusually comprehensive survey; it valuably combines anthropometry, social indicators, economic data such as consumption, and cognitive achievement in one data set. This is in notable contrast with the DHS, which offers only coarse indicators of asset ownership to control for socio-economic status, particularly problematic in this

case because toilet facilities are used in the construction of the DHS asset index.

Although the IHDS includes data on both urban and rural children, this analysis will use only the rural subsample. This is in part because some of the analysis draws upon the earlier Human Development Profile of India (HDPI), which only surveyed rural households. But it is also because this analysis will make frequent use of a local area open defecation variable, constructed as the fraction of households in a child's survey Primary Sampling Unit (PSU) who report defecating in the open. The existing literature notes that this is most likely to accurately describe a child's disease environment in rural places. If urban data were used instead or in addition, we would expect the gradient between sanitation and child height to be even *steeper* because population density would be greater (Hathi et al. 2014).⁶

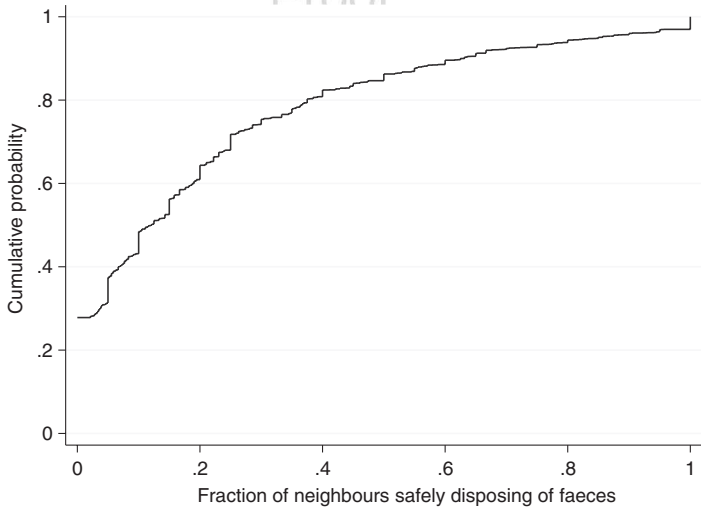
Non-parametric analysis: disease externalities

Before constructing regression models, this subsection examines the data visually, both to better understand the variation in the data that the regression models will exploit and to demonstrate disease externalities. Economists emphasize externalities as a key rationale for public policy: in this case, household are unlikely to take into consideration the effect of their open defecation on other households. However, these effects can be considerable. As the graphs below demonstrate, children in India are importantly exposed to other households' faeces.

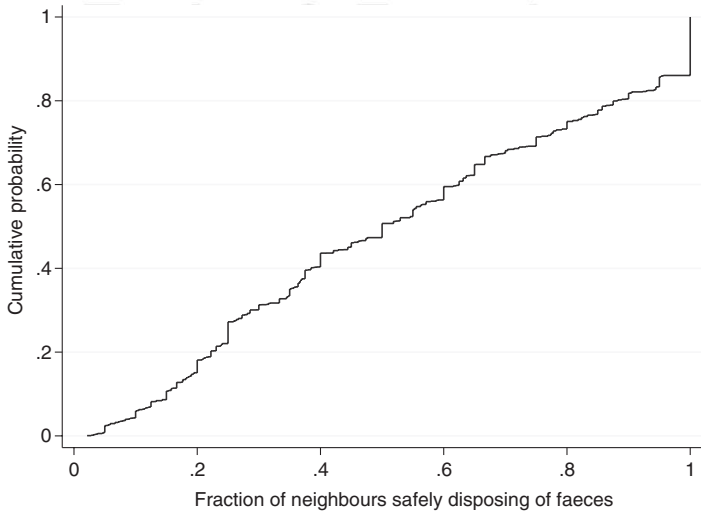
Even children using latrines are exposed to open defecation

Figure 4.1 plots the empirical cumulative distribution function of the central independent variable of this chapter's analysis. It is constructed from the household survey of the IHDS that a fraction of all households surveyed in a survey PSU defecate in the open, rather than safely disposing faeces in a toilet or latrine.⁷ This is what some researchers call a *context* variable, to distinguish it from a household level. Note that it is constructed from all households in the PSU, not only those with children under five, even though children are the units of observation in the figure.

Two conclusions are apparent from the figure. First, many children are exposed to much open defecation. Looking at all rural children in Panel (a), almost a third of rural children live in a village where *all* of



(a) CDF of local sanitation exposure of children under five, full sample



(b) CDF of local sanitation exposure of children under five, only children in households that do not defecate in the open

Figure 4.1 Externalities of open defecation are common in rural India

Local sanitation exposure is computed as fraction of households in a child's survey Primary Sampling Unit (PSU) who defecate in the open.

the surveyed households defecate in the open. Well over 80 per cent of rural children live in a PSU where more than half of the surveyed households defecate in the open.

Second, one's own household using a latrine is not enough. Panel (b) demonstrates the scope for externalities by focusing only on children whose own households do not defecate in the open. Even among these children whose households dispose of faeces safely, well over 40 per cent of them live in places where over half of the surveyed households defecate in the open. Because these germs from neighbours get into children's environment, they too are susceptible to the sort of early-life disease that stunts growth.

*Open defecation stunts growth of rich and
poor children both*

Is living amidst local open defecation indeed a threat to children's growth? Figure 4.2 suggests that it is. The solid line plots the simple local non-parametric regression of child height-for-age against local area open defecation. Children living among more neighbours who defecate in the open are shorter. However, a reader may note that poorer children are exposed to more open defecation, on average.

How much of this association is simply an artefact of wealth or poverty? The dashed line plots residuals against residuals after first separately regressing height and sanitation on the log of consumption per capita and eight social group indicators for religion and caste rank. This is equivalent to 'controlling' for these socioeconomic status variables in a regression, but still allows the figure to plot the entire conditional expectation of height, given local open defecation. Strikingly, the slope of the line changes very little – these SES variables were not at all responsible for the unconditional association.

Figure 4.2 demonstrates another way to show that wealth differences do not account for the gradient between sanitation and child height, and that rich and poor children alike are threatened by disease externalities. The graph plots the conditional expectation of child height-for-age, given household consumption per capita; unsurprisingly, children from richer households are taller, on average. Importantly, this relationship is plotted separately for children living in local areas where more than half of the households defecate in the open and where less than half of households do. Throughout the wealth distribution, there is a clear separation between the lines: rich and poor

Proof

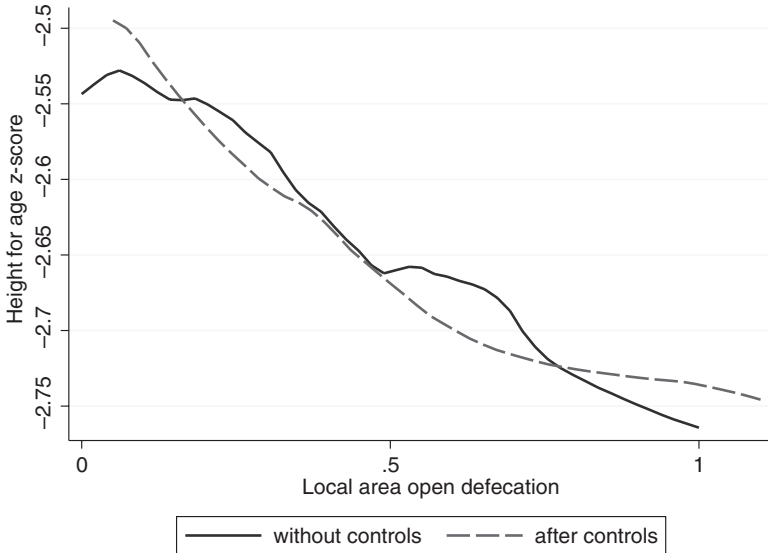


Figure 4.2 Open defecation and child height, local non-parametric regression
 The 'after controls' regression is computed by using the independent and dependent variables regression residuals of each variable on log of consumption and eight social group indicators.

children both who are exposed to many neighbours' open defecations are shorter than economically similar children who are exposed to less of a disease threat. Wealth, this graph suggests, does not buy children immunity from living near bad sanitation (Figure 4.3).

This finding resonates with several papers in the literature. Spears (2013) shows that if average height and exposure to local open defecation is computed for children in each wealth quintile, and these five averages are plotted against country-level height-sanitation combinations, differences in exposure to neighbours' open defecation can fully account for the differences in average child height across DHS wealth quintiles, and furthermore these five subsets of Indian children fall essentially on the international trend. Similarly, but at a more aggregate level, both Subramanyam et al. (2011) and Coffey et al. (2013) show that state-level economic growth in India is not associated with increases in child height, suggesting that policy makers may need to directly invest in determinants of child well-being, rather than assume that economic wealth will translate automatically into better early-life health.

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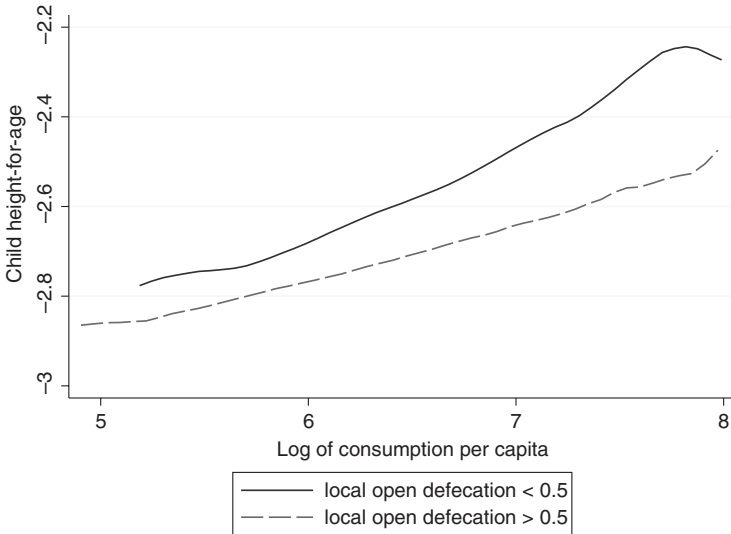


Figure 4.3 Open defecation, consumption, child height, and local non-parametric regression

Regression analysis: sanitation and child height

Are the relationships documented in ‘Non-parametric analysis: disease externalities’ section statistically significant and robust to regression controls? This section estimates regressions of the form

$$height_{ic} = \beta_0 + \beta_1 local\ open\ defecation_c + \beta_2 \ln(consumption)_{ic} + X_{ic}\theta + \varepsilon_{ic}, \quad (1)$$

where i indexes individual children under five years old, c indexes clusters (here rural PSUs), and $height$ is a child’s height for age z -score. Controls X are added in stages. Standard errors are clustered by PSUs, of which there are enough for asymptotic credibility.

Table 4.1 presents results. All specifications include controls for child age indicators interacted with sex. The estimated gradient between open defecation and child height changes little as controls are added. Household controls – in addition to consumption per capita and the eight social group indicators – include the type of ration a household has, if any; the household size in persons; and the highest educational attainment of the household. The last column adds mother and childcare

Table 4.1 Local open defecation predicts child height-for-age, rural children under five

	(1)	(2)	(3)	(4)
height-for-age z-score, OLS				
local open defecation	-0.286** (0.0947)	-0.229* (0.0985)	-0.192† (0.0992)	-0.176† (0.103)
Ln (consumption per capita)		0.145*** (0.0434)	0.0828† (0.0457)	0.0593 (0.0473)
other high caste		0.179 (0.134)	0.212 (0.135)	0.153 (0.134)
OBC		-0.0217 (0.116)	0.0379 (0.117)	0.00338 (0.118)
Dalit		-0.143 (0.119)	-0.0516 (0.121)	-0.0937 (0.122)
Adivasi		0.0429 (0.142)	0.150 (0.145)	0.104 (0.147)
Muslim		-0.221 (0.135)	-0.122 (0.137)	-0.125 (0.139)
Sikh, Jain		0.0793 (0.291)	0.136 (0.307)	0.0429 (0.313)
Christian		0.231 (0.267)	0.267 (0.280)	0.0732 (0.296)
household size			-0.00757 (0.00796)	-0.00382 (0.00811)
highest adult education			0.0228*** (0.00568)	0.0191*** (0.00571)
BPL card			-0.0202 (0.0704)	-0.0434 (0.0707)
APL card			0.00763 (0.0699)	0.0287 (0.0694)
Antodaya cardmother and childcare controls			-0.350** (0.120)	-0.371** (0.122)
<i>n</i> (children under five)	8,665	8,659	8,563	8,563

Standard errors clustered by survey PSU. All regressions control for age-by-sex indicators. Two-sided *p*-values: † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

controls intended to capture proximate determinants of early-life net nutrition: indicators for mothers' beliefs about child's diarrhoea, breast-feeding, milk consumption during pregnancy and the health effects of exposure to smoke from traditional fuel; the household's cooking fuel; whether the mother goes out in *purdah*; whether the mother has pocket money; and how often the mother visits her natal village.

Although local open defecation continues to predict child height, even conditional on this wide range of controls, it is interesting to note what does not. Strikingly, with Brahmins as the omitted category, none of the other population groups have statistically significantly different child height; this suggests that, once local open defecation and consumption differences are accounted for, remaining differences across population groups in average child height in rural India are small. Consumption loses significance when household size, education and ration card ownership are accounted for; the predictive power appears to load onto education. To fit on a page, coefficients on maternal and childcare controls, added in column four, are omitted.

Regression analysis: sanitation and child cognitive achievement

Height is an important variable because of what it indicates and predicts. The same early-life health and net nutrition that helps children grow to their height potentials also helps them grow to their cognitive potentials, so taller people within a population exhibit greater cognitive achievement, on average. This association between height and cognitive achievement explains the well-known gradient between height and wages (Case and Paxson 2008), and is a key reason height has emerged as an important part of the economics of human capital (Currie 2009). Because heterogeneity in early-life health and net nutrition is so much greater in India, the height-cognitive achievement gradient within India is much steeper than the same gradient within the United States (Spears 2012b).

If the association between cognitive achievement is one key reason to care about child height, does sanitation also predict childhood learning attainment? Spears and Lamba (2012) use heterogeneous timing of a government sanitation programme in rural India to show an effect of early-life exposure to sanitation on subsequent child ASER educational test scores. Although we should rely on the Spears and Lamba (2012) paper, and not this analysis, for the econometrics of

causal effect, this subsection estimates a similar cross-sectional association using the rural IHDS data. The IHDS was designed to include the same tests as used in the ASER surveys; so these results do not literally use ASER test scores, but they reflect the same tests.

In particular, Table 4.2 presents estimates of the following ordered logit regressions, separately for reading and math outcomes:

$$\begin{aligned} achievement_{ic} = & \beta_0 + \beta_1 local\ open\ defecation_c \\ & + \beta_2 \ln(consumption)_{ic} + X_{ic}\theta + \varepsilon_{ic}, \end{aligned} \quad (2)$$

where here the sample is 8–11 year olds, the age group that the IHDS tested. The local area open defecation variable is also slightly different from before. It is computed from the earlier HDPI survey – conducted in the same villages just before these children would have been born – to provide an indicator of the disease environment when these children were first growing. The regression, with a smaller sample than before, adds controls for consumption per capita; eight population group indicators; indicators for household size, household education and the child's relationship to the head of the household; and indicators for child age interacted with sex.

Moving from columns 2 and 5 to columns 3 and 6, it is clear from Table 4.2 that the association between early-life exposure to open defecation and subsequent cognitive achievement is approximately stable as controls are added; the coefficient falls going from the first to the second columns, but there is little to recommend a model that does not control for household consumption when that is available. Ordered logit coefficients are hard to interpret meaningfully. One way of thinking about this result is that the improvement in child reading ability linearly associated with growing up in a village where nobody defecates in the open instead of everybody defecating in the open is about 3–4 times the size of the difference in child reading ability – estimated from the same data set – associated with a child being one height-for-age standard deviation taller.

To emphasize, the gradients estimated here are almost certainly not causal effects. Other unobserved changes – such as in school quality – may be associated with these differences in sanitation. The author encourages an interested reader to read Spears and Lamba's (2012) application of a fixed-effects identification strategy to heterogeneity in sanitation resulting from timing of the implementation of the government's TSC.

Table 4.2 Local open defecation predicts child cognitive achievement, rural children ages 8–11

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Reading			Panel B: Math		
local open defecation	-0.982** (0.375)	-0.705* (0.295)	-0.663* (0.290)	-1.011** (0.320)	-0.639* (0.275)	-0.598* (0.253)
ln (consumption)		0.702*** (0.0638)	0.599*** (0.0682)		0.788*** (0.0652)	0.715*** (0.0712)
social group indicators		✓	✓		✓	✓
house hold controls						
<i>n</i> (children 8–11)	4,577	4,575	4,571	4,565	4,563	4,558

Coefficients are from ordered logit models. Standard errors clustered by survey PSU. All regressions control for age-by-sex indicators.

Proof Conclusion

This chapter joins a quickly growing literature documenting the importance of sanitation and exposure to open defecation externalities for child well-being and human capital accumulation. Other papers have emphasized identification strategies for causal inference; this chapter contributes analysis of a particularly noteworthy cross-sectional data set that combines economic, social, anthropometric and cognitive achievement data. A further round of data has been collected that will allow the use of panel data techniques, and the author looks forward to continuing his collaborative study of the effects of sanitation in these data with Diane Coffey and Michael Geruso when these panel data are available.

To offer a brief reflection on policy implications of these results, the findings in this chapter and others suggest that open defecation in India is everybody's problem. This is true in two senses. First, this chapter has documented negative externalities of open defecation: neighbours' faecal pathogens are bad for your children's health even if you dispose of your faeces safely. Even the richest children in India – in large cities, living in houses with flush toilets, benefiting from educated and empowered mothers – typically do not live far from at least some people who defecate in the open. This means that even these children are exposed to faecal pathogens, and may help explain stunting among even children of well-heeled and well-fed families.

The second sense in which open defecation is everybody's problem is that it is a multisector policy priority. Traditionally, sanitation has been categorized as a narrow part of infrastructure. But its policy implications, as we have seen, are much broader. Sanitation matters for early-life health, for child survival, for nutritional outcomes, for cognitive achievement, and – this list implies throughout the economics of human capital – for adult economic productivity. This means that whether you are the minister for health, or nutrition, or labour, or finance, your indicators may well underperform, relative to an India where children are free from open defecation and their neighbour's faecal pathogens. Luckily, there is much scope for sanitation policy makers and other sectors to work together towards common goals – luckily, because ending open defecation is everybody's business.

The policy challenge is considerable, for at least two reasons. First, many people in rural India see little reason to switch from open defecation to latrine use (Coffey et al. 2014). The challenges of changing preferences, attitudes, knowledge and behavior are highlighted

by the fact that there are many, many households in rural India that own a perfectly functional latrine that one or two members of the household use every day (often a young daughter-in-law or a grandmother), while most members of the household continue to defecate in the open, despite having a ready safe option. Second, the problem may be getting worse. Although the fraction of people in India defecating in the open is decreasing, the evidence surveyed here suggests that a key exposure to threat – perhaps the most important – is the density of open defecation, such as the number of open defecators per square kilometer. In recent research, Spears (2014) shows that most people in India live in a district where the density of open defecation *increased* between the 2001 and 2011 rounds of the Indian census. Excluding Delhi – where a little more than 1 per cent of Indians live – a state-level analysis shows that the average Indian’s exposure to open defecation density increased over this period. It appears quite possible that the measure of exposure most relevant for the human capital outcomes studied here continues to worsen for most Indians.

Notes

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- 1 Discussion paper for IDS-NCAER stunting and malnutrition workshop.
 - 2 This literature review draws substantially upon those in Spears (2012a) and Spears (2013), which are more specific to those papers’ empirical strategies.
 - 3 The TSC offered local governments a ‘Clean Village Prize’ for eliminating open defecation. The prize amount was a discontinuous function of village size. Districts with more villages with populations just above the prize discontinuities saw greater declines in infant mortality than districts with fewer villages just above the prize discontinuities. Note that, due to data constraints, this chapter studies the prize in its early years of implementation; unfortunately, since then the incentive has effectively unraveled due to poor monitoring and implementation (Lamba and Spears 2013).
 - 4 This chapter also includes a district-level, fixed-effects analysis: Indian districts in which open defecation decreased by more between the 1992 and 1998 DHS survey rounds also saw greater increases in child height, on average. This finding is buttressed by a forthcoming cross-sectional ecological epidemiological study, in which Spears et al. (2013) show that Indian districts with more open defecation in the 2011 census have greater incidence of stunting in the 2010–22 HUNGaMA survey, even controlling for average calorie consumption. This chapter also contains simulation results that

recommend using height-for-age as a continuous dependent variable, rather than dichotomising into a binary 'stunted' indicator, in order to increase statistical power.

- 5 Other recent econometric studies of child height in India have focused on dimensions of social hierarchy, including within households. Jayachandran and Pande (2013) note that the gradient between height and birth order is steeper within India than within Africa, suggesting that intrahousehold allocations might explain some of the India-Africa height puzzle. Although it is not the focus of their chapter, they also find a quantitatively important role for sanitation, although their numerical estimates and methods differ from Spears (2013). Relatedly, Coffey et al. (2013) document that, within India, in joint households with two adult brothers, children of the lower-ranking daughter-in-law are shorter, on average, than children of the higher-ranking daughter-in-law, which they interpret as evidence for an effect of women's status. These findings are not in any conceptual conflict with an important role of open defecation: it can simultaneously be the case that social cleavages or inequalities within India make some groups taller or shorter than others, while advantaged and disadvantaged children are both shorter than they otherwise would be due to the disease environment. For more discussion of stunting in India, see the August 24, 2013 issue of *Economic and Political Weekly*.
- 6 Of course, population density in the rural parts of north India where open defecation is especially common is pretty high, too.
- 7 For this Figure 4.1 only, the axis is reversed for clarity, so it is labeled as 'sanitation' and a larger number is less open defecation.

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Proof

5

WATER, SANITATION, HYGIENE (WASH) AND THE NUTRITIONAL STATUS OF CHILDREN IN INDIA

Understanding the linkages and
structuring the response

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Introduction

Childhood stunting remains a significant global public health problem. In 2011, the prevalence of stunting among children below five years of age was 26 per cent worldwide (UNICEF, WHO, World Bank 2012), representing just a 14 per cent reduction since 1990 (Black et al. 2013). Protecting children from stunted growth in the 1,000 days from conception to age two years is critical for their health, physical growth and cognitive development. Inadequate nutrition from conception through the first two years causes largely irreversible physical and cognitive damage to a child. It is estimated that stunting contributes to over a third of under-five deaths globally (Lancet 2013; UNICEF 2012). Stunting is especially critical in India which has the largest number of stunted children in the world as 48.0 per cent of children 0–59 months old (i.e. 61 million) have stunted growth (NFHS-3 2006).

Stunting impacts bodies, brains and lives. It not only increases the risk of morbidity and mortality, but stunted children suffer from impaired brain development and thus complete fewer years of schooling; as adults they have reduced work capacity, earn less income and have poorer health (UNICEF 2013). Often, stunting starts before

Proof

birth – as a result of poor maternal nutritional status – and worsens gradually during the first two years of life. Stunting is the outcome of insufficient nutrient intake and/or repeated infectious diseases and is a measure of chronic undernutrition where children are too short for their age. In India, more than 15 per cent of children are estimated to be stunted at birth, and this figure increases steadily up to 58 per cent at 23 months of age and remain nearly stable thereafter (NFHS-3 2006). Thus, the first 1,000 days of life are a critical window of opportunity, during which timely interventions can have a measurable and lasting impact on the prevention of child stunting (Victora et al. 2010).

Child stunting is caused by multiple factors that operate at different levels and interact in a complex manner. These causes have previously been defined using the UNICEF conceptual framework for Maternal and Child Nutrition from 1990 (Black et al. 2008; UNICEF 2013). The immediate causes of child stunting include limited quantity, quality and diversity of children's diets coupled with suboptimal feeding and care practices during the first two years of life and high rates of infectious diseases due predominantly to an unhealthy environment, especially poor WASH conditions. Poor WASH conditions are typical in resource poor settings where undernutrition is prevalent, in India, and worldwide. Smith and Haddad (2014) reinforce this by stating that stunting reduction is driven by safe water and sanitation, women's education and empowerment, and the quantity and quality of food available in countries; income and governance play key underlying facilitation roles.

Dietary interventions alone are not sufficient to promote optimal growth in children. Efficacy studies with nutrient-dense food supplements have shown approximately 0.7 Z-score improvements in average height-for-age Z-score (HAZ) at best (Dewey 2008). This is only a third of the average height deficit in South Asian and African children (-2.0 Z) (Humphrey 2009). Implementation of a package of proven interventions at scale can reduce the prevalence of stunting at 36 months by one-third (Bhutta and Salam 2012); these interventions are the promotion of breastfeeding, dietary supplementation with micronutrients, prevention of protein-energy malnutrition and improvement in the standard of preparation and hygiene of available complementary foods. Therefore, more research and programmatic effort should be directed to underlying causes of nutrition such as WASH.

Ingestion of high quantities of faecal bacteria from both human and animal sources by infants and young children through mouthing soiled fingers and play and household items, and the exploratory ingestion of soil and poultry faeces are common in many rural low-income

environments (Marquis et al. 1990; Ngure et al. 2013a). This leads to intestinal infections, which affect a child's nutritional status by (1) suppressing appetite, (2) impairing absorption of nutrients, (3) increasing nutrient losses and (4) diverting nutrients away from growth to fight off infections (Dewey and Mayers 2011). Environmental Enteropathy (EE), a subclinical inflammation of the small intestine mucosa lining, is characterised by a highly permeable gut and malabsorption of nutrients (Haghighi and Wolf 1997) and is linked to poor WASH conditions (Campbell et al. 2003; Humphrey 2009). EE is thought to be highly prevalent in areas with poor conditions of WASH, and potentially has significant negative effects on child health and growth, as it impairs the intestinal lining absorptive and barrier functions.

There is increasing research interest on the link between WASH and child nutritional status (Dangour et al. 2013; DFID 2013; Humphrey 2009; Spears 2012) and on early child development (Ngure et al. 2013a). Indeed, overall, it has been estimated that 50 per cent of child malnutrition is attributable to poor WASH practices (Fewtrell et al. 2007). Most common WASH interventions are not designed to adequately protect children from ingestion of faecal bacteria and pathogens (Ngure et al. 2013b) during the critical first 1,000-day window (Victora 2010). This is of particular significance in India that hosts approximately 600 million of people who defecate in the open (WHO/UNICEF 2014), the highest number globally, as well as having very high population densities, even in rural areas.

Undernutrition and poor WASH provision: evidence for the linkages with stunting as a marker

Association of improved drinking water supply, sanitation and/or hygiene with improved linear growth has been reported in several non-experimental studies (Checkley et al. 2004; Esrey et al. 1992; Esrey et al. 1996; Fenn et al. 2012; Merchant et al. 2003; Ngure 2012). Significant linear growth benefits identical to those found with rigorous dietary interventions have been reported with improvements in sanitation. In a large cross-sectional study using nationally representative data from eight countries in three continents, improvement in sanitation was associated with 0.06–0.62 increments in HAZ in children living in rural areas and 0.26–0.65 HAZ in children living in urban areas; improved water had less impact (Esrey 1996). These increments in HAZ are similar to growth effects seen in rigorous dietary interventions; 0.0–0.64 HAZ (Dewey 2008). Incremental improvements in

sanitation were associated with incremental increases in children's HAZ (Esrey 1996). The incremental benefits of improved sanitation followed a dose-response pattern. In addition, the incremental effects of improved sanitation were also found for diarrhoea. Consistent findings have been reported in a much larger cross-sectional study (Fink et al. 2011). Access to high-quality sanitation was associated with 27 per cent lower odds of stunting. Due to large representative multi-country samples, these studies had statistical power to detect magnitude of differences that were of biological significance. These studies provide suggestive evidence of the association between improved water and sanitation and height gain.

In a large prospective cohort study, Merchant et al. (2003) have shown a 21 per cent lower risk of stunting in children in Sudan who came from households with water and sanitation compared to their peers from households without these facilities, for children with normal HAZ at baseline. Children who were stunted at baseline, and who came from households with water and sanitation had a 17 per cent greater chance of reversing stunting compared to their peers from households without either facility. Previously, Sedgh et al. (2000) reported a 20 per cent lower chance of stunted children recovering if they came from homes without water compared to those having water in the house, in the same study population in Sudan. The large sample size (Merchant et al. 2003) allowed for detection of small differences in associations and test for interaction. Considering the strengths of this study and the consistency of these results with other observational studies (Daniels et al. 1991; Esrey et al. 1992, 1996; Magnani et al. 1993), the study provides strong evidence that water and sanitation are independently associated with improved linear growth in children.

Consistent findings have been reported in a longitudinal study in Peru (Checkley et al. 2004). Inadequate sewage disposal explained a height deficit of 0.9 cm at 24 months of age. Better water source alone did not accomplish full health benefits. Twenty-four months old children from households without adequate sewage disposal and with small water storage containers were 1.8 cm shorter than their peers from households with sewage and with large water storage containers. These results were consistent with those of the cross-sectional study described previously (Esrey et al., 1996) that showed 0.8–1.9 cm increase in height for children <3 years with better sanitation. Measuring longitudinal diarrhoeal prevalence made it possible to adjust for the cumulative effects of the illness on height gain.

Mucosal damage was significantly associated with lower HAZ, weight-for-age Z-score (WAZ) and weight-for-height Z-score (WHZ) in a six-month longitudinal study on a handwashing intervention (Langford et al. 2011). Handwashing was not effective in lowering the level of mucosal damage, immune stimulation or growth faltering in six months. The authors concluded that in highly contaminated and densely populated environments, with poor access to clean water and sanitation, handwashing may be necessary but not sufficient to reduce the levels of mucosal damage, subsequent immune stimulation and associated growth faltering. This perhaps points to the need for holistic approaches, that is one that ensures the faecal–oral route of disease transmission is minimised together with safe and sufficient water, safe excreta disposal and good hygiene practice. Modelling research in West and Central Africa (LIST 2012) estimates the contribution each individual sector can make to the reduction of stunting in the region, and WASH interventions gave a combined potential reduction in stunting in the order of 40 per cent.

In a recent Cochrane review of 14 studies on WASH interventions conducted in 10 low-and middle-income countries (Dangour et al. 2013), meta-analyses of the evidence from five cluster-randomised trials (Du Preez et al. 2010; Du Preez et al. 2011; Luby et al. 2004; Luby et al. 2006; McGuigan et al. 2011) showed a borderline statistically significant effect of water and hygiene interventions on HAZ (mean difference 0.08; 95% CI 0.00–0.16) in under five-year-old children. The interventions included in the meta-analyses were solar disinfection of water, provision of soap and improvement of water quality. This small benefit on growth was based on relatively short-term studies (9–12 months), none of which was of high methodological quality (Dangour et al. 2013). No study on water supply and sanitation intervention was included in the meta-analysis of randomised trials. High-quality interventions on sanitation would increase the impact significantly since safe excreta disposal is essential in reducing faecal contamination of household environment, consequently minimising possible human contact.

The cross-sectional and longitudinal evidence at hand suggest a positive impact of improved sanitation on children's linear growth (Ngure et al. 2013c). Health benefits from improved water were maximised only when sanitation was improved and only when sufficient safe water was present. Significant complementary effects of increased water usage and sanitation on height gain in infants have been reported in rural Lesotho (Esrey 1992). The largest effect on growth was observed

for children from homes with a latrine and increased water use during the warm wet season. Personal and household hygiene have also been found to be associated with HAZ, independent of infant feeding practices, recent morbidity, household food security and socio-economic status, in two- to five-year-old children in Ethiopia, (Ngure 2012). Households having access to water and sanitation facilities may also have higher economic status, better feeding practices, etc., and influence better nutritional status of the family but enough evidence exists to control for this and underline the key importance of WASH (Smith and Haddad 2014).

WASH interventions have been shown to have high impact (Waddington et al. 2009) and to be highly cost-effective in terms of Disability-Adjusted Life Years (DALYs) saved (Varley et al. 1998; Haller et al. 2007) but this has been primarily assessed in terms of childhood diarrhoea and has not encompassed broader impacts like pneumonia, worm infestations and stunting. Indeed, Jamison et al. (2006) state that using full income in benefit-cost analyses of investments in health, and in health-related sectors such as education, water supply and sanitation, and targeted food transfers, would markedly increase estimates of net benefits or rates of return of interventions like WASH. Cronin et al. (2014a) estimated the cost-benefit analysis of sanitation in Odisha, India, to have significant potential with benefit-cost ratios in the order of 5.7 and they note that full nutritional economic analyses are required for more complete WASH cost-benefit analysis.

Analysis of secondary data (Ngure 2012); and initial analyses of new data sets combining anthropometry and WASH indicators is assisting to strengthen understanding of the magnitude of the WASH and stunting (Rah et al. in review) and will help further streamline intervention planning for optimal impact but it is clear, however, that there are still significant knowledge gaps at field level. Further research on this area is needed as a priority to better inform technical guidance, policy, budget allocation, implementation and joint monitoring of results. Such research may determine the relative contribution of intestinal worms, diarrhoea and EE on child stunting and extend to recommending cost-effective, optimal, holistic, and context-specific and nutrition-sensitive WASH interventions targeting the first 1,000 days (Ngure et al. 2013c). This research critically needs to extend to the operational processes and tools and the required human capacity (quantity and skills) with the scale of a country like India in mind and which we discuss further below.

India and the WASH: nutrition nexus

Children in Asia are, on average, shorter than African children even though they have overall a better economic setting. This phenomenon referred to as ‘the Asian Enigma’ (Ramalingaswami et al. 1996) has drawn attention of research and policy space in respect of sanitation. Spears (2013) argues that differences in average height of children in Africa and Asia are partly explained by differences in rates of open defecation (OD); indeed use of toilets across countries explained 54 per cent of the variation in average child height while GDP only explained 29 per cent; the association between OD and stunting was independent of wealth, differences in governance, genetics, female literacy, availability of water or electrification.

The health burden of poor sanitation falls disproportionately on children living in the poorest households as the result of both greater exposure to infection and increased susceptibility among children in these households due to poor nutrition. This is a function of their increased likelihood of having no access to own toilet or shared toilet and being more likely to live in an area with a high density of open defecators (Rheingans et al. 2012) with associated increased undernutrition burden (Spears 2013). Much of these findings are based on cross-sectional secondary data analysis and in the future more robust evidence coming from randomised trials are required to validate these findings. For instance, the role of animal faeces ingestion is important (e.g. Ngure 2013a) yet little work has been done in India on the issue of whether human excreta poses a greater health risk to humans than animal faeces. This would be an important knowledge gap to address in the Indian context, given the high population density, high rate of OD and the fact that animals are in close proximity to people in both rural and urban areas (e.g. Ngure 2013c).

In a randomised field experiment in Maharashtra, children living in villages randomly assigned to a treatment group that received sanitation motivation and subsidised latrine construction grew taller than children in controlled villages (Hammer and Spears 2012). These findings suggest that improved sanitation is associated with better linear growth in children. It can be argued that wherever proven interventions are delivered at scale (with quality and equity), levels of child stunting can go down dramatically, as the recent Maharashtra State Nutrition survey suggests (IIPS 2012).

Convergent WASH and nutrition interventions in India

The Government of India has also started considering the key importance of WASH in the prevention of child undernutrition. The Ministry of Women and Child Development (MWCD) and the Ministry of Health and Family Welfare (MHFW) are mandated to improve nutrition outcomes for children in India through their respective flagship programmes: The Integrated Child Development Services (ICDS) and the National Rural Health Mission (NRHM). These programmes are implemented through the frontline workers: the Anganwadi Worker (AWW) in the Anganwadi Centers (AWCs), the Accredited Social Health Activists (ASHA) and the Auxiliary Nurse Midwife (ANM) of NRHM. ICDS works with children below six years of age and their mothers through the AWC, literally the courtyard play area. This is the centre for caring for children in the age of 0–6 years throughout rural India; over one million such centres are in operation in the country. They present a unique opportunity for promotion of sanitation and hygiene.

ICDS has been working on child-friendly toilets and handwashing stations, with support from UNICEF, including capacity building on handwashing with soap at critical times. One example is presented from Odisha; Odisha, one of the less developed states in India, has a high burden of open defecation (78 per cent from the 2011 Census) which is severely impacting on its health, nutritional and economic growth (Cronin et al. 2014a). Calculations of the burden of disease linked to incomplete water and sanitation provision in Odisha showed that DALYs were significantly higher in Odisha compared to the national Indian values (Cronin and Dutta 2011).

UNICEF-support to Government of Odisha on interventions in AWCs in Koraput district included:

- strengthening Government schemes on providing sanitation facilities in institutions (schools and AWCs) as part of broader community approaches to total sanitation in the district;
- training of AWWs on safe hygiene practices;
- provision and display in AWCs of related critical WASH messages via communication materials;
- organisation of village volunteers and community theatre groups to promote handwashing; and
- ensuring transfer of best practices on feeding and hygiene from parents of well-nourished children in communities to those of undernourished children.

In order to assess if these interventions can impact on WASH facilities and practices and influence Government flagship programmes, 65 AWCs were randomly selected by an independent research agency (Sigma 2009) in Koraput district and 61 AWCs in nearby Ganjam district (non-intervention district but with higher literacy and sanitation coverage) for comparison purposes. Both quantitative and qualitative research techniques were adopted for data collection. Semi-structured questionnaires were used as the quantitative tool targeting mothers and pregnant women in one batch and village workers (ANM/ASHA) in another. Standard tools for the qualitative techniques included AWC observation sheet, in-depth interviews and separate focus group discussion guides for the key actors, including AWWs, for adolescent girls (11–18 years) and for mothers and pregnant women (Table 5.1).

Table 5.1 Selected comparison of key indicators in the two districts

<i>Indicators (in %)</i>	<i>Koraput (intervention, N=65)</i>	<i>Ganjam (non-intervention, N=61)</i>	<i>% points difference between intervention and control</i>
AWCs observed as very clean/clean	56	36	+20
AWCs observed with very clean/clean surroundings	48	25	+23
AWCs with water accumulated nearby	23	33	-10
AWCs drinking water available	93	93	0
AWCs having toilet	80	25	+55
AWCs having kitchen	89	71	+18
Cooking area clean/very clean	52	39	+13
AWCs having designated place for handwashing	63	43	+20
Children handwashing with soap/ash	69	14	+54
AWCs have drinking water	93	93	0
Stored water left uncovered	3	26	-23
IEC materials available in AWC	95	28	+67

Source: Sigma 2009.

These results demonstrate that the intervention district, despite having lower socio-economic indicators and lower levels of literacy, showed significantly higher levels of WASH hardware and hygiene indicators after a convergent intervention though this was only a simple comparative intervention end-line on a small sample size. Challenges remain in transforming knowledge into practice in these communities and expanding these to scale. Internal Government monitoring of the operation and maintenance of AWCs' water and sanitation facilities is extremely important to overcome such challenges – until the ownership and importance of these facilities are internalised by the AWW, their effectiveness will be limited. A monitoring system run and acted upon by ICDS could have great potential to impact on cleanliness and the other indicators evaluated in the survey. Improving hygiene in the AWC requires greater capacity and follow-up of the AWW. The AWW also needs to educate mothers and caregivers on ways to break the faecal–oral route of transmission and improve child nutrition, through interventions such use of sanitation, exclusive breastfeeding for 6 months, hand-washing before complementary feeding, safe and hygienic handling of foods, avoidance of feeding bottles, etc.

Going beyond these initial efforts, it is imperative to avoid the creation of 'islands of excellence' which have succeeded because of the use of additional external capacity and resources. Such an effect is also possible when interventions complement and build on Government inputs but later such additional efforts may not be replicated or fully owned by Government and taken to scale. There needs to be strong ownership by the AWW and the ASHA/ANM to not only implement but also sustain these interventions. Working through the national Government programmes, such as NBA, ICDS and NRHM, need to focus on strong corrective monitoring for quality, equity and impact. This is essential for working at scale to achieve results at scale and requires strong political and administrative commitment to convergent approaches and corrective monitoring oversight. State Governments play a vital role here in bringing together schemes at planning, implementation and review stages (Cronin et al. 2014b). One challenge is currently AWCs cater mostly for children around 3–6 years of age while most stunting happens prenatally or during the first two years of life and so it is critically important to have greater convergence with the Health Sector and for ICDS to put greater focus on 0–3 year olds, as is now meant to be the case with the ICDS Mission.

Looking forward

Critical operational issues must be addressed when examining the current WASH and Nutrition landscapes in India at present. Four key areas with related questions are presented:

- 1 *Community outreach and how to address the limitation of the WASH sector not systematically having village frontline workers.*
 - How to reach all of the community with the right information, counselling, support and services, especially to families with small children, through frontline workers (particularly those of ICDS and NRHM) with most focus on the most vulnerable communities and households?
 - Is the development of protocol of WASH components/facilities in PHCs/AWCs/NRCs required?
 - How to further build the capacity of frontline workers, including the AWW/ASHA/ANM, on integrated WASH–nutrition messaging for behaviour change?
 - Monitoring hygiene practice in community –Is it needed and feasible?
- 2 *Convergence*
 - Strengthening ICDS-NRHM convergence – if we are to move forward with improving nutrition indicators at scale, then MHFW and MWCD must jointly lead and include adequate WASH components in the information, counselling, support and services that their frontline workers (ANM/ASHA/AWW) and facility (AWC/PHC)-based workers (nurses, midwives and doctors) deliver – how do we get this convergence into the system?
 - How do Public Health Engineering Departments and local Government (*Panchayati Raj*) Departments, currently responsible for water and sanitation, in communities better support ICDS and NRHM to create and sustain that enabling environment for caregivers, mothers and children at Anganwadis and Health Centres, both in terms of WASH facilities and behaviours?
 - Can WASH programmes build in nutrition-sensitive goals and actions and include height measurement in evaluating the impact of WASH interventions and multi-sectoral approaches for improving child nutrition?

- How to build on the great opportunity of Village Health and Nutrition Days as a platform for outreach, and share best practices with joint WASH and nutrition interventions?

3 *Adolescent boys and girls*

- Adolescent girls are critical to reach to break the intergenerational cycle of undernutrition. Interventions must impact not only on the girls' own hygiene, health and nutritional well-being but also on that of the next generation. How to best reach, engage and keep engaged these adolescent girls of today and mothers of tomorrow?
- What are the opportunities to capitalise on such initiatives as SABLA and what are the other ways to tackle adolescent anaemia? (SABLA, or the Rajiv Gandhi Scheme for Empowerment of Adolescent Girls, is a centrally sponsored programme targeting adolescent girls for improved health, nutrition, life skills and knowledge of hygiene and reproductive health).
- WASH programmes can be great entry points for wider community health and nutrition programmes, especially to address gender imbalance – Are we using such opportunities to the full? Do we even fully know the process and tools required to do this and at scale?
- Can menstrual hygiene management in schools be an avenue to reach adolescents with WASH and nutrition messages, and help in ensuring school attendance is not compromised for young women and future mothers?

4 *Cross-cutting issues*

- The role of media and impactful programme communication with impact needs to be expanded – How do we change behaviours, practices and norms sustainably and at scale?
- How do we make good nutrition and WASH a family/community/societal aspiration?
- Nutrition interventions in high water quality risk areas (due to Fluoride and Arsenic in particular) are of particular importance to mitigate geogenic contamination – Are such interventions happening systematically and in tandem with water quality and supply programmes?
- Do we have the optimal policy and operational framework to achieve convergent goals?

It is clear that behaviour change and process of community engagement, including gender empowerment, are critical. Such change that impacts on stunting such as exclusive breastfeeding, tackling child marriage and OD-free villages require 100 per cent participation of the community and this necessitates a complete overhaul of the outlook of the community towards inclusion. Gram Vikas, an NGO in Odisha build into their programmes non negotiable core values which see the inclusion of ALL families, regardless of caste, social or economic status; they support the village to set up a Village General Body, represented by every family in the village and members comprising of each head of household, male and female and emphasise social and gender equity as a prerequisite in all self-governance activities. This approach is taken due to the heavy physical and health burden WASH places on women in particular (UNESCA 2005). The time taken, along with the dignity and privacy intrusion of inadequate sanitation, negatively impacts on the family food security, levels of nutrition and livelihood choices (Lala et al. 2012).

Inclusive process is critical to achieve gains in sanitation and nutrition and can lead to long-term impacts on gender, equity and empowerment (e.g. Biswas 2012). Increased availability and quality of gender disaggregated data is also central to this work (UNICEF, FAO, SACI-Waters 2013). However, the WASH sector in India still lacks a systematic approach to process – a fact compounded by poor governance and lack of political will or focus and poor focus on evidence-based planning and implementation (Cronin et al. 2014b).

Discussion and conclusions

The evidence is clear to support a relationship between the provision of adequate drinking water, sanitation and hygiene and a reduction in child stunting though quantification of this requires further work. Further analysis of secondary data (Ngure 2012) and initial analyses of new data sets combining anthropometry and WASH indicators (Rah et al. in review) is assisting in better understanding of the magnitude of this connection for the survival, growth and development of children.

There is now a pressing need to strengthen the implementation of programmes to address this evidence, especially in the context of India – home to the world's largest population of people defecating in the open, and stunted children. This must be positioned in the context of convergent programming with a stronger focus on results. This requires

open-minded sector institutions and professionals that are willing to embrace a multi-sector, multi-disciplinary dynamic approach; one which understands that the provision of adequate drinking water and sanitation coupled with improved hygiene practices is a 'co-owned corner stone' of good nutrition and health outcomes for children and their mothers.

Critical operational questions are raised around the four key areas of community participation and reach, convergence of interventions, adolescents and cross-cutting issues. Concerned ministries, departments and flagship programmes must urgently extend their sphere of influence to advocate together for and promote an end to OD, improvement in water quality and sustained behaviour change on hygiene. The process of community engagement to achieve these is the key and needs systematic approaches and not just isolated champions or solid NGOs with strong social capital.

It requires that nutrition and health sector professionals, especially, take ownership of key WASH interventions along the continuum of care to improve the health of communities through education and the practice of critical life-saving WASH behaviours. The WASH sector must also build in nutrition-sensitive aims into its interventions. New ways to prioritise WASH interventions and practices are possible to minimise the risk of faecal-oral infections across those critical first 1,000 days. This may range from safe accessible water, handwashing and sanitation for mothers during pregnancy to cord-cutting hygiene at birth to safe and optimal feeding practices in the first six months to ingestion of faecal material up to and beyond 24 months. Safe disposal of child faeces is particularly important at this time.

These are not new messages (Esrey and others before were stating similar points over 30 years ago) but perhaps what is now needed is a new combined approach with a fresh urgency and an overall renewed focus that relies on a strong evidence base leading to corrective management steps in-built. The eradication of polio in India displayed such an urgency as it is required for this issue and perhaps can provide lessons for the eradication of widespread stunting in India, especially around focus, monitoring, communication at scale and strong participatory focus. Participatory and convergent approaches with a strong gender and equity focus are the key. Gender is especially important and women's genuine participation at all levels of WASH-Nutrition interventions is critical to success, both in the short and longer term.

Adequate levels of WASH provision and practices will not eliminate stunting in India on their own but will be an essential and hugely

important milestone on that path. For this reason alone stronger linkages between and across these two sectors are justified and this requires urgent prioritisation.

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6

WOMEN'S AGENCY AND CHILD UNDERWEIGHT RATES IN INDIA IN THE CONTEXT OF AGRICULTURE

A district-level analysis

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Introduction

Women's empowerment creates a positive women's agency. Women's agency can be understood as the process through which women use their endowments to achieve desired outcomes (World Bank 2012). One may perceive women as active agents of change and dynamic promoters of desirable social transformation needed for development, rather than victims of poverty and social oppression and targets of welfare programmes. The widened concept of development is essentially about the enhancement of one's choices (Sen 1985). In essence, wider the choice set, higher would be the capability and consequently a better welfare achievement. Furthermore, the commodities, resources and the public goods at one's disposal and the freedom to act enhance the capabilities. The capabilities also enhance the agency role of women; the agency aspect in general relates to the view of persons as responsible agents (Sen 1985). The agencies, which bring about change, play an important role in 'shaping our own structures and processes' even if the agencies themselves may or may not be consciously aware of the role played by them in bringing about the change (Herda 1999). In particular, Kabeer (1999) emphasises possession of resources by women as a pre-condition for women's agency to achieve the desired outcomes. Women's agency

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can be independent or collective. In the context of health and nutrition, the reference is mainly to the individual agency of women.

To exercise the agency for desirable child nutrition outcomes in particular, the women need to be educated and healthy, possess resources and have the freedom to take decisions and implement the same. While good health is an end in itself, it is also a means or a resource that enhances women's agency. The present health status of women enhances the agency effect of promoting their own health and that of the children at present and in future. There are very few surveys which include child nutrition aspects, women's employment aspects as well as agricultural aspects. This chapter compares the linkages between women's labour force participation and women's education with child underweight, with reference to women's agency role at the district level as well as rural parts of the district, given the district-level enabling aspects such as agricultural performance, hygiene and health.

Women's agency and child undernutrition

The focus on women in reducing undernutrition in children has its origin in the explanation of the 'South Asian Enigma'. The phenomenon as described by Ramalingaswami et al. (1996) is about the existence of high malnutrition among children in South Asia compared to sub-Saharan Africa, despite low child mortality rates, higher levels food production and higher policy focus on child nutrition in South Asia compared to sub-Saharan Africa. While explaining the South Asian enigma, the authors point out low weight gain by pregnant women and the existence of anaemia among pregnant women as one of the major possible causes of newborns with low birth weight turning out to be underweight babies. Further, it was apparent that there are millions of families in the world, where very young children are malnourished but not the adults and older children. They received adequate nutrition. Hence, the key factor in the early months of life is not just the availability of adequate food, but the feeding practices; that is whether the right food is given at the right time and in the right manner. Finally, the frequency, severity and duration of disease are important causes of underweight and stunting in the sense that disease reduces food intake and hence inhibits the absorption of nutrients. The authors point out that women in South Asia (as opposed to the women in sub-Saharan Africa), living in poverty are often oppressed, illiterate and uninformed, anaemic, unhealthy, burdened with work, get less leisure and are unable to provide care to the children,

increasing the incidence of underweight and stunting. Lack of resources and freedom constrain Asian women's ability to achieve better health outcomes for themselves and their children. A number of studies since then have explored the link between women's endowments, freedom and the child nutrition outcomes. Economic resources at the disposal of women, their freedom and level of education seem to be associated with underweight and stunting of children (Mishra and Retherford 2000; Maitra 2004; NFHS-2 1998–99).

Why district-level study?

District-level study not only enables combining of data sets from different surveys, but also enables the assessment of macro-picture relevant to policy. A district-level study need not necessarily give the same result as a household-level study or a state-level study or a multi-level study of combining the household-level data with district-level data. State-level data suffers from severe aggregation problems as the state has several agro-climatic regions. Household-level data provides better insights into care related and intra-household related aspects of child underweight, but less relevant for broader issues such as agricultural production patterns and the impacts on work participation and so on. The district-level analysis has a distinct advantage of capturing the macro effect within a specific agro-climatic region.

Therefore, the basic rationale for exploring this linkage at the district level for total population as well as for rural population is that a large percentage of population depends upon agriculture for their livelihoods. As agriculture commercialises, its impact becomes obvious on semi-urban population as well, due to the backward and forward linkages to non-agricultural sector. Rural population experiences higher levels of poverty and undernutrition. Gain to women from work participation and education assume importance in the context of both child nutrition as well as agriculture non-agricultural prosperity.

The study includes all districts which are not 100 per cent urban. Since rural areas show higher rates of child undernourishment, and higher levels of poverty, the study also attempts to capture the importance of women's agency, in rural parts of the district as well¹. This chapter is organised into five sections. The following section gives an overview of the literature. The subsequent sections provide the preliminary data analysis and the results and its interpretation, and the last section summarises the findings of the study.

Child undernutrition: linkages to women's work, education, agriculture, hygiene and health

Women's work and child nutrition

Most of the women workers (79 per cent) in India are engaged in agriculture in the rural areas (NSSO 2011). The rest (21 per cent) are engaged in non-agricultural work. Women also play an important role in connecting agriculture to child nutrition. Three of the seven pathways linking agriculture to child nutrition have been through women (Gillespie and Kadiyala 2011). They are: (1) women in agriculture and intra-household decision making and resource allocation; (2) female employment in agriculture, childcare and feeding; and (3) women's own nutritional status particularly among those engaged in agriculture.

There is a large body of evidence that points towards the impact of women's employment and nutritional status of child, measured either by child mortality, child underweight or child stunting. This evidence can be classified as those arising from primary survey on a small group of households (Nair et al. 2013; Sivakami 1997) or those arising from country-wide sample survey data (Berman et al. 1997; Thampi 2007; and; Bhalotra 2010; Shukla 2011). The trade-off between mother's employment and child's nutritional status comes through the income effect versus quality of child care.² The results of the study depend on how the studies have been carried out, and what is the nature of information on child's nutritional status has been assessed. For instance, Nair et al. (2013) find that birth weight of children with mothers earning wages through the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is better while exclusive breastfeeding and its timeliness did affect the infant feeding practices. A study in Nicaragua (Lamontagne et al. 1998) has shown that among poor households the income effect of mother's employment had positive influence on child's underweight and stunting while the poor quality of child care given by the caregiver had an adverse influence on these children's nutritional status. Several other studies have highlighted the adverse impact. Additional female wages were found to be too small to change the spending allocation to health (Berman et al. 1997). Rural infant mortality risk seems to be 50 per cent higher if the mother works in agriculture (Bhalotra. 2010).

Female literacy has been widely recognised as having positive impact in reducing underweight and stunting in children (Mishra and Rutherford 2000; Kalaiselvi 2011). The evidence from secondary data sources

for country-wide data in India on women's work and child nutrition show that either female work participation has no influence on child's nutritional status after socio-economic and cultural factors are controlled for, or have a beneficial impact largely indicating the income effect. Women's literacy and women's education show a stronger association with lower levels of child undernutrition in India. Health of a pregnant woman in general and especially anaemia increases the risk of low birth weight children.

Agriculture and child undernutrition

The evidence on linkages between agriculture and nutrition in India was examined across seven pathways under the project 'Tackling the Agriculture and Nutrition Disconnect in India (TANDI)' and found to be weak (Gillespie and Kadiyala 2011; Kadiyala et.al. 2014). The study found the evidence from existing literature as inconclusive of a strong linkage but suggestive of influencing diets, incomes and food prices in general. The authors of another study concluded that agricultural growth and food-grain production growth do not lead to nutritional improvement in India. However, the same study finds agricultural gross domestic product (GDP) per worker and non-agricultural GDP per worker to have a negative significant association with stunting but not with underweight at the state level (Headey et al. 2011). The other pathways linking agriculture to child nutrition include subsistence production for consumption and reduction in real food prices associated with increased food production (World Bank 2007). Food grains provided more than 70 per cent of the calories in the average rural diets and more than 62 per cent of the calories in the average urban diets (NSSO 2007). Food grain production per capita appears to be an alternative aspect of agriculture relevant for enhanced food consumption and better child nutrition.

Evidence on the poverty reducing impact of agricultural growth and thence its effect on undernutrition has been mixed in the literature. Dutt and Ravallion (1997) indicated that agricultural growth in India reduced poverty in both rural and urban areas, while economic growth in urban areas did little to reduce rural poverty. Kumar and Joshi (2000) while analysing the NSS data on farm households in 1993–94 show that where consumption out of home-grown produce is prominent, there was less poverty. In contrast to this, Bhagowalia et al. (2012) using IHDS data show that agricultural income did not have any positive impact on poverty reduction or reduction in underweight

and stunting. On the other hand, non-agricultural income was associated in rural areas with better nutritional outcomes. Similarly, Galab and Reddy (2011) also show that households who sell their produce in the market rather than those who predominantly consume from the market had lower underweight rates among children. Overall, literature reviews suggest that agriculture prosperity-child undernutrition link is rather weak, but agricultural productivity per work has links to stunting. Food consumption and adequate production seem to help nutrition, though the growth in these aspects are not associated with child nutrition outcomes.

Sanitation, health and child undernutrition

Much of the undernutrition currently prevalent in the children of developing countries is attributable to conditioned malnutrition, arising from infections (Gopalan 2013). Sanitation and safe drinking water have been identified as key factors in reducing stunting and underweight by researchers (Bhagowalia et al. 2012; Spears 2013). Hammer et al. (2013) have shown through randomised control trials of community sanitation programme in Maharashtra that it is possible to achieve 0.3–0.4 standard deviation increase in children's height-for-age z-scores, or approximately 1.3 centimetres in a four-year-old child, with the provision of safe sanitation to children's immediate environment. With the help of panel data from National Family Health Surveys (NFHS), Spears had shown that lack of access to toilets and its interaction to population density in India explains much of the excess stunting in India compared to other countries (Spears 2013). Health of the pregnant women especially anaemia has a link to low birth weight of the child. Low birth weight is one of the reasons for underweight. The study found that the likelihood of low birth weight tripled and that of preterm delivery doubled with anaemia caused from iron deficiency (Scholl et al. 1992).

Preliminary data analysis

Data sources

Data for variables on nutrition, health and sanitation are sourced from second round of District Level Health Survey (DLHS-2), 2002–04. It includes percentage of underweight children (in district and rural area), prevalence of anaemia in women and percentage of household

using toilets. Also, percentage of females having secondary education is taken from DLHS-2. Although most of the information is taken from DLHS-2 reports, wherever the reports were unavailable the information was extracted from data set of DLHS-2. Census 2001 is used for work participation ratio of females. Data for agricultural variables, that is, food grain production per capita and per worker agricultural GDP, is taken from Department of Agriculture and Cooperation, and Indicus Analytics, respectively. Both the variables are triennium average of years 2002–03 2003–04 and 2004–05.

The key features of the district data is the wide variation across the districts. The descriptive statistics show fairly large standard deviations for the variables, ranging from a low of 11 per cent in female work participation to a high of 28.42 per cent in triennium average per worker productivity in agriculture. Triennium-average food-grain production has the highest variability of 222.99 kilograms per annum (Table 6.1).

Table 6.1 Descriptive statistics

<i>Variable</i>	<i>No. of districts</i>	<i>Mean</i>	<i>Std. Dev.</i>
Child underweight rate – all (%)	526	46.2	14.50
Child underweight rate – rural (%)	524	47.7	15.14
Female work participation rates – all (%)	526	29.0	11.59
Female work participation rates – rural (%)	524	33.5	12.83
Females with above secondary education – all (%)	526	30.5	14.13
Females with above secondary education – rural (%)	524	21.7	14.98
Per worker GDP from agriculture at current prices (Rs. '000)	526	22.6	28.42
Average production of food grains (kg per annum)	523	224.4	222.99
Population with access to toilet – all (%)	526	41.3	22.36
Population with access to toilets – rural (%)	524	25.5	25.58
Women with moderate anaemia – all (%)	519	41.7	19.76

Source: Author's calculations

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A graphical analysis of the association between underweight rates and female workforce participation rates for the districts as a whole and for rural areas in particular, of these districts, does not show any strong relationship (Figures 6.1a and 6.1b).

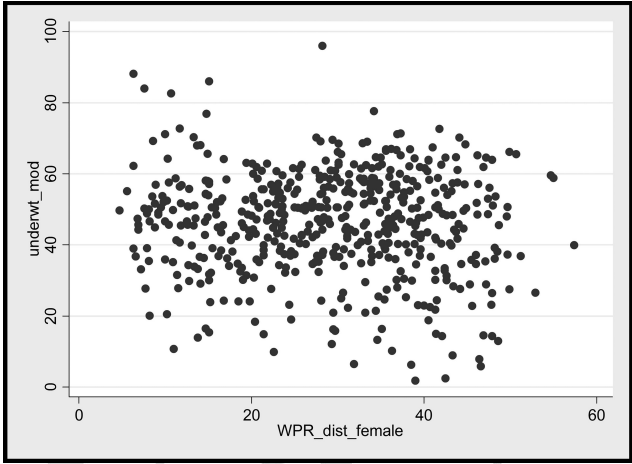


Figure 6.1a Female workforce participation rates and child underweight rates: all districts

Source: Authors' plot

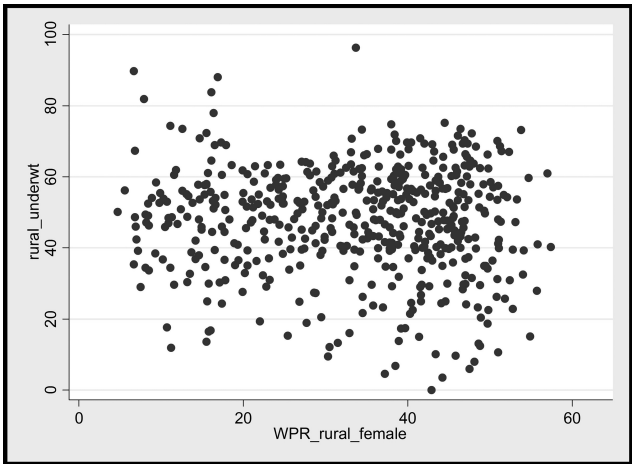


Figure 6.1b Female workforce participation rates and child underweight rates: rural areas of districts

Source: Authors' plot

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In comparison to this, the relationship with above secondary education rates of women shows a clear negative association with underweight rates irrespective of the region (Figures 6.2a and 6.2b).³

The econometric results in Table 6.2 further corroborate the observations from the figures above. It shows that work force participation

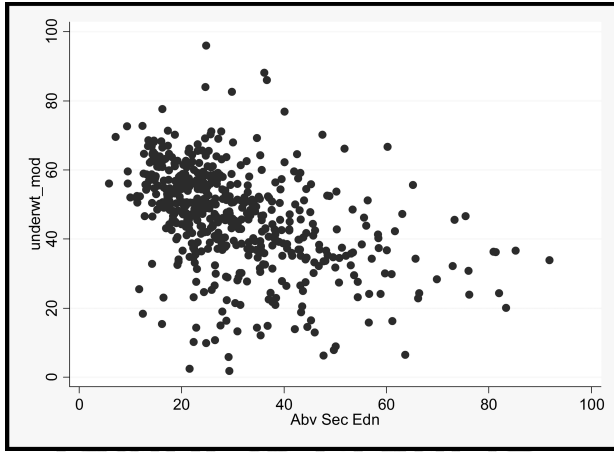


Figure 6.2a Above secondary education rates and child underweight rates: all districts

Source: Authors' plot

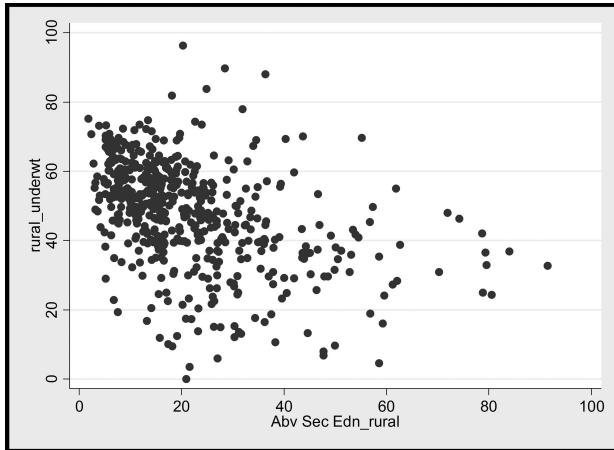


Figure 6.2b Above secondary education rates and child underweight rates: rural areas of districts

Source: Authors' plot

Table 6.2 OLS estimates for impact of women's work participation and education on child underweight rates: all and rural

Variable labels	All (rural and urban)			Rural		
	Model 1a	Model 1b	Model 1c	Model 2a	Model 2b	Model 2c
Female work participation rate	-0.086 (0.115)		-0.146** (0.003)	-0.058 (0.264)		-0.108* (0.022)
Percentage of females who have completed more than secondary-level education		-0.434** (0.00)	-0.447*** (0.00)		-0.424** (0.00)	-0.433*** (0.00)
Intercept	48.7*** (0.00)	59.5*** (0.00)	64.1*** (0.00)	49.6*** (0.00)	56.9*** (0.00)	60.7*** (0.00)
Adjusted R ²	0.0028	0.177	0.189	0.0005	0.174	0.181

Source: Author's calculations

Note: Values in bracket are p-values; # p<0.10; * p<0.05; ** p<0.01; *** p<0.001. Percentage of underweight children in the district is the dependent variable

rates have a weak relationship while there is a stronger association of secondary education rates with underweight rates. What is however more important to note is that after controlling for education, the female participation rates have a strong impact on underweight rates (models 1c and 2c in Table 6.2). Thus, improvements in workforce participation rates after controlling for secondary education rates prevailing in the districts decreases underweight rates in the respective regions of the districts.

Education of women above the secondary level has a significant negative association, and is higher for rural areas of the district than for the district as a whole. The reason could be the existence of more number of educated women at the district level. Education seems to have an impact quite distinct from contributing towards household earnings. Part of the effect of secondary education, may have already been captured in the female work participation at the district level and yet it has a significant influence in reducing underweight in children. It underscores the importance of women's education at a minimal level. Theoretically, certain threshold education is important for awareness creation in childcare. Results in Table 6.2 show that controlling for other factors that influence child underweight rates across districts is important to understand the impact of women's agency in the form of work participation rates.

To begin with, two different regressors capturing the role of agriculture are considered. These two variables are: per worker agricultural GDP and food grain production per capita and are related to agricultural performance. As mentioned earlier, we consider agriculture related variables since this chapter focuses on the relevance of women's agency in the context of an agricultural setting. The expected pathway of linking agriculture with child nutrition is via poverty reduction. Agriculture includes crops, livestock, fisheries and forestry. Hence, it is best to use agricultural GDP in value terms for easier aggregation. The variable chosen to indicate agricultural prosperity for the reference period of 2002–04 at the district level is the triennium average per worker gross domestic product at current prices ending in 2004. Further, the price effect of food grain abundance seems to help in the total district context, more than the rural context. There are two alternative explanations for this. Price effects may get muted in the rural areas in the presence of widespread poverty and high proportion of underweight children. It does not mean that high food prices do not affect them. It only means that the variable cannot fully capture the influence as opposed to other factors that strongly influence child underweight. Alternatively, rural people in subsistence conditions may be producing

their own food or depend upon public distribution system, even if the district in general happens to be a food grain deficit area, so that food grain deficit does not make a difference to them.

Table 6.3a shows that per worker agricultural GDP has significant and negative impact on underweight rates but not food grain production per capita (Models 3a and 3b in Table 6.3a). However, focusing on the models which include women's agency variables, the per worker agricultural GDP is insignificant but food grain production per capita is now significant at 10 per cent level of significance (Model 3f). For the rural areas, the final model has rather similar results for the agriculture variables as shown for Model 4f in Table 6.3b. Once again controlling for secondary education seems to take away the impact of per worker agricultural GDP but for food grain production per capita, the same relationship does not hold.

Two other variables that are important to be controlled for in the models explaining variations in underweight rates are: (a) hygienic conditions that affect the absorption of nutrients and (b) expectant mother's health status. Preventing the children from frequently falling ill particularly with diarrhoea and respiratory ailments; thereby affecting the improvements in physical growth during early childhood is important. Mother's health status particularly, anaemia among pregnant women impacts inter-generational transmission of malnutrition.

Table 6.4 shows that the percentage of population with access to toilets (or absence of open defecation) contributes significantly to the decline in underweight rates and contributes substantially to the overall goodness of fit in the absence of any other control variables (Models 5a and 6a). Models 5c and 6b show that results for women's agency effect are not affected due to the inclusion of the health related variables (Models 5c and 6b). The contribution of mother's high anaemia status can also be observed in Model 5c though its contribution is not that high as that of sanitary conditions (Model 5b).

Finally Table 6.5 presents the results combining all the three components women's agency, agriculture and sanitation to see the effect of each of these regressors after controlling for the remaining ones. As the preliminary analysis in the previous tables indicates, the impact of women's agency and health and hygiene variables are significant while agriculture variables do not to influence underweight rates in the presence of these variables. Moreover, only about one-third of the variation in underweight rates is captured by the variations in the variables included in the model for all the four models.⁴ Clearly there are other variables that could influence underweight rates not included here and

Table 6.3a OLS estimates for impact of women's work participation and agriculture on child underweight rates: all districts

Variable labels	Model 3a	Model 3b	Model 3c	Model 3d	Model 3e	Model 3f
Per worker agriculture GDP [@]	-0.081*** (0.00)		-0.0914*** (0.00)		-0.023 (0.286)	
Per capita food grain production [@]		-0.003 (0.219)		-0.004 (0.179)		-0.005# (0.055)
Female work participation rate			-0.13* (0.018)	-0.095# (0.083)	-0.155** (0.002)	-0.15** (0.003)
Percentage of females who have completed more than secondary-level education					-0.433***	-0.446***
Intercept	48.0*** (0.00)	47.1*** (0.00)	52.0*** (0.00)	50.0*** (0.00)	(0.00) 64.4***	(0.00) 65.4***
Adjusted R ²	0.0233	0.0010	0.0319	0.0048	0.189	0.189

Source: Author's calculations

Note: Values in bracket are p-values; # p<0.10; * p<0.05; ** p<0.01; *** p<0.001; @ These two variables are triennium averages ending in 2005. Percentage of underweight children in the district is the dependent variable

Table 6.3b OLS estimates for impact of women's work participation and agriculture on child underweight rates, rural

Variable labels	Model 4a	Model 4b	Model 4c	Model 4d	Model 4e	Model 4f
Per worker agriculture GDP [@]	-0.087*** (0.00)		-0.097*** (0.00)		-0.0219 (0.338)	
Per capita food grain production [@]		-0.005 (0.109)		-0.005# (0.089)		-0.0058* (0.029)
Female work participation rate in rural areas			-0.101# (0.052)	-0.062 (0.232)	-0.116* (0.015)	-0.114* (0.016)
Percentage of females who have completed more than secondary-level education in rural areas					-0.419*** (0.00)	-0.433*** (0.00)
Intercept	49.7*** (0.00)	48.9*** (0.00)	53.3*** (0.00)	51.0*** (0.00)	61.2*** (0.00)	62.3*** (0.00)
Adjusted R ²	0.0253	0.0030	0.0305	0.0038	0.1810	0.1860

Source: Author's calculations

Note: Values in bracket are p-values; # p<0.10; * p<0.05; ** p<0.01; *** p<0.001. @ These variables are triennium averages ending in 2005. Percentage of underweight children in the district is the dependent variable

Table 6.4 Impact of women's work participation and health and hygiene variables: all and rural

Variable labels	All		Rural	
	Model 5a	Model 5b	Model 5c	Model 6a
Female work participation rate			-2.08*** (0.00)	-0.14*** (0.00)
Percentage of females who have completed more than secondary-level education			-1.52** (0.00)	-0.168*** (0.00)
Percentage of households with toilet facility	-0.347*** (0.00)		-2.84*** (0.00)	-0.322*** (0.00)
Percentage of severely and moderately anaemic pregnant women (15–44 years)		0.220*** (0.00)	.0844** (0.00)	
Intercept	60.6*** (0.00)	37.0*** (0.00)	65*** (0.00)	55.9*** (0.00)
Adjusted R ²	0.285	0.087	0.335	0.296

Source: Author's calculations

Note: Same as Table 6.2

Percentage of underweight children in the district is the dependent variable

Table 6.5 Impact of women's work participation, agriculture and aspects of health and hygiene: all and rural

Variable labels	All		Rural	
	Model 7a	Model 7b	Model 8a	Model 8b
Female work participation rate	-2.01*** (0.00)	-2.08*** (0.00)	-1.32** (0.00)	-1.41** (0.00)
Percentage of females who have completed more than secondary-level education	-1.159*** (0.00)	-1.156*** (0.00)	-1.177*** (0.00)	-1.17*** (0.00)
Per worker agriculture GDP [@]	0.019 (0.343)		0.024 (0.264)	
Per capita food grain production [@]		-0.004# (0.08)		-0.003 (0.219)
Percentage of households with toilet facility	-2.9*** (0.00)	-2.77*** (0.00)	-2.8*** (0.00)	-2.72*** (0.00)
Percentage of severely and moderately anaemic pregnant women (15–44 years)	.0846** (0.00)	.0925** (0.00)		
Intercept	64.8*** (0.00)	65.4*** (0.00)	62.6*** (0.00)	63.8*** (0.00)
Adjusted R ²	0.335	0.331	0.325	0.323

Source: Author's calculations

Note: Values bracket are p-values; # p<0.10; * p<0.05; ** p<0.01; *** p<0.001; @ These variables are triennium averages ending in 2005. Percentage of underweight children in the district is the dependent variable

it is quite possible that the inclusion of those may alter the findings reported here. Thus, overall, the models presented above shows that women's agency aspects of education and work participation has negative influence on underweight children.

While the results clearly show that female work participation has an effect in reducing underweight children, it is not clear what type of work has a bigger negative impact. It is possible as has been indicated in Bhagowalia et al. (2012) that non-agricultural work in rural areas reduces child underweight rates compared to work in agriculture. Unfortunately, DLHS women's schedule does not give employment information. However, the agriculture undernutrition link is not observed in most of the estimated models, in the presence of a strong women's agency influence of education and work participation and social provisioning of toilet facilities. On the other hand, the message could be that unless agricultural prosperity results in the demand for social provisioning and empowers women through resource endowments, child underweight problem will continue to persist.⁵

Results: quantile regression estimation

The results presented in the previous section were based on regression models that explain the average variations in child underweight rates due to the variations in a given set of explanatory variables. In this section, we extend that analysis to estimate several regression models, each based on various quantiles or percentage point of the distribution of child underweight rates and referred to as quantile regression model (Koenker 2005). This approach helps us in understanding the differences in the causal relationship across the entire distribution (spread of the distribution) of the child underweight rates. Since lower quantiles would encompass districts with high levels of underweight rates and they are of more interest from a public policy perspective for intervening, such an analytical tool is of relevance in the current context of the study.

To ensure that we do not miss-out on the lowest deciles, we reversed the underweight percentage to non-underweight that is now the dependent variable captures percentage of normal children in the district and not that of underweight children. Consequently, coefficient in the estimated model reverses in sign compared to the results presented in the earlier section. Tables 6.6 reports estimates for the district and rural areas of the district separately with per worker agricultural GDP as the agricultural variable. Table 6.7 presents a similar analysis with, food grain production per capita as the explanatory variable.

Table 6.6 Estimates for child underweight rates with per worker agricultural GDP as the agriculture variable; quantile regression model, district and rural

Variable labels	All districts		Rural districts	
	Coefficient	p-value	Coefficient	p-value
	Quantile: 0.20			
Female work participation rate	0.123	0.176	-0.017	0.801
Percentage of females who have completed more than secondary-level education	0.140*	0.087	0.124**	0.032
Per worker agriculture GDP [®]	-0.025	0.660	-0.054	0.352
Percentage of households with toilet facility	0.246***	0.000	0.275***	0.000
Percentage of severely and moderately anaemic pregnant women (15–44 years)	-0.079**	0.037		
Intercept	31.023***	0.000	34.865***	0.000
R ²	0.1337		0.1409	
	Quantile: 0.40			
Female work participation rate	0.120*	0.057	0.081	0.130
Percentage of females who have completed more than secondary-level education	0.191***	0.000	0.174**	0.016
Per worker agriculture GDP [®]	-0.016	0.563	-0.01	0.788
Percentage of households with toilet facility	0.258***	0.000	0.265***	0.000
Percentage of severely and moderately anaemic pregnant women (15–44 years)	-0.111***	0.001		
Intercept	36.468***	0.000	36.062***	0.000
R ²	0.1943		0.1833	

(Continued)

Table 6.6 (Continued)

Variable labels	All districts		Rural districts	
	Coefficient	p-value	Coefficient	p-value
	Quantile: 0.60			
Female work participation rate	0.178***	0.002	0.116**	0.049
Percentage of females who have completed more than secondary-level education	0.163**	0.016	0.218**	0.011
Per worker agriculture GDP [@]	-0.017	0.437	-0.015	0.618
Percentage of households with toilet facility	0.308***	0.000	0.287***	0.000
Percentage of severely and moderately anaemic pregnant women (15-44 years)	-0.090**	0.011		
Intercept	37.819***	0.000	39.226***	0.000
R ²	0.2406		0.2195	
	Quantile: 0.80			
Female work participation rate	0.212***	0.001	0.105*	0.081
Percentage of females who have completed more than secondary-level education	0.199***	0.003	0.260***	0.000
Per worker agriculture GDP [@]	-0.010	0.836	-0.036	0.456
Percentage of households with toilet facility	0.348***	0.000	0.341***	0.000
Percentage of severely and moderately anaemic pregnant women (15-44 years)	-0.076***	0.008		
Intercept	39.466***	0.000	44.327***	0.000
R ²	0.2563		0.248	

Source: Author's calculations

Note: (1) The dependent variable is the respective percentage of normal children and hence signs of the coefficient will be reverse of that for underweight rates in 'All' and 'rural'. (2) ** 1 per cent level of significance, *** 5 per cent level of significance, * 10 per cent level of significance; @ These variables are triennium averages ending in 2005.

Percentage of underweight children in the district is the dependent variable

Table 6.7 Estimates for child underweight rates with food grain production per capita as the agriculture variable: quantile regression model, all and rural

Variable labels	All districts		Rural districts	
	Coefficient	p-value	Coefficient	p-value
Female work participation rate	0.093	0.374	-0.042	0.527
Percentage of females who have completed more than secondary-level education	0.253**	0.007	.1539**	0.010
Per capita food grain production [®]	0.008**	0.006	0.003	0.152
Percentage of households with toilet facility	0.130	0.068	.2184***	0.000
Percentage of severely and moderately anaemic pregnant women (15–44 years)	-0.073	0.108		
Intercept	29.89***	0.000	34.73***	0.000
R ²	0.1364		0.1399	
Female work participation rate	0.1464*	0.022	0.069	0.226
Percentage of females who have completed more than secondary-level education	0.1634*	0.016	0.1884**	0.006
Per capita food grain production [®]	0.0052*	0.025	0.002	0.453
Percentage of households with toilet facility	0.242***	0.000	.2498***	0.000
Percentage of severely and moderately anaemic pregnant women (15–44 years)	-0.112***	0.000		
Intercept	35.62***	0.000	35.84***	0.000
R ²	0.1927		0.1806	

(Continued)

Table 6.7 (Continued)

Variable labels	All districts		Rural districts	
	Coefficient	p-value	Coefficient	p-value
	Quantile: 0.60			
Female work participation rate	.1645**	0.002	.1441**	0.009
Percentage of females who have completed more than secondary-level education	.1917*	0.015	.1959*	0.010
Per capita food grain production [®]	0.003	0.258	0.004	0.166
Percentage of households with toilet facility	.2633**	0.000	.2692***	0.000
Percentage of severely and moderately anaemic pregnant women (15–44 years)	-.1031**	0.004		
Intercept	38.17***	0.000	37.93***	0.000
R ²	0.2368		0.2160	
	Quantile: 0.80			
Female work participation rate	.1878**	0.001	.1262*	0.023
Percentage of females who have completed more than secondary-level education	.229***	0.001	.2546***	0.001
Per capita food grain production [®]	0.003	0.355	0.002	0.626
Percentage of households with toilet facility	.3398***	0.000	.335***	0.000
Percentage of severely and moderately anaemic pregnant women (15–44 years)	-.0861**	0.001		
Intercept	39.03***	0.000	42.56***	0.000
R ²	0.2534		0.2454	

Source: Author's calculations

Note: Same as Table 6.6.

Percentage of underweight children in the district is the dependent variable

Districts are different from households while discussing the quantiles ranging from few normal children to large number of normal children. It is important to note that districts in the lowest underweight quintile (having fewer normal children) with an average of more than 75 per cent of the children below six years being moderately underweight fall in the lowest three per capita GDP quintiles (Appendix Table A1.2). That is, undernutrition is spread wider over GDP distribution and is an indication that average prosperity of the district automatically does not reduce proportion of underweight children. It is observed from the data that 16 per cent of the districts with high underweight children in the range of 75 per cent have a per capita district GDP of more than Rs. 25,000/- per annum. On the other hand, about 8 per cent of the districts in the lowest per capita GDP quintile with just about Rs.9,000/- GDP per capita per annum seem to have eliminated the problem of underweight in children. This perhaps points to the need for other enabling factors like social provisioning and women's agency aspects to be consciously promoted through policy and not expect overall prosperity to eliminate underweight in children.

Female work participation rates

The coefficient for female work participation remains insignificant in the lowest quantile, for the district study and in the two lowest quantiles in the district rural study. Work participation becomes significant in the 40th, 60th and 80th quantiles for the district and in the 60th and 80th quantiles for the district rural areas. This is probably due to the low level of wages and low returns to labour in subsistence work, when more than 75 per cent of children are in the underweight category in the district.

Absence of significance for female work participation in the lower quantiles seem to support the observations in some case studies that women's work participation per se has no value for improving the proportion of normal children but other conditions of empowerment matter. Some interaction effects of work participation of females and their education which is not captured in the present analysis may be at work. In India, work participation rates of women are observed to fall with income and urbanisation, despite increase in the education levels of women. More research by extracting the data on number of women with educational qualifications above secondary level who are also working may help to understand the women's agency aspects of work participation.

Above secondary education

In contrast to female work participation, women's education above the secondary level has a significant positive association with fewer underweight children in all the quantiles in all the four sets of analysis. The coefficient consistently has higher magnitude in higher quantiles, both for the total district population and rural population of the districts. Thus, education seems to have higher agency value than work participation.

Agriculture

The results show that agriculture per se has a weak linkage to proportion of normal weight children in the district, when examined from the perspective of agricultural worker productivity and food grain production per capita after controlling for other covariates. The only instance where we observe some impact of agriculture on child nutrition in the presence of control variables is when triennium average food grain production per capita is significant with the proportion of normal children in the 20th and 40th quantiles of the district estimation (Table 6.6). This last result perhaps lends us to conclude that price effect of food grain abundance is restricted to districts with high underweight children. We may reiterate our earlier claim that agriculture's link to underweight via worker productivity and food grain production appears rather weak in a model when other factors like women's work participation, education or sanitation facilities are controlled for. At this stage, it is not clear if any other indicator of agricultural prosperity such as land productivity or diversification would have performed better. In the presence of strong women's agency influence and the influence of sanitation through social provisioning, any other agricultural or non-agricultural prosperity indicator would be insignificant in the district analysis. However, if we want to ask the question how does agriculture/non-agriculture help empower women through work participation and higher wages, then probably agriculture is not irrelevant to reduction in underweight children. This is beyond the scope of the present study.

Hygiene and health

The coefficient magnitude is high for toilets and increases from the lowest 20th quantile to the 80th quantile in all the four estimations. This only indicates that the quality of toilets probably improves increasing the effectiveness of toilets as we move from few normal children

quantiles to large normal children quantiles. However, the magnitude of this coefficient is low for the lowest quantile in district estimation where food-grain production per capita is used. Finally, the percentage of pregnant women with anaemia has a significant negative association with percentage of normal-weight children, though the coefficient value is low and a somewhat non-uniform effect across the quantiles. In the model with food grain production per capita, this variable turns out insignificant for the lowest normal-weight quantile.

Overall, the results show the higher level of woman's education, and better sanitary conditions are more important across the quintiles while female work force participation has better impact for lower (higher) levels of underweight (normal) children and agriculture variables have very limited influence on district-level underweight rates.

Conclusions

This study has attempted to explain the variations in underweight rates across districts of India and also particularly among rural areas of the districts. The focus has been on the agency effect of women's work participation and higher level (above secondary) of education in an agricultural setting. The intention to focus on agriculture as a possible pathway along with women's agency comes from the fact that higher levels of underweight rates are noted among rural areas and those involved primarily in agriculture while female employment is also predominantly in agriculture. Further, the impact of women's agency is assessed after controlling for access to toilet and mother's anaemia rates as these two variables also influence underweight rates.

The quantile regression analysis establishes the fact that women's education above the secondary level is the single most significant factor in improving the proportion of normal weight children in all the quantiles. Higher the proportion of women with secondary education, lower the proportion of underweight children in the district. Beyond any doubt women's education enhances the women's agency effect. More or less, uniformly the magnitude of the coefficient also increases from lower quantiles to higher quantiles.

However that is not the case with the work participation rates of women. The female work participation ratios result in positive outcomes on child nutrition but once again in a limited sense. Women's work participation is effective from 40th quantile at the district level and only from 60th quantile in rural areas, that is has relevance in the upper quantiles of the normal-weight children. In contrast, women's

education has a positive impact on reducing underweight across all the quantiles considered in this study. Work participation is not of much use when the underweight rates are rather high in the 20th and 40th quantiles where the underweight children happen to be as high as 75 per cent and 60 per cent respectively. In the 60th quantile, when the level of underweight children falls close to 50 per cent, women's work participation assumes agency effect to reduce the proportion of underweight children. A combination of higher impact of work participation and women's education works better only in the 80th quantile, where the toilets are also highly effective to reduce the underweight children to 35.5 per cent. Women's agency aspects get enhanced with the combined influence of women's work and education.

We may surmise that the link between agriculture and nutrition is inconclusive in our study. There could be some underlying mechanism of agricultural prosperity influencing poverty reduction through higher female work participation. There is no clear evidence on this. As it turns out, GDP per worker has been insignificant throughout the analysis, though its inclusion improves the fit of the model. Food grain production per capita turns out to be significant in the Ordinary Least Squares (OLS) results also in the 20th and 40th quantiles in the quantile regression estimates of the district. The coefficient has the highest magnitude and significance in the lowest quantiles compared to other quantiles. The magnitude falls and it turns insignificant in higher quantiles. Probably it is an indication of its importance for reducing food deprivation and improving child nutrition in the lower quantiles. Probably it is also capturing the changing priorities of agriculture with less emphasis on food grains. Food grain production per capita seems less relevant in rural areas and a more in-depth study is required to capture the reasons.

It appears that social provisioning of health, sanitation and education should go hand in hand for women's agency to have an impact on increasing the proportion of normal-weight children in India. Further research with a combination of household data and district data with regional characteristics may help to understand the transmission mechanisms better.

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Notes

1 Magnitude of child under-nutrition in India

	<i>Stunting</i>	<i>Wasting</i>	<i>Underweight</i>	<i>Poverty (%)</i>
Urban	39.6	16.9	32.7	25.7
Rural	50.7	20.7	45.6	41.8
All India	48.0	19.8	42.5	37.2

Source: IIPS (2007); Planning Commission (2014)

- 2 Women's employment can be either paid employment (wages/salaries) or unpaid employment. Both types of employment contribute to the household income through labour contribution. Work participation may or may not lead to access to the money earned and choice to spend. We are only considering the enhanced household income leading to better nutrition of children.
- 3 Appendix 6.II presents a few more graphical representations capturing the variability between child underweight rates and regressors used in the analysis here.
- 4 The collinearity among the regressors was examined using variance inflation factor and the results did not warrant any problem of multi-co-linearity.
- 5 Interestingly, even non-agricultural per worker GDP and per capita district GDP turn equally insignificant in the presence of women's agency aspects in the equation. Agricultural per worker GDP appears to be a more logical choice as many women workers are engaged in agriculture.

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APPENDIX I

Table 6A1.1 Results of single variable OLS regressions at the state and district levels in India

<i>Dependent</i>	<i>Independent</i>	<i>Coefficient</i>	<i>R</i> ²
District cross-section			
n = 526			
Percentage of household with low standard living Index	Per worker agriculture GDP (Triennium ending 2005)	-0.27**	0.1604
Percentage of moderately underweight (<-2 SD) children (0-71 months)	Percentage of household with low standard living of Index	0.26***	0.1257
Percentage of moderately underweight (<-2 SD) children (0-71 months) in rural areas	Percentage of household with low standard living Index in rural areas	0.26***	0.1468
State-level panel; n=51			
Rural poverty rate	Net state domestic product per agricultural worker at current prices	-0.003***	0.4054
Percentage of moderately underweight (<-2 SD) children (0-71 months) in rural areas	Rural Poverty rate	0.27**	0.0999
Rural Stunting rate	Rural Poverty rate	0.227**	0.106

Source: Authors' calculations

Table 6A1.2 Distribution of districts across quintiles of GDP per-capita and quintile of prevalence of underweight in children

<i>Quintile of underweight rates</i>	<i>Quintiles of average per capita GDP#</i>					<i>Total</i>	<i>Mean underweight</i>
	<i>I1</i>	<i>I2</i>	<i>I3</i>	<i>I4</i>	<i>I5</i>		
U1	34.6	23.1	26	12.5	3.8	100	75.3
U2	35	20.4	23.3	14.6	6.8	100	60.4
U3	29.5	17.1	21	16.2	16.2	100	52.4
U4	4.7	21.5	15	27.1	31.8	100	45.7
U5	3.7	15	19.6	26.2	35.5	100	35.3
Total	21.3	19.4	20.9	19.4	19	100	46.2
Mean GDP per capita ('000 Rs.)	9.1	13.8	18.6	24.9	42.1	21.3	

Source: Authors' Calculations

Note: #Per capita GDP (Triennium ending 2005) and source is Indicus Analytics; U1-U5 denotes the five quintile classes based on the distribution of underweight rates and similarly I1-I5 are the five quintile classes obtained from the distribution of Average per capita GDP of the districts. The first quintile (U1/I1) represents the group with bottom 20 per cent value and progressively, the top quintile (U5/I5) represents the group with top 20 per cent values for that respective variable.

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APPENDIX II

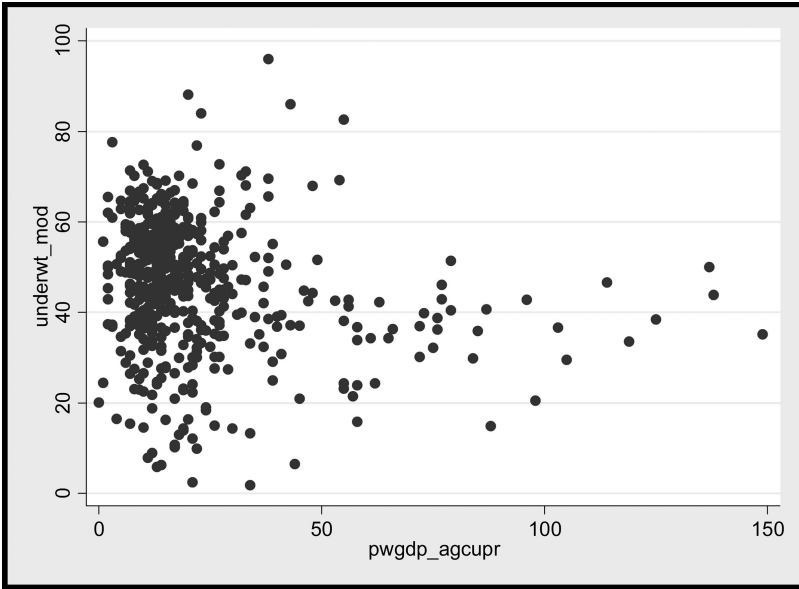


Figure 6A2.1 Underweight rates and per worker agriculture GDP (2002–2004)
Source: Authors' plot

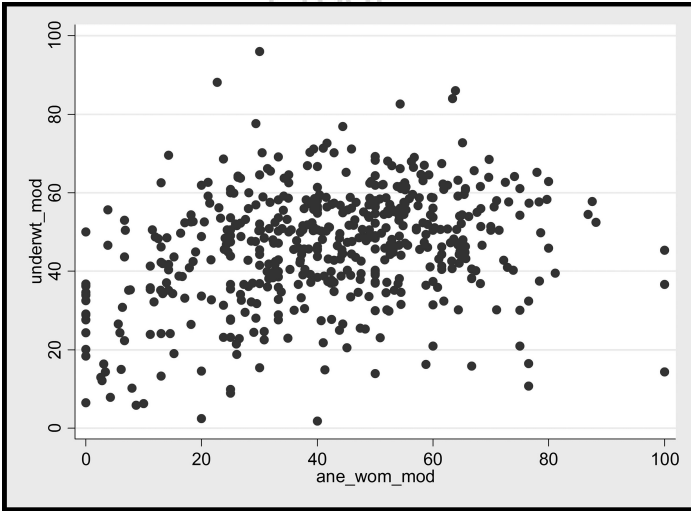


Figure 6A2.2 Underweight rates and percentage of severely and moderately anaemic pregnant women (15–44 years) (2002–2004)

Source: Authors' plot

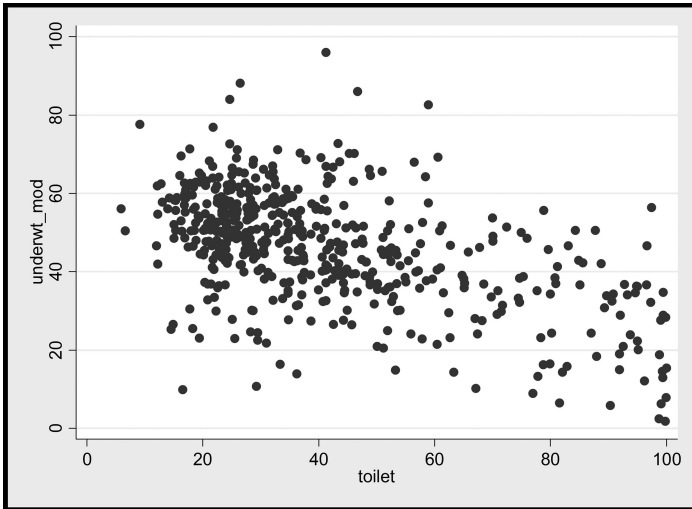


Figure 6A2.3 Underweight rates and percentage of households with toilet facility, all districts (2002–2004)

Source: Authors' plot

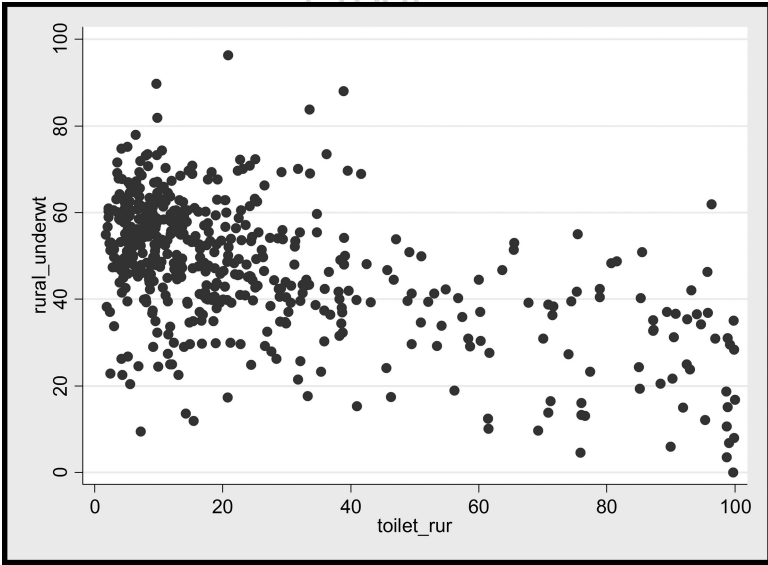


Figure 6A2.4 Underweight rates and percentage of households with toilet facility, rural (2002–2004)

Source: Authors' plot

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MATERNAL NUTRITION

Breaking the intergenerational cycle of malnutrition: significance, challenges and opportunities

Sheila C. Vir

Maternal undernutrition: a critical public health issue

Maternal undernutrition plays a crucial role in influencing maternal, neonatal and child health outcomes (Mason et al. 2012). With India's commitment to Millennium Development Goal 4 (MDG 4), reduction of maternal mortality rate (MMR) has received substantial attention. New programme directions and strategies have been introduced. These include special focus to increase coverage of antenatal care (ANC) services, institutional delivery and family planning services. Under the National Rural Health Mission (NRHM), special programme designs have been developed to reach the marginalised population such as those living in remote rural areas, poor urban pockets or scheduled cast/scheduled tribe population. With such intensive efforts, the MMR in India has dropped from 301 per 100,000 live births in 2003 to 212 in 2009 (SRS 2009). The effort is to reach the MDG of 109 by 2015.

The significance of addressing maternal undernutrition as a high risk factor for maternal mortality as well as child undernutrition is not yet well appreciated and remains a low priority in public health agenda of the country, including the package of ANC services (Saldana et al. 2012). This is evident from the fact that the percentage of undernourished women has remained almost stagnant in the last two decades despite a sharp and impressive increase in antenatal care services and institutional deliveries (CES 2009; NFHS-1 1992–93; NFHS-2 1998–99; NFHS-3 2005–06).

Maternal undernutrition such as addressing thinness and stunting, low body mass index (BMI) and anaemia are significant risk factors not only for maternal mortality but also for influencing the health and nutrition of the future generations. In fact, maternal malnutrition reduces capacity to healthy foetal growth resulting in intrauterine growth restriction (IUGR), low birthweight (LBW) and poor start in life with higher incidence of stunting (Mason et al. 2012).

This chapter reviews the evidence on the links between maternal nutrition and a range of outcomes, the current government programmes in operation to address maternal malnutrition and proposes actions for improving the maternal nutrition situation.

Maternal nutrition, birth outcomes and child undernutrition

The association of maternal nutrition with birth outcome and child undernutrition is complex and is influenced by many biologic, socio-economic and demographic factors, which vary widely in different populations. Factors such as early marriage, conception at a young age of below 20 years, women entering pregnancy with poor nutrition and inadequate knowledge of self-care, inadequate coverage and poor quality of ANC services, unintentional pregnancies contribute to high incidence of LBW. Incidence of LBW is 3–4 times higher in mothers who are adolescent or below 18 years as compared to those over 18 years (NFHS-1 1992–93). Early marriage combined with social pressure to prove fertility increases adolescent conception which hinders the second growth spurt of adolescent girls (Vir 1990). In India, 35.7 per cent of girls begin childbearing by 19 years of age (NFHS-3 2005–06). Such mothers have a higher chance to enter pregnancy with poor height and weight. LBW and preterm delivery are twice as common and neonatal mortality is almost three times higher in adolescent pregnancies than adult pregnancies (Wu et al. 2012). Poor nutrition in utero and during early childhood in girls' constraints future capacity to support healthy foetal and infant growth and this capacity is further diminished by continued poor nutrition throughout the lifecycle (Saldana et al. 2012).

Almost a quarter of children in India, estimated 7.5 million babies each year, have an LBW of less than 2.5 kg. In fact, India is one of the five developing countries where the incidence of LBW exceeds 20 per cent and accounts for one-third of the global burden of LBW (UNICEF 2013).

The situation of LBW in India is possibly worse since the available data is primarily limited to birthweight records linked to institutional delivery. However, only three-fourths of newborns are reported to be weighed before discharge (CES 2009; JSY 2011). Moreover, the weight record is far from accurate since a callous attitude has been observed at health sub-centre level – weight being often recorded to a rounded figure of criteria of the LBW cut off of 2.5 kg to remain in the safe limit of normal births.

The implications of LBW on nutritional status of children are evident in early pregnancy itself. Almost a third of children are stunted by six months of age. After six months, the prevalence rate of stunting continues to increase and is about 45 per cent by two years of age (Adhikari et al. 2013; NFHS-3 2005–06). LBW combined with poor infant and young child feeding (IYCF) practices and high rate of infection are the primary causes of such poor growth trend in infancy. This is supported by a longitudinal study of child growth in India which confirms that LBW children have a poor start in life and continue to grow rather poorly and rarely catch up in growth (Ghosh et al. 1971).

A recent analysis using data of low- and middle-income countries report that LBW is associated with 2.5–3.5-fold higher odds of wasting, stunting and underweight in children. This analysis reveals that childhood undernutrition may have its origins in the foetal period, highlighting the significance to intervene during pregnancy to prevent foetal growth retardation and preterm birth (Christian et al. 2013). High incidence of LBW sets up a vicious cycle of stunting that passes from generation to generation, contributing to high number of stunted children and short adults with small pelvic size with risk factors for delivery complications, morbidity and mortality. Taking these factors into contribution, the first 1,000 days of life, that is from conception to the first two years of life is considered the ‘window of opportunity’ for addressing undernutrition.

The significance of mothers entering pregnancy in well-nourished condition is evident. In fact, the major determinants of poor birth outcomes are poor maternal nutritional status of women before and during pregnancy such as short maternal stature due to mother’s own childhood undernutrition, low BMI at conception and inadequate gestational weight gain due to poor dietary intake and anaemia (Saldana et al. 2012). Dietary intake data indicates that almost a third of pregnant women consume less than 50 per cent Recommended Dietary Allowance (RDA) of protein while over 75 per cent consume less than

50 per cent RDA of iron, vitamin A and calcium (NNMB 2012). Intake of pulses, oil and vegetables remain rather low through pregnancy.

In India, mean birthweights of infants born to mothers below 45 kg is reported to be about 2.63 kg as compared to mean birthweight of 3 kg in case of mothers 55 kg and above (Ramachandran 1989). An association of birthweight and economic situation of mothers has also been reported with poor mothers having lower height and weight (NNMB 1979–2006). Several studies have reported a positive relationship between maternal anthropometries such as weight, height, BMI and birthweight. Recent analyses of data on maternal height and offspring growth from Brazil, Guatemala, India, Philippines and South Africa indicates maternal height associated with birthweight and short mothers (< 150 cm) are three times more likely to have a child who is stunted at two years of age (Addo et al. 2013). Maternal malnutrition in fact is a key contributor to poor foetal growth, LBW, infant morbidity and mortality and can cause long-term irreversible and detrimental cognitive, motor and health impairments (Saldana et al. 2012).

Besides mother's health and nutrition status, other basic factors such as poor education of women, low status in society, tradition of 'eating last', inadequate decision-making power are some of the important underlying causes resulting in poor maternal and child health and nutrition situation. It has been projected that 'if women and men had equal status in South Asia, with other factors remaining unchanged, the percentage of underweight children would be reduced by 13 percentage points (from 46 per cent to 33 per cent) roughly 13.4 million children' (Smith et al. 2003; UNICEF 2012). Education empowers women, and higher school education can be considered a proxy indicator of the decision-making power of women. An analysis of the National Health and Family Survey-3 (NFHS-3) data reveals that with increase in level of education of women, there is reduction in percentage of adolescent marriage, increase in median age of first birth, decrease in spousal violence as well as decrease in percentage of women with low BMI (NFHS-3 2005–06). Mother's status such as education, exposure to mass media and violence experience are also analysed to be the highest risk-loading factors associated with under-nutrition in children. Investment in maternal education, including exposure to mass media, is evidently an investment which would yield long-term health and nutrition benefits (Vir 2011).

The implications of women's health and nutrition situation need to be viewed beyond its direct impact on birth outcome and nutritional

status of children. Women's own right to healthy living is crucial and has implications on educational performance, working capacity, productivity, family and child care. Moreover, poor education of women continues to perpetuate gender inequalities in societies resulting in poor socio-economic status, inadequate power to make decisions, insufficient understanding and appreciation of importance of appropriate care of family and thus playing a central role in the intergenerational cycle of malnutrition (UNICEF 2012). The significance of women's nutrition therefore needs to be considered in a broader context.

Women's nutrition in India: the current scenario

Over a third of women are reported to have low BMI. There is a wide state variation in the rate of undernutrition in women. Thirteen states in the country have a higher percentage of mothers with low BMI compared to the national average of 35.6 per cent. The percentage of women with low BMI is higher in rural region (40.6%) compared to urban region (25.0%). The situation of low BMI is much worse off in the scheduled tribe (46.6%) compared to scheduled cast (41.1%) and others (29.4%). The undernutrition scenario in women and children with reference to wealth quintiles also indicates that the situation improves with increase in wealth but the situation of poor BMI is almost 20 per cent even in the highest wealth quintile (Figure 7.1) (NFHS-3 2005–06).

Interestingly, unlike Nigeria and Ethiopia, a substantial and sharp decrease in undernourished prevalence rate of women is observed in

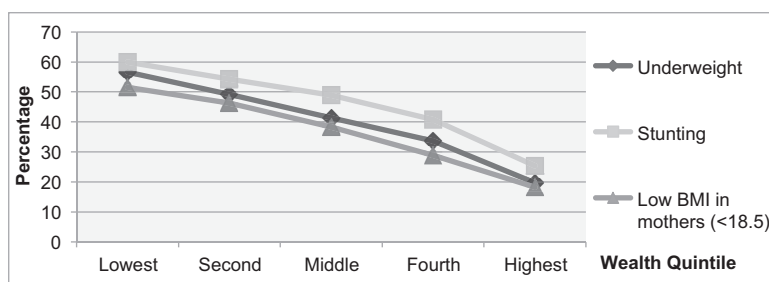


Figure 7.1 Trend in undernutrition (underweight and stunting) in children and low BMI in mothers with wealth quintiles

Source: NFHS-3 (2005–06)

India with increase in wealth quintile (Victora et al. 2012). This highlights the significant equity issue which needs to be addressed.

Overnutrition in women is also being observed to be an emerging problem in India with serious implications on adult onset non-communicable diseases. In the highest wealth quintile, almost a third of adult women aged 15–49 years are reported to be suffering from overnutrition compared to 1.8 per cent in the lowest wealth quintile (NFHS-3 2005–06). Similarly the prevalence of overweight is almost four times higher in urban India (23.5%) compared to rural India (7.4 %) with a wide state variation. Interestingly, as per NFHS-3 data, percentage of mothers who are overweight also increases with years of education.

Anaemia is prevalent across all age groups – about 70 per cent young girls below five years, 55.8 per cent adolescent girls, 56.2 per cent women in reproductive age group and 58.7 per cent pregnant women are reported to be anaemic (Figure 7.2).

State-wise anaemia prevalence rate is higher than 40 per cent, the cut-off prevalence rate indicating anaemia being a severe public health problem, in all the states of India except five states – Punjab, Manipur, Mizoram, Goa and Kerala.

Anaemia prevalence rate is almost similar in all wealth quintiles (Figure 7.3). The primary reason being low consumption of animal food and poor availability of iron from cereal-based high-phytate vegetarian diet consumed by Indian population. Onset of menstruation in adolescence and physiological demands of pregnancy greatly increases requirements for iron and other micronutrients. There is almost a ten-fold increase in iron requirements by the third trimester of pregnancy.

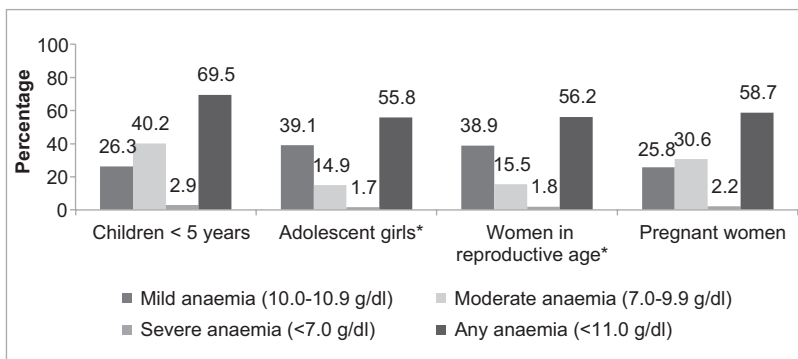


Figure 7.2 Prevalence of anaemia in different age groups in India

Source: NFHS-3 (2005–06)

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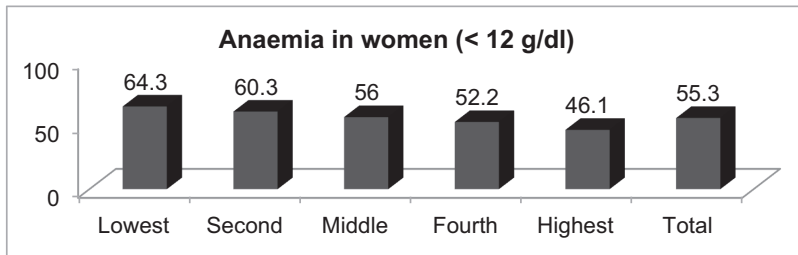


Figure 7.3 Women aged 15–49 years with anaemia prevalence by wealth quintile (%)

Source: NFHS-3 (2005–06)

Most local diets fail to meet such higher needs. The consequence is high incidence of anaemia. Routine consumption of iron-folic acid (IFA) supplement tablets by women in reproductive age is therefore critical.

Addressing women's nutrition: past efforts and current focus

In 1982, UNICEF-WHO advocated a focus on GOBI (growth monitoring, oral rehydration therapy for diarrhoea, promotion of breastfeeding and childhood immunisation) as 'selective primary health care' intervention package for optimum use of scarcity of resources to achieve health for all. Subsequently the focus of GOBI shifted to GOBI-FFF with addition of three interventions related to women – family planning with birth spacing, food supplementation to pregnant women and female literacy. In actual implementation, the women-related interventions remained a lower priority.

At global level, improving adolescent and women nutrition re-gained significance in 1998 when the conceptual framework of undernutrition positioned maternal nutrition as an important underlying cause of child undernutrition and stressed on breaking the intergeneration cycle of undernutrition. After a decade, based on evidence from India and other developing countries, a focus on under twos or the first 1,000 days of life is now being stressed (World Bank 2006). Global guidelines include specific interventions for improving nutritional status of women and adolescent girls (Bhutta et al. 2008). These have been contextualised with reference to India's nutritional epidemiology and list of ten interventions are proposed by the Nutrition Coalition of India (The Coalition 2010). As presented in Table 7.1, for most of

Proof

Table 7.1 Policies of government of India for improving health and nutrition situation of women and adolescent girls: current status and proposed actions

<i>Nutrition and health intervention</i>	<i>Policy/programmes</i>	<i>Proposed actions</i>
Intensive health, nutrition and sanitation-hygiene education (HNEd)	RCH of MHFW *ICDS of MWCD#	<ul style="list-style-type: none"> - Standardise messages of health and nutrition education (HNEd) - Streamline HNEd with livelihood, SHG, microcredit programmes - Strengthen education through interpersonal communication and mass media
Improving nutrient intake of women life especially during pregnancy	Supplementary nutrition (SN) of ICDS	<ul style="list-style-type: none"> - Introduce target approach-focus on universal coverage <45 kg pregnant women - Introduce policy on special quota of pulses and oils for families with pregnant women under PDS
Promoting weight gain during pregnancy	RCH	<ul style="list-style-type: none"> - Weight monitoring and promote weight gain of 10–12 kg (integrated part of ANC services) - Support energy conservation measures – easy access to water, sanitation and fuel
IFA supplement to pregnant women and women in reproductive age	National Anaemia Control Programme, NIPI***, RCH	<ul style="list-style-type: none"> - Effective communication and monitoring strategy to increase compliance (focus on benefits) and systematic checking of quality of IFA tablets
Biannual deworming supplementation	RCH	Consultation & early formulation of policy
Iodised salt consumption	NIDDCP, MHFW	Introduction of iodised salt in the food basket of public distribution system (PDS)
Calcium supplement	MHFW	Early issue of policy

<i>Nutrition and health intervention</i>	<i>Policy/programmes</i>	<i>Proposed actions</i>
Micronutrient/iron-folic acid fortification of food	MHFW	<ul style="list-style-type: none"> - Based on available evidence, formulate policy for fortification of cereals, Take Home Ration (THR)/hot cooked meal of ICDS and marketing of Double Fortified Salt (DFS) - Active private sector involvement
Maternity care services and schemes		
>Conditional Cash Transfer (CCT) schemes	<ul style="list-style-type: none"> - Janani Shishu Suraksha Karyakram (JSSK) - Indira Gandhi Matritva Sahyog Yojana (IGMSY), MWCD 	<ul style="list-style-type: none"> - Explore convergence of JSSK and IGMSY - Include IFA compliance, birth weight factors in incentive package - Include outcomes (normal nutritional status at one year) to incentive package
>Maternity Leave Benefit Scheme	MWCD, MHFW, Ministry of labour	<ul style="list-style-type: none"> - Effective implementation of formal and non-formal sectors
Health and nutrition care of adolescents girls		
>Prevent early marriage and early pregnancy	ARSH** (MHFW), SABLA (MWCD) Education (MHR)	<ul style="list-style-type: none"> - Execution of existing legislation - Ensure higher incentives and political support for completing middle and high school education
>Weekly IFA supplementation (WIFS) and Biannual Deworming Prophylaxis	Weekly IFA Supplementation (WIFS) programme, MHFW	<ul style="list-style-type: none"> - Social marketing of IFA tablets to reach non-government private schools-Quality check of IFA tablets

*Reproductive and Child Health (RCH) programme of Ministry of Health and Family Welfare (MHFW)

#Integrated Child Development Services (ICDS) of Ministry of Women and Child Development (MWCD)

***National Iron Plus Initiative (NIPI)

**Adolescent Reproductive Sexual Health (ARSH)

these interventions, health and nutrition policies have already been issued by the two nodal ministries of the Government of India – Ministry of Health and Family Welfare (MHFW) and Ministry of Women and Child Development (MWCD).

Policy to actions: current status of scaling up efforts

Presented below is description of the policy and programmes which directly or indirectly influence maternal nutrition and health along with suggestions for improving coverage and impact. This section focuses on (a) policies pertaining to selected direct nutrition interventions targeted to maternal malnutrition, (b) maternity care schemes that serve as platforms to improve coverage of the selected direct nutrition interventions and protects legal rights, (c) policies and programmes which are in place to address nutritional status of adolescent girls and (d) state-level initiatives undertaken to address the issue of maternal malnutrition.

Direct nutrition intervention actions

As presented in Table 7.1, there are policies and programmes in place which address micronutrient deficiencies such as iron and iodine deficiency as well as programmes which aim to improve energy and protein intake.

(i) **Anaemia control programme:** In 1971, interventions were introduced for control of anaemia. The programme was later introduced as ‘National Nutritional Anaemia Control Programme’ and was made an integral part of Child Survival Safe Motherhood (CSSM) programme (Vir 2010). Unfortunately, as a part of ANC services, the gap between supply and consumption of IFA tablets remains wide (Figure 7.4) (CES 2009). The fact that iron supplementation in pregnancy reduces the incidence of LBW by almost 20 per cent (Imdad 2012) needs to be recognised and urgent measures taken for effective implementation (Table 7.1).

Besides IFA, promotion of consumption of foods rich in micronutrients, such as iron and vitamin A, needs special attention. Findings of the Pune Maternal Nutrition Study from western India reports that the consumption of micronutrient-rich foods like green leafy vegetables, fruit and milk is significantly associated with foetal growth (Rao et al. 2001). Variation in mean birthweight of babies born during different seasons of the year is also reported to have an association with availability of seasonal fresh fruits and vegetables (Tamber 2006).

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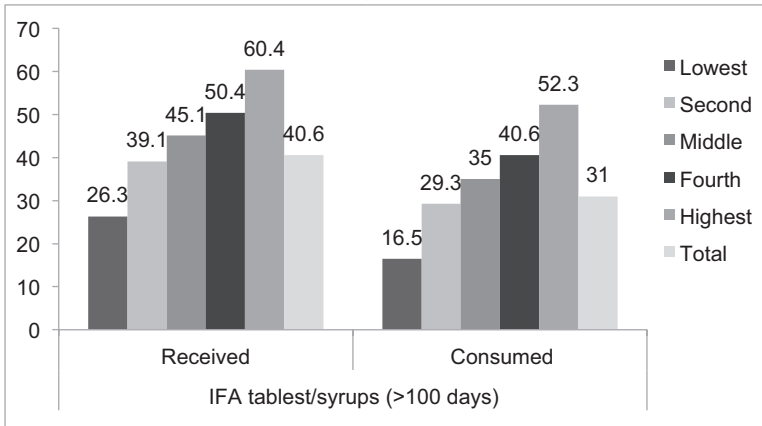


Figure 7.4 Women who received and consumed 100 IFA tablets/syrups for >100 days based on wealth quintile (%)

Source: CES 2009

(ii) **Prevention of iodine deficiency:** Ensuring universal consumption of iodised salt, under the National Iodine Deficiency Disorders Control Programme (NIDDCP) is the most cost-effective way of delivering iodine and improving maternal and infant nurture (Vir 2010a). Appreciating the serious implications of iodine deficiency on maternal and foetal hypothyroidism, impairment of neurological development of foetus as well as on reduction in the mean IQ of 12–13.5 points in young children, new strategies have been evolved in the last three decades to ensure only iodised salt is produced, procured and marketed for edible purposes (Vir 2010). Today 71.1 per cent of households in India are consuming salt with adequate levels of iodine. Mainstreaming of iodised salt programmes through large-scale social safety net programmes is being put in place to reach the most disadvantaged and protecting from the risk of giving birth to newborns with brain damage caused due to iodine deficiency (Rah et al. 2013).

(iii) **Calcium and other micronutrient deficiencies:** Dietary inadequacy in calcium intake is well documented (NNMB 2012). However, there is no policy to date on calcium supplements. As per the WHO guidelines, daily calcium supplement of 1.5–2 grams elemental calcium/day is recommended from 20 weeks of pregnancy. Multiple micronutrient supplementation during pregnancy has also been recommended as key proven practices (Black et al. 2013; Wu et al. 2012;

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WHO 2013). Only one efficacy trials on multiple micronutrient supplementation in India are reported (Gupta et al. 2007).

(iv) **Supplementary nutrition:** Besides provision of micronutrient supplements, provision of 50 per cent of daily recommended allowance of selected set of micronutrients through Supplementary Nutrition (SN) component of ICDS has been introduced (Table 7.1) (ICDS 2011). The rationale of providing such food supplement is based on the fact that there is a wide gap in micronutrient intake against the recommended levels. Moreover, there is no increase in average diet and nutrient intake during pregnancy and lactation as compared to the pre-pregnancy phase (Figure 7.5) (NNMB 2012).

Policy guideline regarding composition and cost of the supplementary food has undergone a number of changes in the last four decades. However, translating SN policy into action has been rather poor with only 15.6 per cent urban and only 21.4 per cent rural pregnant women receiving any supplementary nutrition in either cooked or take home ration (THR) form (NFHS-3 2005–06). The wide variation in coverage of pregnant women with SN – varying from 0.6 per cent in Bihar to 64.1 per cent in Chhattisgarh – reflects the impact of political priority, quality of governance and programme management (NFHS-3 2005–06). It is evident that translating the SN policy into action remains a challenge, especially with reference to reaching the most disadvantaged undernourished women and for ensuring actual consumption of THR by pregnant women themselves and not by entire

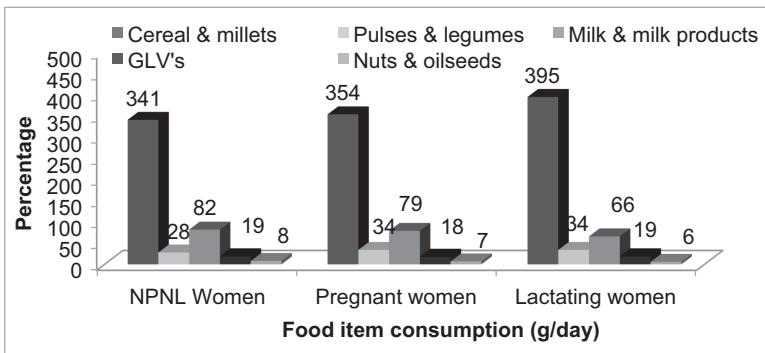


Figure 7.5 Dietary intake (g/day) of selected food items by non-pregnant, pregnant and lactating women in rural India (2012)

Source: NNMB 2012

family. Counselling on the significance of consuming THR is crucial and should be an integral part of the SN Policy. It is time to revisit the policy with reference to focusing on undernourished disadvantaged pregnant women with SN and social mobilisation efforts of addressing the practice of 'eating down' during pregnancy to avoid large babies (Table 7.1) (World Bank 2006).

Maternity care services and schemes

(i) *Janani Suraksha Yojana (JSY)/Janani Shishu Suraksha Karyakram (JSSK)*: The *Janani Suraksha Yojana* (JSY), launched by MHFW, is a national conditional cash transfer scheme. It was initially designed to incentivise women of only low socio-economic status to give birth in a health facility with the goal of reducing the numbers of maternal and neonatal deaths (JSY 2005). Later, modification in JSY policy was introduced with the aim of reaching each and every women, irrespective of socio-economic status and parity. Additionally, JSY provides a small amount of financial assistance for even non-institutional births at home for pregnant women aged 19 years and older who are living below the poverty line. The rationale being that such women who opt for home deliveries are amongst the poorest, young and least educated and have high risks for mortality. The cash incentive was initially limited to the first two births. A new dimension of newborn care has been added to the scheme with the nomenclature of JSY being changed to *Janani Shishu Suraksha Karyakram* (JSSK). Evaluation of JSY reveals a significant effect on increasing ANC and in-facility births with an effective coverage of families who are below poverty line (BPL).

Unfortunately, nutrition counselling during pregnancy is not explicitly included in the ANC package. Promoting appropriate dietary intake, regular weighing and counselling on adequate weight gain of about 10 kg, ensuring consistent and adequate supply of IFA (as indicated in Figure 7.4), and counselling for increasing IFA compliance remain a low priority of ANC services (Ramakrishnan et al. 2012). This is further confirmed by evaluation findings from Bihar state which indicates that actions such as promoting weighing of pregnant mothers at ANC sessions and ensuring control of anaemia through IFA tablets consumption were not included in the list of main responsibilities of the frontline health workers (referred as Accredited Social Health Activists, or ASHAs). These actions were also noted to have not been included in the guidelines for financial compensation norms for ASHAs.

The challenge is to redesign the JSY programme policy with a political and financial commitment to reduce not only maternal mortality but for creating demand and delivery of nutrition-related services, including consumption of IFA tablets and adequate weight gain. JSY offers a platform to reach the poorest and the most disadvantaged women with improved coverage and quality of ANC services, including counselling on diet, weight gain monitoring and IFA consumption (CORT 2008).

Undertaking regular weighing of women during pregnancy, provision of recommended iron-folic acid tablets, deworming dose of 400 mg Albendazole in the second trimester and counselling of pregnant mothers on health and nutrition care could be considered high-priority functions of ASHAs and in the cash incentive system. It is important to ensure that women prior to the onset of conception are healthy and well-nourished. Incentives to ASHAs could be built not only for appropriate services during pregnancy but also for interventions in the pre-pregnancy phase for registration of marriages and follow-up care of newly-weds. Incentives could be linked to actions focusing on increasing weight to a minimum of 40 kg prior to conception, ensuring supply and consumption of the recommended dosage of iron-folic acid tablets, six-monthly deworming as well as counselling for adoption of family planning practices for preventing conception at younger age of less than 18 years. (ii) *Indira Gandhi Matritva Sahyog Yojana (IGMSY)*: In the past two years, a new incentivised programme, *Indira Gandhi Matritva Sahyog Yojana (IGMSY)*, for pregnant mothers was launched in 53 selected districts across the country by the Department of Women and Child, as a part of the ICDS programme (IGMSY 2011). The scheme is designed to address socio-economic problems of pregnant women and prevent serious consequences on health and nutritional status of mothers, the growing foetus and appropriate childcare actions in early infancy. Cash incentives, in three instalments, are provided to women during pregnancy and in the postnatal stage so that women are not pushed into a situation to continue working till the last stage of pregnancy or resume work soon after childbirth. A lack of clarity in operationalisation of IGMSY is observed. There is a need to systematically study the Scheme and findings of the recent evaluation prior to rolling it out in the entire country. The mere inclusion of IGMSY scheme in the National Food Security Act is not considered adequate to facilitate in scaling up of the scheme (Planning Commission 2012).

Under IGMSY, for intensifying focus on nutrition interventions, it would be useful to explore the possibility of adding on special incentives which are linked to outcomes such as weight gain of at least 8–10 kg during pregnancy and birthweight of newborn being over 2.5 kg. In the presence of such outcome-related incentives, the chances of nutrition counselling being translated into adoption of appropriate practices at family level by socio-economically disadvantaged women, with active family support, is expected to increase substantially. Recent evaluation of the IGMSY by the MWCD does not report on impact. A comprehensive impact evaluation is important prior to introducing any such modifications in the design of the IGMSY scheme. Moreover, it is important to explore the possibility of combining JSSK and IGMSY under one CCT scheme for improving maternal and infant care.

(iii) **Maternity benefit schemes:** Maternity protection law is another important measure for improving maternal and child nutrition since women in India are increasingly getting engaged in both formal and non-formal sector in urban India. In other developing countries, such as Sri Lanka and Vietnam, care of working mother is a high priority. In these countries, along with mandatory maternity leave in government and private sectors, counselling and convincing mothers to follow exclusive breastfeeding practices and seek appropriate timely child health care services have proved effective in reducing malnutrition (Wu et al. 2012). Women in India have maternity benefit rights under the Maternity Act of 1961, and 180 days leave pattern is being followed by most of the formal sector in the states. There is a need to monitor implementation of the policy and use the contacts with pregnant mothers for improving health and nutrition care.

Extension of maternity benefits to the non-formal sector remains a concern. In this context, an interesting intervention has been introduced by the State Government of Chhattisgarh in 2008, that is the maternity benefit welfare scheme (*Bhagini Prasuti Sahayata Yojana*) for women construction workers. This scheme, under the 'Unorganised Labourers Social Security Board', aims to ensure financial stability to women. This scheme includes maternity grants during pregnancy, paternity grant (12 weeks paid maternity leave to pregnant women labourers and treatment bonus). By mid-2013, 4,059 women labourers were reported to have benefitted from the scheme (Hindustan Times 2013).

*Schemes for addressing health and nutrition
of adolescent girls*

The other initiatives launched in the last five years to improve the health and nutrition situation of women pertain to care of adolescent girls. It has been well recognised that poor nutrition in utero and during early childhood in girls' constraints future capacity to support healthy foetal and infant growth and this potential is further diminished by continued poor nutrition throughout the lifecycle.

Since 2002–07, a number of initiatives have been introduced by MHFW and MWCD. A pilot project entitled 'Nutrition Programme for Adolescent Girls' (NPAG) focusing on provision of 5 kg of wheat per month, free of cost, to families with adolescent girls weighing less than 35 kg as well as pregnant mothers weighing 40 kg was introduced in selected 51 districts of India. Following an evaluation of NPAG, it was recommended that feeding support to pregnant women with a cut-off weight of 45 kg is critical and therefore should be continued (NFI 2007).

The Adolescent Reproductive Sexual Health (ARSH) of the MHFW and Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (RGSEAG), also referred as SABLA programme of MWCD, offer opportunity to improve nutritional situation of adolescent girls. ARSH aims to educate youth about their sexual and reproductive health and offers youth-friendly services (ARSH 2014). The SABLA programme launched in 200 districts is expected to provide 600 kcals and 18–29 grams protein every day for 300 days in a year for girls 11–14 years of age who are not in school and to all girls 15–18 years. The life skill education to 11–14 years is one of the important components of the scheme (Table 7.1).

Additionally, the Weekly Iron-Folic acid Supplementation (WIFS) programme for adolescent girls, based on global programme experience, is currently being scaled up in the entire country (Table 7.5) (WHO 2010). The WIFS programme offers an opportunity for imparting education on self and family care to adolescent girls. Such a strategy of combining WIFS with family life education (FLEd) has been successfully piloted in the UMANG project in the state of Uttar Pradesh (Vir et al. 2008).

The launch of the Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A) approach by MHFW in 2013 is a confirmation of the significance being attached by the Government of India to continuum of care approach (NRHM 2013). These include

improving coverage for perinatal, antenatal and postnatal care, health and nutrition care of under-fives, anaemia reduction in adolescents, family planning services and measures for improving the child sex ratio. For addressing the serious implications of Folic acid deficiency in early pregnancy on neurological tubular defects (NTD), daily dose of 500 mcg of Folic acid prior to onset of pregnancy is recommended in the RMNCH+A approach. However, the operational guideline for reaching women in the pre-pregnancy stage remains to be spelt out.

State initiatives: emerging findings – making a difference

The responsibilities for the execution of the health and nutrition policies lie with the state government systems. Political commitment, strong leadership, organised administrative support and state-level technical programme expertise is essential for formulation of appropriate state-specific strategy and for scaling up implementation with quality. Implementation of the National Nutritional Anaemia Control Programme for pregnant women is a good example of the state governance factors contributing to wider interstate variations – only 8.4 per cent women in Bihar compared to 87.4 per cent in Kerala are reported to have received the minimum prescribed 100 IFA tablets (Figure 7.6) (CES 2009). The difference observed can be attributed to the quality

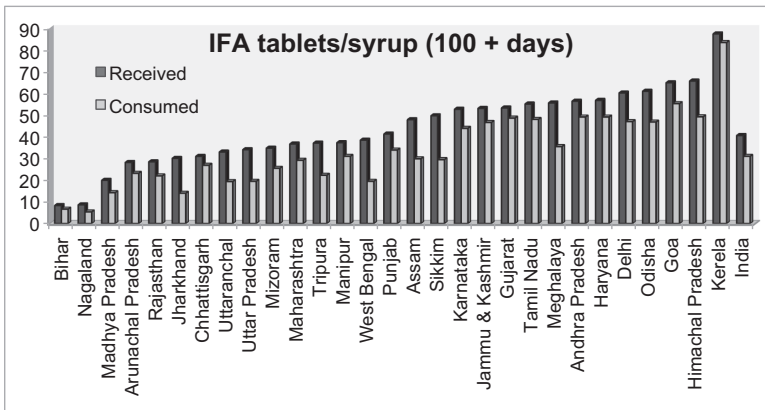


Figure 7.6 Women who received and consumed more than 100 IFA tablets according to states, India (%)

Source: CES 2009

of governance which impacts the various components of programme such as ensuring steady supply, appropriate distribution of IFA tablets as well as skilled functioning of trained frontline workers in quality counselling for increasing demand, addressing barriers and improving compliance. In fact, an enabling programme environment of a state results in greater confidence of women in public health system with higher demands for health and nutrition services as well as better utilisation of services offered.

At the state level, the only large-scale nutrition programme which in early 1990s paid any special attention to improving maternal nutrition was the Tamil Nadu Integrated Project (TINP) implemented by the ICDS department of Tamil Nadu state. One of the objectives of TINP programme was to reduce LBW by 50 per cent. However, in actual practice, maternal nutrition remained a secondary objective and the focus remained primarily on care of young children (Shrimpton 2012). Only 10 per cent pregnant women received at least 90 IFA tablets while 45 per cent pregnant women and 30 per cent lactating women received food supplements for at least 16 weeks. No impact on maternal and foetal nutrition was evident and lowering LBW observed was not ascribed to TINP programme. It is possible that this is one of the reasons for the impact of TINP being limited to only reduction in percentage of severe undernutrition.

In the past five years, some other state governments have demonstrated high level of political commitment for addressing undernutrition with focus on the first 1,000 days of life. In the state of Odisha, attention has been directed to strengthen the supply of supplementary nutrition and improve other maternal nutrition care services. In late 2011, decentralised production and supply of ready to eat (RTE) foods for pregnant and lactating mothers, as take home ration (THR) or supplementary food, is managed by self-help groups (SHGs) of women. RTE food production by SHG is a unique initiative, which besides improving supply of THR, has economically and socially empowered women. Another major initiative of Odisha state government is the launch of the MAMTA (meaning 'maternal love') scheme, conditional maternity benefit cash scheme (Odisha ICDS 2011). Incentives are linked to practices such as delaying conception to minimum 19 years, early registration of pregnancy, limiting family size not exceeding two live births and availing of ANC services such as acquiring IFA supply and TT injections. The scheme is a good example of how a state government's commitment to reduce undernutrition has introduced schemes which involves cash incentives, effective

intersector coordination of the nodal ICDS programme with Health, Food and Civil supplies, PRI departments, banking institutions as well as engagement of community in planning, execution and monitoring. Information of each mother and her child is recorded in the Mother–Child Protection (MCP) cards. These cards are referred to as MAMTA cards at state level. Computerisation of data, operationalisation of the mother–child tracking system, and use of technology such as mobile phones are other interesting initiatives in the pipeline. The current evaluation of MAMTA programme is expected to facilitate in modifying the scheme with reference to broadening of cash incentive support to include actions essential for improving maternal nutrition such as regular weighing of pregnant mothers, recording and counselling on adequate weight gains, counselling undernourished pregnant women on dietary practices and ensuring high compliance of IFA tablets.

Nutrition Missions have been launched with high political visibility, support and commitment in the states of Maharashtra, Gujarat and Madhya Pradesh. Specific interventions to improve maternal nutrition for reduction in the incidence of LBW and improving child nutrition situation are important components of the state missions. One of the primary interventions of the State Nutrition Mission of Maharashtra (*Rajmata Jijau Mother–child Health and Nutrition Mission*), launched in 2005, is to improve birthweight of children by intensifying efforts on promoting weight gain during pregnancy, as a part of ANC services. Integrating the services of NRHM and ICDS is recognised to be crucial for delivery of quality ANC services. ANC contacts are being used to promote appropriate behaviour practices for improving dietary intake and ensuring optimum nutrition through effective use of SN provided by ICDS, institutionalising monitoring of weight gain during pregnancy, ensuring regular IFA supply, counselling on IFA compliance, including addressing social barriers to compliance and administration of deworming dosage. Universal weighing of newborns and monitoring weight gain of LBWs for ensuring catch up growth are also being given high priority. A decrease in 16 percentage points in stunting rate in the seven-year operation of Maharashtra Mission period has been reported (DWCD Maharashtra 2012). Gujarat Nutrition Mission also plan to follow a similar programme design while Madhya Pradesh state is introducing innovative strategy of linking health and nutrition care of women through platforms of SHGs and livelihood programmes (GSNM 2012; UCL 2013). Andhra Pradesh state is also linking micro-credit schemes with maternal nutrition improvement interventions (World Bank 2012). External evaluation

of the state-based strategies are expected to provide insights into programme process and outcome and facilitate in scaling up operations in other states.

Indirect interventions influencing nutrition situation of women

Besides direct nutrition actions, there is increasing appreciation of the significance of simultaneously addressing collaborative partnership across sectors in improving women's education, economic and social status (Planning Commission 2012). Special efforts are being directed to address women's education, unequal social status and limited decision-making power. Moreover, measures for conservation of energy are recognised to be crucial (Table 7.1). Reduction in daily workload is an important intervention that cannot be ignored for conserving energy and promoting weight gain in pregnancy and post-pregnancy stages. Farming activities reveal a seasonal energy stress on women, depending on lean or harvesting period of farming, with its impact on pregnancy outcome. Additionally, maternal activity such as strenuous water fetching also adversely influences mother's energy reserves and is reported to be inversely related to birthweight (Rao et al. 2003).

About a third of the workforce of Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) scheme, being run by the Government of India, is stipulated to be for women for unskilled manual work (MNREGA 2007). It is important to also revisit the existing MGNREGA policy and explore the possibility of introducing 'soft' or sedentary jobs for pregnant and lactating women, instead of the current focus on manual construction work. Such jobs could include sanitary napkin production at local level, weaving or tailoring work, counselling in family care sessions, etc. Involvement of pregnant women in MGNREGA with relevant modifications could result in wider access and not only yield social-economic improvement but also influence in conservation of energy with resulting benefits in growth of foetus and improvement in mothers' nutrition. Prior to any such modifications, systematic evaluation of MGNREGA and its impact on purchasing power and dietary intake of families is imperative.

The significance of education of women on nutrition scenario in India is evident from the analysis of NFHS-3 data. In India, three states (Kerala, Goa and Himachal Pradesh) have over 20 per cent women

with education of 10–11 years. Two of these three states have the lowest stunting rates in children in the country – Kerala, 24.5 per cent; and Goa, 25.6 per cent (NFHS-3 2005–06). The outstanding decline in child undernutrition reported in Brazil has also been attributed to a much higher investment and improvement in maternal education, particularly with significant increase in the proportion of mothers with at least elementary schooling (Monteiro 2009).

In India, under the '*Sarva Shiksha Abhiyan*' (meaning universal education campaign), special incentive-based strategies and schemes have been introduced by various state governments for promoting completion of school education by girls (GoI 2001). One of the earliest scheme being the *Mukhyamantri Balika Cycle Yojna* in Bihar state. These initiatives are observed to encourage girls to stay in schools and delay age of marriage to 18 years. In fact, such a scheme is expected to be more effective than family planning programmes in preventing teenage pregnancies. The State Health Society of Bihar, complementing the actions of the State Education Department, has also launched a media campaign and school education to discourage early marriage and school curricula. Similarly, the education system could be used systematically for introducing health and nutrition education to girls enrolled in the middle and high schools.

Self-help or micro-credit groups, livelihood programmes, agriculture men groups, seed bank groups, network of retailers attached to public distribution system, etc., are important platforms for reaching disadvantaged unreached pregnant women who are missed out by health or ICDS systems for ANC and SN services. Investing in strategies of linking nutrition interventions with such non-traditional programme platforms is planned to be explored in high priority 200 districts in the first phase (Planning Commission 2012).

Additionally, special attention is required to endure easy access to potable water and improved sanitation facilities. Poor hygiene practices as well as poor water, sanitary and living conditions are critical underlying cause of undernutrition. Data from state of Uttar Pradesh indicates that only 34.8 per cent mothers interviewed had washed their hands with soap and water after defecation, whereas another study of 100 districts reports such washing of hands by only 19 per cent mothers (HUNGAMA 2011; Vir 2013). Open defecation and poor sanitation practices is common with serious implications not only on infection and resulting undernutrition but on school retention, education, safety and overall development of women.

Moving forward: time to act

A high percentage of women in India, despite economic progress, continue to be undernourished and anaemic, undergo motherhood at young age and suffer due to unwanted pregnancies, domestic and sexual violence. This is despite the fact that India, unlike many other developing countries, has formulated appropriate policies and rolled out programmes that address direct high impact interventions for improving child, adolescent and maternal health and nutrition. Effective implementation and scaling up these essential interventions is the priority challenge (Table 7.1). A recently conducted qualitative study points out that 'India has a rich portfolio of programs and policies that address maternal health and nutrition; however, systematic weaknesses, logistical gaps, resource scarcity and poor utilization continue to hamper progress' (Ramakrishnan et al. 2012). The problem is poor appreciation of the significance of the centrally conceived policies, lack of effective strategies for improving implementation of the interventions, absence of clear operational guidelines for translating the various policies into actions, and inadequate human and financial resources as well as political support. Political commitment and investment for improving women's nutrition remain a low priority despite evidence of its significant benefits for families, communities and national economy. Measures to address gender discrimination such as 'eating last' or after every other family member had their 'fill' is another important societal barrier which has not been actively discouraged for addressing women's nutrition. Efficacy studies provide evidence that provision of food supplement to pregnant women can improve birthweight and reduce small gestational age births in sub-population with inadequate diet (Imdad 2011).

The immediate challenge is to undertake intensive advocacy with a focus on universal coverage of select direct interventions in the first 1,000 days of life. This critical period, extending from conception to two years of age, is proven to be the most cost-effective period for preventing undernutrition (SUN 2012). A high priority must be accorded to invest in the following actions to improve women's nutrition.

1. Promote adequate weight gain of at least 10–12 kg during pregnancy. Link health-nutrition education components to health, ICDS, Public Distribution System (PDS) and various other programmes, such as CCT and micro-credit programmes for women, as well as agriculture extension systems such as Krishi Vigyan Kendras (KVKs).

2. Strengthen anaemia prevention measures including IFA supplements, food fortification and dietary diversification. For IFA supplementation, besides government network, involvement of private sector in reaching adolescent girls and women in non-government schools, employed in factories or other private sectors is crucial. Provision of double fortified salt (DFS) and marketing of flour fortified with micro-nutrients such as iron, folic acid at an affordable cost needs to be actively explored in the country. Production and marketing of fortified flour remain a private sector initiative for flour millers. Policy on fortification of flour requires urgent attention. Additionally, policy on calcium supplement to pregnant women as a public health measure needs to be introduced urgently along with effective operationalisation of the existing policy of folic acid supplements to women prior to the onset of pregnancy.

3. Target supplementary nutrition provided by ICDS to ensure universal reach of pregnant women weighing less than 45 kilograms. In addition, consider provision of pulses and oil at lower cost to families with pregnant women, through the public distribution system (PDS). Today, with the current high rate of registration of women for ANC services, the possibility of introducing such measures linked to PDS appears feasible and worth introducing. There is also a scope to link ANC services and counselling sessions as well as provision of subsidised food package through PDS network to reach this group of population for improving maternal health and nutrition status and providing appropriate childcare support. Additionally, social marketing of low-cost, nutrient-dense supplements for promoting minimum weight gain during pregnancy is an intervention that could be encouraged to be spearheaded by the private sector.

4. Ensure effective implementation of following measures for reducing young age conception – effective implementation of legislations for preventing child marriage, increased focus on the ongoing family planning interventions for newly married couples and strengthening programme operations pertaining to cash incentive schemes for promoting completion of school education by girls. Additionally, adoption of the available limited experience of registering and tracking newly-weds in a community for provision of health and nutrition services is required (Vir 2013). Such interventions in fact would imply reaching at a time only 5–10 newly-weds in a population of 1,000 per year.

5. Introduce measures for conservation of energy by women, especially pregnant women, for day-to-day work. This would imply actions for improving access to source of water, sanitation facilities and fuel, reducing

time for cooking by using pressure cookers. Ensure effective implementation of maternity leave schemes by formal and non-formal sectors.

6. Provide support for effective implementation of micro-credit and livelihood schemes to improve purchasing and decision-making power of women. Timely dissemination of positive lessons emerging from some states such as Odisha, Andhra Pradesh, Chhattisgarh, Madhya Pradesh and Maharashtra deserve special attention.

7. Accord high priority to periodical surveys and evaluations for updating national and state data on women-child nutrition situation, dietary and nutrition intake pattern, maternal weight gain pattern, birthweight scenario and programme impact data. Such information is essential for effective advocacy towards gaining political priority as well as resource commitment and investments for seriously addressing the issues of women's nutrition.

Today, the challenge is implementing the above-stated measures and moving from policy to action. The focus should be on appropriately designing strategy to address the barriers to the delivery as well as uptake of interventions to improve maternal nutrition. Maternal nutrition must be positioned high in the national and state development agenda. The overlap of actions by the two primary systems, health and ICDS, should be urgently addressed for effective implementation and for the best use of available resources. It is imperative that health and nutrition interventions, being implemented separately by health and ICDS schemes, are coordinated and integrated. Health sector has a well-designed strategy in place to reach the newly-weds for family planning services and pregnant women for ANC services and therefore could spearhead the coordinated interventions. The scope of merging JSSK and IGMSY schemes implemented by MHFW and MWCD also needs to be explored. An extensive well-planned advocacy at all levels and mass awareness generation is crucial for achieving high level of political support. Efforts are required for intensifying actions for improving women's nutrition towards achieving the World Health Assembly target of reducing LBW by 30 per cent between 2010 and 2025 (WHO 2012).

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UNDERNUTRITION IN INDIA

A case of public policy inertia

Veena Rao

Background

The study and analysis of Public Policy have become an integral part of academia and think tanks across the world, for gaining better understanding regarding how public good can become the foundation, objective and outcome of governance. Theoretically, public policy is a statement of intent and overarching principles, approved at the highest levels of Government, according to which laws, government programmes, fund allocations and decision making are expected to conform.

Theoretical tests that may be applied to public policy are whether it fulfils the public good objective, whether it is inclusive, has logic and coherence, is based on evidence and is technically valid. The policy-making domain is a privileged niche of government, sometimes called the softest part of governance, being exempt from field testing or other reality checks, and enjoys the prerogative of a 'conceptual' umbrella under which everyone connected is told what is good to do and why. There is also a visible divide in governmental treatment of Developmental Public Policy, generally related to immediate and direct public good, but involving strong government initiative, investment and expenditure, and Economic Public Policy, where immediate public good is more distant and indirect, but the objectives relate to investment, business, trade, revenue and profit for the government and private sectors. Consultations with stakeholders generally precede finalization of public policy. Stakeholders of Developmental Public Policy are usually committed social workers and NGOs, academics, researchers and experts. The public good objectives and outcomes they seek are at best aspirational and not quantifiable, unlike stakeholders of Economic Public Policy, who have specific, quantifiable, programmatic and financial objectives and operational blueprints that easily get

converted into projects. Economic stakeholders are also much better organized and have higher influence and negotiating capacity with government as compared with heterogeneous development stakeholders and activists.

Public Policy in India governing undernutrition emanates from the highest level, viz., Article 47 of the Constitution of India in the Directive Principles of State Policy that reads:

‘Duty of the State to raise the level of nutrition and the standard of living and to improve public health.

‘The State shall regard the raising of the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties and, in particular, the State shall endeavour to bring about prohibition of the consumption except for medicinal purposes of intoxicating drinks and of drugs which are injurious to health.’

National policies in India directly and indirectly governing the subject of undernutrition are the National Nutrition Policy 1993 (NNP), followed up by the National Plan of Action on Nutrition 1995, National Health Policy 2002 and the National Policy for the Empowerment of Women 2001. All these policies have defined the life cycle covering the girl child, adolescent girl and the adult woman; stated that nutrition is a continuum covering the life cycle and should not be compartmentalized; and emphasized essential intersectoral complementarities between health, nutrition, sanitation, drinking water, education, women’s empowerment and agriculture.

The National Nutrition Policy 1993, drafted by the Department of Women and Child Development, Government of India, advocates a comprehensive, integrated and intersectoral strategy for addressing the multifaceted challenge of malnutrition.

The Policy prescribes the following Direct and Indirect interventions:

Direct interventions

- *Expanding safety nets for children*
- *Triggering behavioral changes among mothers*
- *Reaching the adolescent girls*
- *Ensuring better coverage of pregnant mothers so as to prevent low birthweight*
- *Fortification of essential foods with appropriate nutrients*
- *Popularization of low-cost nutritious foods*
- *Control of micronutrient deficiencies among vulnerable groups*

Indirect interventions

- **Food security**
- *Improvement of dietary pattern*
- *Poverty alleviation programmes and strengthening of Public Distribution System*
- *Land reforms*
- *Nutrition surveillance*
- *Monitoring and research*
- *Equal remuneration*
- *Communication*
- *Minimum wage administration*
- *Community participation*
- *Education and literacy*
- *Improved status of women*

In retrospect, the National Nutrition Policy 1993, though still alive on our policy books, can unfortunately only be viewed as an inert or a failed policy. Its implementation was to be done by an Interministerial Coordination Committee in the Department of Women and Child Development, overseen by the National Nutrition Council headed by the Prime Minister. The National Nutrition Council never met, and the Interministerial Coordination Committee turned out to be non-functional. No sectoral programmes were drawn up in accordance with the NNP, and consequently no budgets were allocated. The NNP, though a most holistic and comprehensive document, failed to get implemented into programmes, and an opportunity to highlight malnutrition as a priority and gap area in India's development agenda was missed. The NNP, though it might require some updating in the light of new research, data and evidence, remains relevant even today.

Where are the gaps?

In India's contemporary and complex socio-economic transition, manifested diversely and unevenly in different parts of the country, the gap in addressing undernutrition lies not in lack of a Policy, but in the intent of translating its provisions into programmes backed by budgets. Ideally, the essential interventions of the NNP should have been woven into a national programme to combat undernutrition long ago, with a definite implementation template of workable interventions on the ground. But the political will, or official initiative and skill to make that happen appears to have been absent. Some interventions included in the NNP form core components of national programmes, such as immunization, administration of Vitamin A and Iron and Folic Acid (IFA), sanitation, safe drinking water, but there is no system in place to ensure that these critical intersectoral interventions operate simultaneously with full coverage of target groups. Further, real-time monitoring systems, concurrent monitoring and evaluation, to ensure complete target group coverage by intersectoral interventions, and measure impact do not form part of the Integrated Child Development Services (ICDS), or national health, water or sanitation programmes.

Without a national strategy and programme to combat undernutrition, ad hoc additional interventions have over the last two decades been loaded on to the Anganwadi, which has neither trained manpower, nor the capacity or resources to implement them effectively. Hence, gaps, both structural and systemic, show up conspicuously the disconnect between the causes of malnutrition in India and the interventions

within existing programmes. Even though the NNP has comprehensively covered the structural causes of undernutrition and micronutrient deficiency in India, and made recommendations to address them, several critical recommendations remain unattended. For example, the most critical life-cycle and intersectoral interventions have not been structured into a single integrated template for implementation. There is very little advocacy or information, education and communication (IEC) for dissemination of child/adolescent girl/maternal care or nutrition information for the community at grass roots to overcome the nutrition information gap. The protein-calorie-micronutrient deficit, (the most proximate cause of under nutrition), prevalent among diverse age groups among at least 50% of the population, remains unaddressed, even though confirmed by successive National Nutrition Monitoring Bureau (NNMB) Repeat Surveys, including the latest in NNMB Technical Report Number, 2012. What emerges is a visible asymmetry between structural causes of India's undernutrition well stated in the NNP, and the ongoing programmes and interventions, the sum total of which do not address even a majority of them.

Even within ongoing, nutrition-related programmes and interventions, there are conspicuous systemic gaps at the cutting edge, community level, where the real interventions against undernutrition must happen. Important systemic gaps lie in the provisioning for Anganwadi infrastructure and manpower, providing a rationalized and practical charter of responsibilities to the Anganwadi worker, establishing real-time monitoring mechanisms and accountability systems, creating systems for ensuring complete coverage of target groups, for intersectoral mechanisms at village level to engineer 'convergence', and for effective behaviour change strategies at the grass roots.

The minimum, basic intersectoral convergence for combating undernutrition requires that every targeted family must simultaneously receive the following benefits – calorie-protein-micronutrient supplementation to bridge the dietary deficit; complete immunization of children; IFA for addressing anaemia among children, women and adolescent girls; safe drinking water; and hygienic sanitation. Four of these interventions already form part of national programmes. Unfortunately, there is no village functionary in the present implementation system, who is tasked with the responsibility of ensuring that the targeted households receive this complete package simultaneously, which alone can create positive transformational impact. Consequently, we have no data at the national, state or district regarding the same; and intersectoral programmes instead of operating simultaneously remain scattered.

Social sector policies and programmes in India generally result from Constitutional commitments or commitments at international bodies, or through sustained internal demand or activism. Political governance in States is either demand driven or election driven. Popular demand for nutrition programmes from the afflicted is absent, as the community lacks information and awareness regarding their affliction or its causes. And absence of a national programme further inhibits community knowledge about undernutrition, which could have created demand; a clear chicken-and-egg situation. Experience shows that public awareness and information dissemination on social and development issues is largely generated through the medium of strong national programmes, that themselves become the strongest advocacy tools taking the messages down to the grass roots, for example, the health, education and women's empowerment programmes. Information and awareness regarding malnutrition have no such medium. Hence, the vacuum in information at grass roots within families, community organizations, PRIs and field staff of NGOs and government, regarding critical issues like preventing child undernutrition, proper maternal nutritional care to ensure adequate pregnancy weight gain and prevent low birthweight babies (first casualties to neo-natal mortality), and nutritional care of adolescent girls (the most undernourished in the world), who are future mothers.

This lack of information and awareness is a major cause for the absence of capacity creation at all levels and stages of the participation/implementation process, and more importantly, it leads to absence of demand for nutritional services from the afflicted population, simply because they have no knowledge or awareness regarding their affliction. All these factors put together perhaps explain why there are hardly any think tanks, research or capacity-building institutions at State or District levels; no journals or information in local languages to inform rural populations, NGOs or local institutions about the subject, not even vernacular equivalents for terms like 'body mass index' or 'chronic energy deficiency'.

The above factors cascade into the absence of an enabling environment for a united and vocal nutrition lobby with strong leadership to influence government, as exists in other sectors. There is negligible presence of Public Health/Nutrition curricula in research institutions in State capitals and none at all in District/Block institutions, where the action really lies. Besides, the nutrition lobby is disunited, often deflecting attention from the urgency of addressing malnutrition holistically, by generating adversarial debate on issues like food

fortification and low-cost complementary food. A strong, united nutrition lobby, providing innovation and working models could have acquired greater clout to prevail upon the government to announce a national programme to address malnutrition, so urgently required in the country.

There has also been sustained prejudice against private sector cooperation in India's strategy to combat undernutrition or engage with them. The private sector must assume some measure of responsibility for making available appropriate low-cost energy foods for poor, undernourished and anaemic children, women, adolescent girls and boys, the sick, aged and infirm, in rural and urban markets. The numbers are large enough to support a viable business proposition. But there is a huge market vacuum in this respect, unfortunately, filled up by forcefully advertised low-cost junk foods and tobacco products.

Undernutrition and the Five Year Plans

Prior to the National Nutrition Policy (1993), the development of India's policy regarding undernutrition can be gleaned from the Five Year Plans. The early Plans addressed the clinical manifestations of malnutrition and micronutrient deficiencies, such as nutritional blindness, beriberi, pellagra, marasmus and kwashiorkor. The focus then shifted to food production and food security, research and nutrition data collection. It was the third Five Year Plan (1961–66) that emphasized improving the nutrition status of the people, dietary diversification and creating nutritional awareness. The fourth Plan (1969–74) recognized the problem of malnutrition among vulnerable groups, and directed specific nutrition programmes for addressing protein-energy malnutrition in children, nutritional anaemia among pregnant women and blindness due to Vitamin A deficiency in children. Programmes followed the Plan prescriptions, and new nutrition programmes, such as the Crash Feeding Programme for children, the Balwadi Nutrition Programmes, National Nutritional Anaemia Prophylaxis Programme and the National Prophylaxis Programme Against Nutritional Blindness due to Vitamin A deficiency, were launched.

The concept of the integrated approach for addressing undernutrition among children and women was conceptualized in the 5th Five Year Plan (1974–79), and in 1975 the Integrated Child Development Services (ICDS) was launched in 33 Blocks. I believe the ICDS became the watershed point of India's future policy towards undernutrition. On the one hand, it was a step in the right direction for an integrated

child development programme with the five components of supplementary nutrition: immunization, health check-up, referral services, preschool non-formal education, and nutrition and health education. On the other hand, because its objectives did contain among others, 'improvement of the nutritional and health status of children in the age-group 0–6 years', and 'reduction of mortality, morbidity, malnutrition and school dropout', the ICDS acquired a mistaken identity. All Plans subsequent to the fifth Five Year Plan have treated ICDS, originally meant to be an integrated child development programme, as a programme to combat undernutrition in India. A belief also appears to have set in the minds of policy makers and planners that the problem of undernutrition had been sufficiently addressed by the ICDS and midday meal programme, and no further initiatives were required. This is perhaps the reason why all components of the Minimum Needs Programme (1974)¹ became independent national programmes, except nutrition. Future Five Year Plans have persisted with the same programmatic arrangement, with a few ad hoc additions to the ICDS.

What needs to be done

To conclude, India's undernutrition problem is not lack of Policy, but implementation of its National Nutrition Policy (1993), which in a situation of lack of demand requires strong political will. The silent undernutrition crisis in India is one of the alarm, and Government response is urgently required. The NNP must be revisited and updated, and should address the problem holistically with reference to the latest demographic and epidemiological data, as reflected in the NNMB reports covering all age groups of the population. Nutrition data of the 1970s and 1980s, the ICDS era, related mostly to women and children. This is perhaps the reason why India's pandemic undernutrition, even today, is persistently viewed as a women and children's issue by government, NGOs, researchers and academia. Undoubtedly, women and children are the worst sufferers and hapless vectors of undernutrition, and require highest priority in a national programme. But the underweight and stunting data of schoolgoing children above six years, of adolescent girls and boys, the Chronic Energy Deficiency and micronutrient deficiency rates among adult men and women, justifies that the problem of malnutrition be treated as a serious population issue. Inflation and price rise of food items have reduced food intake among the poor, further deteriorating their nutritional status. Direct evidence of this is forthcoming in the Karnataka Nutrition

Mission Pilot Projects' data, confirmed by the NNMB Technical Report Number 26.

The terms of the Prime Minister's Committee on Nutrition Challenges (2008)² are limited to providing policy directions and reviewing nutrition programmes, without any mandate for providing fresh strategies for specifically reducing malnutrition. These could be revised to include the responsibility of drawing up its blueprint for addressing malnutrition in mission mode, something announced in the ruling party's election manifesto.

What India urgently needs is the political will to address undernutrition through a national programme, backed by adequate financial allocations, that addresses the structural and systemic causes, with monitorable targets, real-time monitoring, evaluation mechanisms and accountability systems.

The good news was that as the author was giving the last touches to this chapter, the Finance Minister had announced in his Budget speech on July 10, 2014 that 'A national programme in Mission Mode is urgently required to halt the deteriorating malnutrition situation in India, as present interventions are not adequate. A comprehensive strategy including detailed methodology, costing, time lines and monitorable targets will be put in place within six months.'³

Finally, the radical strategy shift has happened in government policy. It must now be translated on the ground.

Notes

- 1 <http://planningcommission.nic.in/plans/planrel/fiveyr/6th/6planch14.html>, accessed on July 14, 2014.
- 2 <http://upsc-help-line.blogspot.in/2012/10/prime-minister-committees-and-councils.html>
<http://timesofindia.indiatimes.com/india/National-panel-on-nutrition-setup/articleshow/3701953.cms>.
(The Committee has been removed from the PMO website. Hence, these references, which will probably have to be removed anyway.)
- 3 http://finmin.nic.in/fmspeech/fm_budgetspeech_july2014.pdf.

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Part III

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GOVERNANCE CHALLENGES TO REDUCING HUNGER AND MALNUTRITION IN INDIA

N. C. Saxena

Introduction

High economic growth in India in the last two decades has unfortunately not been translated into satisfactory progress on reducing hunger and malnutrition. According to the Global Hunger Index Report, India continues to be in the category of those nations where hunger is 'alarming' (IFPRI 2012). The hunger index in India between 1996 and 2011 has gone up from 22.9 to 23.7, while 78 out of the 81 developing countries studied, including Pakistan, Nepal, Bangladesh, Vietnam, Kenya, Nigeria, Myanmar, Uganda, Zimbabwe and Malawi, have all succeeded in reducing hunger.

The hunger and malnutrition report (HUNGAMA) released by the Prime Minister in January 2012 showed that the number of malnourished children in the 112 rural districts of India was 42 per cent, whereas stunting was even higher at 59 per cent (Hungama 2012). In the entire country 48 per cent of children under five (i.e. 61 million children) are stunted due to chronic nutrition deprivation. Current levels of child malnutrition in India are higher than those in sub-Saharan Africa. Evidence shows that stunted children enrol later in school, perform less well and complete fewer grades; this leads to reduced capabilities and income-earning capacity in adult life and perpetuates the intergenerational cycle of poverty and deprivation in families and communities. This is an unacceptable loss (Chambers and Medeazza 2013).

As is well established, the hunger dimension is quantified by measuring underweight, stunting and wasting rates among children because these indirectly reflect inadequate access and lack of

affordability of a balanced diet (Viswanathan 2012). Children also suffer most because of problems of inadequate diet, poor early care practices and lack of hygiene. With half its child population malnourished and stunted, India's demographic dividend – a large young generation being born each year – will not pay off. Specifically, the return of the investments currently being made in elementary education will be halved because of undernutrition, which thus remains India's greatest development challenge and a question mark on India's credibility as a global player.

Emerging economies have demonstrated that child undernutrition can be drastically reduced: Thailand (Garg and Nandi undated) reduced the percentage of underweight children by half (from 50 per cent to 25 per cent) between 1980 and 1986; Brazil reduced child undernutrition by 75 per cent (from 20 per cent to 5 per cent) from 1990 to 2006; and China reduced child undernutrition by 68 per cent (from 25 per cent to 8 per cent) between 1990 and 2002 (UNICEF 2009). Even Viet Nam, a country poorer than India, has seen a reduction in underweight children from 41 per cent in 1996 to 25 per cent in 2006.¹ Therefore, nutrition improvement at national scale is possible. However, economic growth is not enough; it needs to be coupled with effective policy and budgetary action, particularly for the most vulnerable: the youngest, the poorest and the excluded.

Falling foodgrain and calorie consumption

HUNGAMA is caused by a large number of factors, of which availability and access to a balanced diet is quite important. National Sample Survey Organisation (NSSO) data shows that the per capita cereal consumption in India is lower than the desired norm and it has shown a decline over time. As regards changes in expenditure on food over the years, two trends have been observed. First, while consumption expenditures in both rural and urban regions rose, this was not reflected in a commensurate rise in expenditure on food. As shown in Table 9.1, the growth in food expenditure has been significantly lower than the increase in overall expenditure on all goods during the period of analysis.

Thus the average per capita food expenditure during the period 1993–2010 increased only by 0.2 per cent annually in rural India, and fell slightly by 0.1 per cent per annum in the urban areas. One may argue that this could indicate shift to more sedentary lifestyle needing less calories. However, the second trend negates this hypothesis for the

GOVERNANCE CHALLENGES TO REDUCING HUNGER

Table 9.1 Growth in real average per capita expenditure on all goods and on food (in Rs.) at 1993–1994 prices

<i>Years</i>	<i>Average per capita expenditure</i>		<i>Average per capita food expenditure</i>	
	<i>Rural</i>	<i>Urban</i>	<i>Rural</i>	<i>Urban</i>
1993–1994	281.4	458.0	177.8	250.3
2009–2010	347.5	637.8	184.8	244.9
Annual rate of growth 1993–1994 to 2009–2010	1.3	2.1	0.2	–0.1

(Gupta 2012)

Table 9.2 Changes in per capita cereal consumption (kg per month) since 1993–1994 for different MPCE classes: all India, rural

<i>Year</i>	<i>Monthly per capita cereal consumption (kg) in population percentile class</i>									
	<i>0–10</i>	<i>10–20</i>	<i>20–30</i>	<i>30–40</i>	<i>40–50</i>	<i>50–60</i>	<i>60–70</i>	<i>70–80</i>	<i>80–90</i>	<i>90–100</i>
1993–1994	10.52	12.03	12.63	13.19	13.33	13.72	14.07	14.41	14.59	15.39
1999–2000	10.45	11.64	12.27	12.56	12.89	13.03	13.36	13.45	13.67	13.96
2004–2005	10.39	11.33	11.70	11.98	12.16	12.37	12.61	12.77	12.72	13.14
2009–2010	10.17	10.63	11.06	11.12	11.48	11.42	11.72	11.75	12.05	12.07
2011–2012	10.42	10.80	11.03	11.14	11.49	11.46	11.50	11.58	11.48	11.71

NSS 68th Round, Report No. 555

poor, as the decile-wise data (Table 9.2) clearly shows that the hard working poor consume much less cereal (the cheapest form of food) than the non-poor. It also shows a declining trend in the annual per capita consumption of cereals, for all classes of people.

Table 9.2² clearly shows that as India moved to greater prosperity in the last twenty years the cereal consumption of the rural rich went down, but there was no increase for the poor. At any given point of time the cereal intake of the bottom 10 per cent in rural India

continues to be about 10–20 per cent less than the cereal intake of the top decile of the population, despite better access of the latter group to fruits, vegetables and meat products. Their sedentary life style too should be taken into account while assessing the difference between the two groups. Calorie needs of the non-poor may be declining because labour-saving devices are becoming increasingly available in the household, in the workplace, and in transportation (NSSO 2014). For the upper segment of population the decline may be attributed to a diversification in food consumption, easy access to supply of other high value agricultural commodities, changed tastes and preferences, and consumption of more expensive non-foodgrain products. Higher economic growth and per capita incomes thus contribute to reduction in per capita demand for cereals for the rich.

However for those who are around or below the poverty line, this has to be understood as a distress phenomenon, as with marginal increase in their incomes over time they are forced to cut down on their food consumption to meet other pressing demands that were not considered important in the past. For instance, as more schools open, the poor too wish to send their children to schools, where expenses are incurred on clothes, books, etc. despite the school fees being met by government. These expenses would thus become a new item on the household budget, and food expenditure may be curtailed to make room for it. Fighting sickness leads to another chunk of essential expenses, for which opportunities did not exist in the past, as there were no doctors in the vicinity. The share of fuel and light in total consumer expenditure has risen from under 6 per cent to 10 per cent in both rural and urban areas between 1972–1973 and 2004–2005. Finally, the rural labouring masses have to spend on transport in order to earn their livelihoods. The food budget of the poor has been squeezed out because the cost of meeting the minimum non-food requirements has increased (Sen 2005). Thus, it is not possible for households around the poverty line to purchase their initial food basket within their current food budget.

There are also issues at the macro-level. According to the central government's Economic Survey 2012–2013, foodgrain production in India has gone down from 208 kg per annum per capita in 1996–1997 to 200 kg in 2011–2012, which was a year of bumper production. From the reduced production, India has been exporting on an average seven million tonnes of cereals per annum, causing availability to decline further from 510 gm per day per capita in 1991 to 439 gm

in 2012. This has adversely affected the cereal intake of the bottom 30 per cent which, as shown above, continues to be significantly less than the cereal intake of the top decile of the population. Their expenditure on health, education, liquor, tobacco, transport and fuel has also gone up. Food is still needed, but not demanded as they get used to eating less food and in the process get stunted and malnourished. Endemic hunger (often hidden) continues to afflict a large proportion of Indian population.

Calorie consumption: As regards calorie consumption, the national average for per capita calorie intake for the rural region in 2009–2010 was 2,020 kcal, while it was 1,946 kcal for the urban region (Chandrasekhar 2012). Actual intake in 2009–2010 for the rural poor was 1,755 kcal/person/day, whereas the same figure for high income rural households was 2,572. These figures for the urban India were 1,665 and 2,394 kcal respectively for the poor and the rich. Thus poor households suffered from a daily per capita calorie deficiency of 281 kcal in urban areas and 265 kcal in rural areas when compared with the average, and with greater deficiency when compared with the corresponding figures for the high income households (Chand and Jumrani 2013).

Food and Agriculture Organisation (FAO) uses a uniform norm of 1,800 kcal. Even taking the low FAO norm, there is wide prevalence of undernutrition, as shown below.

Table 9.3 Prevalence of undernutrition in India based on FAO norm

<i>Expenditure class</i>	<i>% undernourishment</i>
Rural	
Poor	56.9
Middle income	21.3
High income	7.0
All rural	32.3
Urban	
Poor	66.7
Middle income	33.7
High income	10.1
All urban	39.5
Rural + Urban	34.2

(Chand and Jumrani 2013)

One-third of the population living in rural households and close to 40 per cent in urban households were found undernourished based on the FAO norm. More than half of the rural poor and two-thirds of urban poor consumed less than 1,800 kcal. Such a scenario is not due to the non-availability of adequate cereals in India. Calorie deficiency of the poor is because they do not have the necessary income resources to take care of the quantity aspect of their intakes. Problem is more of access than availability.

Factors other than food that lead to malnutrition

Less well understood than hunger is the nagging problem of undernutrition amongst children that leads to their not achieving normal height and weight for their age. What is worse is the fact that India has made little progress in reducing malnutrition in the last ten years (Haddad 2009).

The commonly held belief that food insecurity is the primary or even sole cause of malnutrition is misplaced. Even the National Food Security Act, 2013 provides that every pregnant woman and lactating mother shall be entitled to one free meal a day during pregnancy and six months after the child birth; and maternity benefit of rupees one thousand per month for a period of six months. Thus the focus is still on food, and not on health and care related interventions. Consequently, the existing response to malnutrition in India has been skewed towards food-based interventions and has placed little emphasis on schemes addressing the other determinants of malnutrition (World Bank 2006).

Child malnutrition starts very early in life, and often it is an inter-generational issue. Adolescent girls who are themselves underweight give birth to low weight babies. The child rearing practices in India unfortunately are highly unscientific, as giving colostrum to the newborn, exclusive breastfeeding for first six months of a child's life, and complementary feeding several times a day after six months are not commonly practised. In the 100 districts studied in the HUNGaMA report 51 per cent mothers did not give colostrum to the new born soon after birth and 58 per cent mothers fed water to their infants before six months. Besides, due to bad quality of water and lack of toilets children are exposed to stomach infections, develop diarrhoea, and start losing weight. At this stage they need proper medical care which unfortunately is not available. Then the mothers have to work long hours away from home without any support system, and are unable to afford health care.

Thus, there are other factors too that cause HUNGaMA, especially amongst children (Saxena 2011), such as:

- Low status of women in Indian society, their early marriage, low weight at pregnancy and illiteracy leading to low weight of new born babies.
- Poor childcare practices, such as not immediately starting breast-feeding after birth, no exclusively breastfeeding for the first five months, irregular and insufficient complementary feeding afterwards, and lack of quick disposal of child's excreta.
- Poor supply of government services, such as immunisation, access to medical care and lack of priority to primary health care in government programmes.

These factors combined with poor food availability in the family, unsafe drinking water and lack of sanitation lead to high child undernutrition and permanent damage to their physical and mental capabilities.

Intervention through government programmes

The Indian State implements massive food, livelihood and social security programmes – some of the largest in the world – which theoretically support vulnerable people from even before their birth to their survivors after death. For children, government runs in every village a programme called Integrated Child Development Services (ICDS). As on 31 January, 2013, 1,331,076 centres, called Anganwadi Centres³ (AWCs) are operational across 35 States/UTs, covering 93 million beneficiaries under supplementary nutrition (SN) and 35 million 3–6 years children under pre-school component. The Twelfth Five Year Plan (FYP) has allocated Rs 1,236 billion to ICDS – a three-fold increase from the previous FYP.

On paper, expectant mothers are fed in ICDS centres, along with infants, children up to the age of six, and adolescent girls. Children in school get school meals. As adults, women receive maternity support, bread earners are guaranteed 100 days of wage employment in public works; and if identified as poor, they can buy subsidised cereals from a massive network of half a million ration shops. The aged – and in many states widows and disabled people – are given pensions. And if an earning adult dies prematurely, the survivor is entitled to a lump-sum payment of Rs 10,000.

This looks good on paper but the ground reality is different. These programmes are plagued by corruption, leakages, error in selection, delays, poor allocations and little accountability. They also tend to discriminate against and exclude those who most need them, by social barriers of gender, age, caste, ethnicity, faith and disability; and state hostility to urban poor migrants, street and slum residents, and unorganised workers. In Rangpur Pahadi, a slum area just two kms away from Vasant Kunj (Delhi), people living since 1984 have not been given even voter ID or any ration card. Thus their very existence is denied by the Delhi Government! Therefore, not only do we need to identify the excluded and run special programmes for them, but improve monitoring and accountability for all programmes that impinge on hunger.

Supreme Court too has been active to improve malnutrition amongst children. In April 2004, several marathon hearings on ICDS were held in the Court and detailed orders were issued, followed by further orders on 7th October 2004, in which a few key directions were made, including: 'All SC/ST habitations should have an anganwadi as early as possible. Until the SC/ST population is fully covered, all new anganwadis should be located in habitations with high SC/ST populations.' Thereafter the Hon'ble Supreme Court passed another order on 13th December 2006, where the entitlements of children under the age of six have been further strengthened, especially in regard to 'universalisation with quality' in a time-bound manner. The State Government must undertake, on war-footing, extensive 'Health Camps' in every village to identify every malnourished and/or anaemic child, adolescent and all pregnant women and ensure that they receive proper nutrition and health care. There must be individual monitoring of all of these persons to prevent any further deaths (Rozario 2013).

These orders of the Hon'ble Supreme Court should have worked as useful wake-up call to the State government, at least as far as the universalisation of ICDS and provision of proper nutrition is concerned. Instead, the present situation stands testimony to the failure of the state to take all the necessary steps, and the results so far unfortunately have been disappointing.

ICDS: some evaluations

In addition to general problems of governance and delivery that affect all programmes, ICDS, the main programme to address malnutrition, is particularly doing quite poorly. We discuss some field studies.

A comprehensive evaluation of ICDS (Planning Commission 2011) concluded that despite the fact that outlay for the ICDS was increased from Rs 121 billion in the X Plan (2002–2007) to Rs 444 billion in the XI Plan (2007–2012), the outcomes were most disappointing. Only 19 per cent of the mothers reported that the AWC provides nutrition counselling to parents. More than forty per cent of the funds meant for SN are siphoned off. For FY 2008–2009 the amount of SN allocation diverted is estimated at Rs 29 billion. Although 81 per cent of children below six years of age were living in an area covered by the AWCs only 31 per cent children received SN and only 12 per cent children received it regularly (Planning Commission 2012). Only 38 per cent of pregnant women and lactating mothers, and 10 per cent of adolescent girls received SN.

A recent evaluation of ICDS in Gorakhpur by the National Human Rights Commission (Saxena 2013) showed that despite Supreme Court orders to provide hot cooked meals, all centres supplied only packaged ready-to-eat food, containing only 100 calories, as against a norm of 500 calories, and 63 per cent of food and funds were misappropriated. The food being unpalatable, half of it ends up as cattle feed. The ready-to-eat food is produced in poor hygiene conditions. Some of the ingredients shown on the bags containing the finished product were not found in stock at the time of visit and the stock of maize was only enough to meet 25 per cent of the daily requirement.

However, such reports, though few, are hardly discussed in state Assemblies, as they meet now for fewer than 30 days a year. We need a new law making it compulsory for Parliament and Assemblies to meet for at least 150 days a year.

Comptroller and Auditor General of India's (CAG) performance audit⁴ in 2013 revealed how ICDS was failing to help infants and young children. The audit, covering the period 2006–2007 to 2010–2011, found that 52 per cent of Anganwadis surveyed lack toilets, and 32 per cent don't have drinking water. Around 61 per cent Anganwadis did not have their own buildings and 25 per cent were functioning from semi-pucca or open or partially covered spaces. Medicine kits are not available in 33 %–49 per cent of Anganwadis. The audit also revealed 33 %–45 per cent gap between eligible beneficiaries and actual recipients of SN. CAG also noted distribution of sub-standard food by the AWCs as 'ready to cook mixes' were unpalatable. Audit found that some of these items had sticky texture which became inedible within minutes of preparation. 'In 18 test-checked AWCs, children were reported to have fallen ill after consuming the preparation. The

supplier, M/S A. P. Foods (A Government of Andhra Pradesh enterprise engaged in manufacturing and supplying fortified nutritious food to ICDS projects), continued to supply these mixes till November, 2011, despite reports about the beneficiaries disliking the food in two test-checked projects.' The Audit further found that there was no system of watching expiry of food items.

Governance issues

Although governance has several dimensions, for this paper we restrict our discussion to its relevance to the capacity of governments to design, formulate and implement policies and programmes, including accountability of government employees who should be held responsible for their actions. On all these dimensions the record of ICDS and related health programmes is quite poor: the design of ICDS is flawed, it is poorly delivered, and the staff fudges the reported data so as to avoid responsibility for high malnutrition. We discuss these below.

ICDS design needs a change: The ICDS has not yet succeeded in making a significant dent in reducing child malnutrition, as the programme has placed priority on food supplementation rather than on nutrition and health education interventions, and targets children mostly after the age of three when malnutrition has already set in. Very little of the ICDS resources, in terms of funds and staff time, are spent on the under-three child (Planning Commission 2012), and this low priority must be reversed.

Therefore the focus in ICDS programme, government's main intervention, should be on components that directly address the most important causes of undernutrition in India, specifically improving mothers' feeding and caring behaviour, improving household water and sanitation, strengthening referrals to the health system and providing micro-nutrients. The basic nature of the programme should be changed from centre-based to outreach-based, as the child under three cannot walk to the centre and has to be reached at his/her home. Another advantage of visiting homes is that the entire family, not just the mothers, are sensitised and counselled.

Discourage 'ready-to-eat' food in Supplementary Nutrition Provisioning (SNP): Government of India (GOI) should discourage the distribution of manufactured 'ready-to-eat' food, as it leads to grand corruption at the Ministerial level, but unfortunately GOI has encouraged such tendering by laying down the minimum nutritional norms for 'take-home rations' (a permissible alternative to cooked meals for

young children), including micro-nutrient fortification, thus providing a dangerous foothold for food manufacturers and contractors, who are constantly trying to invade child nutrition programmes for profit making purposes. This may have the unintended consequence of supplementing micro-nutrients without consultation with medical professionals as well as leaving the door open for large-scale centralised corruption and subversion of the programme through the back-door entry of private non-descript contractors.

ICDS should learn from the success of hot freshly cooked mid-day meals programme that runs fairly well even in states not known for efficiency, whereas the supply of packaged food in ICDS even in efficient states is not popular with the children, besides being irregular and discouraging local participation. For children below the age of three years, nutritious and carefully designed locally prepared take-home rations based on locally procured food should be the recommended option, but there could be centre-specific variations. If fortified milk powder is to be provided, it must be manufactured by a well-known manufacturer. Before inviting financial bids, states must invite technical bids in a transparent manner so that unscrupulous contractors who get into the racket of supplying packaged food through bribes are eliminated. Children can eat only small quantities of food and therefore need fat rich food to obtain necessary calories. In the absence of oil supplies, there is almost no fat content in the food being given, whereas for children below three, almost 40 per cent of their calorie requirement should come from fats. This aspect gets totally unfulfilled in the current SNP.

The best solutions to child malnutrition are based on access to diverse local nutritious diets which will meet calorie, protein and micro-nutrient requirements. This can be done successfully with engagement of local communities in the supply of SN. Evidence is that this has led to increased demand for the programme, better community monitoring as well as supported livelihoods of thousands of women.

Improve reporting system: Officials at all levels spend a great deal of time in collecting and submitting information, but these are not used for taking corrective and remedial action or for analysis, but only for forwarding it to a higher level, or for answering Assembly/Parliament questions. Field staff reports only on activities, it is not involved in impact assessment, or in qualitative monitoring. The concept of stakeholder monitoring is unknown. No indicators exist for assessing public participation or their awareness. Reporting system in the state governments needs overhauling, as at present many reports are not credible.

Malaria deaths (and so are malnutrition deaths) are under-reported, while immunisation achievements are over-reported.

ICDS too faces substantial operational challenges, such as lack of accountability due to lack of oversight and an irresponsible reporting system. It appears that state governments actively encourage reporting of inflated figures from the districts, which renders monitoring ineffective and accountability meaningless. Objective evaluation by National Family Health Survey (NFHS)-3 shows that 40.4 per cent of children were underweight in 2005–2006, 15.8 per cent of whom are severely malnourished. However, according to a Planning Commission study, the state governments in 2009 reported 13 per cent of children as underweight, and only 0.4 per cent as severely malnourished (IAMR 2011: 140). Although since then reporting has improved a bit, yet GOI's website shows that the percentage of severely malnourished children (reported as grade 3 and grade 4 children in the state data) in March 2013 in Andhra was 0.07, 0.70 in Assam, 0.38 in Rajasthan and UP, and 0.18 in Tamil Nadu. Where is the problem then? India is as good as Denmark or Norway!

One district Collector, when confronted with this kind of bogus figures, told the author that reporting correct data is 'a high-risk and low-reward activity'! Dr Manmohan Singh as Prime Minister termed government's performance as a 'national shame', but he was not able to persuade the states to accept that the problem exists!

Lack of follow up at the top: After the NFHS-3 came up in 2007 with the startling findings that there has been almost no decline in the percentage of underweight children in India during 1998–2006, Prime Minister decided to establish a high-powered Nutrition Council headed by the Prime Minister himself. Unfortunately it met only once in November 2010 and decided to further strengthen the programme in selected 200 high burden districts, but formal orders were issued only on 22nd October 2012. Its impact on the field is still to be felt. Moreover, there has been no all-India survey after 2006. Rather than reduce the gap between the periodicity of NFH Surveys, government has unfortunately delayed the next survey, thus diluting accountability and escaping from responsibility for poor progress.

Staff vacancies: There are massive vacancies due to which their effectiveness is limited. As per the Ministry's website, the sanctioned strength of Child Development Project Officers (CDPOs) and Supervisors in March 2013 is 9034 and 54103 in the country, but only 5985 and 34639 respectively were in position. Thus more than one-third of these positions are vacant. In Bihar, for instance, 90 per cent of the

Supervisors' posts were vacant. Only 64 per cent of AWWs received their salary either regularly or with a delay of one month, the rest reported delay of two to six months in getting their meagre salaries (Planning Commission 2011).

Unresponsive bureaucracy: Absenteeism of field staff is rampant though seldom measured. Many ICDS centres are often closed or function irregularly. Referral services for severely malnourished children are very weak as primary health care system does not function satisfactorily.

Lack of decentralisation: Very few state governments involve local bodies in implementation of programmes relating to health, nutrition, and hygiene. Empowering local Panchayats to deal with the problems relating to HUNGaMA will certainly help achieve convergence and meet the challenges of poor delivery in many parts of the country.

Improve mobility: The supervisory officials in ICDS do not visit villages and give the excuse that they have no access to a government vehicle. State governments should introduce a scheme for giving interest free loans to CDPOs and Supervisors to buy motor bikes, provided they possess a driving license.

Focus on behaviour change is missing: The child-rearing practices in India unfortunately are highly unscientific, as giving colostrum to the newborn, exclusive breastfeeding for first six months of a child's life, and complementary feeding several times a day after six months are not commonly practised. Similarly the scheme for distribution of iron folic acid tablets for pregnant and lactating women, and adolescent girls does not function well for weaknesses on both fronts – supply as well as demand.

Corruption: There are large-scale irregularities in the supply of Supplementary Nutrition Provisioning (SNP) in violation of the orders of the Supreme Court by the engagement of contractors in ICDS in many states such as, Maharashtra, Karnataka, Uttar Pradesh and Gujarat.

There is grand corruption afflicting the programme both at the GOI level and the states. Instructions from the GOI officials that SN must conform to certain nutrition standards are motivated, to ensure that only 'ready to eat food' manufactured in the factories is distributed. These manufacturers bribe at various levels, including ministers, but packaged food that is distributed in many states is not palatable, nor does it contain the claimed amount of calories and micro-nutrients. Ultimately it ends up in the market or as cattle feed.

Non-functional child care system in urban India: ICDS runs very poorly in urban slum areas because of lack of space for setting up of

Centres. In urban slums, the problems of appallingly low rent allocations (e.g. Rs 1,000 per month for Delhi) for hiring spaces and non-availability of government buildings need to be addressed urgently to fill the gap in universalising services for slum populations. In the short term, temporary structures can be put up to provide toilets in those slums where either due to legal issues or space constraints, it is not possible to put up permanent structures.

Weak links with sanitation: Only 35 per cent households in rural India have toilets. Besides, due to bad quality of water and lack of toilets children are exposed to stomach infections, develop diarrhoea, and start losing weight. Evidence is now sufficient to conclude that open defecation is an important cause of child stunting. Children's height matters because the same early life health and net nutrition that help children grow tall also help them grow into healthy, productive, smart adults. Open defecation is particularly harmful where population density is high – so children are more likely to encounter germs from faeces – which means that India's widespread open defecation and high population density constitute a double threat. Lack of medical attention further aggravates malnutrition, as discussed below.

Political economy of ICDS reforms

Many of the suggestions listed above have been made by professionals and even World Bank over the past several years. Why is then nothing happening? Is it just turf battle or bureaucratic inefficiency or are there some deeper issues?

There are several factors that explain lethargy on the policy front. The Ministry of Women and Child Development (MWCD), as also the departments in charge of ICDS at the state level, are weak organisations with little clout over other sections of government or over the field staff. IAS officers take it as a punishment posting, and are keen to move on to more attractive economic Ministries. During their short stay they find it convenient to be in a 'denial mode' about undernutrition, and collude with the field staff who under-report the extent of malnutrition. Fudging of weighment registers can be checked if the children are weighed in an open meeting with village participation (as is done in Thailand, described below), but unfortunately of all the important flagship programmes ICDS has the least degree of peoples' participation.

The MWCD has never been keen to make the ICDS field machinery responsible for nutrition outcomes. They would like this difficult task

to be passed on to the Health Ministry and gladly keep the AWCs responsible only for pre-school education, as it was before 2004. However, Health Ministry has not been keen on taking the added responsibility. Lack of ownership leads to indifference on the part of the Ministry officials, and they do not suggest radical reforms so badly needed to correct the design flaws.

In the last ten years a lot of vested interest has developed, especially at the states' level, in favour of centralised contracts for 'ready-to-eat' food. Concerns about high malnutrition are then used to justify even higher budgets for nutrition, discouraging at the same time independent studies that would show alarming leakages.

Learn from international experience: Thailand has been one of the most outstanding success stories of reducing child malnutrition in the period 1980–1988 during which child malnutrition (underweight) rate was effectively reduced from 50 per cent to 25 per cent. This was achieved through a mix of interventions including intensive growth monitoring and nutrition education, strong supplementary feeding provision, high rates of coverage ensured by having high human resource intensity, Iron and Vitamin supplementation and salt iodisation along with primary health care. The programme used community volunteers (with no honorarium) on a huge scale (one per 20 children), and involved local people, so as to instil self-reliance and communicate effectively with target groups. Communities were involved in needs assessment, planning, programme implementation, beneficiary selection, and seeking local financial contributions. Inter-village competition in reducing the number of undernourished children was encouraged, and villages were rewarded for their success.

This has significance for nutrition programmes in India as the levels of per capita GDP, proportion of women in agricultural workforce and child malnutrition rates around 1980 in Thailand were similar to what we have in India now.

Linkages with health programmes

Although bringing strong nutrition focus in Health programmes is one of the objectives of ICDS, the health sector itself suffers from several deficiencies. India is likely to miss achieving the Millennium Development Goals in respect of health indicators. For instance, Infant mortality rate (IMR) is to be reduced to 28 by 2015, but the decline has been from 60 in 2002 to only 42 in 2012. Wide differences exist between the attainments of health goals in the better

performing States as compared to the low performing States. The IMR in the poorest 20 per cent of the population is 2.5 times higher than that in the richest 20 per cent of the population. It is clear that national averages of health indices hide wide disparities in public health facilities and health standards in different parts of the country. Given a situation in which national averages in respect of most indices are themselves at unacceptably low levels, the wide interstate disparity implies that, for vulnerable sections of society in several States, access to public health services is nominal and health standards are grossly inadequate.

Rural health care in most states is marked by unfilled staff vacancies, absenteeism of doctors/health providers, low levels of skills, shortage of medicines, poor management, inadequate supervision/monitoring and callous attitudes. There are neither rewards for service providers nor punishments for defaulters. In addition, the behaviour of public services in terms of interactive quality is of serious concern and is an important factor that influences health seeking behaviour. As a result, despite instructions that a severely malnourished child should receive medical attention, this rarely happens because of non-existent and uncaring curative health care close to the village.

Doctors and nurses need to be present at the primary health centres and effective at their jobs, and provide the care that children need. But they are often mired in a system where the incentives for effective service delivery are weak, and political patronage is a way of life. Highly trained doctors seldom wish to serve in remote rural areas. Since those who do serve are rarely monitored, the penalties for not being at work are low (World Bank 2003). Even when present, they treat poor people badly. The declining quality of public health and education threatens past achievements and future prospects, and imposes additional costs on women and children.

Indian public spending on health is grossly insufficient – amongst the lowest in the world; and the consequent high proportion of private out-of-pocket expenses (69 per cent) imposes a heavy financial burden on most people. The private sector health care is unregulated pushing overmedication and the cost of health care up, thus making it unaffordable for the poor. From the meagre public spending its share on preventive health services has a low priority over curative health in the country as a whole.

India has tried to meet public health challenges with antibiotics, unlike the west, where the battle was won with clean water and sanitation, and focus on primary health care. Therefore complementary

investments in nutrition, drinking water and sanitation, and schooling are essential for achieving better synergies to guarantee nutrition and health outcomes.

There should be better coordination between the Anganwadi and ASHA health workers. GoI should expand the role of ASHAs and include nutrition education, and treatment of some common illnesses such as diarrhoea in their duties. While we need incentives, both monetary and non-monetary, to get resident doctors and nurses in remote areas, we also need to accept the principle of locally resident health workers and systems to train them. To facilitate the treatment of children requiring hospitalisation, the state government should set up Nutrition Rehabilitation Centres linked to the Community Health Centres at the sub-district level.

Re-examine the role of the Ministry

When the new MWCD was set up it was expected that it would take a holistic view of the problems of women and children, and keep a watchful eye on the activities of all other Ministries, such as health, education, labour, drinking water and sanitation that deal with the subjects impinging on children's welfare. It would develop systems that inform GoI, for instance, how and why children are malnourished. On the other hand, it has been observed that the new Ministry took a minimalist view of its responsibility, and reduced itself to dealing with the ICDS only without critically monitoring the lack of other inputs needed for reducing malnutrition. Such ostrich like attitude defeats the purpose for which the Ministry is created. It was expected that the MWCD would generate field reports that look at the access of children to health, water and sanitation, and how it affects malnutrition. Continuous measurement of the critical inputs alone will put pressure on other Ministries and their field administration to improve all services holistically. However, in the present circumstances, advocacy is not a popular agenda with the MWCD officials.

Summing up

Higher public investment in nutrition based programmes needs to be accompanied by systemic reforms that will improve the quality of public expenditures and overhaul the present system of service delivery, including issues of control and oversight. At the same time, ICDS should correct the design flaws, focus more on the younger age group,

on community participation and strengthening of convergence with related health and sanitation programmes.

Problems of lack of coordination between the Ministries (Women and Child, Health, Water & Sanitation) cannot be resolved by passing laws or by incorporating goals of minimising stunting and undernutrition in the Food Security Act. The experience of both Right to Education and Right to Employment shows that problems of bad design, inadequate funding and poor implementation require administrative and not legal action.

In the ultimate analysis, the constraints to overcoming malnutrition and hunger are rooted in bad policies, faulty design, lack of appropriate monitoring and evaluation, poor governance and lack of political will. Action is needed on all the fronts. Economic growth alone is insufficient to bring about significant reductions in the prevalence of malnourishment among children, or improvement in health of the poor. Without a major shake-up in policy and an improvement in design of the ICDS as well as in the effectiveness of its implementation, the attainment of the goal of fast reduction in HUNGA looks unlikely.

Notes

- 1 <http://www.unsystem.org/scn/Publications/SCNNews/scnnews36.pdf> (accessed on 7 July 2014).
- 2 It is likely that eating out for all classes has increased. Cereal content of meals taken outside at own cost or at public cost is hardly known, and is not captured in the NSSO data.
- 3 These are generally one or two room structures, where children gather for about four hours every morning for various ICDS activities.
- 4 http://articles.timesofindia.indiatimes.com/2013-03-06/india/37499356_1_cag-audit-icds-malnourished-children and http://zeenews.india.com/news/nation/substandard-food-being-distributed-by-anganwadis_834305.html (accessed on 7 July 2014).

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10

WHAT FACTORS SUPPORT OR LIMIT CONVERGENCE IN SERVICE DELIVERY TO IMPROVE NUTRITIONAL OUTCOMES

A study of policies and
programmes in India

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Introduction

India is currently not on track to meet the Millennium Development Goal of reducing the under-five mortality rate (United Nations 2012). Despite the country's impressive economic growth, the persistence of undernutrition is also a major concern. The National Family Health Survey (NFHS) data from 1998–99 to 2005–06 shows that the proportion of stunted children under three years of age decreased from 51 per cent to 45 per cent between the two survey periods, and there was only a marginal decline in the prevalence of underweight, from 42 per cent to 40 per cent (IIPS and Macro International 2007).

The period from pregnancy to 24 months of age is widely recognised as a critical window of opportunity for intervention and reduction of child undernutrition (Victora et al. 2010). In India, there is now broad agreement on the package of direct nutrition interventions targeted to the first 1000 days of life (Avula et al. 2013). This package of 14 essential nutrition interventions includes optimal breastfeeding and complementary feeding practices, anaemia prevention, complete

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immunisation, vitamin A deficiency control, prevention and treatment of diarrhoea, among others (Box 10.1). With the adoption of these essential nutrition inputs, even greater attention and focus has been placed on the delivery of these services.

Box 10.1 Essential inputs for child nutrition

- 1 Timely initiation of breastfeeding within one hour of birth
- 2 Exclusive breastfeeding during the first six months of life
- 3 Timely introduction of complementary foods at six months
- 4 Age-appropriate complementary feeding, adequate in terms of quality, quantity and frequency, for children ages 6–24 months
- 5 Prevention of anaemia
- 6 Safe handling of complementary foods and hygienic complementary feeding practices
- 7 Complete immunisation
- 8 Reducing vitamin A deficiency
- 9 Reducing burden of intestinal parasites
- 10 Prevention and treatment of diarrhoea
- 11 Timely and quality therapeutic feeding and care for all children with severe acute malnutrition
- 12 Improved food and nutrition intake for adolescent girls, particularly to prevent anaemia
- 13 Improved food and nutrient intake for adult women, including during pregnancy and lactation
- 14 Prevention and treatment of malaria

Source: Avula et al. (2013).

Interventions to reduce child undernutrition must be implemented at scale to achieve rapid reductions in undernutrition (Bhutta et al. 2013), but less than 55 per cent of mothers and children receive any of the essential health and nutrition inputs in India (IIPS and Macro International 2007). The delivery of nutrition-specific interventions is spread across two prominent ministries, the Ministry of Women and Child Development (MOWCD) and the Ministry of Health and Family Welfare (MOHFW), and thus requires coordination between them. A recent document review suggests that two national programmes, the MOWCD’s Integrated Child Development Services (ICDS) and the

MOHFW's National Rural Health Mission (NRHM), address all the nutrition-specific interventions, but there is a critical need for convergence between these two programmes to ensure effective service delivery (Avula et al. 2013). Despite a call for convergence and multi-sectoral coordination to address undernutrition in Indian policies (e.g. the National Nutrition Policy in 1993 and the National Plan of Action in 1995), there has historically been little horizontal coordination due to distinct intra-ministerial operational and regulatory structures and processes (Mohmand 2012).

This conceptual paper provides a framework for convergence and identifies opportunities and challenges to achieving convergence between ICDS and NRHM, based on analysis of the national and state-level policy documents and stakeholder interviews at the national level and from Madhya Pradesh and Odisha states.

Methods

In this study, convergence is defined and operationalised using concepts from an analytic framework on intersectoral convergence (Ved and Menon 2012) and from broader literature. Convergence is generally defined as a meeting point or a continuous line, and thereby considered as a dynamic process and a state that can be measured at a particular point and time. Ved and Menon (2012) define convergence as 'strategic and coordinated policy decisions and program actions in multiple sectors, such as agriculture, nutrition, livelihoods, education, and women's empowerment, to achieve a common goal (of reducing child undernutrition)'.

In the political and programmatic context, convergence involves a complex interplay of actors and actions that are often intended to result in a programmatic outcome. Actors typically include policymakers, programme implementers, development partners and civil society. The actions are policy choices; funding allocation; operational strategies; deployment of human resources; selection, measurement, and use of indicators for monitoring; and decisions about evaluation (Ved and Menon 2012). The convergence process is conceptualised within three domains: (1) policy formulation and planning, (2) implementation and (3) monitoring and evaluation. Examining the processes within these three domains helps to clarify the extent and context of convergence. These three domains are described below.

Convergence in policy formulation and planning: Achieving successful intersectoral cooperation requires a strong political commitment

(Mohmand 2012) and a common recognition among multiple stakeholders (e.g. government and non-government agencies, donors, and research institutions) that nutrition is a core indicator of development (Acosta 2012). Therefore, the initial step in assessing convergence is to identify whether the objectives defined in policies require convergence or not, the actors and actions involved in the process of policy formulation, and the nature of leadership driving the policy convergence (Ved and Menon 2012).

Convergence in implementation: A shared understanding among the staff involved in the issues requiring convergent actions and facilitation of these actions are important to achieve convergence in implementation. Advocacy and dialogue, training, and sensitisation workshops are some mechanisms to bring together multiple stakeholders, and providing detailed guidelines of roles and responsibilities helps programme implementers carry out their work and work together (WHO 2013). Explicit institutional mechanisms such as interdepartmental committees can provide a platform for convening departments from multiple sectors to report on and coordinate implementation (Acosta 2012). Political will is an element critical to the high functionality of such committees (WHO 2012).

Convergence in monitoring and evaluation: Although individual departments have their own monitoring and evaluation indicators, those that are dependent on convergent actions require common frameworks and methods of exchange. Indicators linking outcomes across multiple departments and indicators to assess specific convergent actions are imperative to assess the extent of convergence, identify facilitators of and barriers to convergence, and re-assess the need for convergence (Ved and Menon 2012).

Convergence between the ICDS and NRHM was analysed in this study using the lens of the three domains. Reviews of national policies and strategic plans (Public Health Foundation of India 2013b), the national five-year plans (India, Planning Commission 2012b; India, MOWCD 2012a), and the nutrition initiatives in Madhya Pradesh (Public Health Foundation of India 2013a) were conducted to examine the policy intent for convergence between the ICDS and NRHM, focusing on their objectives and monitoring frameworks. The membership of working groups (India, MOWCD 2011a, 2012b; India, Planning Commission 2012a) and steering committees (India, Planning Commission 2011) that provide recommendations for ICDS and NRHM programmes was analysed to determine the potential influence of group composition and leadership on convergence in policies

and programmes. The ICDS and NRHM national programme documents (India, NRHM 2010a, 2010b; India, MOWCD 2011, 2010b; India, MOHFW 2007), the annual programme implementation plan for Madhya Pradesh (Directorate of Integrated Child Development Services 2013), the landscape analysis of nutrition initiatives in Madhya Pradesh (Public Health Foundation of India 2013a), and Odisha programme documents were examined to assess the intent for convergence in the implementation of the two programmes.

Face-to-face interviews were conducted with national-level nutrition stakeholders ($N = 38$), including key actors from government, non-governmental organisations, academia, and media, identified by snowball sampling as influential in policy and programme decision making. Interviews were conducted with state-level ICDS and MOHFW/NRHM government staff and development partners in Odisha ($N = 13$) as part of a larger study examining intersectoral convergence between the ICDS and MOHFW/NRHM programmes. In Madhya Pradesh, state-level interviews were conducted with government staff, development partners and media ($N = 13$) as part of another study examining the knowledge needs and use of evidence in policymaking in nutrition. Preliminary results from these interviews are used in this paper to identify the potential opportunities for and threats to convergence between the programmes of the two ministries. Study results are organised according to the three convergence domains, first on the findings on convergence at the national level and then followed by illustrations of convergence in Madhya Pradesh or Odisha.

Results

Convergence in policy formulation and planning

At the national level, India has a robust policy environment where nutrition is concerned, with a substantial focus on nutrition interventions in several policy documents. The MOWCD's 1993 National Nutrition Policy (India, MOWCD 1993) positioned malnutrition as a complex development problem with linkages to agriculture, food production and poverty. The National Health Policy adopted in 2002 recognised child undernutrition to be an important determinant of infant and child health (Ved and Menon 2012). Despite their separate programme mandates, the objectives of the ICDS and MOHFW/NRHM pertaining to maternal and child nutrition overlap, presenting a case for intersectoral cooperation (Table 10.1). Several policies and planning documents

Table 10.1 Common objectives shared by the Integrated Child Development Services and the Ministry of Health and Family Welfare/National Rural Health Mission within national policies

<i>Objectives of the Integrated Child Development Services (ICDS)</i>	<i>Objectives of the Ministry of Health and Family Welfare (MOHFW)/National Rural Health Mission (NRHM)</i>
<ul style="list-style-type: none"> • Improve the nutritional and health status of children in the age group 0–6 years • Reduce the incidence of mortality, morbidity, malnutrition and school dropout • Achieve effective coordination of policy and implementation among the various departments to promote child development 	<ul style="list-style-type: none"> • Improve maternal and child health (Action points: promote institutional deliveries, safe deliveries and complete immunisation for children 0–12 months old) <p>Objectives of the Reproductive and Child Health II programme under the NRHM:</p> <ul style="list-style-type: none"> • Child health programme goals: Lower rates of maternal mortality, neonatal mortality and under-five mortality <p>Areas of emphasis:</p> <ul style="list-style-type: none"> • Nutrition • Management of common childhood illnesses • Immunisation

Note: The table presents *only* those objectives of the ICDS and MOHFW/NRHM that overlap.

emphasise the need for convergence between health and nutrition. In fact, the Twelfth Five Year Plan (2012–17) (India, Planning Commission 2012b) envisages the need for convergent actions for nutrition and recommends that the MOHFW and MOWCD build institutional arrangements to deliver services in a coordinated manner.

At the forefront of these policies is an intense policy formulation process that involves many actors. One government official explained, ‘The whole process of preparing the planning document is very tedious and participatory. So many stakeholders, even the independent researchers, independent actors . . . they all participate in this process. The groups, the influence groups, they are part of the reference or steering group or the working group. So when you look at the planning document, they are the main source’. Evidence from diverse sources is being increasingly considered in drafting policies, although to varying extent. Steering committees and working groups consolidate evidence and provide recommendations for policies and play an important role in determining what is articulated within the policy documents. Therefore, in addition to the quality of

interactions, the composition of these groups becomes an important ingredient in the process.

For the Twelfth Five Year Plan (India, Planning Commission 2012b), the Steering Committee on Health (India, Planning Commission 2011) was charged with giving recommendations on child health and nutrition, among other issues. Under the chairmanship of a Planning Commission member, the committee comprised secretaries from various ministries, including the MOWCD, academicians, health care professionals and representatives from the chamber of commerce. Also, a working group to assess the performance of the NRHM and provide recommendations for the Twelfth Five Year Plan was constituted under the chairmanship of the secretary of the MOHFW, and a representative from the Department of Women and Child Development (DWCD) was part of the group. Similarly, a working group on nutrition for the Twelfth Five Year Plan was constituted by the Planning Commission; the working group was chaired by the secretary of the DWCD and included the NRHM mission director and a MOHFW senior adviser along with representatives from other ministries. One of the sub-groups within this working group examined interventions and institutional mechanisms for care and support of maternal and child undernutrition and was comprised of the DWCD secretary and the NRHM mission director, along with members from other ministries and civil society. The inter-ministerial group focusing on the ICDS re-structuring was chaired by a member of the Planning Commission and attended by the secretaries of the MOWCD, MOHFW, Department of Drinking Water Supply and Sanitation, and officials of other ministries. This cross-group participation, in which members of the MOHFW are part of MOWCD policy discussions and, conversely, the MOWCD members are part of the MOHFW policy discussions, is indicative of the potential for learning about the operational needs of the individual departments, identifying redundancy of services and discovering opportunities for convergence between the departments during the policy deliberation stage.

Intersectoral policy formulation must be followed by planning for action. Historically, the details of actions intended to promote convergence have not been well articulated, despite wide acceptance of their importance. For example, National Nutrition Policy, National Health Policy, National Plan of Action for Children, Reproductive and Child Health II, and NRHM documents allude to undernutrition as being critical for child survival but do not specify convergence-related goals or describe any budgetary commitments, institutional arrangements

or human resources required for convergence (Ved and Menon 2012). Lack of time, linked resource allocation and review of progress are challenges for addressing intersectoral convergence as part of district health plans (India, NRHM 2012a).

In the recent MOWCD strategic plan (2011–16) (India, MOWCD 2011a), however, specific steps for facilitating convergence were identified. The plan recommends creating a Policy Coordination and Support Unit in the Planning Commission to ensure better convergence, accountability and action. It also suggests setting up a nutrition surveillance and data management system together with health management information systems (HMIS) for Anganwadi Center (AWC) services and health data for women and children. Furthermore, the NRHM national framework identifies opportunities for convergence between the MOWCD and the MOHFW. It suggests reviewing job descriptions of the Anganwadi workers (AWWs), auxiliary nurse-midwives (ANMs) and accredited social health activists (ASHAs) to ensure that responsibilities for convergence are clearly defined; reviewing the training curricula for AWWs and ASHAs; and ensuring joint training of all frontline workers (India, MOHFW 2013a).

*A case of convergence in state
policy formulation and planning*

In Madhya Pradesh, several national nutrition policies and guidelines have been adopted and are being followed, including the National Nutrition Policy, Policy on the Control of Nutritional Anemia, Policy on the Elimination of Vitamin A Deficiency through Vitamin A Supplementation, Infant and Young Child Feeding Guidelines, and Guidelines for the Facility Based Management of Severe Acute Malnutrition (Public Health Foundation of India 2013a). In addition, the state developed a nutrition policy to reduce malnutrition through intersectoral coordination, targeting female adolescents for health care delivery and nutritional awareness and targeting the family as the focal point for nutrition-related programmes. The adaptation of national policies and formulation of state policies are indicative of the state's strong political commitment to reducing undernutrition.

In 2010, the Atal Bal Arogya Evam Poshan Mission, referred to as Atal Bal Mission (ABM), was set up to act as an overarching institution to bring together health and nutrition interventions (Directorate of Integrated Child Development Services 2013). Strong political will

was recognised as a critical factor in realising the ABM, as explained by one government staff member:

The basis for this dedicated mission [Atal Bal Mission] was that we have huge numbers of malnutrition and also the commitment of our Chief Minister saying that ‘I see this as a curse, and we need to handle it.’ So there was a series of workshops, all the development partners from UNICEF [United Nations Children’s Fund] to DFID [UK Department for International Development], NIN [National Institute of Nutrition], and many others. Think of nutritional experts in the country; they were at least involved or invited to contribute on that. There were discussions, workshops, and they came out [with recommendations]. And finally those [recommendations] were presented before the Chief Secretary, and this is how the mission document and the strategy and vision document for the Atal Bal Mission document was formulated.

The ABM was envisioned to bring about convergent action through integrated planning between multiple departments (i.e. MOWCD, MOHFW, Panchayat and Rural Development, School Education, and Public Health and Engineering) instituted at the state, district and sub-district levels, through building the capacity of the MOWCD and the MOHFW to implement evidence-based interventions and to effectively document programmatic actions and identify research areas for evidence-based planning. Through partnership between the MOHFW and the ICDS, the ABM is expected to support effective and regular distribution of supplementary foods, support development of model AWCs, and promote supportive supervision and monitoring of community-based management of moderately and severely malnourished children (Directorate of Integrated Child Development Services 2013).

Convergence in implementation

The MOWCD delivers its programmatic actions to address maternal and child undernutrition primarily through the ICDS. Given the overlapping objectives of the ICDS and of the MOHFW and NRHM (Table 10.1), they make natural partners in service delivery. Table 10.2 provides a summary of results from the policy and programme document review, which identified areas of convergence in implementation between ICDS and MOHFW/NRHM.

Table 10.2 Proposed areas of convergence in programme design and implementation between the Integrated Child Development Services and the Ministry of Health and Family Welfare/National Rural Health Mission

<i>Integrated Child Development Services (ICDS)</i>	<i>Ministry of Health and Family Welfare (MOHFW)/National Rural Health Mission (NRHM)</i>
<p>The Ministry of Women and Child Development (MOWCD) Strategic Action Plan¹ recommends:</p> <ul style="list-style-type: none"> • Creating a Policy Coordination and Support Unit in the Planning Commission to facilitate convergence, accountability and action. • Establishing a nutrition surveillance and data management system and convergence with the health management information system for Anganwadi Center services and health data for women and children. 	<p>The NRHM framework³ for district plans acknowledges the importance of drinking water, female literacy, nutrition, early childhood development, sanitation and women's empowerment to improving health.³</p>
<p>The MOWCD framework for developing state annual programme implementation plans² specifies to:</p> <ul style="list-style-type: none"> • Explain convergence with the NRHM for Village Health and Nutrition Days; • Identify existing convergence and coordination mechanisms with line departments, including Health, Education, Water and Sanitation, Horticulture, Rural Development, Panchayati Raj, and Ayurveda, Yoga, Naturopathy, Unani, Siddha and Homoeopathy; and • Explain the status of joint planning with the DHFW at district/block/village levels, joint visits/reviews with the DHFW and other departments, and joint training of Anganwadi workers/auxiliary nurse-midwives/supervisors. 	<p>The NRHM identifies the following actions of convergence:⁴</p> <ul style="list-style-type: none"> • Mobilise women, adolescents, and children; and provide health education and services such as immunisation and micro-nutrient supplementation for children and pregnant women. Integrated Management of Newborn and Sick Child Illnesses, examination of pregnant and postpartum mothers, distribution of pills and condoms for birth spacing, and referrals at the village level. • Promote women's empowerment and equity through involvement of community-based groups, prevent child marriages, raise awareness against sex selection, prevent domestic violence, and mobilise resources through collective action for health and other emergencies. • Potential mechanisms for convergence: <ul style="list-style-type: none"> ◦ Jointly develop behaviour change communication strategies, materials and messages; ◦ Identify strategies for joint planning at village, block and district levels; ◦ Develop joint management information system, including common indicators; and ◦ Identify joint training opportunities.

Sources:

¹ Ministry of Women and Child Development (2011), Five Year Strategic Plan (2011–16);

² Ministry of Women and Child Development (2011), Integrated Child Development Services Scheme: Framework for Development of the State Annual Programme Implementation Plans (AIPs); ³ National Rural Health Mission. Meeting people's health needs in rural areas. Framework for implementation, 2005–12. New Delhi, India: MOHFW; ⁴ Intersectoral convergence between DWCD and DHFW-DOHFW. <http://nrhm.gov.in/nhm/nrhm/guidelines/nrhm-guidelines/intersectoral-convergence-between-dwcd-and-dhfw-dohfw.html>

The design of the ICDS programme adopts a multi-sectoral approach to child well-being; incorporating health, nutrition and education interventions; and emphasises a lifecycle approach to potentially address both the underlying and direct causes of undernutrition. ICDS services are expected to be delivered through a network of AWCs by the AWWs. The ICDS has an explicit objective to achieve coordination of policy and implementation among various departments to promote child development (Ved and Menon 2012).

The NRHM, launched in 2005 to strengthen the state health systems, has a special focus on reproductive and child health services and disease control programmes. The reproductive and child health programme integrates interventions that promote child health and addresses factors contributing to infant and under-five mortality. The main focus areas for child health are neonatal health, nutrition, management of childhood illnesses and immunisation. For maternal health, the focus areas are ensuring quality antenatal and postnatal care of the mother and the newborn in addition to other reproductive health services. The NRHM interventions are delivered by ASHAs and MOHFW frontline workers known as ANMs. The combined frontline cadre of AWWs, ANMs and ASHAs are expected to implement all the ICDS and NRHM interventions at the community and household levels.

According to programme documents, the ICDS and NRHM together are expected to deliver all of the 14 globally recommended interventions or inputs to improve maternal and child nutrition (Box 10.1). Depending on the intervention, the frontline workers in each programme complement or reinforce one another's roles. For example, in delivering interventions related to paediatric anaemia, ASHAs identify anaemic children and ANMs provide the paediatric iron and folic acid tablets to children six months to three years of age on Village Health and Nutrition Day, a day designated each month for providing various health and nutrition services at AWCs. The AWWs are expected to hold the stock of iron and folic acid tablets and vitamin A supplements for the ANMs. Thus, by design, delivery of services to prevent paediatric anaemia requires close coordination between the three types of frontline workers. Similarly, all three types of frontline workers are expected to coordinate their efforts to plan and provide services together during Village Health and Nutrition Days (Avula et al. 2013). In delivering interventions to promote optimum infant and young child feeding practices, AWWs and ASHAs are expected to conduct home visits and counsel mothers on appropriate feeding practices;

thus, these workers are expected to play reinforcing roles (Avula et al. 2013). Programme documents at the national level provide guidelines on the consensus package of essential nutrition interventions and for the coordination of service delivery by ICDS and MOHFW/NRHM frontline workers.

*A case of convergence in
implementation at the state level*

Results from state interviews suggest that in Odisha, the MOWCD and MOHFW/NRHM work jointly on several nutrition-related initiatives. One government official described a close collaboration to develop guidelines for community management of acute malnutrition, wherein the process for the development of guidelines was initiated by the MOWCD and the MOHFW/NRHM provided technical inputs. The Mother and Child Protection card was also prepared jointly and is used by both departments. Also, the MOWCD and MOHFW/NRHM closely coordinate implementation of the Adolescent Anemia Control Programme, Village Health and Nutrition Days, Pushtikor Diwas (a bimonthly event held in the community to examine severely malnourished children), and Mamata Scheme (a conditional cash transfer initiative of the MOWCD, which is an extension of a national maternity benefits scheme).

Training was identified as another core area for coordination between the two departments. One government staff member explained that at the state level, two major training activities demonstrated convergence. The first was in relation to the Integrated Management of Neonatal and Childhood illnesses programme. Until recently, the MOHFW funded and trained the training of all AWWs involved in the programme. However, given the large increase in the number of AWWs, MOWCD has started to provide funding, while the MOHFW continues to train them. Second, the MOWCD provides funding for training on the 1000-day approach, while the technical support is given by the MOHFW.

One development partner described convergence of actions as being strongest at the frontline level: 'When we look at implementation, I find that the [strength of] convergence between Health and ICDS [is greatest] at community level, then at the block level, and then at the district and state levels. If I look at all the four levels, it is strongest at the community level.' Box 10.2 provides an illustrative case of convergence in service delivery at the frontline level.

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Box 10.2 Case of close convergence in implementation among frontline workers in Odisha

At one district in Odisha, an exceptional case of well-orchestrated convergence in service delivery was revealed through interviews with several workers at the frontline level. AWWs from the ICDS and ASHAs and ANMs from the MOHFW/NRHM described their involvement in providing 10 different services that encompass the 14 essential nutrition inputs that the two departments aim to deliver. Six out of the 10 services were actually provided together by AWWs and ASHAs, often through joint home visits or regular events, or as equally shared roles. In three services (child immunisation, vitamin A supplementation and referrals of severe acute malnutrition), the frontline workers had a clear understanding of their division of labour and worked together to accomplish the overall goals. Only in one service (distribution of food supplements) did the AWWs lead the activity from start to finish with little to no involvement by any MOHFW/NRHM frontline workers. These results are summarised in the table below.

<i>Services provided, according to the essential nutrition inputs listed in Box 1</i>	<i>Role by type of frontline worker</i>	
	<i>AWW(ICDS)</i>	<i>ASHA, ANM (MOHFW/NRHM)</i>
1 Optimal IYCF counselling, including food safety and hygiene (inputs 1–4 and 6)	Joint	Joint
2 Antenatal care, distribution of iron tablets and counselling on maternal nutrition (inputs 5 and 13)	Joint	Joint
3 Administration of complete child immunisations (input 7)	AWW convenes	ANM administers
4 Administration of vitamin A supplements (input 8)	AWW convenes	ASHA administers
5 De-worming (input 9)	Joint	Joint
6 Education about diarrhoea prevention and ORS distribution (input 10)	Joint	Joint

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7 Referrals for treatment of severe acute malnutrition (input 11)	AWW measures	ASHA accompanies
8 Distribution of iron tablets to adolescent girls (input 12)	Joint	Joint
9 Distribution of food supplements to pregnant and lactating women (input 13)	AWW provides	No role
10 Education about malaria prevention and bed net distribution (input 14)	Joint	Joint

Note: 'Joint' roles indicate where AWW and ASHA both conduct the activity during joint home visits, community gatherings, or regular events, or share equal roles in providing the service.

Facilitators of coordination

Frontline workers identified that a clear understanding of each other's work responsibilities and timely communication, often by telephone, helped them cooperate and coordinate in the implementation of the various services. When they understood what each worker was supposed to accomplish, the workers were able to hold each other accountable and help cover the work when someone became ill or unable to complete his or her duty at a particular moment. This shared understanding of responsibilities was initiated through joint participation in trainings and orientations.

Barriers to coordination

When AWWs and ASHAs working in the same villages lived far from one another (i.e. physical distance), it was difficult to coordinate home visits and events to deliver services. However, telephone use has become more common and frequent, which helps overcome this barrier at times. Frontline workers recognised that their increasing workload and heavy work responsibilities also pose difficulties to coordination.

Source: Preliminary findings from an ongoing IFPRI study on convergence in Odisha, 2013–14.

Notes: ANM = auxiliary nurse-midwife; ASHA = accredited social health activist; AWW = Anganwadi worker; DHFW = Department of Health and Family Welfare; ICDS = Integrated Child Development Services; IYCF = infant and young child feeding; NRHM = National Rural Health Mission; ORS = oral rehydration salts.

Periodic joint review meetings at the district and state levels serve as mechanisms to facilitate convergence. At the district level, monthly joint committee reviews are held under the chairmanship of the district collectors, in order to discuss and review the work of the ICDS and MOHFW/NRHM. However, one development partner described these meetings as often being dysfunctional:

I don't really find functional convergence. They participate [in meetings], but it is not functional. It is more like, what do I say, routine participation, where CDPOs [child development project officers] do not bring out [real] issues. Sometimes what I find is that breakouts occur, when each one puts blame on the other; like ICDS will blame that doctors do not come, or Health will blame that supervisors do not come. So, the blame game sometimes interrupts the convergence approach or the functional convergence at the district or block levels.

Three factors were identified to influence the effectiveness of joint meetings. Bureaucratic hierarchy, or rank of official positions, precludes meaningful discussions during meetings, as described by a participant:

In district and block-level review meetings, the participation of ICDS sometimes becomes statutory rather than participatory . . . this is because our medical officers or the district CDMO [chief district medical officer] is at much higher levels compared to a DSWO [district social welfare officer] or a CDPO, who are junior social welfare officers. Because of that difference in the hierarchy, it affects their participation.

Secondly, the meeting discussions are driven by the agenda, which is often determined by the department that initiates the meeting: 'I strongly feel that in these joint meetings, we do not have a specific agenda to discuss on ICDS interest areas. It remains more of a statutory attendance rather than an active participation in these reviews.' Finally, technical knowledge (or the lack thereof) of the topics in discussion influence level of participation:

I often found in the meeting agendas that they [MOHFW/NRHM] usually focus on addressing the technical areas. The

ICDS people feel weak, and they are shy in participating. For example, when malnutrition is discussed, about MUAC [mid-upper-arm circumference], or what protein is needed, what is the calorie need, etc. ICDS people are more comfortable in discussing supplementary nutrition programs or early childhood development [the preschool programme].

At the state level, a project steering committee meeting is held twice a year to review programmes and plans involving multiple departments. The meeting is chaired by the development commissioner and attended by the MOWCD, MOHFW, Department of Rural Development and Panchayati Raj institutions along with development partners. Other interdepartmental meetings are theme-specific or focused on specific interventions such as the Mamata Scheme, nutrition rehabilitation centres, and community management of acute malnutrition. Strong departmental leadership and the personal interest of the departmental heads were identified as facilitating convergence at the state level, but staff participation in such meetings is limited and determined by the seniority of the departmental chair who organises the meeting. Also, a high-ranking official who could mobilise officials across departments is preferred, since meetings led by a single departmental representative or a low-ranking official may be attended by junior-level staff, who are considered as passive participants and not equipped to make decisions. One development partner described the scenario:

The development commissioner should take the lead because we cannot leave it just to that particular departmental secretary. One department head could be a commissioner, and another department's secretary could be the senior bureaucrat in the state. When you leave this convergence only to a particular person, then it may be . . . in the sense of tokenism. So that when such a convergence meeting is called, then it will be attended by people who are much lower in rank . . . But when chief secretary calls or the development commissioner calls, then those particular departments will be mandated to attend.

There is low impetus within the departments to organise and actively participate in interdepartmental meetings due to lack of time and heavy workloads. Therefore, external entities often act as stimulators to bring

them together. One development partner indicated that he sometimes facilitated the joint meetings of these departments, so that they communicate with each other on interventions such as NRC and Pushtikor Diwas:

Often being development partners, we have to tell the departments, “Why don’t you call the other departments?” . . . They are very comfortable within their [own] cocoons. So whenever there is a state-level review meeting, everybody will call their own line department people rather than trying to mix the groups.

Convergence in monitoring and evaluation

Monitoring and evaluation of service delivery, supervisory systems, and feedback loops are necessary to know whether outcomes are being achieved and whether convergence is enabling the achievement of outcomes (Ved and Menon 2012). However, regular and systematic monitoring and evaluation are not effectively integrated into the ICDS programme; one government staff recounted that the ICDS programme expanded after the Supreme Court mandate for the universalisation of the programme, ‘but we lost sight of evidence’. The present ICDS monitoring system is designed to track coverage data but does not include outcome indicators. Monthly progress reports are prepared on key programme indicators at the AWC level and then aggregated up to the state level. However, new revised management information system (MIS) guidelines are being proposed to include joint monitoring indicators with NRHM and other related sectors (India, MOWCD 2011b). Recently, efforts have been made to bring about convergence in monitoring the implementation of activities such as Village Health and Nutrition Days through joint supervision visits with the MOHFW (India, MOWCD 2011c).

Monitoring and evaluation is an integral part of the MOHFW’s activities, particularly with HMIS, where service and outcome data are aggregated from the village level up to the state level. After the NRHM was launched, key indicators for NRHM interventions were integrated into a common monitoring of information and evaluation system format that would facilitate efficient monitoring of programmes (<https://nrhm-mis.nic.in/Pages/eBrochureTemplatePrint.aspx>). Additionally, there is a Mother and Child Tracking System (MCTS), which is a web-based application that compiles information on all pregnant women and children in the country. This system has been devised to monitor data on maternity benefits and child

immunisation. However, there are currently no nutrition-related indicators in the HMIS or in the MCTS except the proportion of low-birth-weight babies (Ved and Menon 2012). Given the overlap of the data collected by the two departments, the NRHM itself recommends a joint review of the MIS of MOWCD and MOHFW, with the goal of developing a joint MIS with common indicators (India, MOHFW 2013a). However, the joint MIS had not yet been developed at the time of this writing.

Given the proposed revamping of the ICDS MIS and the MOHFW/NRHM recommendations to develop common indicators, opportunities exist for convergence in the two departments' monitoring efforts. However, a challenge to developing a common MIS is the different objectives of the two departments. For example, improving the nutrition and health status of children from birth to six years is an objective of the ICDS but not of the MOHFW/NRHM. The common indicators for both departments are antenatal care, immunisation, vitamin and mineral supplementation, morbidity, and mortality. The nutrition indicators, which are central to the ICDS, are not core for the MOHFW/NRHM. The difference in data handling between the departments was described by a development partner as follows: 'The definition of data, data collection dates, data collection points are different for Health and the ICDS. If a maternal death occurs in a village, then the AWW reports it in her records, but if a maternal death occurs in a hospital, then the ANM reports it.' Thus, despite the different location of events, the population and outcomes of interest are the same for both departments, so there is a need to apply a common MIS that will be useful to both departments.

There have been a few evaluation studies of the ICDS programme at the national level – two studies conducted by the National Institute of Public Cooperation and Child Development in 1992 and 2006, and two by the National Council of Applied Economic Research in 1998 (India, MOWCD 2013) and 2011 (India, Program Evaluation Organization 2011). The MOHFW and NRHM programmes, in contrast, have an established system for periodic programme review and evaluation. For example, the monitoring and evaluation division, population research centres, and regional evaluation teams are involved in the evaluation of ongoing interventions. Furthermore, the monitoring and evaluation division conducts large-scale surveys at five-year intervals, such as the NFHS, District Level Household Surveys, and Facility Surveys to assess and evaluate the outcome and impact of interventions. Additionally, the Planning Commission evaluates the NRHM

programme at the national and state levels. The National Health Systems Resource Center, an apex body of technical assistance under the NRHM, conducts regular evaluations and recently conducted an evaluation of the ASHA programme. At present, data from national surveys are used by the MOWCD, but they have little participation in data collection or reporting (India, MOHFW 2013b). MOWCD's participation in the design, collection, and analysis of data would be an opportunity to include indicators of interest to both departments.

*A case of convergence in state
monitoring and evaluation*

In Odisha, despite the lack of formal mechanisms, data are shared between the ICDS and the MOHFW/NRHM at the state level due to the interest of departmental leaders and staff in the two departments. Also, efforts are under way to systematise the data sharing process using the MOHFW/NRHM's state-level Maternal and Child Health Tracking System (MCHTS), which does not have a code to identify the AWC in its output. Although the state MOHFW is willing to include the centre code, the MOWCD does not have access to the source code of the MCHTS computer programme (obtainable only from the national MOHFW) to add in the AWC code. Thus, despite cooperation in data sharing, there is still little progress in converging monitoring and evaluation systems or processes.

Discussion

Our findings show evidence of the diverse nature of convergence approaches and activities across the three domains related to policies and programmes from the national to local levels. Tackling undernutrition has progressively emerged as a priority in Indian policies. Various national and state policy and programme documents from the health and women and child development sectors display common recognition of the importance of nutrition and demonstrate consensus regarding the inputs necessary to address child malnutrition. Broadly representative steering committees and working groups for policy formulation and a trend toward action-oriented planning that recognises convergence provide opportunities for greater convergence across sectors. However, there are still gaps in providing operational guidelines on how to implement the policies (Public Health Foundation of India 2013b). While evidence from diverse sources appears to be used in nutrition-related

policy formulation, there is little documentation of the process of evidence-based planning (Public Health Foundation of India 2013b).

In implementation, given the overlap and complementarity of human resources and service delivery structures, there are many opportunities for convergence at various operational levels. At the state and district levels, the extent of convergence is strongly influenced by political commitment, will and leadership. To some extent, rigid bureaucratic hierarchies inherent to the Indian bureaucracy and departmental territorialities, arising from differences in technical strengths and resource allocations, interfere with interdepartmental collaboration. Establishing explicit methods, responsibilities, and budgetary lines for collaborative planning could avoid threat to existing departmental budgets and encourage effective convergent action.

Likely in part due to less systemic bureaucracy and greater operational activities, convergence was found to be stronger at the frontline than at higher levels. The delivery of interventions requires work arrangements among the three cadres of workers (AWWs, ASHAs and ANMs) that facilitate convergence. Personal relationships and a shared understanding of responsibilities, issues and actions were also facilitators. However, it is possible that convergence at the frontline was influenced by factors at the district and block levels. These findings are based on interviews from one district in Odisha and build an illustrative positive case of convergence, and thus cannot be generalised to the entire state.

Convergence is weak in the monitoring and evaluation domain, where currently there is no integration or exchange of common indicators, processes or outcomes that are jointly monitored and evaluated. However, opportunities have been identified in data sharing and common data management.

Strong political leadership can rally different sectors, agencies and partners to work together in policy formulation and planning, but there is a need to harness this leadership so that the composition of groups is more broadly representative throughout the process. The ABM in Madhya Pradesh is an example of strong political will bringing about convergent actions in policy formulation and programming. However, for such convergent actions to be sustained, the political will to reduce undernutrition in the states needs to be maintained (Harris and Drimie 2012).

Although political support facilitates the formulation of policies, the operationalisation of such policies through intersectoral convergent actions is often limited (Harris and Drimie 2012). This study

shows that MOWCD and MOHFW/NRHM programme services are closely linked at the delivery points, necessitating coordination at the frontline among the workers from these departments. However, similar coordination is not observed at the block, district and state levels. Interdepartmental committees provide a mechanism for convening departments from multiple sectors to report on and coordinate implementation, and strong leadership is needed to facilitate the functioning of coordinating bodies (Acosta 2012; Mohmand 2012; Mondal and Kalita 2012). In Odisha, there are joint coordination committees for reviewing programmes and convergent actions at the state and district levels, but they are made less effective by the hierarchical bureaucratic structures that determine staff participation and influence the nature of interactions at these meetings. These results confirm that conveners with the credibility to bring all relevant parties together are needed to facilitate meaningful deliberations for joint action (Gupta et al. 2003; Harris and Drimie 2012; Mondal and Kalita 2012).

Convergence in monitoring and evaluation is an integral part of intersectoral convergence activities. In addition to formulating intersectoral policies and implementing them, it is imperative that common indicators be identified and monitored. This may be done through agreed-upon indicators and knowledge management arrangements (WHO 2012). Our findings suggest that the ICDS has weak monitoring and evaluation systems, whereas the MOHFW/NRHM has a systematic MIS in place. The overlap of indicators monitored by both departments presents an opportunity to developing common monitoring frameworks. The example of Odisha suggests that a major challenge to developing such a common framework is that changes must be incorporated at the national level, which again requires political will.

In spite of the evidence found in this study on the diverse nature of convergence, the study also raises the question of how much convergence is necessary or appropriate to optimise actions within the three key domains. It is clear that some level of convergence is necessary where various entities or sectors are working toward the same goal or objective. However, convergence-related actions can take a wide range of forms. Convergence may range from cooperation (i.e. sharing or exchanging information or resources) to coordination (altering one's activities to achieve a common purpose) to collaboration (enhancing one another's capacity) to integration (sharing structures or merging sectoral remits) (Garrett and Natalicchio 2011). Our study shows that the activities of the two departments in the policy formulation, implementation, and monitoring and evaluation domains

fall along this continuum of convergence. For example, the current informal exchange of monitoring information between the ICDS and MOHFW/NRHM demonstrates cooperation, although efforts are being made to coordinate by incorporating common indicators within monitoring systems between the departments. Arrangements between the two departments for joint training and implementation range from collaboration to integration.

This paper presents a framework for examining convergence along with the conditions for achieving convergence using examples from Odisha and Madhya Pradesh. Although this paper identifies possibilities for convergence within the three domains, it does not address questions on the need and extent of convergence, its adequacy, and/or quality within these domains and its implications for improving maternal and child undernutrition. Furthermore, whether convergence in planning and implementation leads to effectiveness, including intervention quality and coverage, is an empirical question to be tested. To this end, a larger mixed-method study of convergence is currently being undertaken by the primary authors of this paper. Given the broad nature of the malnutrition problem and the many different ways to address it, we present the case of the relevance, feasibility, and usefulness of intersectoral convergence. Further research is also necessary on this highly pertinent issue and its effects on development effectiveness.

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11

TACKLING CHILD MALNUTRITION IN INDIA

Achieving the doable or chasing
the desirable?

Satish B. Agnihotri

Malnutrition challenge

Chapters in this volume and elsewhere (Dreze and Sen 2013) document that India's track record reducing child malnutrition has been dismal. This poor track record compares unfavourably its neighbours (e.g. Sri Lanka or Bangladesh) with other Asian countries having similar economic growth levels, and even sub-Saharan Africa. The irony of the failure of the state in reducing malnutrition in face of India's impressive economic growth rate of the last decade is magnified by the fact that for the past three decades India has made strong attempts at reducing child malnutrition, at least on paper.

Failure of the Indian state in reducing the incidence of malnutrition, measured by the weight for age parameter, between two rounds of the National Family Health Survey (NFHS) (i.e. NFHS-2 (1997–98) and NFHS-3 (2005–06)) was brought out clearly after publication of the NFHS-3 results. The reduction in the level of underweight for children under three years was only 2.3 per cent, from 42.7 per cent to 40.4 per cent (International Institute of Population Sciences, 2007) at all India level, an unsatisfactory outcome by any objective standard. The response from the state was quick and predictable: question the data. Several state governments responded in this fashion, irrespective of their levels of development. Have we not after all been running the Integrated Child Development Scheme (ICDS), the largest intervention of its kind anywhere in the world for over three decades

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now? How can there be no commensurate results? Surely the data is suspect! The research community too got activated once again into various analyses of the pattern, the trend and the causes. Policy planners and programme implementers got busy once again with the ideas of revamping the ICDS; trying to do more of the same¹ than doing something different. However, several success stories within India offer insights into how ICDS might be used as a vehicle for reducing child malnutrition.

More ICDS or better ICDS?

The ICDS is an important intervention initiated by the Government of India in the field of child development. Its objectives include, inter alia, improvement in the nutritional status of the children. The programme which initially began on a pilot basis in few community blocks of the country in the early 80s has been scaled to all the districts of the country making it one of the largest interventions of its kind anywhere in the world. The programme boasts today of a coverage of 1.33 million Anganwadi or 'child care' centres against a sanctioned number of 1.37 million (Annual Report 2012–13 of the Ministry of Women and Child Development, Government of India). These are supervised by the ICDS supervisors, typically one supervisor covering 6–8 centres. They in turn report to the Child Development Project Officers (CDPO) at the project level. Every district has a number of ICDS projects coinciding with the blocks in rural areas and municipal administrative units in the urban area. Each Anganwadi centre has a worker (AWW) and a helper. They have been provided with requisite wherewithal of space, food stuff, pre-school teaching material, weighing scales to weigh children and the like.

However, lack of improvement in nutritional statistics has led to an advocacy for the 'total revamp' of this programme. For advocates of this approach, the failure of the ICDS programme over its three and half decades of existence is a proof of the need for the total revamp of the scheme and unless that happens, no improvement can be suggested (e.g. Sinha 2006; Economic and Political Weekly Editorial 2013). But most of the total revamp ideas revolve around 'more ICDS' rather than 'different ICDS' (i.e. more AWW, more buildings, more wages, more coverage or a more complete coverage of smaller habitations). Asserting that 'unless you do such and such thing situation will not improve' can be quite counter-productive, providing the existing system a convenient excuse for not attempting any improvement.

This paper suggests that there is a need to pause and ask as to where has the ICDS succeeded, how much and how. The next logical question to ask is whether it is possible to build upon its success, scale it up and improve upon it qualitatively.

Very surprisingly, and we are pre-empting the arguments that follow, the NFHS data itself shows that reasonably impressive reduction in the incidence of malnutrition has been achieved, that too in states not hitherto known for better nutritional status of their children (Mapa 1a and 1b). The reduction in underweight children under three years of age has been in the range of 12.1 per cent in Maharashtra, 10.8 per cent in Odisha, 9.9 per cent in Rajasthan, 7.7 in West Bengal and 5.4 per cent in Chhattisgarh against the national average of 2.3 per cent (Table 11.1).

In states where ICDS programme has shown some success, particularly Maharashtra and Odisha, sustained, dedicated and systematic efforts were made to measure, track and tackle moderate and severe malnutrition among children. A similar initiative was taken in West Bengal over a limited area and was not sustained. Rajasthan and Chhattisgarh had also followed part of this strategy but that has not been documented in detail and will hence not be covered in this narration. What was common to these efforts was the use of the existing ICDS system, motivation of the available staff, better monitoring and focused intervention on the moderately and severely malnourished children by joining hands with the health system. It is asserted here that such efforts have considerable merit.

The author had an opportunity to work as Secretary in the Women and Child Development Department (DWCD) in the state of Odisha in two phases, 1997–99 and 2003–05. The first term just followed the NFHS-2 survey while the second term preceded NFHS 3 survey. In the intervening period, he also worked as a Consultant to UNICEF Kolkata on Child Health and Malnutrition (2001–03). The strategy described here took shape quite gradually over this period in these two states but could be taken up rapidly in Maharashtra during 2002–10, first in a specific region (i.e. Marathwada) and subsequently in the entire state thanks to the pioneering initiative and sustained interest taken by Mr V Ramani of the Indian Administrative Service, initially as the Divisional Commissioner, Marathwada region, then as Secretary DWCD in state before heading the Mother-Child Health and Nutrition Mission in the state (2005–10).

The strategy in most of these initiatives consisted of (i) unpacking the issue to prioritise the interventions, (ii) identifying the weak links and

Table 11.1 Changes in proportion of children ages 0–3 years who are underweight

Name	NFHS 2 (1998–1999)	NFHS 3 (2005–2006)	Changes	Name	NFHS 2 (1998–1999)	NFHS 3 (2005–2006)	Changes
Maharashtra	44.8	32.7	12.1	Punjab	24.7	23.6	1.1
Orissa	50.3	39.5	10.8	Manipur	20.1	19.5	0.6
Rajasthan	46.7	36.8	9.9	Gujarat	41.6	41.1	0.5
West Bengal	45.3	37.6	7.7	Kerala	21.7	21.2	0.5
Uttar Pradesh	48.1	41.6	6.5	Goa	21.3	21.3	0
Mizoram	19.8	14.2	5.6	Assam	35.3	35.8	-0.5
Tamil Nadu	31.5	25.9	5.6	Sikkim	15.5	17.3	-1.8
Chhattisgarh	53.2	47.8	5.4	Bihar	52.2	54.9	-2.7
Himachal Pradesh	36.5	31.1	5.4	Jharkhand	51.5	54.6	-3.1
Karnataka	38.6	33.3	5.3	Nagaland	18.8	23.7	-4.9
J&K	29.2	24	5.2	MP	50.8	57.9	-7.1
Delhi	29.9	24.9	5	Arunachal Pradesh	21.5	29.7	-8.2
Uttaranchal	36.3	31.7	4.6	Haryana	29.9	38.2	-8.3
Andhra Pradesh	34.2	29.8	4.4	Meghalaya	28.6	42.9	-14.3
Tripura	37.3	35.2	2.1				

Source: www.ncbi.nlm.nih.gov, <http://www.rchiips.org/hfhs/factsheet.shtml>.

improving these since a chain is only as strong as its weakest link and (iii) working out a replication mechanism for the improvements to spread and sustain both geographically and in time. This involved considerable two-way communication between state-level and field-level functionaries vertically as well as horizontal communication with other sectors, particularly health, so as to handle identified cases of severe malnutrition.

Measurement and identification

In each successful initiative, the first step was to improve upon the data base on the nutritional status of the children. For this, it was necessary to provide wherewithal to ensure timely, accurate and complete weighing of the children enrolled under the ICDS, and analyse this data to identify pockets of malnutrition which could be: (a) *regional* districts (e.g. Kalahandi, Purulia or Nandurbar), (b) *social* (e.g. tribal children) or (c) *age-based* (e.g. 7–24 month age group). Such analysis led to the realisation that the problem is not as voluminous as it appeared in the first instance. Second realisation was that a considerable part of the problem gets tackled with improved focus and monitoring itself. This creates a larger space for the ICDS and the Health system to provide better attention to a smaller number of more severely affected children. Finally, the early successes and reduced volume of the problem can set up a virtuous cycle of motivation, releasing considerable local initiative paving way for further improvements in the programme.

While data collection is supposed to be an integral part of the ICDS, in reality many challenges to good data collection and identification of the malnourished were observed. One of the important tasks of the AWW is to send data on weight for age of all children in the 0–6 year age group enrolled in the centre along with the nutritional status based on the weight for age charts. These reports are expected to be regular, accurate and sent in time and are looked upon as an important programme input.

Two challenges to good data collection were observed: First, data were frequently not collected or not collected accurately; second, when transmitted to district headquarters they were rarely analysed appropriately and simply sent over to Government of India. Very little feedback was given to field units based on these data. The data move only in one direction, upwards and do not have much bearing on the programme directives that also move only in one direction, downwards. This was a common experience whether in Odisha, West Bengal or in Maharashtra.

The mechanical approach to data transmission was apparent from the fact that for a considerable time, the AWWs all over the country

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kept reporting the nutritional status of children in the 60–72 months age group when the weight for age chart had no such provision!

With such an indifference, it was no surprise that in a number of states, the weighing scales used to be lying at the warehouses in the state headquarters instead of reaching the Anganwadi centres (e.g. Agnihotri 1999). The story was common in state after state. The indifference and consequent loss of faith in one’s own reporting system, had led to a situation where all projections on nutritional status of children was being done on a thin wicket of less than 20 per cent of the enrolled children being weighed (Ramachandran 2000). The first task was therefore to correct this situation, ensure that weighing scales reach the centres and reporting happens regularly.

West Bengal’s experience (2000–01) in improving measurement efficiency is instructive where tremendous regional variation existed in proportion of children who were weighed (Figure 11.1). In response

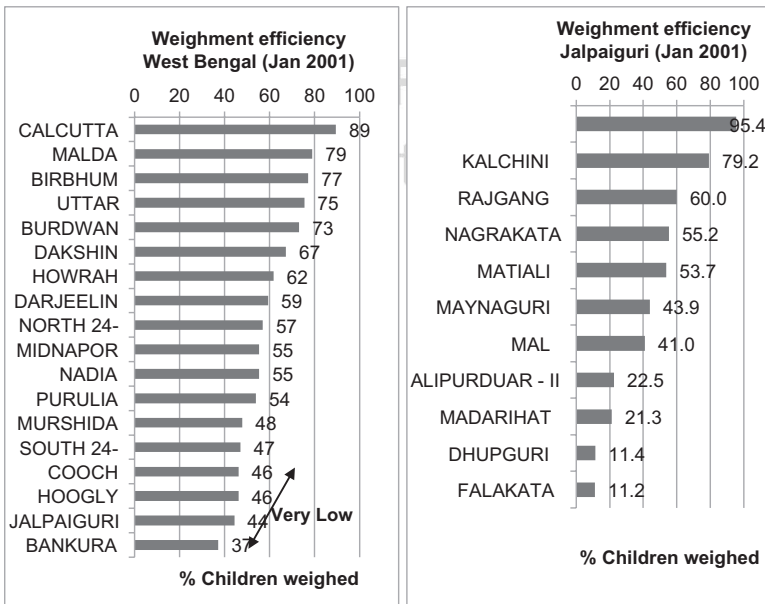


Figure 11.1 Regional variation in proportion of children whose weight measurements were taken in West Bengal

Source: Prepared by author based on NFHS-3 data.

to these inefficiencies, considerable efforts were made in improving the weighing efficiency, simplification of the reporting formats, e-data base creation and creating awareness about the problem of malnutrition and the identification of its clusters.

In Maharashtra the efforts to improve on the data collection efficiency using mobile and IT application has taken the monitoring and evaluation to new heights where the field functionary only feeds voice data on incremental basis for a mother-child dyad into a central facility from where it is uploaded into a server and the server-based application creates alerts and tasks for the health worker in respect of the at-risk mothers, attending the Expected Date of Delivery (EDD) cases and preventing the slippage in immunisation (<http://emaharashtra.iletsonline.com/2013>, *ibid.*).

What does mere measurement do? Many a sceptics asked this question in the initial phase of the initiative. Without analysis and feedback, a measurement can do precious little. But with clear analysis and feedback, it can give encouraging results. The first effect is on the weighing efficiency itself. Communicating a league table of weighing efficiency created a healthy sense of competition among different districts and, within a district, among different projects (Table 11.1b and 11.1c). Mapping identified the high and low pockets of malnutrition (Map 2a). Analysis of the gender dimension of malnutrition drew attention on the higher level of malnutrition among the girl children (Map 2b). A focus on moderately and severely malnourished children in the 0–3 year age group, usually numbering below 20, allowed the ICDS functionaries enough quality time to work out local level solutions. These included initiatives for de-worming, making energy-rich, ready-to-eat food, giving emphasis on breastfeeding for the first six months of a child's life, immunisation, etc. These aspects that culminated in initiation of a campaign at the state level in Odisha have been narrated in Agnihotri 1999 (*ibid.*).

Identification of children who are malnourished has tremendous programmatic impact since it allows for targeting interventions. This approach was in contrast to the omnibus prescription to the AWW that she should focus on all malnourished children simultaneously. An assertion that 'half the children are malnourished' without any finer nuance, can dampen the courage of even a diehard enthusiast. It was necessary therefore to let the system focus first on the moderately and severely malnourished children in the 0–3 year age group. This usually

meant 18–20 children in one child care centre at the most – a number that did not daunt the field functionaries.

Nuanced approach to identifying malnourished children showed that child malnutrition was more concentrated in the 0–3 year age group; or to be more precise in the 7–24 month age group. This point had been repeatedly stressed by Dr Shanti Ghosh a renowned paediatrician but had fallen on ‘deaf’ policy ears. Since this had been substantiated on the basis of a large data set (Ghosh 2006), it made considerable sense to focus on this group thereby narrowing the focus further.

Even in the 0–3 year age group, the incidence of moderate and severe malnutrition was found to be usually only 20–25 per cent. If efforts are made to tackle this group first, the number of children the AWW has to attend to is much less and hence manageable.

Tightening the nuts and the bolts

Collation of good quality data and its analysis only represents half the job done. The next logical step is to reduce the levels of malnutrition, or improve the nutritional status of the children on a sustained basis. Two different approaches have been possible.

The traditional route which Odisha also followed in the first phase (1999–2003) focuses on steps like (i) attending to the moderately and severely malnourished, (ii) trying to create community awareness, (iii) providing the mothers with home-based solutions and (iv) medical referral for chronic cases and the like. These are standard tools in the ICDS toolkit and targeted use of these with a focus on malnourished children rather than all children was the first weapon used in Odisha. While these did not generate a ‘template’ for scaling up the localised success stories and still depended on the initiative of the field functionaries and hence remained sporadic in nature. These efforts nevertheless resulted in reducing the malnutrition levels to some extent – the easier layer that depended on just tightening the nuts and bolts of the programme. For example, more regular delivery of the foodstuff, better access to this food for the moderately and severely malnourished children, increased home visits to the households of such children and stress on timely immunisation. But any systematic scale-up was rather difficult to come by even though isolated insights kept cropping up and getting disseminated.

We can do it: energising communities

It was at this stage that a procedural breakthrough came about when UNICEF Kolkata office took up the ‘positive deviance’ approach later locally rendered as ‘keno parbo na’ (why can’t we do it) in Bangla, Aame bi paribu (We too can) in Odiya.

‘We too can’: learning from poorer households with healthy children: This method was brilliant in its simplicity. After surveying the nutritional status of all the 0–3 year age group children in a village, it did not direct all its energy chasing the general incidence of malnutrition. Rather, it recognised and identified relatively poorer households with well-nourished and healthy children and drew the attention of the community, mothers in particular, to these households. A discussion was then initiated among the care givers to identify the local ‘best practices’ that these mothers may be following. More often than not, what these mothers were doing was to intuitively or otherwise follow the recommended ‘infant and young child feeding and care practices’, without of course being aware of the formidable label IYCFP! More importantly, the other mothers or care givers found these steps doable since certain ‘mothers next door’ were actually following these local and home grown strategies and benefitting from these. This realisation was a far bigger motivator compared to all the sermons and circulars from various ‘headquarters’ whether state level, national level or the international level.

Such realisation was the first step that paved the way for the mothers of undernourished children to take up some ‘hands on training’ in learning these best practices. In this training, it became possible to add and institutionalizes other various recommended ‘best practices’ that the particular village was not following. A successful outcome in terms of weight gain of the child was the best motivator for the household and the group of mothers as well to sustain the training.

The internalisation of the best practices was done by organising a 12-day camp of just 1–2 hour duration every day where mothers of 12–15 malnourished children participated along with the ‘positive deviant’ mothers. Discussions were held about the recommended feeding and care practices theme by theme. The mothers cooked regular local food for the children and fed them together before dispersing. Each child was weighed before and after the 12-day camp and the weight gain was noted. The mothers were asked to follow the best practices learnt during the 12-day camp at home for next 18 days, before coming for the next 12-day session where the weight gain was once again assessed.

Some of these practices like introduction of timely complementary feeding in the 6–9 month age group, frequency and manner of feeding and adoption of hygienic practices do matter a great deal. Seemingly inconsequential factors like eating in company of other children, having a separate bowl earmarked for the child, frequency of feeding or storytelling can dramatically change the food intake of a malnourished child. And these are not ‘text book’ or academic examples, these are encountered in the field. But there is a need to institutionalise such learning. ‘Keno parbo na’ was one possible way of doing so.

Interestingly, the initial gains of such hands on training followed by the practice at home were quite dramatic resulting in quite significant and sustainable weight gain by the child within 3–6 months and the commensurate improvement in the nutritional grade. Moving from grade III and IV (severe malnutrition) to grade II (moderate malnutrition) was relatively easier, grade II to grade I (mild malnutrition) was little more difficult, while moving to normal status was not easy.

Scaling up: However, scaling up and sustaining such a methodology was not an easy task since it requires tremendous commitment on the part of the organisers. Initially, UNICEF Kolkata took the help of certain NGOs, two notable ones being the Child in Need Institute (CINI) and the Shibpur Peoples’ Co-operative Organisation (SPCO). After the experience gained in the methodology and the operating practices, efforts were made to scale up the initiative at the project level to begin with, followed by few districts where the district administration was open to experimentation and sensitive to the issue of malnutrition. However, scaling up such an initiative at the state level needed the support of the state DWCD. Such a support was not forthcoming. It has always remained a puzzle as to why a professedly pro-poor regime, such as in West Bengal then, did not take support this initiative even after the clear improvements were seen in functioning of the ICDS in the concerned projects. Weighing of children had improved, there was enthusiasm in the community after seeing initial results, the esteem of the AWW went up and linkages with health system were deepened. For some reasons, unfathomable to this author, a highly potential opportunity of banishing the moderate and the severe form of malnutrition from among young children was dissipated away.

State-level support to the Aame bi Paribu initiative became readily available in Odisha through a chance event, that is, posting of the present author as Secretary, W&CD in the state once again (Nov 2003–Aug 2005). As the earlier initiative of improving the weighing efficiency and carrying out district wise analysis had sustained itself, the stage was set

for starting the 'we too can' initiative. This was done in the tribal district of Mayurbhanj (July 2004) and later in the famously backward district of Kalahandi (Oct 2004) before expanding it further.

While the details of the initiative have been documented elsewhere (www.unicef.org/india/state_profiles_4622.htm, www.positivedeviance.org/projects/nutrition.html?id=74) some of the features of the initiative are worth recounting. Mayurbhanj was initially selected because of the good quality of the ICDS staff, tribal population and its proximity with West Bengal which helped in drawing upon UNICEF Kolkata support in the initial stages. ICDS functionaries were sensitised about the methodology, training of trainers was conducted and initial situational analysis was done in selected villages with the support of expert resource persons to map the nutritional status of all children in the village, identifying all malnourished children and then focusing on the poorer households with healthy children to convince all mothers about the need and feasibility to remove malnutrition from among young children on a lasting basis.

This was followed by selecting a group of 10–15 most malnourished children for taking part in the 12-day Nutritional Care and Counseling Session (NCCS) where their mothers or care givers would come together, cook together and have the children eat together. During these sessions, typically lasting about two hours, good feeding and care practices are not just discussed but put to use as well. Mother's enthusiasm is gauged from the voluntarily contributions they brought in terms of vegetables, eggs or other similar additions for the food routinely cooked for the children with the ICDS entitlements. The children are weighed before and after the NCCS. For the next 18 days, the mothers practice at home what they have learnt at the centre. Another 12 day NCCS follows. Children are weighed again so as to assess the impact of the home-based practice. This goes on till the child attains a desirable grade of nutrition.

It was interesting to see the reaction of mothers, care givers and members of the community as children started making progress. They begin to discuss and analyse what they see. A mother, initially disappointed that her child gained only 100 gms during 12 days, sheepishly admits that she had forgotten to de-worm the child before coming to the practice session. 'You are feeding the Krimi (the worm)', exhort other mothers. Come the next session, she has not repeated the mistake. The child this time gains 400 gms. This one example convinces the community of the usefulness of de-worming the children far more than all the sermons in the world!

These and other 'good practices' gain currency among the mothers/care givers especially since these are doable, often evolve from local practice, are picked up from the 'mother next door' and are reinforced during the NCCS. These relate not only to feeding but cover overall child care including immunisation, hand washing with soap, awareness of growth faltering, need for the father paying attention to care of children and the like.

There are instances when a mother is not able to attend the training on certain days. She makes sure that some other members of the household, in some cases even the father, brings the child to the care practice sessions. Absenteeism is rare (see e.g. www.unicef.org/india/reallives_5861.htm, tripurawelfare.nic.in/WB_Keno%20Parbo%20Na.ppt).

The results: Did this approach really yield impressive result in a short span? Well, figures speak for themselves. Out of the 432 children in 29 ICDS centres of the three blocks where the programme was initiated, as many as 207 children graduated to mild level of malnutrition (Grade-I) within first six months. A few even came to the normal grade. Likewise, out of the 45 severely malnourished children to begin with, only 18 were left at that level after six months with other children moving to higher grades of nutritional level. Practitioners in the child health and nutrition field concede that this decline in levels of malnutrition is rapid indeed.

Some interesting insights emerge too. In the initially selected 432 children, there is a clear preponderance of girl children; 265 girls and only 167 boys! Among the severely malnourished too, girls number 33 and boys 12. Point this out to the ICDS functionaries and there is often a shrug of the shoulder. This is quite common, they will tell you. Girls are usually more malnourished than boys. But now there is a difference. It does not have to be so and Aame Bhi Paribu brings down the malnourishment among the girl children too! But again, boys do appear to gain earlier and faster even though the girls eventually gain. The 18 severely malnourished children at the end of six months comprise of 13 girls and 5 boys. Among the 188 moderately malnourished children, 128 are girls, 60 are boys. But mothers and often fathers and grand parents too are now convinced that all children will eventually make it. Experience of a similar programme in Dakhin Dinajpur district in West Bengal showed that the girls reach there eventually, but it takes a bit longer, 9–12 sessions usually. Once the care practice sessions run their 'full course', the gender gap in nutritional status nearly disappears.

How do the mothers look upon these 12-day sessions and 18-day home practice on a continuous basis? A simple analogy has appealed to them; 12 days 'tuition' followed by 18 days home work! And one must go on doing this till one passes the test – the important test of one's own child beginning to look healthy, cheerful and bubbly! Usually they are asked to continue till one year or till the child attains the normal grade and stays there for a while.

The AWW also feels more elevated in the eyes of the community. She has earlier been weighing the children and religiously sending the data up the reporting hierarchy without relating to it ever. Now the power of analysis followed by actual action in the field leading to concrete results, enthuses her. Eventually all children may grow out of grade II, an outcome very few had dared dream on a large scale.

Other villagers had begun demanding for this programme too. That certainly means it was getting them convinced. There is no money, no contracts and yet there is a demand. In one specific case, a Sarpanch is anxious that his village should be included in the next round. 'You should have told me about these outcomes earlier' he frowns 'now I will be blamed for going slow on such a useful programme'.

A more telling case was of the mother who had gone to her parental place. Her child did lose some weight during the visit as the parental household was not so well to do and she was not able to look after him. When the visitors asked her jokingly as to what she would do next time, she emphatically told that she will not be visiting her parental place ('Maika' in Hindi, 'Bapa Ghar' in Oriya) till the child was in normal grade. Those aware of the rural Indian realities would recognise this to be a very bold resolve indeed!

The spread effect: Success in Mayurbhanj was not a one off or a 'flash in the pan'. Results from Narla, Karlamunda and Madanpur-Rampur block of Kalahandi showed similar encouraging results; 133 children out of the initial sample of 313 moderately and severely malnourished children 'graduated' to a better nutritional status in a short span of six months. Interestingly, 90 among them are girls and 43 are boys. Girls do appear to gain more out of the programme, but then more girls were more malnourished to begin with (Figures 11.2 and 11.3). Even on a larger scale, results from Kalahandi match those in Mayurbhanj if not better them. In one of the 12-day session, an independent observer from World Food Programme (WFP) did see a fight between a mother and the AWW; the mother was angry as to why her child did not have the same weight gain after 12 days like another child when both had same weight at the start of the session!

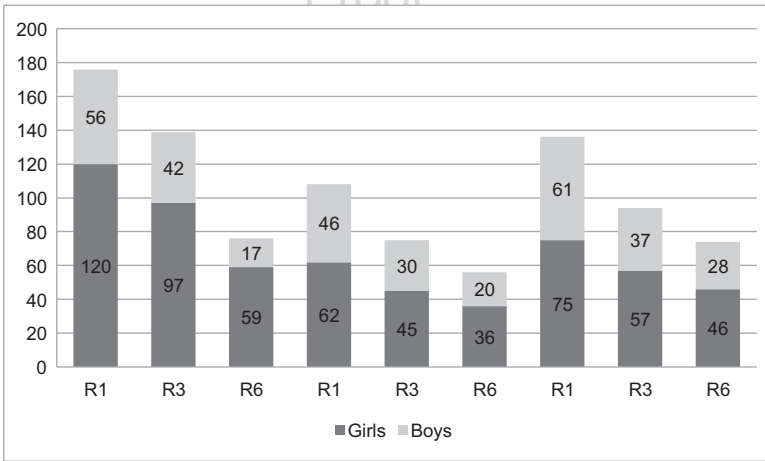


Figure 11.2 Reduction in underweight children in Mayurbhanj, Orissa during Aame Bhi Paribu campaign (%)

Source: Prepared by author based on the ICDS field data in concerned blocks in Mayurbhanj and Kalahandi.

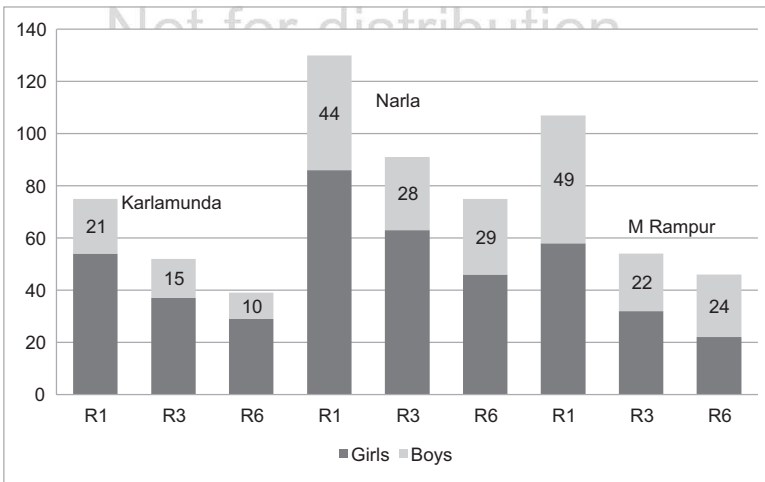


Figure 11.3 Reduction in underweight children in Kalahandi, Orissa during Aame Bhi Paribu campaign (%)

Source: Prepared by author based on the ICDS field data in concerned blocks in Mayurbhanj and Kalahandi.

Some of the blocks where the programme ran over a year, witnessed an overall reduction in malnutrition level from even the uncovered centres. Among the households of trained mothers, younger siblings appear to not become malnourished in the first place. This clearly marks the spread of 'good practices' by word of mouth.

Sustaining the momentum: Even after the author's departure as the Secretary of DWCD in Orissa in August 2005, the programme continued and expanded with encouraging results from different districts. In the initial stage, the donor and multilateral agencies showed remarkably conservative approach when faced with request for funding, notwithstanding the success of the programme recorded in West Bengal and in Mayurbhanj. However, the low costs involved allowed the initial expansion to happen from available ICDS funds since the mother's training did come within the purview of an existing, though neglected, component under ICDS (i.e. Nutrition and Health Education (NHED)). Later, WFP was the first to extend support to the initiative under NHED in five districts where they were supporting ICDS activities. Eventually, UNICEF Odisha also followed suit and offered support for taking the programme to scale in all districts. However, the momentum could not remain sustained for a long time and the programme stagnated at a plateau even though improvement in the nutritional status of children in Odisha continued.

Integration of health and nutrition interventions: the Maharashtra experience

In contrast to Odisha, Maharashtra adopted a different approach towards the care of the malnourished child. One of the reasons for this sustained effort was the continued formal involvement of V Ramani, first as Divisional Commissioner Marathwada (2002–04) where the initiative was scaled up, later as Secretary in DWCD in the state followed by his position as the head of the Mother-Child Health and Nutrition Mission (2005–10). This allowed him to do considerable institution building including a strong monitoring and evaluation (M&E) cell. Equally important, UNICEF Mumbai gave the initiative a sustained support throughout the period 2002–12 unlike in the case of Odisha.

The Maharashtra experience has been documented in details elsewhere (Ramani V. 'Making a difference-the mission approach to reducing child malnutrition': Forthcoming), but it will be useful to recapitulate its main features. The first phase which started in Marathwada region from March 2002 onwards followed more or less the Odisha strategy of identification and data collection resulting in improving

enrolment efficiency, weighing efficiency, identification of pockets of high malnutrition, creation of awareness, etc.

Where the programme made its main departure was to institutionalise the interaction between the health and nutrition functionaries for tackling the cases of severely undernourished children through the structure of Child Development Centres (CDCs) located in the health institutions, mainly the Primary Health Centres (PHCs). These CDCs provided for, among others, the institutional arrangement for the mother and the malnourished child to stay at the CDC while compensating the mother for the lost wages, medical expenses required and training her in learning the recommended child care practices. What was crucial for the success of the CDCs was the development of the protocols for admission, treatment, nutrition, mother's training and monitoring. Although the improvement rates in terms nutritional grades were significant (Table 11.2), the cost of intervention was considered to be high.

Table 11.2a CDC* performance – 1503 CDCs; 32v districts

<i>Growth standards</i>	<i>Category</i>	<i>Admissions</i>	<i>Discharged</i>	<i>Upgradation (nos.)</i>	<i>Upgradation (%)</i>
IAP	Grade III	9,030	8,146	2,985	37
	Grade IV	2,052	1,662	875	53
	Total	11,082	9,808	3,864	39
WHO	MAM	3,883	3,443	2,201	64
	SAM	6,048	5,373	3,020	56
	Total	9,931	8,816	5,221	59

Source: Rajmata Jijau Mission (June 2010) – *CDCs are located in Primary Health Centre.

Table 11.2b VCDC* performance – 220 VCDCs; 3 districts

<i>District</i>	<i>No. of VCDCs</i>	<i>Total admission</i>			<i>Total upgradation</i>			<i>Per cent upgradation</i>		
		<i>MAM</i>	<i>SAM</i>	<i>Total</i>	<i>MAM</i>	<i>SAM</i>	<i>Total</i>	<i>MAM</i>	<i>SAM</i>	<i>Total</i>
Beed	19	143	47	190	71	29	100	50	62	53
Pune	16	108	22	130	84	18	102	78	82	78
Nandurbar	185	1,018	703	1,721	510	439	949	50	62	55
Total	220	1,269	772	2,041	665	486	1,151	52	63	56

Source: Rajmata Jijau Mission (June 2010) *VCDCs are located in Anganwadi centres.

This cost issue was tackled through the introduction of the village CDC (VCDC) located in the Anganwadi centre where the child and the mother will spend two sessions of three hours each over a 30-day period during which the CDC protocols, modified suitably for the VCDC will be followed. Now of course, the mother was not compensated for the wage loss. This VCDC initiative reduced the expenses significantly while continuing to improve the nutritional status significantly (Table 11.3). Scaling up was easier compared to the Odisha initiative which took longer time to stabilise the NCCS cycle of tuition – homework – tuition – homework. However, expansion of VCDC was feasible as long as funds for the VCDCs could be made available. At present, the VCDC scheme has not been scaled up beyond three districts due to the issue of funds and compensation of wage loss for the mother. It is felt in this backdrop that the ‘we too can’ approach taken in Odisha and West Bengal is perhaps more sustainable in this regard since it is not fund intensive. But only time will tell which way do the future developments move.

While some of the efforts remained pegged at this stage, the next qualitative initiative was to institutionalise the process of capacity building of the mothers of malnourished children. While in Odisha this was achieved through community-based training and counselling of these mothers about the best practices of feeding and child care for the infants and young children, in Maharashtra it was done through the PHC-based CDCs initially and then through the village-based VCDCs. Results of these efforts are presented below.

The virtuous cycle of addressing more basic causes: One of the advantages of the Maharashtra approach was that it triggered a virtuous cycle of analysis of the more basic causes of the growth faltering that move beyond ICDS. An emphasis on exclusive breastfeeding, immunisation, tracking of low birth weight babies, analysing correlates of the low birth weight, tracing of the ‘at risk’ pregnant mothers have followed in quick succession. The data analysis has even covered the seasonal effects on the levels of malnutrition. Based on these insights, the programme has moved to the next logical step of attending to the mother-child dyad to identify potentially ‘at risk’ mothers and to ensure that they get the requisite ante natal care (ANC). For this, the state has taken up a mobile-based reporting on a pilot basis. (<http://emaharashtra.eletsonline.com/2013>)

Table 11.3 Nutritional status of children at the beginning of the 1st round and end of the 3rd and 6th Rounds: Aame Bi Paribu (Positive Deviance) Kalahandi Orissa (October 4–March 5)

Grade	Gender	Karlamura (14 centres)			Narla (7 centres)			M Rampur (8 centres)			Total		
		R1	R3	R6	R1	R3	R6	R1	R3	R6			
N	Children	0	0	1	0	0	2	0	2	5	0	2	8
G1	Children	0	18	31	0	27	41	1	51	53	1	96	125
G2	Children	62	47	36	116	79	65	88	44	36	266	170	137
G3/4	Children	13	5	3	14	12	10	19	10	10	46	27	23
A/D	Children	0	5	4	0	12	12	0	1	5	0	18	21
N	Girls	0	0	1	0	0	1	0	2	3	0	2	5
G1	Girls	0	13	21	0	17	30	1	25	34	1	55	85
G2	Girls	44	33	27	78	56	41	49	29	19	171	118	87
G3/4	Girls	10	4	2	8	7	5	9	3	3	27	14	10
A/D	Girls	0	4	4	0	6	9	0	0	1	0	10	13
N	Boys	0	0	0	0	0	1	0	0	2	0	0	3
G1	Boys	0	5	10	0	10	11	0	26	19	0	41	40
G2	Boys	18	14	9	38	23	24	39	15	17	95	52	50
G3/4	Boys	3	1	1	6	5	5	10	7	7	19	13	13
A/D	Boys	0	1	1	0	6	3	0	1	4	0	8	8

Layer-by-layer approach to tackling malnutrition

What has emerged from these experiences is that the problem of malnutrition needs to be tackled layer by layer. The first fluffy and large 'outer layer' gets tackled by tightening the nuts and bolts of the existing system, creating awareness and identifying pockets of higher levels of malnutrition. Improved feeding and care practices internalised by mothers of malnourished children brings about the next set of improvement on a more sustained basis preventing growth faltering as well as onset of moderate or severe malnourishment in the first place. The third 'harder' layer, though with smaller numbers, has to be handled through medical intervention. This releases the space to identify and attend to more fundamental causes like the low birth weight babies and the 'at risk' mothers. Such interventions have more lasting effect. These also reduce the volume of the future problems underlining the adage that prevention is better than cure. The feasibility of doing this has been seen both in the Maharashtra and Odisha experience.

Has the success been unqualified? Far from so. In fact as the narration shows, the achievements can be fragile, at least in the initial stage. In some cases, these can die down in the absence of any sustained momentum, in some others these could plateau while in some, and fewer, cases these may lead to further consolidation and improvisation. But therein lies the hope for the success of the approach and answer to its critics.

Need for an external nutrition audit: In order sustain momentum, it is necessary to undertake external audit. This is virtually the last but 'missing' leg of the initiative. In Odisha a system of internal audit was tried out at a pilot stage where the ICDS functionaries of one district go to another district to do a nutrition audit of a set of Anganwadi Centres to ascertain the veracity of the reporting. However, an internal system has its own pitfalls and sometimes there is a pressure at the higher levels of the hierarchy, or temptation at certain reporting levels to systematically doctor the figures. This has been the experience in other places as well. It is necessary therefore to take up an external audit and the civil society has to come forward to support such an initiative. Based on the results of the audit various incentives can be provided to the concerned project. In fact time has come to devise an 'exit strategy' for the ICDS projects that have achieved desired levels of nutritional status so that these can focus on other tasks like pre-school education. Such transitions were not envisaged in the initial stages of the ICDS but the time has come to think of these.

Eliminating malnutrition: step by step

Above discussion clearly brings out a way forward to improve the nutritional status of young children in India without getting mired into the debate on the appropriateness of the standards or waiting for the 'total revamp' of the ICDS. While efforts need to be made to improve the coverage under the ICDS, these need not stand in the way of achieving the doables. The second and more real danger is that the 'unless you do such and such' approach may end up having the business continue as usual with the malnourished children waiting for Godot! Similarly, any attempt to change the standards or the measures will only result in scoring a debating point but will not help in actual improvement of the nutritional status of the children. On the other hand it will merely give the state an excuse to blame the standard as a convenient escape route and undermine the problem thanks to the 'rationalised' standards.

There is thus a clear merit in adopting a pragmatic route of optimising the resources that are available by identifying the weak links in the chain and improving these. The major weak links today include the thin and low quality data base, absence of proper monitoring, analysis and feedback, and capacity building of the mother/care giver.

Steps are therefore necessary to

- i improve the enrolment and weighing efficiencies
- ii focus on clusters of malnutrition
- iii institutionalise the care giver's capacity to improve the nutritional status of the child and prevent growth faltering,
- iv identify deeper causes and addressing these incrementally so as to
- v set up a virtuous cycle of capacity building, confidence building, motivation and demonstrated reduction in moderate and severe forms of malnutrition, and
- vi establish a credible monitoring system by introducing audit and incentives for good performance.

That these steps are feasible has been shown by the template in more than one state at scales that are impressive by any objective standards. The layered approach to malnutrition needs to be recognised so that the outer, easily eradicable layer is eradicated as an immediate task. This will create space for sustainable reduction in malnutrition through attention to best practices in feeding and child care and medical care where required. Efforts are also needed to bring a credible

monitoring system by introducing audit and incentives for good performance as outlined above. At the same time ICDS needs to incentivise the regions which succeed in reducing malnutrition on a sustained basis towards higher level tasks. This will call for a paradigm shift from a static perception of the same tasks of the ICDS perpetuated for all time to come. This is both feasible and necessary. There is thus a need to 'walk on both the legs' or else the debate on the failure of the Indian state in improving the nutritional status of its children will continue ad nauseam. The time to act is now.

Acknowledgement

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Note

- 1 The ICDS has seen an expansion from 33 projects to 6,719 operational projects between 1975 and 2010 period.

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COORDINATION FAILURE

Can multi-sectoral interventions
to tackle hunger and malnutrition
succeed in India?*Santosh Mehrotra*

A development process usually involves synergies between interventions. There are two synergies present. One synergy of outcomes plays out at the macro-level among income-poverty reduction, human capital development (or human functioning at the aggregate level) and economic growth. The other synergy of outcomes, at the micro or individual level, occurs as basic social service provision leads to improved human functioning at aggregate societal level. These two are linked by the mutually reinforcing interaction among good health, nutrition, and education – which are both ends in themselves, but also means to other ends at a macro-societal level, and hence common to both sets of synergies.

It is the second synergy that is one focus of this paper, especially as it relates to nutritional outcomes. Malnutrition, therefore, is a major threat to social and economic development as it is among the most serious obstacles to attaining and maintaining health of this important age group¹. Poor feeding practices in infancy and early childhood, resulting in malnutrition, contribute to impaired cognitive and social development, poor school performance, and reduced productivity in later life. There is a critical link between health and good nutrition. Interventions in health promote good nutrition, and interventions in nutrition promote good health. As figure shows, inadequate dietary intake and disease are the immediate causes of nutritional outcomes.

When poor nutrition starts in utero, it extends throughout the life cycle, particularly in girls and women. This not only amplifies the risks to the individual's health, but also increases the likelihood of damage to

future generations, through further foetal retardation. Poor nutrition of the mother during pregnancy leads to low birth weight of the baby. Low birth weight increases the risk of infant and child mortality and those infants who survive are usually undernourished, fall ill frequently and fail to develop optimally, both physically and mentally. Further, undernourished adults are functionally impaired and unable to sustain productive physical activity throughout the day. The lack of nutritional requirements leads to sluggish recovery from an illness. Malnutrition can also be linked to the growing HIV/AIDS pandemic as malnutrition makes adults more susceptible to the virus. The conceptual framework for the causes of malnutrition is presented in the Figure 12.1.

This graph suggests not only the underlying and proximate causes of malnutrition, and can explain why malnutrition is so high in India, but also within it lies the policy implications to ensure the elimination of malnutrition and adult chronic hunger.

Since malnutrition that sets in utero can either get exacerbated or improve during the first two years after birth, it is critical that caring practices for mothers (just before and after childbirth) and children are optimal. This is because, if caring practices are sub-optimal, the nutritional damage will become irreversible after age three – and can never be corrected again in the life of the child as she grows into an adult. As we will argue in this chapter, prevention of this damage is contingent upon having a functional primary health system. In practical terms, this requires that (a) child birth takes place under the supervision of a professionally trained health provider or at a medical institution; (b) the new born baby is fed colostrum within the first hour after birth, so that the infant develops the immunities that only the mother's first breast milk (colostrum) can provide; (c) the mother and baby receive very careful post-natal care during the first 28 days after birth, since that is the period during which infections lead to most of the infant deaths during the first year after birth; (d) for the first six months, the mother exclusively breastfeeds the baby, and the baby is absolutely not fed anything else; (e) after six months the mother introduces solid mushy food, alongside breast-feeds, in adequate and at appropriately short timely intervals; and (f) full immunisation of the baby is ensured.

As we will argue in this chapter, most of these conditions are not met in the case of a shockingly high proportion of the population. Equally worrying is the fact that dietary intake itself is inadequate for a significant proportion of households in India. This is the issue we address in the next section, i.e. food security.

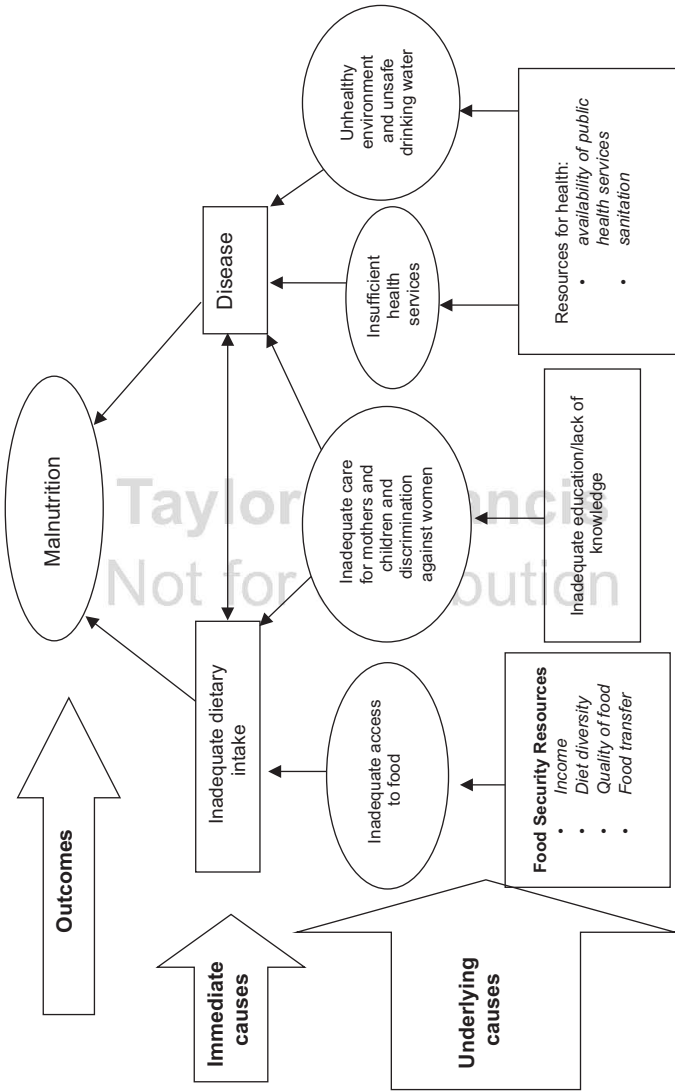


Figure 12.1 Conceptual framework: determinants of malnutrition
 Source: Adapted from UNICEF (1990); Jonsson (1993); Smith and Haddad (2000) and Mehrotra (2003)

This paper argues that given the multiplicity of sectors involved, as explained in the conceptual framework above, the desire for intersectoral coordination, as well as the incentive for it, among senior managers located within each sectoral ministry must be very high indeed. Without such intersectoral coordination it is likely that the individual and separate interventions of the various ministries may not have synergistic impact on nutritional outcomes, which in an ideal world should be the goal of policymakers. Coordination failure is an endemic characteristic of the Indian bureaucracy. Therefore, we argue in this paper that it may be more realistic if policymakers were to focus on improving the cost effectiveness of current interventions within each sector. Aiming to achieve intersectoral coordination between ministries for the target group in a specific geography may be asking for the moon, given the rigidity of institutional structures currently in place in central and state government line ministries in India.

Each of three types of interventions (involving three separate ministries) are the subject of this paper. Section one deals with the deep flaws in the current system to ensure household-level food security (which is handled by one ministry). The second section examines the problematic design of the interventions of another ministry that deals with women and child development which have prevented any serious impact on child nutritional outcomes. Section three on health sector and sanitation interventions needed to improve nutritional outcomes is necessarily brief, for reasons of space. However, each section will establish how profoundly flawed are the priorities within each sector. Under the circumstances, the concluding section notes that not much value will be added by merely attempting to ensure, through administrative fiat, intersectoral coordination in a situation where even the design of sectoral interventions related to diet, care for mother and children, and disease themselves leave much to be desired.

Ensuring food security: eforming the public distribution system to implement the Food Security Act

The facts

Food access and availability has remained a problem at the household level – an immediate cause of the high levels of both child and adult malnutrition found in India (43 per cent and 36 per cent, according to the last National Family Health Survey (NFHS)-3, 2005–06). The

following facts from the India Human Development Report 2011 (IAMR 2011) are evidence that the immediate cause of inadequate dietary intake has been present for many decades:

- Availability of calorie consumption has been declining, with consumption of poor below norm²
- Increase in the share of non-cereals is not enough to compensate for decline in cereal consumption
- Calorie consumption of the poorest quartile is significantly lower than the top quartile of the population
- Calorie and multiple nutrient deficiencies lead to the high incidence of malnutrition in India
- No improvement in intergenerational height of mother and daughter

The programmes

The targeted Public Distribution System (TPDS) is an extremely inefficient form of transfer of resources (see e.g. Planning Commission's evaluation of TPDS in 2005), and marked by large-scale leakages and corruption. In fact, so serious are its failures outside of some southern states (Kerala, Tamil Nadu and Andhra Pradesh) and recently Chhattisgarh that even the Eleventh Five Year Plan document speaks about the need for massive reform of the TPDS system.

As someone who co-authored the chapter on Food Security in the 11th Plan (Planning Commission 2007), I find it is distressing to find that over five years later there has been precious little reform of PDS (except in a minority of states). The major problems with PDS were identified then as follows. First is the leakage of subsidised grain from the PDS system (in the transportation between the Food Corporation of India (FCI) warehouses and the Fair Price Shops (FPS)). Thus if we compare the off take of PDS cereals by states from FCI with the estimates by the National Sample Survey (NSS) estimates of PDS consumption of those same grains, one can arrive at the leakage. The leakage was 28 percent for wheat and rice together in 1993–94, but it had risen to 54 per cent by 2004–05. This leakage has since declined to 40 per cent of total PDS grain released for FPS in 2009–10, and further to 35 per cent by 2011–12 (Sen and Sen 2013) – which is still higher than the leakage 20 years ago.

Second, this leakage is only compounded by the following fact. The off take of cereals by the state is being consumed by many non-poor, while many poor are still left out. Only about 36 per cent of

the poor have below poverty line (BPL) (including the ultra-poor Antyodaya) cards, and so many poor simply don't have access to subsidised grain under PDS. At the same time, about 40 percent of the ration cards are with the non-poor. Thus, both exclusion and inclusion errors compound the problem of leakage. This problem may well get mitigated with coverage expanding to 67 per cent of the population on account of the National Food Security Act (NFSA) (2013) (see discussion below).

While these are the two main problems with PDS, there are others: the absence of storage capacity with FCI means that high share of procured grain cannot be stored in silos, is left to lie in the open under tarpaulins and rots as a result.

It is well recognised even by the most ardent supporters of the expansion of PDS that it suffers from serious design and implementation problems, and these problems continue to plague it even after several states in the country have made attempts at reforming PDS (Sen and Sen 2013). They make a case for universal PDS and rightly so on the ground that the TPDS, introduced in 1997, worsened its effectiveness. TPDS served the majority of urban households in only four states in 2004–05, much lower than the 24 states where the urban majority was served in 1993. They account for this worsening by 2004–05 by arguing that the universal PDS naturally ensured a higher coverage, while targeting introduced in India's PDS in 1997 resulted in excluding a large proportion of the deserving. Further, they argue that leakages from PDS also doubled after targeting the BPL households was introduced. They also suggest that reforms carried out since 2004–05 in several states in PDS had led to the majority of households accessing PDS in 13 out of India's 29 states. In fact by 2011–12, they suggest that the number of states in which the majority of households had access to PDS rose to 20 (Sen and Sen 2013). This is a credible argument, which they support with data.

However, they admit that even in 2011–12, despite all the reforms of PDS, as much as 35 per cent of all grains were leaking from PDS. Thus, while targeting the PDS resulted in a rise in leakage from 28 per cent in 1993–4 to 55 per cent in 2004–05, the much-touted reforms, while bringing down leakage to 40 per cent in 2009–10, still did not succeed in reducing leakage below 35 per cent in 2011–12.³ If after reforms over a third of grain procured by the Government of India was getting leaked between the warehouses of the FCI and the FPS (from where consumers purchased them at a heavily subsidised price), then the reforms cannot be claimed to be a success. Nor can extension

of reforms necessarily be expected to bring down the scale of leakage (which effectively involves black marketing by a mafia of traders with the connivance of officials and the political class). Such black marketing involves a distortion of the market, which serves neither the poor consumers (since the FPS deny the 35 kg. of cereal entitlement to the ration card holders) nor the state (whose fiscal deficit on account of the food continues to mount). The only benefits are flowing from the farmers who are assured of a minimum support price on grains purchased from them by the state.

PDS expanded with the National Food Security Act

Without reforming the PDS, the Government of India decided to expand the coverage of PDS. The NFSA is a misnomer, because all it does is to guarantee five kilogram of cereals per person for 65 per cent of the population only, as opposed to food. Therefore, any claim in regard to either PDS or the NFSA contributing to enhancement of food security, let alone malnutrition, is far-fetched. Thus claims in regard to NFSA being an Act intended to achieve household food security are unfounded. The Act has many weaknesses. First, it will deliver only five kilogram of cereals per person per month. But the mean consumption of cereals per person in India is 10.7 kilograms. In other words, all beneficiaries of PDS grains will continue as in the past, to access the open market for over half of their cereal needs. Moreover, even the relatively poor Indians are consuming some fruits, vegetables and protein foods (milk, eggs and fish), all of which are purchased from the open market prices of which are rising faster than that of cereals. Thus the so-called food security bill hardly guarantees food security.

Secondly, food inflation has been running well above the consumer price index since 2007–08, and real food security requires that food inflation rates are brought down (the measures needed for which are discussed in Chapter 3).

In India's federal system of governance, reform of PDS depends crucially upon the goodwill and commitment of state governments. There is a vast mafia that has built up over the decades in every state linked to the possibility of black marketing afforded by the PDS. It is not entirely clear how, even after nearly a decade of reforms of the PDS, the state governments will be able to destroy the power of this mafia, when we know 35 per cent of all cereals have been leaked even after reforms.

The proponents of the Act claim that if we have 67 per cent of the population under NFSA, then the problem of exclusion/inclusion will be resolved in one stroke. What no one has clarified is how the problem of black marketing (cheap PDS grain is diverted into the open market and sold at higher prices by a mafia consisting of state officials, transporters of grain from FCI warehouses and FPS shop owners, all operating with political patronage) will be addressed by coverage of a layer share of the population. The proponents claim that the leakage will be addressed by computerisation of the supply-chain management system (Report of the Task Force on an IT strategy for PDS, 2011).

Proponents also point out that by leveraging information technology and the biometric platform (the Unique Identification or Aadhar number, a unique 12-digit identification number being issued to all residents of India), the leakage problem will be resolved. The argument goes as follows.

They propose that an Aadhar-enabled PDS is created online, that allows for stock positions to be updated in real time. Consumers would give their biometric details to the FPS owner through a point-of-sale device that is connected through a GSM network to a networked stock management system. This would ensure the end of fake cards/beneficiaries, but also allow citizens to buy their rations from any FPS (not just the one FPS as at present), and thus generate competition among vendors. This would also enable entitlement portability, so even migrants who are unable to access their entitlement will be unable to do so (as has happened in Chhattisgarh State) (Patnaik 2013).

There is, however, a slightly different approach to the same problem. The PDS subsidy could be transferred into the citizen's bank account – provided a bank account existed, which does not for 50 per cent of Indians – so that they can pay the full price of the subsidised foods to the FPS owner. As the FPS owner would also pay the full price for commodities when collecting them from the FCI warehouse, the possibility of re-sale in the black market by the FPS owner or the transporter would disappear. I would argue that this is a far superior approach to the previous one.

Proponents of the first approach argue (Patnaik 2013) that the second approach could lead to diversion of the money meant for food grains to other household expenditure. This assumes that the family does not know what is good for it. If the family needs more cereals it will buy as much cereals as it needs. It also ignores the fact that our approach would give flexibility to the household to choose its

consumption basket according to its needs. All the evidence suggests families choose wisely (SEWA 2013; Barrientos and Hulme 2010; Standing 2012). Needs do vary between households, even within the same income group.

There is an even larger benefit that might flow from the adoption of this second (as opposed to the first) approach. It will encourage financial inclusion in a way that has not happened in the entire post independence history of India. The fact that nearly half the rural population does not have a bank account leaves millions of India's citizens outside the pale of the modern economy. Three recent developments have begun a 'game-changing' transition. The first is the fact that almost all wage payments under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) (that guarantees 100 days per year of work on public works to every rural household that demands much work) are since 2011 being made directly to bank accounts of such workers. As a result, 110 million new bank or post office accounts were opened in a matter of merely two years in rural areas, obviously for the poorest who never had an account before. The second development is the biometric identification of residents under both, the Unique Identification number programme which started only in 2011 and had covered 500 million residents within two years, and the National Population Register which is engaged in a similar exercise (in such states as Tamil Nadu, Bihar, UP, Chhattisgarh and West Bengal) though at a slower pace. Prior to such biometric identification public sector banks would ask for so many means of personal verification⁴ from poor citizens it was impossible for them to produce them. The Unique Identify number now enables them to open a bank account easily. The PDS cash payment would give an impetus to this process.

There is a third, and almost equally important reason for the government to adopt this second approach to PDS subsidy payment into resident's bank accounts. The number of bank branches in rural areas had shrunk after the economic reforms began in 1991. The Reserve Bank of India is giving India Post the status of a bank, in which case it will promote the inclusion of the un-banked poor. The number of post offices, which also offer bank services, is much greater than of bank branches. An important externality of PDS transfers to bank accounts would be a higher revenue flow to Business Correspondents (BC) that have been hired in recent years from local rural youth by banks in order to provide deposit and cash withdrawal services, using a mobile telephone technology to establish electronic contact between the BC

and his home bank. The BC works on a commission per transaction basis. The PDS subsidy transfer to residents' bank accounts would increase the revenue to BCs, attracting more youth to such jobs, while simultaneously increasing bank accounts and thus financial inclusion.

However, proponents of the continued physical supply of cereals through the PDS continue to argue their case. Dreze and Khera (2012) covered 1,227 BPL households in nine states over May–June 2011 in a survey of PDS (in 106 randomly selected villages). They report two major findings. The first is that there is evidence of a major revival of the PDS across the country, even in states like Orissa and UP (with the main exception being Bihar). They report that average monthly purchase of PDS grain (kg/household) was 24, as opposed to the 35 kg. allocated for each household. On this basis they claim: 'The days when up to half of the PDS grain was "diverted" to open market are gone' (P. . . .). That this claim has only some validity is shown by the fact that the analysis of NSS data on consumption of grain demonstrates that leakages have declined from 54 per cent of FCI released in 2004–05 to 40 per cent in 2009–10, and further to 35 per cent in 2011–12. However, a leakage of 35 per cent is still huge.

Care: does the Integrated Child Development Scheme address malnutrition?

The above mentioned data makes it abundantly clear that the strategy must be multi-sectoral, involving many ministries and many levels of government but that is a major part of the problem (that we will address later). The first level of problem is that the Integrated Child Development Scheme (ICDS) (run by the Ministry of Women and Child Development) has proved to be a relative failure in addressing the problem of pregnant/lactating mothers and 0–6 year old children, the two main groups whose problems need to be addressed if malnutrition rates are to fall. This is because it suffers from major design flaws.

The programme is supposed to deliver six services: (i) supplementary nutrition for pregnant and lactating mothers, and take-home rations (THR) for 0–3 year olds, (ii) hot cooked meals served in the ICDS centre for 3–6 year olds; (iii) immunisation; (iv) health referral, (v) health and nutrition education; and (vi) pre-school education for 3–6 year olds. The 11th Plan had made serious recommendations to re-structure, and only to universalise the programme. In fact, the ICDS was universalised during the 11th Plan but not re-structured. So, all

the problems that have plagued the programme since its inception in 1975 have practically survived at least until 2012, if not beyond.

*Is increased financial allocation in
Plan after Plan for ICDS a good thing?*

The allocation to ICDS had been increased four times for the 11th Plan on the requirement that the programme would be re-structured. The allocation had been around Rs 10,000 crores for the Tenth Five Year Plan (2002–07), and despite the increase to about Rs 40,000 crores for the 11th Plan (2007–12), the programme was not re-structured. In fact, all the money was utilised to expand the coverage to all the 160 million 0–6 year old children of the country, when in 2007 the programme only covered one-fourth of the country's children. Thus, a dysfunctional programme was allowed to be universalised, when the obvious way forward in 2007 was that it is reformed, re-designed and re-structured first. The 12th Plan (2012–17) increased the allocation for ICDS over three times that of the 11th Plan, to Rs 123,000 crores. The re-structuring of the ICDS was approved by the National Council of Ministers only in late 2012. It is only in the 12th Plan document (Planning Commission 2013) that finally there is recognition of the 1,000-day window of opportunity: 270 days of pregnancy and the 730 days of the first two years of the baby. Whether it will get translated into actual practice, when it has not happened in 37 years since the ICDS began in 1975, remains to be seen – since re-structuring was agreed by the line ministry even at the time of 11th Plan (2007).

At the same time, it is true, as the 12th Plan recommends that a new focus has to emerge on the 1,000 days. For this the 12 Plan recommends several actions. First, an additional Anganwadi worker (AWW) in 200 high burden districts to prioritise home visits for children under three years and mothers to promote infant and young child care and feeding practices (IYCF). Second, though IYCF is a component in National Rural Health Mission (NRHM), it will also be ensured that each health facility has skilled IYCF counsellors. Third, the frontline workers' team comprising of Accredited Social Health Activist (ASHA), AWW, Auxiliary Nurse-Midwives (ANM) and the Panchayati Raj Institution (PRI) representatives will be fully involved in organising Village Health and Nutrition Day (VHND) to bring about changes in child caring practices and promote IYCF practices. Fourth, community owned ICDS accreditation system will be introduced to ensure quality standards in child care service delivery at all levels, with grading of AWCs. Finally, community ownership of

ICDS will be ensured through the common Village Health, Sanitation and Nutrition Committees and the AWC Management Committees.

However, notice that the one AWW, who works part-time on a stipend of Rs 3,000 per month (her helper who mainly does the cooking of the hot cooked meal for the 3–6 year old children, who normally attend a 3–4 hour day at the centre) is supposed to perform four health-related functions (immunisation, health check-up of children, health and nutrition education or IYCF, and health referral to a health centre of a malnourished child or pregnant/lactating mother experiencing problems), in addition to providing supplementary nutrition (of hot cooked meal to the 3–6 year olds, as well as the once-a-week ‘take home rations’ to pregnant/lactating mothers), as well as pre-school education to the 3–6 year olds. So to summarise, this semi-educated woman is supposed to perform multiple and complicated tasks related to health and infant care counselling/education/referral and assist the ANM from the Ministry of Health’s sub-centre as well as the ASHA (the latter another semi-educated woman from the village who is not a paid government employee but is provided incentives for her to encourage institutional child-birth) to conduct health check-ups of the children/pregnant women and immunisation. This is in addition to providing the 3–6 year old children with pre-school education, and hot cooked meals every day. But is she even equipped/trained to do so, by her training or education?

The central government’s website (www.mwed.nic.in) shows clearly that there are no clear eligibility norms for the job of an AWW. Many of them clearly are not even Class 8 pass, and the majority do not have a secondary education (Class 10 pass). A Parliamentary Standing Committee on Empowerment of Women has suggested (in September 2012) fixing Class 10 and Class 8 as minimum qualifications for the job of AWWs and helpers, respectively.⁵ The Parliament Committee noted: ‘No minimum educational qualifications have been prescribed by the government for anganwadi workers and helpers . . . In view of the inclusion of multifarious activities in the ambit of the scheme, it is high time to prescribe a minimum educational qualification for anganwadi workers and helpers’.⁶

*Is multi-sectoral action to reduce
malnutrition still possible in India?*

IFPRI has been promoting the cause of multi-sectoral action to address malnutrition recently (Garrett and Natalechio 2011). It has shown that such coordinated action has worked in both Latin America (Peru,

Colombia, Bolivia) and Africa (Senegal, Uganda, South Africa). Since nutritional status is a multi-sectoral outcome (as we saw in Figure 12.1) so the actions must be similarly multi-sectoral. It is suggested that there is a continuous collaboration for such action: the most basic form is networking (involving an exchange of information for mutual benefit); coordination (involving achieving a common purpose and altering activities); cooperation (involves sharing resources); collaboration (involving enhancing one another's capacity); and finally, the most advanced form is integration (involving sharing structures and merging sectoral remits).

While such an approach may be advisable in India, the real question is: is it feasible, given the time lag in achieving such coordination? India is already beyond the mid-point of its demographic dividend (which started in the early 1980s and will end by the end of the 2030s); ICDS has been around since 1975 as the cutting edge of India's anti-malnutrition strategy, and yet has made hardly a dent in the problem in 37 years. The question the governments (central and state), and the parents-citizens of India have to ask is: are we going to wait for another five-years to elapse with possibly little to show for an increased (tripled after being quadrupled) budget between the 10th and 12th Plans? Is the additional year lost in a malnourished/stunted/wasted child's life not worth anything? And can India afford an additional year gone in the quarter-century remaining for the demographic dividend to pass?

Therefore, waiting for multi-sectoral coordination is a dream that India's policymakers may aspire to, but perhaps realise only in the very long run. The pre-conditions for serious multi-sectoral coordination simply do not exist, and can only be potentially created in the very long run. Meanwhile, if India is serious about reducing malnutrition rapidly, which it needs to do if the demographic dividend is to be realised, then focus has to shift to the following three sets of actions, all of which will reduce the burden of work on the existing one AWW in all the 441 districts that are non-high burden of malnutrition districts of India (200).

First, the responsibility for the health-related functions of ICDS must essentially shift from ICDS to the ANM at the sub-centre, which is managed by the ANM. The Ministry of Health has to incentive the ANM financially to ensure that on the VHND, she takes care of all the four functions – immunisation, health check-up, health education/IYCF counselling, and referrals of seriously malnourished or disease-prone children – systematically. The AWW and ASHA can assist in

maintaining mother/child health report cards and record maintenance, but little more than that. It is the ANM who should be incentivised for discernible improvement in health and nutritional indicators, provided transparency can be ensured in collective such monitorable indicator data. The ANM, under the Ministry of Health (and not the Anganwadi should be held accountable for these four functions). There is no case for the 200 high burden districts to get an additional AWW under ICDS. Rather, the same additional staff member should be a second ANM in the sub-centre. As it is there are shortages of ANMs (27 per cent) as we note in the next section (Health). This would reinforce the message that it is ANMs and the Ministry of Health that must deliver on the four ICDS functions hitherto performed so poorly by the ill-educated AWW, who is also poorly trained.

Second, the ICDS scheme for THRs for pregnant/lactating mothers and 0–3 year old children must be terminated immediately in its current form. There continues to be complaints about the quality of THRs, and it should be replaced by a cash transfer. The manner in which replacement should occur is discussed in Chapter 14.

Third, adolescent nutrition is important to the health of girls and is relevant for its consequences for maternal nutrition. Adolescence is a period of rapid physical growth and motivation from childhood to adulthood. In fact, some researchers have argued that adolescence provides some potential for height catch-up in children with stunting from early childhood (Prentice et al. 2013).

Yet adolescent girls' programming in India is among the weakest of programme (among already weak ones). The 12th Plan must correct this situation forthwith. Adolescent girls between 11–18 years are 16.8 per cent (or 83.2 million) of female population. Of these 27.5 million (33 per cent) are malnourished. Moreover, adolescents have a high prevalence of anaemia. For instance, 55.8 per cent of adolescents age 15–19 years and 56.7 per cent of women aged 20–24 were anaemic in India (while corresponding values for Guatemala were 21 and 20.4 per cent, respectively (Black et al. 2013)). Their health and nutrition is further at risk due to early marriage and early child-bearing. In fact, nearly 43 per cent of currently married women in the age group 20–24 years were married before attaining the age of 18 years.

In fact, adolescent fertility is three times higher in low middle income countries than in high income countries. Black et al. (2013) point out that pregnancies in adolescents have a higher risk of complications and mortality in mothers and children and poorer birth outcomes than

pregnancies in older women. Furthermore, pregnancy in adolescence will slow and stunt a girl's growth. In some countries, half of adolescents are stunted, increasing the risk of poor peri-natal outcomes in their children.

Hence, we recommend that adolescent girls that are no more in upper-primary school, or have dropped out before completing upper primary level, must attend Anganwadis and get the hot cooked meal with the children. This will help them socialise the younger children, who may often be then siblings, and also thus assist the AWW in her work for a brief period. One would exclude the adolescent girls in upper-primary level only because they are already receiving a hot cooked meal in school.

Moreover, the adolescent girls at upper-primary as well secondary and higher secondary levels must also receive health education, zinc and iron tablets, so that the micro-nutrient deficiency, especially anaemia, falls. The real question is whether the AWW, is equipped to perform these functions. An even more challenging question is whether the once-a-month village health-nutrition-sanitation day where the ANM from the nearest sub-centre of the public health systems is present can meet this need.

Sanitation and health services

In the previous section we examined the programmatic weaknesses with the government's efforts to ensure household food security. Those weaknesses were on account of the inability of the NFSA (and its instrument, the PDS) to ensure either access or availability of food to deficient households. In this section we showed the weaknesses of the care-related programmes. In this section we turn to the issues of quality of sanitation, and the weaknesses of the health systems which also contribute to the state of undernutrition.

Sanitation

Open defecation (69 per cent of Indian rural households lack a toilet) is an underlying reason for child/adult undernutrition. Diarrhoea is associated in much research with lack of toilets and poor hygiene (no handwashing), of which the secondary effect is undernutrition. In a pooled analysis of nine studies with diarrhoea and growth data for 1,393 children, the possibility of stunting at 24 months increased by 2.5 per cent per episode of diarrhoea and 25 per cent of all stunting in

24-month old children was attributable to having five or more episodes of diarrhoea in the first two years of life (Humphrey 2013). However, other authors (e.g. Briand 1990) have argued that the effect of diarrhoea on permanent stunting is small because growth velocity can be faster than average for very young children between illness episodes resulting in catch-up growth. Hence, Humphrey (2013) notes that the relative contribution of diarrhoea to undernutrition, and hence the potential effect of diarrhoea control through sanitation and hygiene could have on growth are still unresolved.

However, Humphrey reports that a major cause of child malnutrition is a sub-clinical disorder of the small intestine called tropical enteropathy that increases permeability, inflammation of cells and modest malabsorption; that tropical enteropathy is caused by faecal bacteria ingested in large quantities by young children living with poor sanitation and hygiene. The route from sanitation and hygiene to undernutrition is tropical enteropathy and not diarrhoea.

It is clear, therefore, that while all Anganwadis (ICDS centres) must have a child-friendly toilet to promote good hygiene practices, the need for a home toilet is overwhelming. If the mindset of at least 600 million Indians who still defecate in the open is not changed through the programme designed for that purpose, then undernutrition and stunting will survive, regardless of any other programmatic intervention.

Health

As we noted in the dual synergy framework articulated in chapter 1 of this work as well as the conceptual framework at the beginning of this chapter, health outcomes are the result of the social determinants of health status (food security, nutrition, water and sanitation) and the coverage and quality of the health system. This section deals with the coverage and quality of the health system only.

The current stage in the evolution of India's public health system needs to be understood, if the current dysfunctionality is to be appropriately addressed. Public health expenditure as a proportion in of GDP in India is the lowest for any developing country at 1.2 per cent, even after a major increase in health public expenditure began with the NRHM from 2005 onwards. However, because of the then prevailing fiscal crisis, unfortunately state's expenditure on health in the 1990s had fallen. This was especially a problem as state governments account for 65–80 per cent of total health expenditure by state and central

governments combined. There was no expansion of public health system capacity, and many states did not replace retiring staff. The private sector grew in size, but this growth was concentrated mainly in urban areas. These factors combined led to a decline in access to health care, especially in rural areas. As a result, assessment by the National Health System Resource Centre (NHSRC 2012) notes that this process 'led to an understanding of health sector reform which was aligned to the economic reform of these years' (page 10). Public health financing got confined to a selective list of health priorities (for example reproductive and child health, and vertical programmes related to tuberculosis, HIV AIDS, vector diseases and control). The public health sector was exposed to market mechanisms so that user fee for all hospital services was made a part of financing conditionalities, and public hospitals aimed at cost recovery. Most public hospitals withdrew provision of free drugs and diagnostics except for National Disease Control Programmes. There was no effort to fill government health system vacancies, especially in the high focus states (i.e. the ones with the lowest per capita income and located in the North and East of India) where there were significant gaps even before the 1990s. Medical education, which until 1990 had been government run, became predominantly private run by the end of the decade. However, with market forces predominant, medical and nursing colleges set up by the private sector grew in only about 6 of the more developed states in the South and West of India. Thus, India saw stagnation of the public health system, while the private sector expanded further. As a result, out-of-pocket (OOP) expenditures in health remained an important cause of households falling below the poverty line (often due to catastrophic OOP expenses). OOP expenditures accounted for 80 per cent of total health expenditure, making India's health system one of the most privatised in the world.⁷

The public health system in India consists of four levels: health sub-centres to cover a few villages at a time, primary health centres (PHCs) at the block level, community health centres (CHCs), and district hospitals at the district level. At the end of the 11th Plan (2012), the shortfall in terms of this infrastructure were of the order of 20 per cent for sub-centres, 24 per cent for PHCs and 37 per cent for CHCs, based on the Indian Pharmacopeia Health System (IPHS) norms. Most of this shortfall was concentrated in the states of Bihar, Jharkhand, Madhya Pradesh and Uttar Pradesh, the northern states with the highest communicable disease burden and the lowest per capita income level. In 2005, of these 30,969 only 2,243 facilities could qualify to be called

24X7 facilities. However, by 2012 this number of 24x7 facilities grew to 15,014, a five-fold increase. But despite this increase India is still at 48 per cent of the target. Thus while very significant achievements have been made as a result of the health expenditures undertaken by the central government through the NRHM, the achievements still fall short by 52 per cent. In the northern and eastern states the shortfall is much higher (of the order of 65 per cent). In any case, the concept of a functional 24x7 First Referral Unit needs to be expanded beyond RCH services, for which most of the infrastructure is now in place but the specialised skills gap remains to be filled.

As regard human resources there have historically been three kinds of inter-related problems. First, a shortage of physicians and specialists compared to the IPHS norms has existed in the country as a whole. Second, an imbalance between doctors on the one hand and paramedic staff (including nurses) on the other has historically existed, compared to international norms, demonstrated by a severe shortage of nurses and paramedics. This situation was worsened by the closing of nurse training institutions in the 1990s (discussed earlier). Third, a historical imbalance has existed in the deployment of staff within the public health system, with doctors and nurses all preferring to be located in urban areas.

The NRHM, a central government flagship was started in 2005 to carry out an architectural correction in regard to some of these imbalances. There has been an improvement in the number of health personnel in position. Nevertheless the gap between staff in position and staff required at the beginning of 2012 was 62 per cent for mid-wives and nurses, 67 per cent for doctors, 88 per cent for specialists and 58 per cent for pharmacists. Addressing these shortages would require the allocation of funds by both central and state governments.

Concluding remarks: reasons why multi-sectoral actions will inevitably fail

We have shown in this paper that each 'sector' that impact on nutritional outcomes – food, care, health, sea water/sanitation – suffers from pre-existing design flaws in government run programmes that are supposed to deliver services: adequate food intake, care services/behavioural change for pregnant and lactating mothers and 0–6 year old children, public health services and safe water/sanitation. In the absence of credible programmes, it is not meaningful to suggest that better

coordination among the multiple ministries will deliver better outcomes, when programmes in each area are failing to deliver services.

Even if programmes were delivering, the question still remains: do the bureaucrats who are charged with delivering these services have any incentive to collaborate or cooperate, beyond mere meetings in Delhi and state capitals that are meant to discuss intersectoral coordination (as opposed to actually achieving intersectoral cooperative action at the local level)?

This paper is arguing that coordination is more difficult to achieve than addressing the weaknesses of each programme, and hence the focus of policy reform must be on fixing the components of the various programmes. It is also arguing that coordination is pointless until the components become stronger.

There are three sets of reasons why even if each programme was operating at high levels of effectiveness, the objective of achieving cooperative action at local level is likely to fail. The first is that the bureaucracy charged with delivering programmes only cares about inputs, not about outcomes. The second is that personal, individual incentives for cooperation are not only absent, but they actually positively discourage cooperation. The final reason is that the local governments in India's systems of governance are among the weakest parts of the governance chain, and since coordination (let alone cooperation) can only be ensured within a limited geography to be effectively weak, local governments cannot deliver multi-sectoral interventions in a cooperative manner when the state and central government functionaries themselves have no incentive to cooperate.

An incentive to collaborate/cooperate would exist if senior officers' performance was measured for achieving outcomes/impact, as opposed to merely spending money to deliver inputs. However, despite attempts by the Cabinet Secretariat's Performance Management and Evaluation Services Division to get senior bureaucrats to report through the Results Framework Document on outputs/outcomes, the input-orientation services continue (Mehrotra 2013). The overworked Joint Secretary in any ministry, who is normally responsible for managing and financing a programme across a vast country of 29 states, cannot realistically be expected to ensure effective delivery of services. These programmes, even if they were well designed, are actually delivered by state-level bureaucrats who are also not evaluated or assessed by outcomes/impacts.

The second set of problems arise from the fact that there is no incentive or reward for cooperating across ministries, either at the central

government level or even state level. In fact, even coordination across two departments which are under one ministry, and hence led by one minister of cabinet rank, is rare. Under the circumstances, expecting that at least three or four ministries will coordinate actions in respect of nutrition in each of India's 641 districts, is asking for the moon. Joint Secretaries control thousands of crores worth of programme finding. Coordination or cooperation may involve sharing funds, which means possibly losing control, even though it may involve only a small part of total programme funding. Sharing funds is the equivalent of losing control and a bit of power. The bigger the funds of a programme, the greater the power. There is no incentive in the administrative system for sharing power. Thus if external accountability is not ensured through any emphasis on outcomes or impacts of services, internal efficiency in processes to deliver of services is undermined by the lack of incentive to cooperate.

There is evidence from other programmes where exhortations to coordinate have been repeatedly made, and where the case for coordination is crystal clear, but little of it happens. Thus, the rural development ministry has two departments dealing, one dealing with land resources (land record modernisation, watershed management), and the other rural welfare programmes (e.g. the rural employment guarantee, rural housing, old-age pension, rural roads). Watershed management refers to programmes that attempt to improve the water-conserving capacity of cultivable land, particularly on areas exceeding 500 hectares. Rainwater harvesting methods on a large scale can raise the water table in underground aquifers. The other department in the same ministry manages the rural employment guarantee, which by law mandates that most of its work must relate to soil and water conservation, through small actions like building check dams, tanks and wells.⁸ It would be natural for them to coordinate their actions. However, such coordination was very difficult to achieve between the two line departments. Seven years after the start of the rural employment guarantee, the Mihir Shah Committee report (2012) was still exhorting the two programmes to coordinate their plans so that their cost-effectiveness could be improved.

The final reason why multi-sectoral interventions will be a non-starter in India is deeper and more structural, as coordinated action can only happen in a limited geography, and local development in such geography requires empowered local government. However, the three tiers of local government created in rural areas in 1993 (Panchayati Raj) and the urban local bodies created in 1994 (by the

72nd and 73rd amendments to India's Constitution), that can trigger and sustain multi-sectoral action not only for nutrition, but also to achieve many other development outcomes, effectively disabled by the centralised form of governance practiced in India. Local bodies are unable to mobilise local officials to implement intersectoral action to address malnutrition. The pre-condition of effective coordination is that functionaries, functions and funds are all devolved to the local body, but in the two decades since the local bodies were created, state governments have systematically prevented such devolution to happen (Mehrotra 2014).

In other words, it is not as though coordination among the components of the nutrition programme happens more easily at the state than at the central level. In fact, the same problems (as mentioned above) arise at the state level as well as at the central level. Missions have been used to bypass the state treasury and state bureaucracy by the central government for centrally sponsored schemes, so that funds are transferred directly to the Missions, which are often registered societies. But they are not necessarily an instrument of coordination, and cannot substitute for genuine accountability of officials to the parents of malnourished children. If lower-level officials merely report vertically to line ministry superiors, there is no scope for accountability horizontally to the people who are the beneficiaries of a programme (Mehrotra 2008).

It is also not the case that greater coordination will be a spur to improving the effectiveness of the components of the nutrition programme, via greater peer review or transparency. If there are serious problems with the design of programmes, there is little that can be achieved with merely coordinating efforts. States that have effective PDS or health services (e.g. Tamil Nadu or Kerala) still suffer from serious lacunae in the sanitation. Hence, these same states might have the best child nutrition rates in the country (29–30 per cent, NFHS, 2005–06), but these rates are still as bad as the average in sub-Saharan Africa.

Hence, at the current stage of development, the only administratively feasible course of action is to ensure that design flaws in existing sectoral programmes are addressed. Regrettably, the evidence of the last decades is that even though the first NFHS was conducted in 1992–93, that showed worse levels of underweight, stunting and wasting than in sub-Saharan Africa, the evidence on malnutrition has not jolted the administrative machinery to course correct even for flawed sectoral programmes.

- 1 Scientific evidence suggests that mental damage due to early childhood malnutrition is irretrievable. For a detail discussion see Berg (1968) and Unicef (1981). Berg A D, 'Malnutrition and National Development', the journal of Tropical Pediatrics, Sept 1968, pp 116–124; and Unicef, 'The Impact of malnutrition on the learning situation', May, 1981.
- 2 It is true that the calorie norms of 2,400 for rural and 2,100 kcal for urban areas per person per day were estimated on the basis of age–sex–occupation distribution of the population prevailing in 1971 (as found in the Census of 1971 by the Planning Commission for estimating the poverty line). This may not be an appropriate norm for current conditions nearly half a century later, as was also noted by the Tendulkar Committee for the revised poverty line estimates of 2011. Nevertheless, the fact remains that total kcal declines *on average* in the country, given that distribution of those calories across income groups will be highly skewed, is still a matter of grave concern.
- 3 Himanshu-Sen (2013) also argue, rather remarkably, that despite cereals purchased from fair price shops under the PDS account for only seven per cent of monthly per capita consumption expenditure over the bottom quintile. Yet, they argue food transfers lifted 55 million people above the poverty line in 2009–10. The number would be 402 million without these transfers, 16 million more than the 347 million who remained poor after transfers. How such a miniscule proportion of MPCE rise could contribute such a large decline in poverty is baffling, and defies logic. It is particularly notable, they find that PDS raised the calorie intake of the population as a whole by about 6 per cent in 2009–10. This contribution had fallen from in 1993–04 to 2004–05 but increased 6 percent with PDS revival. That PDS contributes so little to calorie intake is self evident.
- 4 For instance, proof of address, voter ID card, electricity bill in the person's name, and so on.
- 5 *Deccan Herald*, 4 September 2012.
- 6 The possibility of political interference in the selection and recruitment process is recognized by the Parliamentary Committee, when it found that some states have included members of the state Legislative Assemblies (i.e. the state's parliament) in the selection committees.
- 7 On the ratio between private and public expenditure on health in India, in a comparative perspective, see Dreze and Sen (2013).
- 8 The author was the head of the rural development division in the Planning Commission, 2006–08, and hence responsible for the two sets of programmes, and dealing with both line departments in the line ministry on a regular basis.

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13

UNTAPPED POTENTIAL OF ICDS

Commentary

Arti Ahuja

High levels of economic growth, reducing levels of poverty, and persisting undernutrition – the equation does not seem intuitively correct, yet it is true in the Indian context. The Integrated Child Development Services (ICDS) has been the main vehicle for removal of undernutrition, though not the only one. At best, it provides only supplementary nutrition and advice on appropriate feeding practices for mothers and children through a village-level honorary worker, often underpaid and underqualified. The chapters in this book document the challenges facing the ICDS if it is to serve to reduce child malnutrition.

The core of ICDS has changed little since it was launched in 1975. The programme has expanded in its geographical scope but broadly; the mode of delivery and the service package remain the same. Some services, such as for adolescent girls, and Village Health and Nutrition Days have been added over the years, but within the basic framework and objectives. There are many critical issues relating to undernutrition such as focus on 1,000 days, ensuring equity, following the life-cycle approach and monitoring outcomes; that ICDS in its current form does not address comprehensively, leading to much criticism. Besides, there are systemic weaknesses and inefficiencies (Saxena, in this book), requiring a drastic makeover.

Convergence with other schemes and sectors is also difficult due to their own inherent limitations and inefficient functioning (Mehrotra, in this book). The scenario seems bleak and hopeless when viewed thus. However, much leeway rests with the states on implementing ICDS

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and consequently there are many good initiatives across the board, overcoming the systemic constraints and finding the way forward.

From a policy perspective, a dilemma often faced by policy makers and implementers at the state level with limited human and financial resources is how to prioritize time and effort among competing demands. Especially in the nutrition sector, where there are myriad cause-and-effect relationships, the gestation period of any initiative often outlasts the policy makers themselves, and support systems are weak. Lack of attributable outcome monitoring (e.g. through periodic NFHS) also dilutes any incentives for change.

However, there are instances, some of which are cited in this book, which demonstrate successful efforts at (a) working within the ICDS system and (b) achieving convergence with other departments; which have the potential of overcoming the limitations in the current systems and delivering on nutritional outcomes.

Two good examples of working within the existing system are outlined in Agnihotri's paper – the Odisha positive deviance initiative in two districts in 2003–05, and the VCDC in Maharashtra, where community-level structures were set up and interventions taken up through them. These initiatives were successful mainly due to state-level leadership. They also showed that proper planning, data analysis, mapping, and working with and empowering village communities is a workable strategy. This has also been the experience in the decentralisation of SNP across the state in Odisha in 2011. In fact, Saxena (in this book), while focusing on the ills within the system recognises that decentralisation and community monitoring do work.

In the area of convergence with health department, ICDS in Madhya Pradesh and Odisha are good examples, albeit following different mechanisms (Avula). Institutional convergence has been attempted nationally by setting up the Nutrition Council under the Prime Minister and similar structures at the state level. However, the fact remains that convergence is often person-specific and bureaucratic hierarchies often stymie such attempts (Avula, in this book). There could also be insecurities in ceding control to another department (Mehrotra, in this book). Setting up nutrition missions is a good idea, but as Avula shows, such a body needs to be headed by a senior-level person and not housed in a particular ministry – it has to have an overarching role, where the departments can be called to task for non-performance on deliverables.

Convergence, if effective, ought to be most visible at the community level – that is if the field functionaries see their roles as complementary

and not competitive. This can come about by putting in place review mechanisms at different administrative levels as well as by asking for the same kind of information, from the same source, so that the functionaries have no option but to converge in service delivery. The use of Mother and Child Protection (MCP) cards in Odisha, supplied by Health Department, filled in by the AWW, and used for the MIS of both WCD and Health is one such example. The Conditional Cash Transfer Scheme 'Mamata' of the WCD department hinges on the MCP card for ascertaining the fulfilment of conditions and triggering electronic payment into the accounts of the eligible women. Thus, the insistence on the use of the MCP card ensures not just a convergence between the two departments but also strengthens the functioning of each department individually by focussing on clear deliverables and their triangulation at the most basic level. As also pointed out by Avula, the village is the strongest level of convergence. The over-worked honorary workers in the village are indeed able to see their roles as synergistic and work in a supportive manner. Such synergy has not been easy to achieve with the equally important Water and Sanitation sector, mostly because strong structures to ensure such convergence do not exist, and there is no congruence in the status or location of the field-level workers.

Contrasting the two approaches, it is not easy to achieve intersectoral convergence unless the basic systems in the related departments are internally strong and flexible enough. As long as convergence is not inbuilt and is person-specific or leadership-based, it cannot be sustainable. A similar caveat also exists for reform within ICDS, as that is also leader-specific. However, system reforms at the state level are more often than not, sustainable, if they get adapted and entrenched as a way of working at the grassroots level, such as the decentralisation of SNP in Odisha.

However, from the larger perspective, there is no gainsaying the fact that state-level reforms or state-specific convergence mechanisms only work in that specific situation and cannot overcome the larger gaps within the ICDS. Having a clear national nutrition policy and strategy with a strong institutional set up with the mandate and teeth to ensure implementation across sectors is the only way to ensure achievement of national nutritional outcomes.

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Part IV

NFSA

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CHANGES AND STATE-WISE DIFFERENCES IN THE NUTRITIONAL IMPACT OF THE INDIAN PUBLIC DISTRIBUTION SYSTEM

Tara Kaul

Introduction

Assuring food security to poor households is a key policy issue in India today. Despite a relatively high rate of economic growth in past decade, undernutrition has not declined substantially (Deaton and Dreze 2009). According to UNICEF, one out of every three malnourished children in the world lives in India.

The Indian government's flagship programme to augment food intake and improve nutrition is the public distribution system (PDS). Under this programme, the central government physically procures food grains from farmers at a minimum support price and provides them to poor households at substantially discounted prices through a wide distribution network. The difference in the procurement cost of food grains and revenue from their sale at subsidised prices is provided for under the national food subsidy. This subsidy accounts for almost 1 per cent of the country's GDP – in the 2012–13 budget, the total food subsidy was projected at Rs. 750 billion (Government of India 2012).

The PDS aims to supplement the caloric intake of food insecure households by guaranteeing a monthly quota of food grains (rice and/or wheat). Many state governments add to the centrally provided allocation, resulting in differences across states in the total amount of subsidy provided. Differences in efficiency of delivery also exist at the state level – some states have been much more successful than others

at kerbing leakages from the PDS. Though the programme has serious issues in implementation, it remains a critical form of support for a substantial proportion of the country's population.¹ The National Food Security Bill (NFSB), which was passed in September 2013, will lead to a further expansion in the scale and reach of the PDS. Given the state-level differences in the functioning of the programme and its imminent expansion, it is important to study its impact on nutritional outcomes both at the national and state levels.

Past work on the PDS (Kochar 2005; Tarozzi 2005; Khera 2011c) has found its nutritional impact to be quite small. In Kaul (2013), I use a previously unexploited source of variation, generated by differences in state programme rules and random fluctuations in market prices, to estimate the nutritional impact of the programme. Using six years of data (2002–08) from the National Sample Survey Organisation (NSSO) Consumption Expenditure Surveys, I find that the PDS has a positive effect on cereal consumption, total caloric intake and on calories from all food groups. Thus, the programme leads to an increase in total caloric intake that is greater than the increase implied by cereal consumption alone, which it directly subsidises. I also find evidence that the programme is much less effective at improving nutrition in the group of states that are known to be more corrupt.

In this paper, I undertake a state-wise examination of the PDS, specifically the rice subsidy, to study the impact of differences in state-level implementation.² I first examine the profile of PDS users in different states and compare trends in prices and consumption. Next, I estimate the impact of the programme by state and find that the PDS has a much larger impact on nutrition in the southern states as compared to the rest of the country. Finally, using qualitative data from the India Human Development Survey (IHDS) (2005), I find suggestive evidence that irregular supply and poor quality are the key deterrents to households benefitting from the programme.

The chapter is organised as follows: The following section presents the background of the PDS. Previous work on the impact of the PDS is discussed in the subsequent section. The next two sections describe the profile of PDS users by state and the main results. The penultimate section discusses some qualitative aspects of the programme, and the last section concludes.

Changes in the role and challenges of the PDS

The PDS in India was started in the late 1930s. Historically, the programme was a means to cope with food shortages and rising prices

in urban areas. Over time, it was expanded to rural areas and an elaborate network of food procurement and distribution through Fair Price Shops (FPS), also known as ration shops, was established. In 1997, the PDS was converted into a targeted anti-poverty programme. Households identified as being below the poverty line (BPL) were made eligible for a monthly quota (20 kg) of rice and/or wheat, sugar and kerosene at discounted prices (approximately 50 per cent of the procurement price to the government). The price discount for other families was revoked. In the early 2000s, the quotas were revised upwards to 35 kg/month for most states, and some sections of the population were offered a higher discount.³

Under the PDS, the government physically procures food grains from farmers at the announced minimum support price for the year and then distributes the grains through a network of almost 4.9 lakh FPS. Though the PDS is conceived as a supplementary programme, i.e. it does not meet the entire food requirements of any household, it provides a substantial amount of cereals (and consequently calories) to beneficiary households.⁴

Since the central and state governments jointly fund the programme, there are differences in programme rules across states. Andhra Pradesh, Kerala, Gujarat and West Bengal index the monthly quota to family size, others do not. The total household quota also varies – for states where rice is the main staple, the quota varies from 16 kg/month in Odisha to 35 kg/month in Jharkhand.⁵ Some states such as Himachal Pradesh and Chhattisgarh have started to offer lentils through the PDS (Khera 2011a). While many states have expanded the coverage of the programme, Tamil Nadu is unique in that it has had a universal PDS in place since 2000 and offers 20 kg of rice per month to all households.

Apart from programme rules, substantial differences also exist in the implementation of the programme at the state level. The PDS is notorious for corruption and leakages. The estimated leakage ranges from 58 per cent (Planning Commission 2005) to 44 per cent Khera (2011b).⁶ However, Khera (2011b) finds important differences in state trends and can classify states according to their performance. The better performing states are concentrated in the south, but also include Himachal Pradesh, Jammu and Kashmir and Maharashtra.

Despite issues in implementation, an expansion of the PDS is imminent under the provisions of the NFSB, which was passed in September 2013. This landmark legislation makes it a legal right for 67 per cent of India's population to have access to subsidised cereals: rice, wheat and coarse grains. The bill will provide 5 kg of food grains per

person per month at prices between Rs. 1–3/kg. Thus, both the reach and value of subsidies provided by the PDS will increase. The nutritional impact of this increase will depend critically on how efficiently different states are able to implement the new programme.

Estimates of the nutritional impact of the PDS

The nutritional impact of the PDS has been studied in different contexts. Tarozzi (2005) finds that an increase in the PDS price in Andhra Pradesh did not have a big impact on children's anthropometrics. His paper studies the programme in 1992, when the subsidy was much smaller and the window of exposure to higher prices varies only between one and three months. This may not be a long enough period to pick up significant anthropometric changes. Kochar (2005) estimates the impact of the PDS for rural households in two time periods: before and after the programme became targeted. She finds that the impact on caloric intake is very small and concludes that targeting reduces support for the programme. In her study, BPL status is imputed and not actually observed. The resulting errors of classification could cause her estimates to be biased in the direction of finding no effect. Khera (2011c) presents results from a survey of 300 households in Rajasthan and finds that the PDS has no impact on the overall level of cereals consumed by households.

In Kaul (2013), I use a previously unexploited source of variation in the value of the subsidy for BPL households, to estimate the impact of the PDS. This allows me to address some of the methodological issues faced by previous studies on the PDS. Given the supplementary nature of the programme, all households purchase additional food from the market, at market prices. Thus, the value of the programme for any household is essentially the income gain from the discount and the quota.⁷ The discount that a household receives is the difference between the local market and PDS price of rice. PDS prices are typically set for the year and are not indexed to fluctuations in local prices. Market prices on the other hand, vary geographically and seasonally as a result of imperfectly integrated agricultural markets, state-level controls on the movement of goods, and random weather phenomena. Thus, the discount varies with movements in the market price. The per-person quota that a household is eligible for varies by the size of their household and the state of residence. I combine these two sources of variation to calculate a household-specific value of the subsidy for each PDS using household in my sample.

$$\text{PerCapValSub}_{ijstw} = P_{\text{mkt}}^{\text{mkt}} - P_{\text{pds}}^{\text{pds}} * Q_{is}$$

where

i = household, j = district, s = state, w = season, t = year and $*Q_{is}$ = state-household size-specific quota for household i .

The causal impact of the programme is identified by exploiting state and household size-specific differences in the per-person quota, and variation at the district-season-year level in the discount as a result of unpredictable fluctuations in the market price of rice. The analysis assumes that after accounting for district, season and state-year effects, the residual variation in the value of the subsidy due to the quota and discount is uncorrelated with the household demand for calories. I check for the validity of this assumption by performing a falsification test using non-PDS households and find that the value of the subsidy has no predictive power for their consumption and caloric intake.⁸

I use data from six years (2002–08) of the NSSO Consumption Expenditure Surveys to calculate local market and PDS prices based on quantity and expenditure data for households that purchase rice from the PDS in eight major states where rice is the primary staple. Thus, the sample for analysis comprises only PDS using households.⁹ Local market and PDS prices are computed by averaging across the unit values as reported by PDS using households.¹⁰ Thus, given the targeted nature of the PDS, I do not include higher rice prices paid by households that do not use the programme. Further, using actual state programme rules instead of household-level utilisation allows me to estimate the overall impact of the programme taking into account any inefficiencies in implementation.¹¹ I use standard conversion factors to translate food purchases of over 150 food items into caloric intake and all prices are inflation indexed.

Controlling for household characteristics and district, season and state-year effects, I find that the PDS has a positive impact on cereal consumption, on overall caloric intake and on calories from different food groups. The gains in total caloric intake are higher than the gains in calories from cereals alone – a Rs. 10 increase in the value of the subsidy implies an increase of 126 kcal/day in total caloric intake, of which 60 kcal are from cereals. The estimated elasticity of caloric intake is 0.144, which is higher than Kochar's (2005) estimate of 0.06. This is not unexpected, as Kochar's study is a pre and post intervention analysis of the targeted PDS and uses data from 1993 and 1999–2000. Subsequently, the programme has become more generous and participation in the PDS has also increased. Khera (2011c)

finds that access to the PDS does not have an impact on cereal consumption. However, her study uses households from only one state and does not exploit variation in the value of the subsidy. By using the NSSO surveys, I have a more representative sample and I am able to impute a value of the subsidy to each PDS using household in eight states over a period of six years. Finally, recent experimental evidence on pure price subsidies for rice (Jensen and Miller 2011) suggests a zero or negative impact on calories from different food groups. As opposed to a price subsidy, the PDS provides an income transfer and my results confirm that the PDS subsidy has the expected positive effect on caloric intake from all food groups.

To take implementation issues into account, I group states as functioning and non-functioning, using Khera's (2011b) classification. I find that the impact of the programme on calories and cereal consumption is almost half in states with higher levels of corruption. Finally, I combine the elasticity estimates from my paper with recent price data and average caloric intake to estimate the impact of the NFSB.¹² I find that the increase in the value of the subsidy will lead to an increase of 72 kcal/day in rural areas and 66 kcal/day in urban areas for current beneficiaries of the programme. The NFSB will also increase the proportion of households eligible for the PDS. Evidence from Kochar (2005) and Dutta and Ramaswami (2001) suggests that broader coverage may increase political support for the programme and lead to improvements in the overall delivery of services to all participants. In the state-level analysis ahead, I find some support for this hypothesis as the impact of the PDS in Tamil Nadu, which has a universal programme, is higher than the all-India average.

State-wise profile of PDS users

In this section, I examine the characteristics of PDS using households in eight major states where the programme is targeted and Tamil Nadu, which has a universal PDS. Tables 14.1 and 14.2 present descriptive statistics for the full sample and PDS rice users, respectively. Though the monthly per capita expenditure for PDS households varies from Rs. 382 in Odisha to Rs. 937 in Kerala, on average the expenditure is 40–50 per cent lower than the state average expenditure for all households. In Tamil Nadu, the monthly per capita expenditure for PDS users is much closer to the state average. This is not surprising, given that Tamil Nadu has a universal PDS. The statistics suggest that even relatively more affluent households in this state

Table 14.1 State-wise descriptive statistics for the full sample

State:	Assam	West Bengal	Jharkhand	Odisha	Chhattisgarh	Andhra Pradesh	Karnataka	Kerala	Tamil Nadu
PC Monthly Exp (Rs)	878.2 (996.6)	1010.7 (924.5)	817.1 (744.6)	683.4 (613.3)	806.8 (734.5)	1057.5 (1111.7)	1044.0 (955.7)	1569.1 (1796.8)	1156.1 (1031.3)
PC Daily Calories (kcal)	2488.7 (823.8)	2364.6 (2075.0)	2590.5 (1951.3)	2372.8 (821.4)	2418.1 (949.0)	2280.4 (793.0)	2099.8 (740.1)	2237.5 (1039.2)	2080.6 (764.5)
Proportion spent on food	0.629 (0.117)	0.570 (0.135)	0.595 (0.117)	0.590 (0.124)	0.538 (0.124)	0.533 (0.146)	0.518 (0.133)	0.475 (0.147)	0.506 (0.141)
Size of the household	5.028 (2.221)	4.564 (2.400)	5.161 (2.747)	4.769 (2.410)	5.049 (2.781)	4.012 (1.949)	4.605 (2.597)	4.249 (2.108)	3.773 (1.762)
No. of children below 15	1.720 (1.425)	1.367 (1.404)	1.946 (1.751)	1.503 (1.430)	1.747 (1.633)	1.171 (1.214)	1.346 (1.466)	1.098 (1.219)	0.978 (1.122)
Proportion of women	0.545 (0.188)	0.528 (0.205)	0.534 (0.205)	0.519 (0.202)	0.518 (0.201)	0.500 (0.210)	0.515 (0.215)	0.475 (0.214)	0.495 (0.222)
Age of hh head	45.55 (11.94)	46.98 (13.52)	44.75 (13.05)	46.13 (13.73)	45.50 (13.11)	44.51 (13.53)	46.49 (13.45)	52.24 (14.15)	47.12 (13.67)
Urban dummy	0.247 (0.431)	0.407 (0.491)	0.365 (0.481)	0.266 (0.442)	0.343 (0.475)	0.380 (0.485)	0.469 (0.499)	0.345 (0.475)	0.510 (0.500)
Electricity	0.503 (0.500)	0.626 (0.484)	0.515 (0.500)	0.533 (0.499)	0.784 (0.412)	0.896 (0.305)	0.919 (0.273)	0.874 (0.331)	0.920 (0.272)
Permanent home	0.234 (0.424)	0.324 (0.468)	0.276 (0.447)	0.278 (0.448)	0.192 (0.394)	0.403 (0.491)	0.355 (0.478)	0.405 (0.491)	0.365 (0.481)
Observations	11345	25334	8893	13308	6740	24661	14951	14019	24161

Source: NSSO Consumption Expenditure Surveys (2002–08).

Notes: Rural Poverty line is Rs. 497.6, Urban Poverty line is Rs. 635.7 (Planning Commission). Average daily minimum caloric requirements are 2,400 kcal (rural) and 2,100 kcal (urban). All prices are in 2005 rupees.

Table 14.2 State-wise descriptive statistics for the PDS user

State:	Assam	West Bengal	Jharkhand	Odisha	Chhattisgarh	Andhra Pradesh	Karnataka	Kerala	Tamil Nadu
PC Monthly Exp (Rs)	511.9 (217.6)	533.9 (252.2)	415.4 (177.7)	382.3 (203.7)	446.5 (240.6)	669.0 (372.7)	594.9 (289.7)	937.5 (620.7)	788.0 (502.1)
PC Daily Calories (kcal)	2357.0 (545.0)	2401.6 (552.1)	2265.3 (484.2)	2182.7 (583.2)	2195.7 (584.8)	2234.0 (591.3)	2137.5 (619.1)	2056.0 (887.0)	2116.7 (567.4)
Proportion spent on food	0.658 (0.0871)	0.627 (0.0973)	0.605 (0.0918)	0.623 (0.0980)	0.556 (0.102)	0.583 (0.117)	0.572 (0.0984)	0.527 (0.126)	0.539 (0.121)
Size of the household	4.921 (1.685)	4.438 (1.692)	5.262 (1.967)	4.522 (1.847)	4.812 (2.138)	4.258 (1.862)	4.907 (2.356)	4.574 (2.096)	4.054 (1.696)
No. of children below 15	1.899 (1.409)	1.510 (1.264)	2.169 (1.536)	1.604 (1.415)	1.828 (1.518)	1.335 (1.233)	1.578 (1.464)	1.138 (1.255)	1.116 (1.181)
Prop. of women	0.510 (0.179)	0.495 (0.192)	0.495 (0.180)	0.503 (0.188)	0.488 (0.199)	0.482 (0.194)	0.485 (0.189)	0.461 (0.193)	0.478 (0.199)
Age of hh head	44.80 (11.39)	45.15 (12.45)	44.93 (11.99)	44.54 (12.53)	44.99 (12.56)	44.96 (12.48)	47.06 (11.95)	53.71 (12.90)	47.94 (12.70)
Urban dummy	0.101 (0.302)	0.208 (0.406)	0.213 (0.411)	0.132 (0.339)	0.248 (0.432)	0.236 (0.425)	0.248 (0.432)	0.262 (0.440)	0.394 (0.489)
Electricity	0.181 (0.385)	0.343 (0.475)	0.258 (0.439)	0.178 (0.383)	0.693 (0.462)	0.849 (0.358)	0.855 (0.352)	0.781 (0.413)	0.892 (0.310)
Permanent home	0.159 (0.366)	0.178 (0.383)	0.154 (0.361)	0.138 (0.344)	0.0784 (0.269)	0.378 (0.485)	0.264 (0.441)	0.394 (0.489)	0.355 (0.479)
SC/ST/OBC	0.526 (0.500)	0.525 (0.500)	0.936 (0.245)	0.911 (0.285)	0.939 (0.239)	0.785 (0.411)	0.718 (0.450)	0.793 (0.405)	0.965 (0.184)
PDS Rice Qty (kg)	26.72 (11.27)	9.785 (8.911)	17.83 (6.433)	21.36 (8.497)	31.04 (11.09)	16.63 (6.967)	18.05 (6.722)	20.13 (12.89)	19.06 (7.103)
Market Rice Qty (kg)	33.38 (23.02)	35.47 (21.32)	29.09 (21.28)	33.45 (23.04)	23.46 (21.89)	28.57 (18.10)	9.299 (13.12)	16.99 (15.71)	20.33 (15.08)
Observations	9808	1544	232	1880	918	9808	3836	2934	11842

Source: NSSO Consumption Expenditure Surveys (2002-08).

Notes: Rural Poverty line is Rs. 497.6, Urban Poverty line is Rs. 635.7 (Planning Commission). Average daily minimum caloric requirements are 2,400 kcal (rural) and 2,100 kcal (urban). All prices are in 2005 rupees. Sample comprises households that purchased rice from the PDS in the last 30 days.

choose to participate in the programme. Thus the profile of households using the PDS in Tamil Nadu is very different from other states where the programme is specifically targeted towards poor households. The southern states have a much higher proportion (78–89 per cent) of households reporting access to electricity as compared to the others. Households in these states are also, on average, more likely to report living in a permanent home.

On average the per capita caloric intake is lower for PDS users, and given that most of them live in rural areas, the intake is well below the minimum norm, which is 2,100 kcal/day for urban and 2,400 kcal/day for rural areas.¹³ In West Bengal and Karnataka, the caloric intake of PDS households is higher than the full sample. This is because 40–50 per cent of the total sample in these states lives in urban areas, which have a lower caloric requirement, whereas only 20–24 per cent of the PDS sample resides in an urban location. On average, the PDS users sample spends a much higher proportion of total expenditure on food. This varies from 52 per cent in Kerala to 66 per cent in Assam. Size of the household is similar across most states, with the average being 4.5 persons. Given that Andhra Pradesh, Kerala and West Bengal index the monthly PDS quota to family size and others do not, this generates variation in the per-person PDS quota that households are eligible for. Kerala and Tamil Nadu have fewer children per household as compared to the rest of the states. Other household characteristics including proportion of women and age of the household head are similar across states.

The last two rows in Table 14.2 give the state-wise average quantity of PDS and market rice purchased by households in the last 30 days. The lowest PDS purchase is in West Bengal (9.8 kg) and the highest is in Chhattisgarh (31 kg). The market purchases of rice are much higher than the PDS purchases in all states, except Karnataka. The highest average quantity of rice bought in the market is reported in West Bengal (35.5 kg), which also has the lowest average PDS purchases.

Figure 14.1 plots the average rice purchases by year, for the nine states in the sample.¹⁴ In Karnataka, Chhattisgarh and to a certain extent Kerala, households purchase a higher proportion of rice from the PDS than the market. The time trend for PDS rice is flat in Andhra Pradesh and Tamil Nadu. In Assam, Karnataka and Kerala, PDS rice purchases have fallen over the period 2002–08. In Chhattisgarh, Jharkhand and Odisha, households have received more rice through the PDS over time, indicating an improvement in distributional efficiency.

Trends in the PDS and Market prices of rice are shown in Figure 14.2. In all states, the market price of rice increased post 2007. This is in line

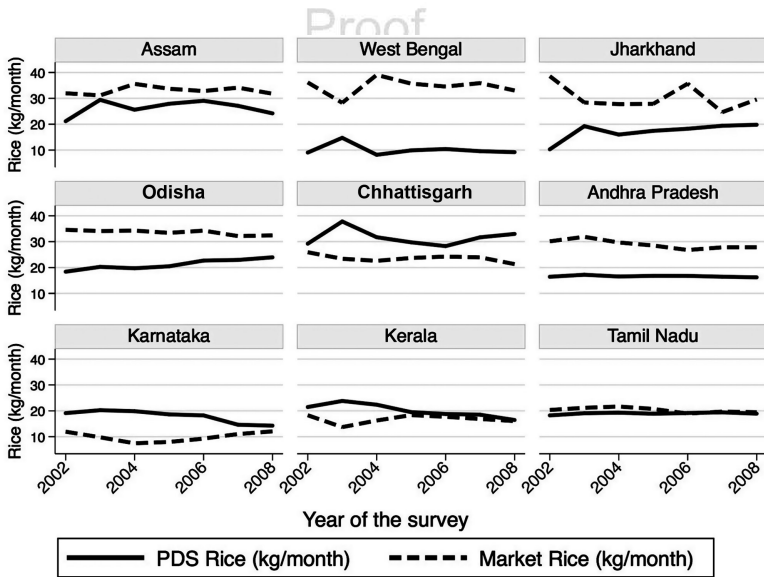


Figure 14.1 Trends in rice consumption (state annual level)

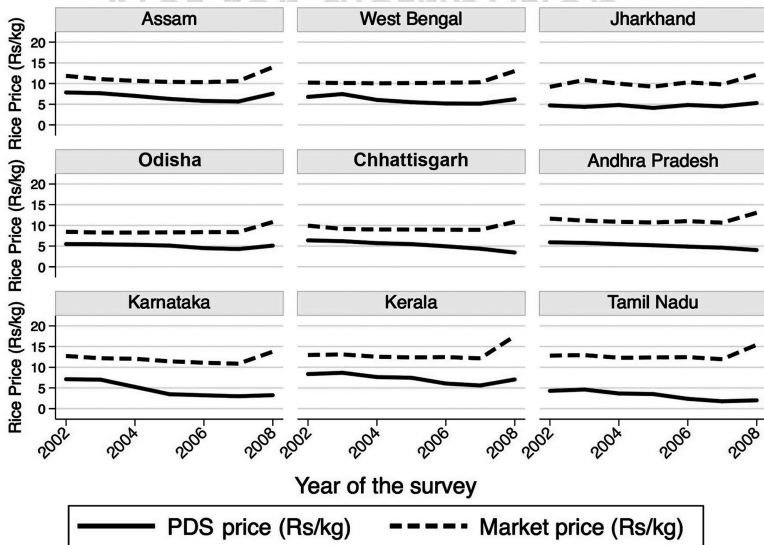


Figure 14.2 Trends in rice prices (state annual level)

with the global rice crisis which started in early 2008 and resulted in a significant increase in rice prices. The PDS price has remained much more stable, as expected. The Chhattisgarh government lowered PDS prices in 2007, and the data confirm this reduction. Over the period 2002–08, PDS prices declined in Karnataka and Tamil Nadu. These two states also have the biggest gap between the market and PDS price, that is, they offer the largest discount.

State-wise impact on nutrition

In order to examine state-level heterogeneity, I re-estimate the regressions from Kaul (2013) at the state level

$$Y_{ijswt} = \alpha + \beta \text{PerCapValSub}_{ijswt} + X_{ijswt} \gamma + \delta_j + \psi_w + \theta_t + \varepsilon_{ijswt}$$

Y_{ijswt} represents the outcome variable (such as per capita caloric intake) for household i in district j , state s , season w and year t . $\text{PerCapValSub}_{ijswt}$ is the per capita value of the subsidy to the household based on programme rules and local prices. X_{ijswt} are household characteristics,¹⁵ δ_j and ψ_w control for district-specific and seasonal effects respectively, and θ_t represents year effects. Year fixed effects also control for any changes in the composition of PDS using households over the six years.¹⁶ All standard errors are clustered at the district level.

The first panel in Table 14.3 presents the results for the impact on cereal consumption. Looking across the columns, there are clear differences in the impact of the programme. An increase in the value of the subsidy by Rs. 10, leads to an increase of 35 g in daily cereal consumption in Andhra Pradesh (column 1), but does not have a significant impact in Assam and Jharkhand (columns 2 and 4). The elasticity of cereal consumption follows a similar pattern: Households in the southern states are much more responsive to the value of the subsidy. Recall that Tamil Nadu has a universal PDS and the profile of households using the PDS is very different in this state. It could be argued that consumption of cereals in more affluent households is less likely to be affected by the subsidy. However, Tamil Nadu has amongst the highest elasticities, implying that household consumption is more responsive in this state. These results are in agreement with Khera's (2011b) classification, according to which the southern states are the least corrupt.

In the second half of Table 14.3, I examine the impact on overall caloric intake. The patterns are similar, with the southern states

Table 14.3 State-wise impact of the subsidy

State:	Andhra Pradesh	Assam	Chhattisgarh	Jharkhand	Karnataka	Kerala	Odisha	West Bengal	Tamil Nadu
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:	Daily per capita cereal consumption (grams)								
PC Rice	3.563***	-0.258	1.493***	0.191	1.555***	2.440***	1.455*	5.172***	1.339***
Subsidy	(0.373)	(0.587)	(0.404)	(0.248)	(0.209)	(0.187)	(0.808)	(1.428)	(0.102)
Adjusted R ²	0.140	0.219	0.111	0.073	0.150	0.134	0.134	0.152	0.177
Dependent variable:	Log of daily per capita cereal consumption								
Log PC	0.214***	-0.00442	0.0933***	-0.0101	0.112***	0.188***	0.0391	0.0860***	0.195***
Rice Sub	(0.0201)	(0.0295)	(0.0249)	(0.0256)	(0.0133)	(0.0197)	(0.0262)	(0.0251)	(0.0140)
Adjusted R ²	0.141	0.217	0.118	0.092	0.167	0.148	0.143	0.143	0.190
Dependent variable:	Daily per capita caloric intake (kcal)								
PC Rice	17.29***	2.600	7.712***	1.058	10.35***	19.18***	7.141**	18.81***	8.429***
Subsidy	(1.575)	(2.520)	(1.386)	(1.308)	(1.366)	(3.133)	(3.413)	(5.018)	(0.428)
Adjusted R ²	0.108	0.190	0.096	0.148	0.153	0.111	0.171	0.110	0.230
Dependent variable:	Log of daily per capita caloric intake								
Log PC	0.229***	0.0343	0.115***	0.00904	0.140***	0.223***	0.0465	0.0607***	0.236***
Rice Sub	(0.0177)	(0.0272)	(0.0211)	(0.0274)	(0.0128)	(0.0254)	(0.0277)	(0.0198)	(0.0121)
Adjusted R ²	0.123	0.224	0.120	0.167	0.189	0.219	0.190	0.103	0.240
Observations	9808	715	918	232	3836	2934	1880	1544	11842

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: 1. All standard errors are clustered at the district level. 2. All equations include household characteristics (education of household head and spouse, age squared of household head, proportion of females, land owned) and urban, year, district and season dummies.

performing the best. An increase of Rs. 10 in the value of the subsidy leads to an increase in per capita caloric intake by as high as 191 kcal/day in Kerala. Assam, Jharkhand and Odisha have the poorest performance in terms of caloric intake.

A natural comparison for the elasticities estimated above would be the expenditure (income) elasticity of calories. The expenditure elasticity of calories for India has been declining over time due to a decline in caloric intake at almost every income quartile and the current estimates are in the range of 0.3–0.4 (Himanshu and Sen 2013; Kaul 2013). In theory, a PDS transfer is equivalent to an income transfer, but it is not surprising that the elasticity estimates for the PDS (0.009–0.23) are lower than the income elasticity of calories. This is due to the presence of transaction costs and leakages from the system that prevents a substantial proportion of the entitlement from reaching the intended beneficiaries. The lower elasticities do not imply that the PDS is ineffective. Himanshu and Sen (2013) use NSSO data to estimate a calorie demand function and find suggestive evidence that PDS transfers imply a larger increase in caloric intake compared to equivalent out of pocket expenditures. The question of cash versus PDS requires further rigorous evaluation and in order to make a fair comparison, the analysis would also need to factor in any leakages and inefficiencies that would be associated with a cash transfer. Cash would also be contentious in remote areas where markets may not function properly. Further, replacing the PDS with a cash transfer may not be simple, because many beneficiaries do not currently own or have access to bank accounts and in order to ensure equality, cash transfers would need to be perfectly indexed to local and seasonal rates of inflation.

Qualitative analysis of state-level performance

The results from the NSSO data are purely based on consumption and expenditure. In the analysis it is not possible to separately identify the effect of state-level characteristic such as inefficiency in implementation, differences in access or distance to ration shops, and differences in quality of grains provided through the PDS. To examine some of the challenges faced by households in accessing the PDS, I use supplementary data from the IHDS (2005).¹⁷ In addition to detailed questions on consumption, expenditure, income and household characteristics, the IHDS also collects information on qualitative aspects of the PDS. From Table 14.4, on average 83 per cent of households all-India report having some kind of a ration card. The proportion of BPL cards varies

Table 14.4 Descriptive statistics on PDS usage

State:	Assam	West Bengal	Jharkhand	Odisha	Chhattisgarh	Andhra Pradesh	Karnataka	Kerala	Tamil Nadu	All India
Any Card	0.855 (0.352)	0.941 (0.235)	0.621 (0.486)	0.780 (0.414)	0.694 (0.461)	0.768 (0.422)	0.724 (0.447)	0.947 (0.225)	0.938 (0.242)	0.826 (0.380)
BPL card	0.257 (0.437)	0.275 (0.447)	0.393 (0.489)	0.545 (0.498)	0.463 (0.499)	0.652 (0.477)	0.558 (0.497)	0.360 (0.480)	0.479 (0.500)	0.461 (0.498)
BPL card users/ BPL card holders	0.977 (0.150)	0.995 (0.0675)	0.923 (0.267)	0.964 (0.186)	0.984 (0.127)	0.988 (0.108)	0.975 (0.157)	0.996 (0.0614)	0.991 (0.0964)	0.982 (0.131)
PDS rice users/ BPL card holders	0.183 (0.387)	0.181 (0.386)	0.236 (0.425)	0.445 (0.497)	0.541 (0.499)	0.931 (0.253)	0.894 (0.308)	0.464 (0.499)	0.854 (0.354)	0.697 (0.460)
Reasons for not accessing the PDS										
Shop Too Far	0 (0)	0.200 (0.422)	0 (0)	0 (0)	0.0909 (0.302)	0.0500 (0.224)	0.0429 (0.204)	0 (0)	0.222 (0.428)	0.0464 (0.211)
No Time to Go	0.0556 (0.236)	0.200 (0.422)	0 (0)	0.130 (0.339)	0.0909 (0.302)	0 (0)	0.0143 (0.120)	0.167 (0.408)	0.222 (0.428)	0.0717 (0.259)
Financial Constraints	0.611 (0.502)	0 (0)	0 (0)	0.407 (0.496)	0.182 (0.405)	0 (0)	0.0143 (0.120)	0 (0)	0 (0)	0.152 (0.360)
Irregular Supply	0.167 (0.383)	0 (0)	0.733 (0.450)	0.278 (0.452)	0.364 (0.505)	0.250 (0.444)	0.0857 (0.282)	0 (0)	0 (0)	0.232 (0.423)
Bad Quality	0.100 (0.308)	0.0909 (0.302)	0.121 (0.331)	0.103 (0.307)	0.545 (0.510)	0.345 (0.484)	0.460 (0.501)	0.857 (0.356)	0.105 (0.315)	0.339 (0.474)

Source: India Human Development Survey (2005).

from 26 per cent of households in Assam to 65 per cent in Andhra Pradesh. Of the BPL card holders, over 98 per cent of households report having used the PDS at some point in the last 6 months. The proportion is even higher in the southern states, where the PDS has a bigger impact. Based on consumption for the last 30 days, the proportion of households reporting rice purchases from the PDS varies from 93 per cent in Andhra Pradesh to 18 per cent in Assam. Well over 50 per cent of households in Chhattisgarh and the four southern states (Andhra Pradesh, Karnataka, Kerala and Tamil Nadu) report having received PDS rice in the last 30 days. Thus there are differences in access to PDS across states.

Of the BPL households that did not use the PDS in the last six months, over half the households report irregular supply and bad quality as the reason for not having accessed the PDS. In Assam and Odisha, financial constraints appear to be more important. Inconvenience does not seem to be a key factor in any state: between 1 per cent and 2 per cent of households claim that distance to the shop and the time involved in going to the store dissuaded them from using the PDS. Thus the statistics from the IHDS suggest that improving the supply and quality of food grains provided through the PDS is key in increasing the benefit that households derive from the programme. This has important implications for the success of the NFSB, which aims to increase the value and reach of subsidies provided through the PDS. In order to increase the impact of the programme on the caloric intake of beneficiaries in all states, implementation of the programme needs to be improved. Kochar (2005) finds that the quality of service delivery was adversely affected after the PDS became targeted in 1997. Since the NFSB provides for a much wider coverage base and more stakeholders, there may be an improvement in delivery through an increase in the customer base of ration shops. The non-profitability of ration shops incentivizes shopkeepers to sell grains in the black market, which adversely affects the quality and quantity of grains provided to PDS beneficiaries (Planning Commission 2005). An increase in the customer base will help to improve the viability of these shops.

Conclusion

The PDS is a critical part of the Indian government's anti-poverty and food security programme. In Kaul (2013), I examine the impact of the rice subsidy programme on the nutritional status of beneficiary households and find that at the all-India level, the programme has a positive

and significant effect on caloric intake. The effect of the PDS is similar to an increase in income and it has a positive effect not just on cereal consumption, but also on calories from all food groups. In this paper, I study the programme in detail at the state level. I find that the impact of the programme on nutrition is much higher in the southern states as compared to the rest of the country. This is complementary to Khera's (2011b) work, which finds that the level of diversion of food grains is the lowest in these states. My analysis allows me to estimate the loss from corruption in caloric terms. The caloric impact of a Rs. 10 increase in the value of the subsidy ranges from 191 kcal/day in Kerala to not significantly different from zero in Assam and Jharkhand. Qualitatively, irregular supply and poor quality appear to be the main reasons why poor households are unable to benefit from the programme.

These state-level differences in the functioning and impact of the programme are particularly important, given the provisions of the NFSB, which proposes to expand the reach and value of subsidies provided through the PDS. The results from my paper suggest that the programme will have very different effects in different states and the efficacy of the bill in terms of improving caloric intake will critically depend on delivery mechanisms.

The role of the PDS as a safety net depends on the different mechanisms households have in place to cope with price risk and volatility. This is particularly relevant given the recent sharp rise in food inflation. Dutta and Ramaswami (2001) find that the pre targeted PDS was regressive in terms of utilisation. Thus, in order to better understand the impact of the programme, it will be useful to undertake an incidence analysis of the NFSB and study which households derive the maximum benefit.

Notes

- 1 As per population projections in 2000, the target population of the PDS was 65.2 million households (Government of India 2008). Estimates from the 2011–12 round of the NSSO suggest that 44.5 percent of the population currently participates in the PDS (*The Indian Express*, July 2013).
- 2 It is standard in the literature to focus on one of the staples – rice or wheat. I examine the impact of the rice subsidy here, a similar analysis can be undertaken for wheat.
- 3 Under the Antyodaya Anna Yojana, the poorest of poor families pay Rs. 2/kg for rice and Rs. 3/kg for wheat. Under the Annapoorna Yojana, destitute senior citizens are provided food grains free of cost.
- 4 For the sample of beneficiary households in this paper, PDS rice accounts for about one-fourth of total calories consumed.
- 5 See Kaul (2013) for a full description of state quotas for the years 2002–08.

- 6 One of the (many) possible reasons for the high levels of leakage from the system is the targeted nature of the program. Kochar (2005) argues that targeting reduces political support for the program. Targeting also reduces the consumer base of ration shops, which incentivizes owners to divert grains to the black market. Planning Commission (2005) finds that only 23 per cent of ration shops are financially viable.
- 7 This is in keeping with previous work on the PDS that imputes a value of the subsidy to every beneficiary household by multiplying the difference between market and PDS price with the amount purchased (Kochar 2005, Dutta and Ramaswami 2001).
- 8 I also perform a number of additional specification checks and robustness tests to confirm the validity of my main estimates. See Kaul (2013) for a more detailed discussions of the identification strategy, underlying sources of variation, and robustness checks.
- 9 The states in my sample are: Andhra Pradesh, Assam, Chhattisgarh, Jharkhand, Karnataka, Kerala, Orissa and West Bengal. I use data from the 58th, 59th, 60th, 61st, 62nd, 63rd and 64th NSSO rounds.
- 10 I use data from the mixed recall method for all rounds.
- 11 As a check, I estimate the impact using actual utilization instead of quotas and find the point estimates to be slightly smaller.
- 12 The new provisions under the NFSB will entail a large increase in the price discount but will leave the quotas unchanged, on average. At current prices, the estimated increase in the per kilogram subsidy will be from Rs. 13.5 to 16.5 (*The Financial Express*, September 2013).
- 13 The per capita caloric intake is corrected for household demographics: Each child (below age 15) gets a weight of 0.5.
- 14 In the analysis ahead, I control for the effect of any annual changes in the composition of PDS using households.
- 15 Household characteristics are education level of the head of the household and their spouse, a quadratic in the age of the head of the household, proportion of women, land owned and an urban dummy.
- 16 I check for interactions and do not find any evidence of a differential impact of the program on urban and SC/ST/OBC households.
- 17 This survey is jointly conducted by National Council of Applied Economic Research in Delhi and the University of Maryland (Desai et al. 2005).

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FROM THE FILES TO THE FIELDS

The story of paddy
procurement in Chhattisgarh

Biraj Patnaik and Dipa Sinha

Introduction

Chhattisgarh is often cited as a state that has successfully managed to turn around its public distribution system (PDS) from one with high leakages and low coverage to one with the lowest leakages in the country and massively expanded coverage. The state has put in place a number of reforms in the PDS which have been extensively written about and also credited with improving the efficiency of the PDS in the state (Ramaswami and Murugkar 2013; Himanshu and Sen 2011; Khera 2011a, 2011b; Drèze and Khera 2010; Patnaik 2010a). Chhattisgarh undertook similar reforms in procurement of paddy as well. This aspect of reforms in Chhattisgarh has been given less attention. This paper argues that a study of decentralised procurement and related reforms in Chhattisgarh is important for a fuller understanding of the success of the PDS reforms in the state.

The objective of this paper is to present a descriptive analysis of the reforms that the Chhattisgarh government undertook in relation to paddy procurement. Some outcome indicators such as increase in procurement, role of Chhattisgarh in contributing to procurement at the all India level, how public procurement is helping the PDS expansion in the state and implication on costs are briefly looked at. This analysis points towards many potential benefits and risks that extend beyond the PDS. While we raise these questions towards the end, further analysis is required to understand the impact of decentralised

procurement in Chhattisgarh on production, farmers' livelihoods and on market prices. Similarly this paper also does not address the question of the implications for the food economy if procurement to the same extent is carried out in other rice and wheat producing states.

The data that has been used in this paper are mainly from the website of the Food Corporation of India (FCI), Ministry of Food, Consumer Affairs and Public Distribution, Government of India (GoI). The data sources from Chhattisgarh include those made available by the Department of Food and Civil Supplies, State Food and Civil Supplies Corporation, and the Chhattisgarh State unit of National Informatics Centre (NIC).

Background to the reforms

The reforms in the PDS were initiated in 2005–06, with the move to de-privatise the entire network of PDS shops as more than half of the shops were being run by the private traders who were mostly from the local elite families. Informal surveys by the Right-to-Food campaign showed that up to 70 per cent of the foodgrains were being siphoned off by the private traders. This data was validated by extensive inspections by officials of the food department of the Chhattisgarh government who mapped the violations of the Supreme Court orders on the PDS in the right-to-food case. The state government then re-drafted the Public Distribution Control Order to incorporate de-privatisation and provide it legal legitimacy. The shops were handed over to village level public bodies including women's self-help groups, village level cooperatives and Panchayats. The private PDS dealers challenged the validity of the order in the High Court which ruled in favour of the state government. The case was subsequently dismissed when it went in for appeal in the Supreme Court.

Encouraged by the rulings, the state government invested in infrastructure, training and capacity building of local bodies to manage the PDS, while simultaneously strengthening the transparency and accountability mechanisms. The second phase of reforms focused on governance issues and combined it with the innovative use of information technology to improve the distribution and procurement simultaneously. This phase of reforms led to the creation of an online public database for the entitlement holders, issuing fresh ration cards which were validated by the local village councils, setting-up of a toll-free helpline for registering complaints, creating an online stock management system for milling and procurement and the 'end-to-end' computerisation of the entire procurement network.

Proof

A toll-free number was set up to receive grievances related to the PDS and protocols put in place for response to complaints. It is claimed that all these reforms contributed towards decreasing the leakages in PDS in Chhattisgarh. It has been proven based some field surveys and analysis of National Sample Surveys (NSS) data that during this period Chhattisgarh did see a tremendous decline in the leakages from PDS (Himanshu and Sen 2011; Khera 2011a, 2011b; Drèze and Khera 2010). However, the procurement side of the reforms have not been written about as much and these are equally important. These reforms were possible because of the political will and attention given to the PDS in the state. Even though Chhattisgarh's overall performance in terms of poverty reduction or pro-people policies during this period is nothing outstanding, as far as PDS is concerned the state has managed to make it a central political issue leading to major improvements in the way the scheme is delivered.

Procurement of foodgrains: the context

Procurement of foodgrains in India has a long and chequered history since the 1960s when the FCI and the institutional mechanisms for administering the Minimum Support Price (MSP) were set-up. Much of the procurement until recently was done by the FCI directly with the operations being supported by state food corporations and marketing agencies of the state governments. One of the factors that strongly influenced the decision on what the scale and coverage of the entitlements under the National Food Security Act (NFSA) should be was the requirement of foodgrains and the ability of the government to procure the same while keeping costs at a minimum and minimising distorting effects over the foodgrains market. For instance, the Rangarajan committee which was set up by the Prime Minister's office to review the recommendations of the NAC on the NFSA, argued that it was imprudent to procure more than 30 per cent of production as it would have the danger of distorting the food prices in the open market. A similar argument was also made by the Commission for Agricultural Costs and Prices (CACP) (Gulati et al. 2012).

On the other hand, the right-to-food campaign argued that an expansion in procurement based on a decentralised manner could not only increase procurement but also could be a way to incentivise production. Further expanded production from across the country could also save costs by decreasing the distance travelled by grain and therefore saving on transport costs. This could also enhance procurement

from small farmers assuring them of MSPs (RTFC 2012). The National Advisory Council (NAC) in its draft National Food Security Bill (NFSB) that was submitted to the government put in provisions for decentralised procurement including a clause which stated that, 'the appropriate government will open procurement centres within a radius of 10 kilometres wherever feasible and provide on spot payment to farmers' (Section 26(5), Draft NFSB, NAC 2011). The NAC also recommended a 'decentralized planning process and to procure, store and distribute food grain at local levels from district to panchayat, with a view to minimize transportation costs and losses and provide state governments with the appropriate facilities and incentives' (Section 26 (4)).

The current situation of procurement of foodgrains in the country is in complete contrast to these recommendations. Traditionally procurement has been concentrated in the Green Revolution belt of Punjab, Haryana, Western Uttar Pradesh and Andhra Pradesh. Looking at the data from 2000 onwards, it is seen that Punjab, Haryana, Uttar Pradesh and Andhra Pradesh contributed to about 85 per cent of the total rice and wheat procurement for the central pool. There has however been a declining trend in the contribution of these four states, especially since 2003–04 onwards with these four states now contributing to about 65 per cent of the total rice and wheat procurement for the central pool. In recent years, newer states have entered the procurement net such as Chhattisgarh and Odisha for rice and Madhya Pradesh for wheat. These three states along with the four traditional states mentioned above, currently contribute to about 90 per cent of the entire rice and wheat procurement for the central pool.¹ The contribution of these three states to total procurement is also showing an increasing trend, particularly after 2008–09. On the other hand, states such as West Bengal and Bihar which are surplus rice producing states, for instance, hardly contribute anything to central procurement. While there is an increase in their contribution to the central pool as well, it is not as much as the other three states mentioned above (see Figure 15.1).

Even the CACP (Gulati et al. 2012) recommends that procurement must be expanded to other states such as Madhya Pradesh, Bihar, Gujarat and so on. Doing so they argue would cut costs as foodgrains can then be delivered to neighbouring states rather than following the current system where procurement of foodgrains takes place in a handful of surplus states and distributed across the country. For this they say that there needs to be a ramping up of procurement efforts

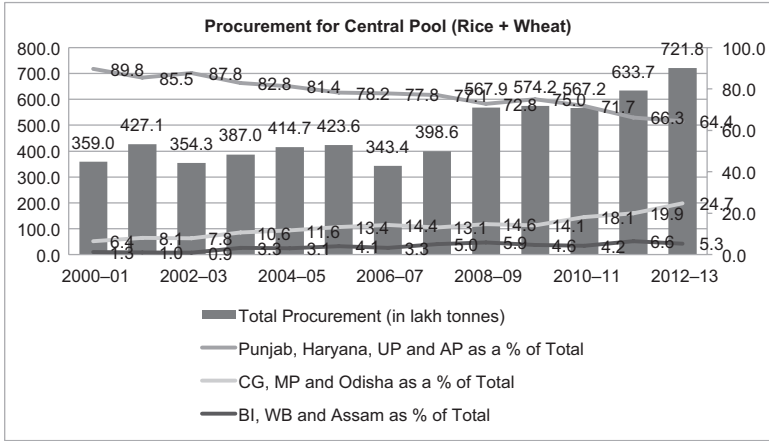


Figure 15.1 Procurement for central pool (rice + wheat)

Source: Food Corporation of India, fciweb.nic.in, Reports from various years

in emerging surplus or self-sufficient states in cereals, such as Uttar Pradesh, Bihar, West Bengal, Assam and Odisha. The gap identified by them is the shortage of *mandis* and procurement centres and storage facilities. The efforts towards a second Green Revolution in the eastern rice producing states also identify increasing public procurement as one of the main strategies (Singh 2012).

In this context where there is a call from different directions for expanding procurement to other states, understanding in details how states such as Chhattisgarh and Odisha managed to enhance their procurement can hold lessons for other rice and wheat producing states as well. In this paper we focus on Chhattisgarh as it has been the most impressive in terms of increase in procurement in recent years. Documenting Chhattisgarh's rice procurement story is also interesting because the state is well known for its reforms in the PDS and has been acknowledged to be one of the states with lowest leakages in recent times.

Decentralised Procurement Scheme (DCP)

The FCI is the nodal central agency of the GoI which undertakes procurement of paddy/rice, wheat and coarse cereals along with other state agencies. Before harvest during each crop season the FCI

announces the MSP based on the recommendations of CACP. The GoI sometimes gives a bonus above this MSP. States governments too can give a bonus on the MSP, so the price at which the farmer sells to the government is the MSP plus any bonuses given by the central and state governments. The grain is purchased through procurement centres established by state governments at various *mandis* and other places.

In the case of rice, there are two main routes of procurement – levy rice and custom milled rice (CMR). Levy rice is the rice that is procured from rice millers which is a fixed percentage of the total quantity of rice that is milled, at pre-determined rates (announced before harvesting taking into account MSP and milling costs). The levy is fixed state wise depending on the production and procurement requirements. On the other hand, CMR is the milling of paddy that is supplied by the Government (or by private agencies on behalf of the government) to the rice mills. In the case of CMR, paddy is procured from farmers thereby guaranteeing them the MSP and the government pays for the milling separately.

Procurement of levy rice necessarily implies millers buying paddy from farmers rather than government and typically prices paid by private trade for paddy procurement is far lower than the MSP. Second, levy rice is more open to manipulation because millers recycle the rice that is diverted from the PDS and supply it to the government as levy rice! The high level committee on long term grain policy report (2002) also recommended moving away from levy rice.

the Committee has reason to believe that the levy route is not helping most farmers in the present situation and is also being misused. Although some expert bodies have recommended the use of levy because this is a cheaper alternative for the FCI than custom-milling of paddy procured directly, we believe that there is a strong case for regular price support operations in paddy.

(GoI 2002)

It is seen that overall there is a trend of procurement moving away from levy rice to CMR. While levy rice contributed to more than 65 per cent of government procurement of rice until the early 1990s, it is now around 30 per cent (Gupta 2013). It is not our case that CMR is not amenable to corruption through recycling. However it is harder to tweak the system in case of CMR.

While all the levy rice directly goes to the FCI, procurement in the states is carried out either directly by the FCI or its state agencies. In 1997–98 the GoI introduced a Decentralised Procurement Scheme (DCP) to give state governments a larger role in procurement operations. Under DCP, the state stores and distributes the grain required under PDS and other welfare schemes and any excess stock is taken over by the FCI. Similarly if there is shortage in any state, this is replenished by the FCI. The GoI meets the expenditures incurred by the state government on procurement operations.

As part of the DCP, state governments receive a credit line from the RBI that is passed on to local banking institutions to cover procurement at the MSP plus statutory taxes. The amount that the state governments can draw on the credit line is negotiated each year based on the anticipated level of procurement. In cases when the RBI credit is not forthcoming or falls short, state governments also resort to short-term borrowings from commercial banks during the procurement season. To provide an incentive to farmers state governments often declare a bonus over and above the MSP given by the FCI. This cost is borne entirely by the state governments.

The DCP scheme is seen to have a number of advantages. Firstly it is expected to reduce costs of procurement, particularly on freight and minimise transport and storage losses in distribution in the PDS. It allows states a share in the revenues from levies and taxes and generates employment locally. DCP would enhance production and procurement, in the states that chose to be part of the scheme. It also gives an opportunity to expand the grains that are procured and meet local tastes and preferences (Table 15.1).

Thirteen states are currently part of the DCP. In 2012, FCI data shows that 23 per cent of wheat and 35 per cent of rice procurement for the central pool was from DCP states. Whilst DCP has many advantages over procurement by FCI, state governments did not take it on as enthusiastically initially. This was primarily because of limited capacities at the state level and an unfavourable policy environment, at the central level, that, till recently, did not provide the support that states needed for DCP. The most common complaint was the non-payment of dues by FCI/GoI that brought many of the state corporations to the verge of bankruptcy (Ramaswami and Murugkar 2013; Patnaik 2010b). With the recent clarity in roles of state and central agencies, DCP has picked up in 13 states for procurement of rice and wheat.

Chhattisgarh became part of the DCP in 2001 shortly after the state was created. In the first year six lakh quintals of paddy were procured

Table 15.1 States participating in DCP

S.N.	State/UT	DCP adopted for
1.	A&N Islands	Rice
2.	Bihar	Rice
3.	Chhattisgarh	Rice/wheat
4.	Gujarat	Wheat
5.	Karnataka	Rice
6.	Kerala	Rice
7.	M.P.	Rice/wheat
8.	Odisha	Rice
9.	Tamil Nadu	Rice
10.	Uttarakhand	Rice/wheat
11.	West Bengal	Rice/wheat
12.	Andhra Pradesh (10 districts) for KMS 2013–14	Rice
13.	Rajasthan (Alwar District) for RMS 2013–14	Wheat

Source: Ministry of Food, Consumer Affairs and Public Distribution, GoI, <http://dfpd.nic.in/?q=node/642>, accessed 5 March 2015.

in the state. For the first few years while it focussed on procurement, there were no other accompanying reforms initiated. In spite of this, by 2004 procurement increased five-fold, to almost 30 lakh quintals of paddy. But this increase also saw a corresponding increase in leakages and corruption that the institutional mechanisms in Chhattisgarh had not coped with before. It was these gaps that the Chhattisgarh government tried to address through its reforms in procurement. The expansion in the PDS by the state government through the Mukhyamantri Khadya Sahayta Yojana (MKSY) in 2007 was the other imperative for improving procurement.

Paddy procurement reforms in Chhattisgarh²

Most of the procurement in the country is through *mandis*, in the case of rice about 35 per cent of the rice procured is also from millers in the form of levy rice. For CMR, paddy is usually procured from *mandis* that are registered agricultural commodity markets registered under the APMC Act by FCI or state agencies. It is mandatory that purchases in *mandis* are made through registered traders popularly known as '*arhatiyas*' (with '*arhatiya*' commissions adding to the costs). This

system of procurement in most places keeps out small and marginal farmers because of the entry barriers to the mandis, the existence of the middle-men, delays in receiving payments and so on. There was also wide-spread collusion between the PDS dealers, mill owners and department officials that facilitated large scale leakages in the supply of levy rice to the state government from the mills. The recycling of rice had reached alarming proportions and the extent of the leakages became evident only after the first phase of reforms were completed, prompting the move to clean up procurement operations. Since the system was not computerised, the potential for the leakages remained very high. When Chhattisgarh undertook reforms in DCP, these were some of the issues that it tried to address.

The corruption in the distribution system in the PDS, linked to procurement issues has been the subject of ongoing litigation in both the High Court in Bilaspur (Chhattisgarh) and the Supreme Court in the PUCL vs. Union of India (CWP 196/2001) case (this case is popularly known as the Right-to-Food Case).³ There is formal acknowledgement of the corruption in the system in the affidavits filed by the State Government in the High Court in Bilaspur and the Supreme Court. A report by Justice Wadhwa, the Central Vigilance Commissioner, appointed by the Supreme Court to study leakages in the PDS also documents the leakages in Chhattisgarh's PDS before the computerisation and other reforms were put in place.⁴

Along with a spate of other reforms in the PDS, the Chhattisgarh government initiated reforms in procurement in 2007. The government of Chhattisgarh had started the first phase of reforms in the PDS that had primarily focussed on the distribution of commodities, and by 2004–05 it was clear to the state government that any reforms in distribution would not be able to comprehensively curb leakages until the procurement side was fixed.

Firstly, to overcome the problem of middlemen and break the nexus between mill owners and department officials, the state government decided to procure paddy directly from state-run farmer cooperative societies (known as PACS and LAMPS).⁵ No middlemen or commission agents are allowed. This was accompanied by reforms in the PDS where private dealers were removed. One of the first steps that the state government undertook as part of the reforms in the PDS was to initiate a process of de-privatisation. A new PDS control order was passed which stated that PDS dealership can be given only to cooperatives, Panchayat bodies and so on. This was a highly contested move, which went up to the High Court. After the High Court delivered a

judgement that supported the de-privatisation, the FPS dealers went all the way to the Supreme Court where the petition was disposed of, favouring the government's decision. However, the new PDS control order prevailed and the entire ration dealer network in the state was de-privatised. The main reasons given for this measure was that the system of giving ration shops to private dealers was a source of patronage and it was the collusion between the dealers and the officials that led to a large part of the leakages in PDS. Further, giving the ownership of ration shops to community groups it was felt would enhance community participation and accountability could be ensured. For similar reasons the procurement operations were also de-privatised.

Secondly, the number of procurement centres was also expanded massively. The absence of adequate procurement centres is identified as one of the reasons for low procurement in many states which are rice producing. For example, a CACP report finds that states like Assam, West Bengal and Jharkhand continue to have very low procurement because they do not have enough procurement centres. The report mentions that FCI reportedly opened only twelve procurement centres in Assam during procurement season in 2011, which was grossly inadequate to meet the requirements. The way to cover more farmers to have more centres (CACP 2012). Chhattisgarh procures from through the cooperative societies wherever they are present. Currently there are over 1,900 procurement centres in the state and it is estimated that no farmer has to travel more than 10 kms to sell his/her paddy produce (data from GoC).

A further problem that was faced by small farmers in selling their grains to the government was the delay in payments. The choice of getting a very late payment or that of less remunerative price by a quicker response at the *mandi* by selling to middlemen was a Hobson's choice for the farmers of Chhattisgarh. To address this, a system of spot payment of cheques was put in place. The farmers bring their paddy to the procurement centre, which is then weighed by electronic weighing machines. The officials also have an estimate of the average yield in the area and the area being cultivated by each farmer who is a member of the cooperative society. They cross verify the quantity being sold by the farmer to ensure that they are genuinely selling their own produce and not bringing in paddy from other areas to get a higher price here. Once the verification is complete and the data entered onto the computer, a cheque is automatically generated.

While computerisation was essential to ensure spot payment of cheques to farmers, it was also made online to allow for real time

monitoring to the extent possible. This was a challenge given the fact that close to a fifth of the procurement centres were in remote locations without connectivity. To overcome this problem 250 motorcycle riders were deployed who would transfer data between different points to ensure that it was as close to real time data as possible. Because of the end-to-end computerisation in the procurement system, it also became difficult to manipulate the documents allowing for leakages.

The overall thrust of the computerisation was to eliminate discretion of local officials in handing out contracts for milling of paddy to rice. Computerisation was central to addressing the problem of late payments to farmers on one side and streamlining the milling operations – both for the levy and the CMR. The module that was developed by NIC ensured that paddy was automatically allocated for despatch to mills that were geographically the closest. In addition to removing corruption, it also helped bring down costs of transportation because of the rationalisation of the distances. The ‘challans’ that were earlier issued physically by the food department were now delivered online, reducing even further the discretionary powers of department officials and thereby the scope for any leakages.

The computerisation of the procurement operations in Chhattisgarh represent a complete business process re-engineering that has been designed to optimise the system at every step and reduce leakages and losses linked to procurement. For instance, ensuring that the turnover from paddy to rice is done in the shortest possible time ensures that losses due to storage and moisture content is minimised. A quick turnaround in CMR operations also ensures that the state government is able to hand over the milled rice to FCI within the shortest possible time and thereby make the claims for dues, without accruing any additional interest burden.

Transportation to and from the point of milling and additional checks and balances at each stage ensures that millers are not able to replace Grade A rice with common rice or exceed the allowed percentage of broken rice per quintal, as was the practise earlier. The business process re-engineering that has been triggered by the computerisation of operations has also resulted in greater accountability and transparency, not just in the public domain but across levels, within the administration. It is now possible for instance, for officials and the political executive, to closely track procurement from every single procurement centre on an (almost) real time basis. This can be done by anyone from the general public as well. As mentioned earlier, even though a fifth of the centres do not have connectivity, motorcycle ‘runners’ travel each day to update the procurement data.

System of paddy procurement in Chhattisgarh DCP in Chhattisgarh: outcomes

The efforts of Chhattisgarh government in reforming the paddy procurement mechanism can be expected to have had multiple effects. There has been an increase in procurement of paddy in the state and this has not only added to the central pool but also has made it possible for the state to expand its own PDS substantively. The procurement reforms in the state could also be expected to have contributed to increases in production of paddy, access to better prices for small and marginal farmers, increase in cereal consumption by households, decline in leakages in procurement operations and so on. Due to limitations of data and the scope of this paper, it is not possible to conclusively estimate the impact of decentralised procurement of paddy on these aspects presently. In the section that follows, we present the basic data on some of the output indicators which can clearly be attributed to procurement efforts of the state. For the wider impact in the state of increase in public procurement by such a large extent needs further research.

Increase in procurement

The direct result of the reforms and the focus on DCP in Chhattisgarh is reflected in the increase in the procurement of paddy in the state. Compared to 2000–01, the procurement of paddy in Chhattisgarh in 2012–13 is more than 10 times. While about 6 lakh tonnes of paddy was procured in the state in 2000–01, in 2012–13 the procurement went up to over 71 lakh tonnes (Figure 15.2). The preliminary estimates for 2013–14 show that the procurement has further increased to 79 lakh tonnes.

If we consider the share of Chhattisgarh in the total paddy procurement rather than rice procurement in the country, we see that it is in second position with currently about 20 per cent of all paddy procurement in the country being from the state (Figure 15.3). This is a more valid indicator to look at because the data on paddy procurement does not include levy rice. Levy rice depends on FCI operations and not state government policy. Therefore, the reforms in Chhattisgarh would be more reflected in paddy procurement. Further as explained above, this also shows whether the benefits of MSP are going directly to the farmers or the millers. In AP for instance, most of the procurement is from the millers. Even though AP is the second largest contributor to rice procurement in the country, only 15 per cent of this is from farmers in the form

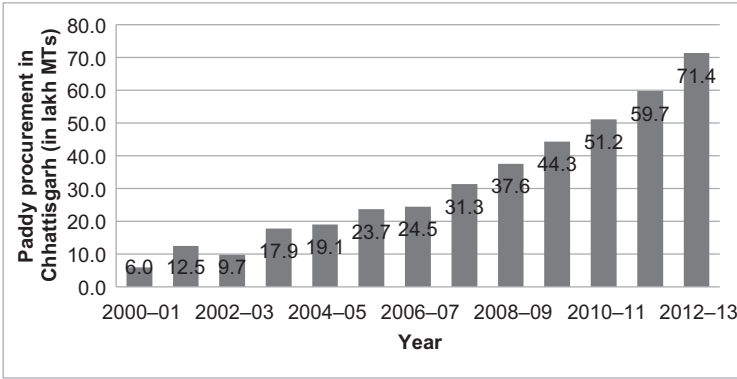


Figure 15.2 Paddy procurement in Chhattisgarh (in Lakh MTs)

Source: Government of Chhattisgarh

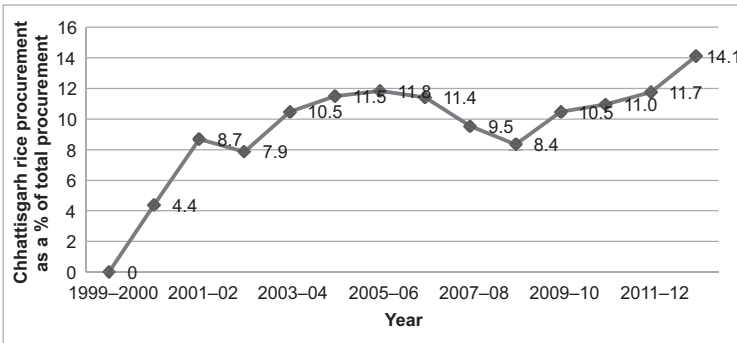


Figure 15.3 Rice procurement in Chhattisgarh as a proportion of total procurement (all India)

Source: Compiled from Food Corporation of India (fciweb.nic.in)

of paddy in 2012–13. On the other hand, in Chhattisgarh in the year 2012–13 contributed about 48 lakh tonnes the rice central pool of which over 47 lakh tonnes were procured as paddy from farmers. In Punjab too the proportion of levy rice procured is very small (Figure 15.4).

Chhattisgarh is also one of the states where the highest proportion of production is procured as seen in Figure 15.5 is very high. The implications of procuring over two thirds of the produce needs to be studied further.

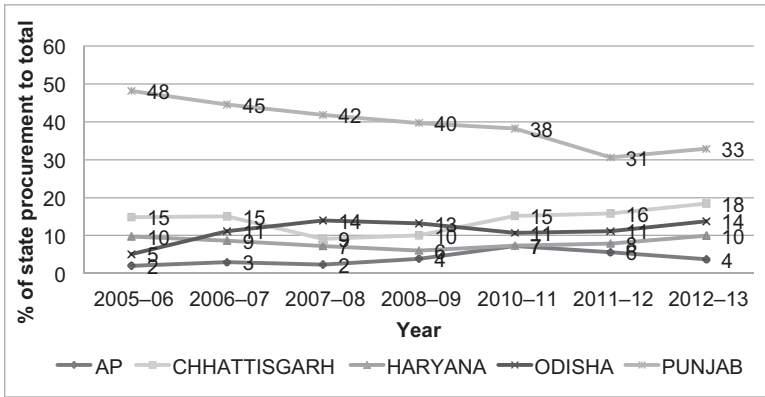


Figure 15.4 Paddy procurement as a proportion of total procurement – selected states

Source: Food Corporation of India (fciweb.nic.in)

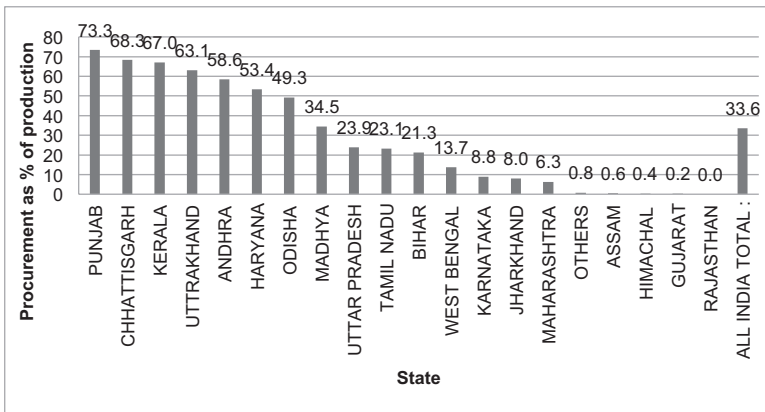


Figure 15.5 Procurement as a percent of production (2011-12) (rice)

Source: <http://www.pib.nic.in/newsite/backgrounders.aspx?reid=91453> (accessed 3 March 2015).

Expansion in state PDS

With the introduction of MKSY in 2007, the number of Below Poverty Line (BPL) cardholders in the state was increased by 30 per cent. The state has managed to meet additional foodgrains required, over and above what was allocated to the state from its own procurement. For

the PDS, states use grain allocated to them by the central government at Central Issue Prices (CIP). The Central Issue Prices (CIP) is different for the Antodaya Anna Yojana (AAY), BPL and Above Poverty Line (APL) categories. The quantum of grain allocated under the AAY and BPL categories was done on the basis of the total population in the state and the proportion of population in the state that was below the poverty line based on the official poverty ratios of 1993–94 and population for 2001 (this has now changed from this year onwards because of the NFSA). The APL grain used to be allocated randomly to meet the needs of the rest of the population.

In the early 2000s because of the small price differential between APL prices and market prices the offtake of foodgrains from the APL quotas was very low in most states (except for Southern states which had already expanded their BPL coverage under PDS that was greater than set by poverty ratios). To account for this the central government in 2006 decided to restrict the allocation of grains under the APL category to the average offtake by the state in the previous three years. As a result, states such as Chhattisgarh which were relatively ‘late reformers’ as far as PDS is concerned could not take advantage of the APL quotas available from GoI to expand their own BPL coverage. So even if the state government was willing to pay APL prices for additional grains under the new rules of the Ministry of Food and Consumer Affairs it was not possible for them to get an allocation from the central pool. The Chhattisgarh government decided to use a portion of its DCP procurement for its PDS needs.

Most of the other states, such as Madhya Pradesh, Odisha and Rajasthan (also relatively ‘late reformers’), that have expanded BPL coverage manage to meet some of their additional grain requirements for PDS by lowering the quantity of foodgrains given per household per month and also lowering the entitlements of the non-BPL population. They are able to offset some of their fiscal burden by only having to meet the cost difference between the APL prices (which are now substantially lower the market prices) and the BPL issue prices. Andhra Pradesh and Tamil Nadu also have lower per household entitlements. Tamil Nadu, which has a universal PDS, also procures additional foodgrains from the open market.

As can be seen in Figure 15.6, in 2007–08 and 2008–09 the contribution of central pool allocations to Chhattisgarh’s PDS was around 52 per cent. In the following two years (2009–10 and 2010–11), this increased to 65 per cent and 73 per cent, respectively. The increase was not because of enhanced allocations by the central government but because of reduced outgo in the PDS in the state. This was because of an exercise carried out by the state government to weed out duplicate and/or bogus ration cards

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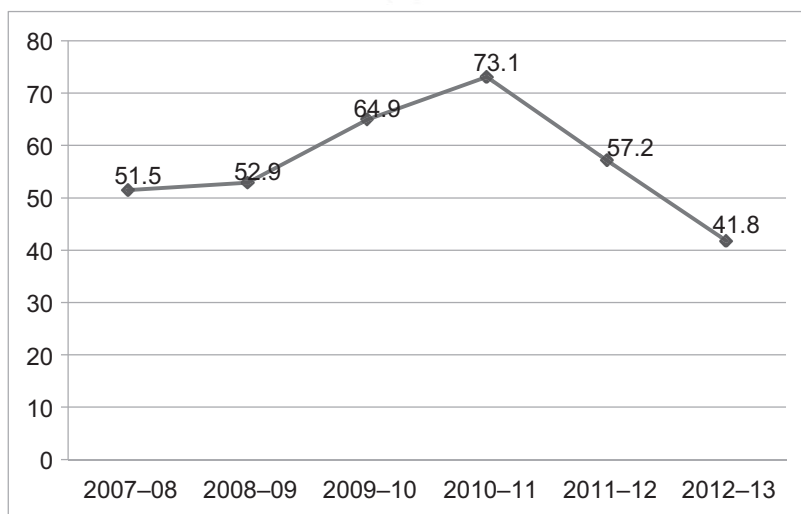


Figure 15.6 Proportion of PDS requirement being met by central allocations
 Source: Computed from data from state government (for total grain distributed) and PDS offtake data from Foodgrain Bulletins, Government of India

as a result of which the ration cards of almost five lakh households were cancelled.⁶ After this a fresh process of issuing ration cards was started to ensure that all those who are left out are included. Further expansion has been ongoing since the passage of the Chhattisgarh Food Security Act (CFSA), 2012. This is reflected in the data where the contribution of the central pool to Chhattisgarh's PDS fell from 73 per cent in 2010-11 to 57 per cent in 2011-12 and further to 42 per cent in 2012-13.

While reforms in PDS in Chhattisgarh started from 2004 onwards, the state has also passed the CFSA in 2012 – even before the central legislation (National Food Security Act 2013). The entitlements under the CFSA have a wider coverage, provide higher quantities of foodgrains and at lower prices. While the NFSA covers about 67 per cent of the population, the CFSA promises subsidised foodgrains to 90 per cent of the population who have been divided into General, Priority and AAY categories. Under the CFSA, those in the Priority and AAY categories are given 35kgs of rice per household per month at Rs. 2 and 1, respectively. This covers 75 per cent of the population. The rest 15 per cent who are covered under the General category get 15 kgs of rice per month at a higher price, but a price that is still less than half the MSP.

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The NFSA on the other hand provides 5kgs of foodgrains per person per month for those in the Priority category and 35kgs per household per month for those in the AAY category. The price of rice is Rs. 3 per kg for both categories. Further, under the CFSA, Priority and AAY households are also given 2 kgs each of iodised salt, pulses and chana at subsidised rates (GoC 2012; GoI 2013).

The allocation of foodgrains for Chhattisgarh under the NFSA is 12.91 lakh⁷ tonnes (Schedule IV, NFSA, GoI 2013). Based on Census 2011 data there are about 56.3 lakh households in the state. To meet the CFSA requirements, the state would need to distribute 19.2 lakh tonnes of foodgrains (based on entitlements given in the previous paragraph for 90 per cent of the population). Even before the CFSA, the coverage of BPL population under MKSY was much higher than what was centrally identified as BPL proportion of the state. While the GoI estimated 18.75 lakh households as being BPL and AAY in the state, under the MKSY the state covered 36.5 lakh households (65 per cent of the population). Therefore the state needs more foodgrains for its PDS than is allocated by the GoI (Figure 15.7). It is in this context that the state's own procurement becomes important for the PDS in the state (Table 15.2).

With the introduction of the CFSA, the rice distributed under PDS in the state has seen a tremendous rise. In one year between 2011–12 and 2012–13, there has been an increase in the distribution of rice in the state by more than 30 per cent.

What is to be noted here is that having a decentralised procurement, allows Chhattisgarh the leeway to expand its PDS operations in a way

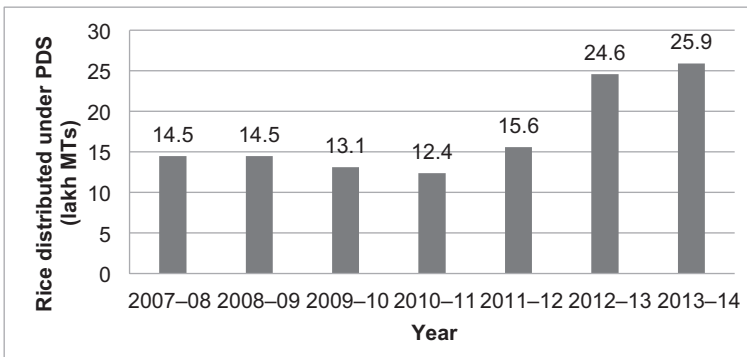


Figure 15.7 Quantity of rice distributed under PDS (Chhattisgarh) (in lakh MTs)

Source: Government of Chhattisgarh

Table 15.2 Entitlements under the NFSA and CFSA

	<i>National Food Security Act</i>	<i>Chhattisgarh Food Security Act</i>
Public distribution system: coverage	Priority: 75% rural and 50% urban Excluded: 25% rural and 50% urban (33% overall)	Priority: 75% across the state General: 15 % across the state Excluded: 10%
Public distribution system: entitlements	Priority: 5 kg foodgrains/ person/month for every person covered under the PDS Antodaya: 35kgs/ household/month (those who currently have Antodaya cards) Foodgrains include rice, wheat and coarse cereals. Rice @ Rs. 3/kg Wheat @ Rs. 2/kg Coarse cereals @ Rs. 1/kg	Priority households: 35 kg foodgrain at Rs. 2/kg 2 kg pulses at Rs. 10/kg (in non-scheduled areas) 2 kg chana at Rs. 5/kg (in scheduled areas) 2 kg iodised salt (free) Antyodaya households: 35 kg foodgrain at Re 1/kg 2 kg pulses at Re 10/kg (in non-scheduled areas) 2 kg chana at Rs. 5/kg (in Scheduled areas) 2 kg iodised salt (free) General households: 15 kg foodgrain at Rs. 9.50/kg for rice and Rs. 7.50/kg for wheat

that would not have been possible if it was dependant on the FCI for additional stocks. Second, it is possible for the state government to ensure quality norms and to fix accountability better in case these norms are not met, as compared to a situation where they would be procuring from FCI. Lastly, it allows for a seamless integration between the distribution operations and the procurement by allowing the most-cost effective choices for milling, distribution and storage logistics.

Costs of procurement

One of the criticisms of public procurement by the FCI that it is highly inefficient as the economic cost is very high. The economic cost of rice or wheat is the total cost to the FCI to procure grain, process it, storage and transportation up to local godowns. The economic cost is comprised of the acquisition cost and the distribution cost. The acquisition cost is the cost of the foodgrains plus procurement incidentals (milling, transporting etc.) The difference between the economic cost and the issue price is the subsidy burden of the government.

Gulati et al. (2012) state that the economic cost of FCI for acquiring, storing and distributing foodgrains is about 40 per cent more than the procurement price. A simple calculation of the same for Chhattisgarh (taking the average for the five-year period 2007–08 to 2012–13) shows these costs in the state are 20 per cent more than the procurement price. Our estimate for FCI for the same period is 39 per cent. This initial calculation suggests that Chhattisgarh's procurement reforms have contributed to 'efficiency' in procurement operations. This is an area that requires further detailed work.

Contribution to livelihoods/employment

While we cannot estimate the additional contribution to livelihood for farmers because of the expanded procurement in the state, there is some data on how many farmers the procurement operations have reached out to. In 2013–14 more than 11 lakh farmers sold paddy under the procurement scheme. The number of farmers reached out to has been increasing since the inception of programme from 7.6 lakh farmers in 2007–08. The paddy procurement exercise also provides employment to 1.25 lakh people at the 1,421 rice mills that are now operational throughout the state. Employment during procurement season is also provided to 3,000 transporters and 20,000 daily wage labourers who work as head loaders for six months in a year (Figure 15.8).

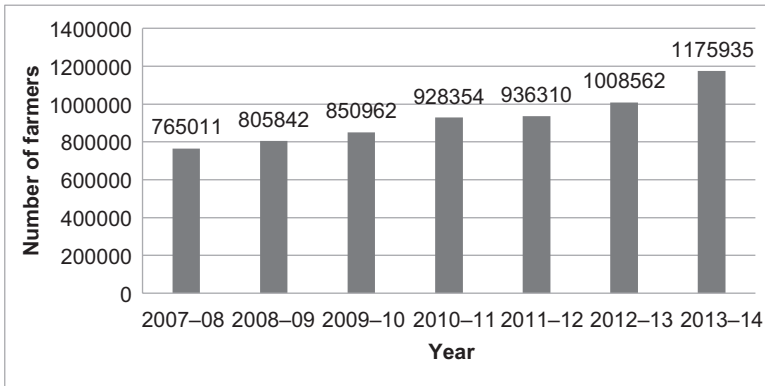


Figure 15.8 Number of farmers who sold their paddy under PSS (2007–08 to 2013–14)

Source: Government of Chhattisgarh

Proof Conclusion

PDS has been one of the central political agendas of Chhattisgarh since 2004 onwards. While the reforms in PDS in the state are much talked about, in this paper we show that these have been accompanied by equally extensive reforms in procurement as well. The combined efforts in improving procurement and distribution in the state have contributed to a PDS with low leakages and wide coverage. The experience of Chhattisgarh shows that PDS reform is not only about the distribution side, it is about procurement too and that distribution reforms can be strengthened if accompanied by reforms in procurement as well.

The procurement reforms in Chhattisgarh were designed to overcome the middleman problem, expand procurement centres, improve payment times, computerisation to facilitate transactions and increase transparency. The reforms improved the procurement volumes from within the state, gave the state a stake in reducing diversion and lowering costs, and increased the number of small farmers participating in procurement. The procurement reforms in Chhattisgarh are important not only for the transparency systems put in place in the form of real time monitoring through computerisation but also for the nature of procurement where they are able to reach to a large part of the state through the cooperative societies.

However it is also clear that there needs to be further studies on the impact of the procurement reforms in Chhattisgarh. While it is clear that the reforms in procurement have allowed Chhattisgarh to continue giving 35 kgs per household per month when other states that have expanded coverage have not been able to do the same (because they did not undertake procurement reforms and/or their production was not sufficient), there is no data to analyse what the impact has been on farmers, whether truly small and marginal farmers have been reached out to, what the related poverty and livelihood outcomes have been and so on. There are stated benefits such as providing MSP to a large number of farmers and incentivising rice production, which need to be backed by field evidence.

The procurement efforts in Chhattisgarh also raises some concerns related to fiscal profligacy, farmers being over-incentivised to produce rice to the detriment of other crops, giving high bonuses on MSP for electoral gains, the damage to the environment due to excessive water use and so on. These and other issues raised in this paper need further research.

What the Chhattisgarh experience does show conclusively is that there can be a re-imagining of procurement operations where the small

farmer is central to it. It also shows how the commitment of the leadership at the highest levels (both political and bureaucratic) to reform the PDS has led to the institution of robust local governance systems. The PDS reforms were personally overseen by the Chief Minister and a message given that no leniency would be shown by the state government towards anyone, however well connected they were with the ruling establishment, if they were charged with siphoning off of food grains. What is significant is that the political party in power chose to make the PDS reforms as their main electoral plank in both the state as well as national elections, with the Chief Minister being known as 'Chawal wale baba' (the provider of rice) in large parts of rural Chhattisgarh. The results in the elections in 2009, which were comfortably won by the BJP, emboldened them to deepen the reforms and to ensure continuity in their policy of zero-tolerance against corruption in the PDS.

The question that remains unanswered is why Chhattisgarh did not extend these lessons to other spheres of governance, which remained as bad, or as many commentators would note, actually worsened under the ten years of BJP rule. Further, the Chhattisgarh state can also neither be characterised as being 'pro-poor' or 'clean' and 'anti-corruption' as this was also the period that saw state complicity on the corruption in allocation of coal blocks, decisions favouring industrial lobbies which resulted in large scale tribal land alienation and the escalation of violence against local tribal communities, in the anti-Maoist operations, where for the first time a local militia supported by the State was pitted against fellow community members. In our view, the overall model of governance in Chhattisgarh was perhaps based on the premise that if essential services were delivered well in a few core sectors, the political elite could go about with impunity in a range of other sectors of the economy, and even deepen rent-seeking. An interesting area for further enquiry is why these reforms are not being extended to other departments or programmes in a similar way, especially given that the basic technological platforms for grievance redressal and accountability can easily be extended to other programmes as well.

Notes

- 1 Figures in this paragraph are based on estimates from procurement data available at <http://fciweb.nic.in>.
- 2 For details on the reforms see One World Foundation of India (2011), Garg (2013). A number of PowerPoint presentations prepared by the Government of Chhattisgarh have also been consulted.

- 3 One of the authors of this paper (Biraj Patnaik) was the Adviser to the Commissioners in the Supreme Court in the right to food case during the period 2003–06, when a large number of reforms were undertaken. He was part of many investigations into reports of corruption in the PDS in Chhattisgarh and closely involved in the drafting of key reform documents. The references to corruption in the procurement and PDS in the state made in this paper are based on this experience.
- 4 This report is available at <http://pdscvc.nic.in/> (accessed 3 March 2015).
- 5 Primary Agricultural Credit Societies (PACS) and Large Area Multi-Purpose Societies (LAMPS).
- 6 A study by the Advisor to the Commissioners of the Supreme Court in the state showed that in this process of weeding out bogus cards the cards of many genuine households were also cancelled. Following this the government re-verified all households and many cards were restored.
- 7 1 lakh = 100,000.

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