

## Review Article

# Poverty and the state of nutrition in India

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India is often thought of as a development paradox with relatively high economic growth rates in the past few years, but with lower progress in areas of life expectancy, education and standard of living. While serious inequalities in growth, development and opportunity explain the illusion of the paradox at the country level, still, a significant proportion of the world's poor live in India, as do a significant proportion of the world's malnourished children. Poverty and undernutrition coexist, and poor dietary quality is associated with poor childhood growth, as well as significant micronutrient deficiencies. Food security is particularly vulnerable to changes in the economic scenario and to inequities in wealth distribution. Migration from rural to urban settings with a large informal employment sector also ensures that migrants continue to live in food insecure situations. While food production has for the most part kept pace with the increasing population, it has been with regard to cereal rather than of pulses and millet production. Oil seeds, sugar cane and horticultural crops, along with non-food crops are also being promoted, which do not address nutrition security, and, coupled with the increase in the consumption of pre-prepared food, may indeed predispose towards the double burden of malnutrition. Access to food is also particularly susceptible to poverty and inequality. Many strategies and policies have been proposed to counter undernutrition in India, but their implementation has not been uniform, and it is still too early to assess their lasting impact at scale.

**Key Words:** poverty, food security, undernutrition, India, agriculture

## INTRODUCTION

India is the third largest economy in the world in purchasing power parity (PPP) terms and has been one of the world's best performing economies for over a quarter century.<sup>1</sup> Its GDP grew by 6.2% between 1980 and 2010 compared to a global rate of 3.3%. The economic reforms undertaken in 1992 coupled with a focus on development of national infrastructure have resulted in high growth rates; over 8% annually during most years of the past decade and, due to reliance more on domestic consumption, the economy has remained comparatively stable despite the recent global slowdown.<sup>2</sup> Unemployment rates have fallen and its GDP per capita (PPP), at US\$ 3,652 in 2011, has more than tripled since the 1980's.<sup>3</sup>

Yet India is thought of as a development paradox; progress in areas of life expectancy, education and standard of living has been slow and it is ranked 134 among 187 countries on the human development index.<sup>4</sup> Over a third of the world's poor live in India, as do over a third of the world's malnourished children; 43 and 48 % of <5 year children are underweight or stunted due to chronic undernutrition.<sup>5</sup> Indeed childhood stunting predicts poor human capital including shorter adult height, lower attained schooling and reduced adult income.<sup>6</sup> Anaemia prevalence in young children continues to remain over 70% in most parts of India.<sup>7</sup> Some 40 % of low birth weight (LBW) babies in the developing world are in India.<sup>8</sup>

The Global Hunger Index (GHI) ranks India 15<sup>th</sup>, in the league of sub-Saharan African nations. From an extremely alarming situation (GHI  $\geq$ 30) in the early 1990s,

though India managed to move over to the next lower stratum (alarming, with GHI between 20 and 29.9) early in 1996, progress thenceforth has been somewhat slow, especially when compared with similar emerging economies such as Brazil or China, or neighbours such as Sri Lanka and Bangladesh.<sup>9</sup> Equally, there is an increasing burden of overweight, particularly in urban areas that have seen and reaped the benefits of economic growth. This review will explore poverty and its association with food insecurity and some of its dimensions in India.

## POVERTY IN INDIA

Poverty cannot be solely defined on economic terms, yet, an income-based definition remains the most pragmatic choice for studying poverty and is often the sole criterion used to identify potential beneficiaries of poverty alleviation programmes.<sup>10</sup> World Bank estimates of extreme poverty in 2010 were that over 32.7% of the Indian population lived on less than \$1.25 a day, down from more than 50% in 1994.<sup>11</sup> Poverty is projected to fall further to 22.5% in 2015, thereby making India the only nation in South Asia that would have achieved the Millennium

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Development Goal of halving extreme poverty.<sup>12</sup> However, a multidimensional approach to measurement of poverty, based on 10 indicators from education, health and standard of living had yielded a much higher estimate of 53.7% for 2005-06, while another 16.4% of the population were considered as being vulnerable to poverty.<sup>13</sup>

The official poverty line in India was based on the amount needed to buy a certain basket of goods and services, anchored around a minimum number of calories per day, set at 2400 for rural and 2100 for urban Indians in 1979.<sup>14</sup> In 2009, the Tendulkar committee suggested a move away from the calorie norm and use of normative food expenditures that ensured aggregate nutritional outcomes instead, as well as inclusion of spending on education and health and abolition of different consumption baskets for urban and rural areas.<sup>15</sup> The poverty lines thus derived permit daily energy intake of only about 1800 kcal/day, closer to the minimum dietary energy requirement set by FAO,<sup>16</sup> as an aggregate for all ages and activity levels for the purpose of estimation of undernourishment in the population; it is unlikely to allow for a productive daily existence. Nevertheless, the new definition revised the number of poor from 27.2% to 37.2% of the population (41.8% rural and 25.7% urban) for the year 2004-05.<sup>15</sup> The latest estimate of population below poverty line (BPL), for 2009-10 is 29.8%, or about 350 million, derived using a monthly consumption cut-off of Rs 859.6 (US \$16.2) in urban and Rs 672.8 (US \$12.7) in rural areas;<sup>17</sup> which could be criticized as being unreasonably low.

While actual numbers may be controversial, a declining trend is clearly evident, although the magnitude of fall in poverty can be disputed. The proportion living below the poverty line dropped by 7.3% between 2004-2005 and 2009-2010, with rural poverty declining more (8%) than urban (4.8%).<sup>17</sup> Such change may still be considered only modest compared to achievements of countries such as Brazil, China and Indonesia and may only reflect movement from extreme poverty to a less unpleasant level for most individuals; yet it is a positive step ahead.

Persistent poverty in spite of two decades of high economic growth indicates a skewed distribution and concentration of incomes. Even in 1993, India's Gini coefficient of 0.33 was higher than that of developed nations, such as those of the OECD group. However, it increased to over 0.375 in 2008, a trend also noted in China.<sup>18</sup> Estimates based on surveys conducted by National Council of Applied Economic Research (NCAER) reflect this growing inequality; real household consumption increased by around 3% in the top-most quintile of consumption and by less than 1% in the lowest quintile during this period.<sup>19</sup> Such unequal growth also has geographic, class and caste dimensions. Based on 2009-10 estimates, India's heartland states each had close to 40% or more of their population living BPL, with Bihar and Uttar Pradesh alone accounting for over 36% of the total poor in the country. Over one-third of the rural Indian population was BPL, while the corresponding proportion in urban areas was just over 20%. Poverty among socially disadvantaged groups such as scheduled castes (47% rural and 34% urban) and scheduled tribes (42% rural and 30% urban) was much higher than other groups. Further, poverty was

highest among agricultural labourers in rural areas (50%) and casual labourers in urban areas (47%).<sup>17</sup>

The reasons for poverty and growing inequality in the background of high economic growth and decreasing unemployment levels are many. While overall levels may be low, employment opportunities as measured by the worker population ratio have reduced by 5% for the poorest, but increased by 3% for the richest over the last decade.<sup>3</sup> Further, over 93% of the work force is still employed in the informal sector,<sup>20</sup> which is characterized by seasonality of work, geographic and gender differentials in access, and a lack of adherence to minimum wages and access to social security benefits, leading ultimately to underemployment and low wages. This preponderance of self-employment and informal sector has in turn been linked to the slow transition in the labour markets.

While the share of agriculture and allied sectors to GDP had fallen to less than 15% in 2011-12, over 50% of the work force was still principally employed in these sectors.<sup>21</sup> Rising costs of inputs, decreasing institutional financial support and largely stagnant crop yields have led to a fall in incomes from agriculture.<sup>22</sup> The agrarian crisis also has spillover effects as the rural poor migrate to urban areas in search of better livelihoods. While migration to urban areas promises improved economic status, only the rural educated middle class easily attains this.<sup>23</sup> Low levels of education, lack of employable skills and inadequate government attention to job creation in the organized sector ensure that the rural poor settle in low level jobs in the unorganized sector and thus continue to face insurmountable odds to overcome poverty.

## POVERTY AND NUTRITIONAL STATUS

The inter-relationships between poverty and nutrition are well known; poverty restricts access to food required to meet daily requirements or ensure dietary diversity and thus leads to malnutrition, while malnutrition can adversely affect educational and economic attainments, thus perpetuating poverty. Therefore, in the existing scenario of unequal growth and poverty, it is not surprising that the burden of malnutrition in India remains high; there is therefore no surprising paradox in the coexistence of relatively high aggregated growth rates and high rates of malnutrition. Periodic monitoring of the nutritional status of the population is vital to measure the impact of strategies to improve nutrition as well as economic growth, but the latest nationally representative data for India on nutritional status is at least seven years old, collected during the National Family Health Survey (NFHS) 3 in 2005-06;<sup>24</sup> any gains made in the recent years may not be clearly evident.

The proportion of babies born with LBW/intra-uterine growth retardation (IUGR), which is reflective of a life term of malnutrition in general and malnutrition during pregnancy in particular is estimated to be 28%,<sup>25</sup> and together with prematurity, accounts for one third of deaths in the neonatal period.<sup>26</sup> The decline from around 35% in the 1960s to the present levels has been seriously slow. Socioeconomic differentials are obvious; the prevalence of low birth weight among newborns with reported birth weight in NFHS 3 was 21.5%; babies born in households in the lowest two quintiles of wealth index had an in-

creased risk of being LBW (OR: 1.6, 95% CI: 1.5-1.8) in comparison to those in the top quintile. Women with 0 or <5 years of education had a 70% higher risk of LBW, compared to women with  $\geq 10$  years of education.<sup>24</sup>

Malnutrition is estimated to play a role in 57% of under-five deaths in the country.<sup>27</sup> Around 50% of under five children in India were stunted in 2005-06 (NFHS 3), reflecting chronic undernutrition, while the proportion underweight (43%) is almost double that observed in sub-Saharan Africa.<sup>24</sup> However, much of the problem of child malnutrition has become somewhat invisible, given that severe cases of acute malnutrition such as kwashiorkor and marasmus have become very rare. A comparison with data from the NFHS 2 (conducted in 1998) underscores the slow progress in combating child undernutrition. Prevalence of stunting and underweight decreased by 6% and 3% respectively, while wasting increased by 3%.<sup>28</sup> A recent survey that covered children predominantly from 100 districts in six high-focus states in 2011 found over 58% of children to be stunted and 11% to be wasted; child underweight had fallen from 53% in 2002-03 to 42%.<sup>29</sup> The prevalence of child undernutrition is higher in rural areas, poor households and children born to mothers with low education. In the NFHS 3 sample, the prevalence of stunting, underweight and wasting in rural areas was higher than that in urban areas, by 11.1%, 12.9% and 3.8% respectively. Children born to mothers with no or <5 years of education were at higher odds for stunting (OR: 3.5, 95% CI: 3.3-3.7), wasting (OR: 1.9, 95% CI: 1.7-2.0), and underweight (OR: 3.7, 95% CI: 3.5-3.9). The highest odds for undernutrition were in households falling in the poorest and poorer quintiles of the wealth index.

Nationally representative data on nutritional status of school-aged children and adolescents is not available in India. However, surveys conducted by the National Nutrition Monitoring Bureau (NNMB) in rural parts of 9 large states in 2006 indicate that stunting and underweight are widespread even among these age groups. About 30% of 6-9 year old children were stunted and this increased to 34.2% and 36.2% respectively among 10-13 and 14-17 year olds. About 57% of 10-13 year old children and 30% of 14-17 year old children were underweight.<sup>30</sup>

More than 35% of women in the age group 15-49 and 34% of men aged 15-54 sampled in NFHS 3 were underweight. Among ever-married women, underweight decreased from 36% to 33% between NFHS 2 and 3.<sup>24</sup> These figures broadly concur with prevalence estimated in the NNMB surveys, which show a slow decline in underweight among men and women over the years; from 54% in the late 1970's to 37% in 2004-05 for men, and from 52% to 38% for women.<sup>30</sup> In the NFHS 3 sample, higher risk for being underweight was associated with poverty, rural residence, low educational status and scheduled caste/tribe status.

Micronutrient deficiencies are commonly encountered in India, exemplified by iron deficiency manifesting as anaemia. Inadequate dietary iron, low folate and vitamin B-12 intake and poor bioavailability of dietary iron from the fibre and phytate rich Indian diets are some important factors associated with the high prevalence of anaemia in India.<sup>31-33</sup> About 70% of children aged 6 to 60 months in

the NFHS 3 sample were found to be anaemic with 43% being moderately to severely anaemic.<sup>24</sup> While more than 97% of adolescent girls surveyed in the District level Household Survey (DLHS) 2 in 2002-03 were classified as anaemic,<sup>34</sup> recent studies including NFHS 3 indicate a smaller burden: more than half of adolescent girls and over 30% of adolescent boys suffer from anaemia. About 56% of adult women and 25% of adult men in NFHS 3 were anaemic, while 58% and 63% of pregnant and lactating women had anaemia. These figures are much lower than the 80% or more prevalence reported in NNMB surveys, DLHS 2 and ICMR Micronutrient survey.<sup>30,34,35</sup> The lower prevalence of anaemia reported in NFHS for all age groups has been suggested to be due to methodological issues described previously.<sup>36</sup> Among all age groups however, it has been noted that low socioeconomic status is associated with higher risk of anaemia. Anaemia is simply one example of deficiency; the possibility that several other micronutrients are also likely to be deficient in poor quality and monotonous diets is very real.

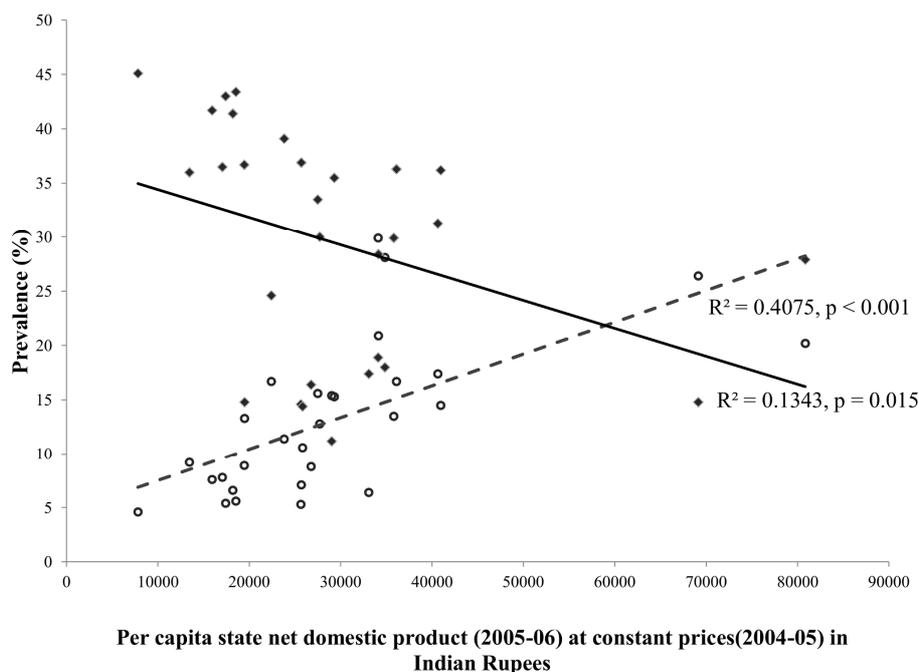
### THE DOUBLE BURDEN

While undernutrition is the predominant form of malnutrition in India, there are reports of increasing prevalence of overweight/obesity, especially among higher socioeconomic groups and in urban areas. Unlike developed nations, where the risk of overweight is higher in lower socioeconomic groups, in India, higher prevalence continues to be associated with urban residence, increasing education and higher wealth. It has also been noted that the urban poor and slum dwellers are at an increased risk of overweight compared to rural poor.<sup>37</sup> While the social and economic factors leading to overweight are outside the scope of this review, it is evident that several dimensions of food production and access that are linked to poverty are, by nature of unequal distribution, linked to overweight as well. Among all social groups, BMI  $\geq 25$  kg/m<sup>2</sup> is more common among women, with prevalence being 15% among ever married adult women in NFHS 3, up from 11% in 1998, while about 9% of men were overweight/obese.<sup>24</sup>

Disaggregating these estimates to the state level shows that states such as Bihar, Madhya Pradesh, Chattisgarh, Jharkhand, Orissa, West Bengal, Rajasthan, Uttar Pradesh, Tripura and Assam have overweight/obesity levels below 10%, while undernutrition levels persist at more than 35%. However, it is noteworthy that all states that have overweight/obesity prevalence above 15% continue to have underweight prevalence more than 25%, except Delhi, Kerala and Punjab.<sup>24</sup> While the correlation coefficients of state per capita GDP for underweight are at most only moderately strong (-0.37 for women and -0.35 for men,  $p < 0.05$ ), overweight (0.66 for women and 0.68 for men,  $p < 0.001$ ) appears to be strongly associated with state income, indicating a greater potential for increase in overnutrition with increasing affluence. Economic growth is often cited as a way forward in eradicating undernutrition, but Figure 1 would suggest that this effect is likely to be modest, and that societal initiatives are also needed.

### FOOD SECURITY

High levels of undernutrition signify inadequate and in-



**Figure 1.** Association of underweight and overweight/obesity among women in Indian states with per capita state net domestic product. A stronger association between aggregate measure of affluence and overweight/obesity than underweight at state level is evident.  $R^2$  for association of underweight prevalence with per capita state GDP=0.134,  $p=0.015$ .  $R^2$  for association of overweight/obesity prevalence with per capita state GDP=0.408,  $p<0.001$ . ◆ Underweight, ○ Overweight/obesity, — — linear trend of association between underweight prevalence and per capita state net domestic product, — linear trend of association between overweight prevalence and per capita state net domestic product. Underweight is defined as BMI  $\leq 18.5$  kg/m<sup>2</sup> and Overweight/obesity as BMI  $\geq 25$  kg/m<sup>2</sup>. Data sources: 24, 38.

equitable access to food, which is measured as a lack of food security. Food security has come to be defined in terms of the following dimensions: availability, access, utilization and stability.<sup>39</sup> An analysis of these dimensions from the Indian perspective can be illuminating in understanding the slow progress in combating malnutrition.

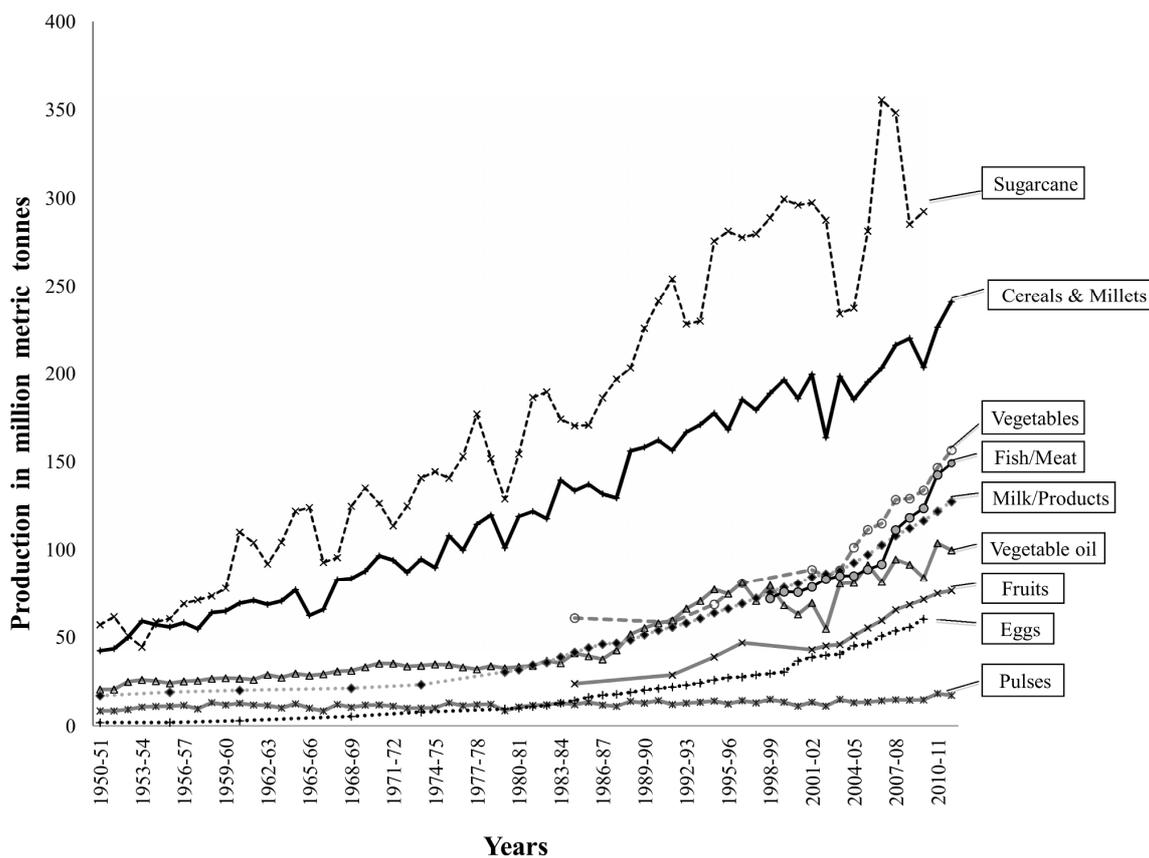
#### Food availability

From a country that depended on food grain imports to feed its population just after its independence, India has moved on to a position of self-sufficiency in the production of food grains, with stocks enough to tide over transient lean seasons. As seen in Figure 2, food grain production has climbed steadily from a mere 50 million tonnes in 1950-51 and has reached a record output of 252 million tonnes in 2011-12, with the growth rate averaging 3.5% over this period. While agricultural growth during the early 60's occurred mainly due to increase in land under cultivation, starting in the late 60s, the Green Revolution took it to a different level, with the introduction of high yielding, resistant crop varieties, increased use of fertilizers, expansion of irrigation facilities and increased institutional support through credit and extension programmes.<sup>40</sup> The growth in production of cash crops such as oil seeds and sugar cane has also been impressive with over 3-fold and 6-fold increases, respectively.<sup>21</sup> The output of fruits and vegetables has also increased, while from the mid-1980s, animal foods such as milk, dairy products and eggs have registered impressive increases in production. Meat production has received a fillip during the last decade.<sup>41</sup>

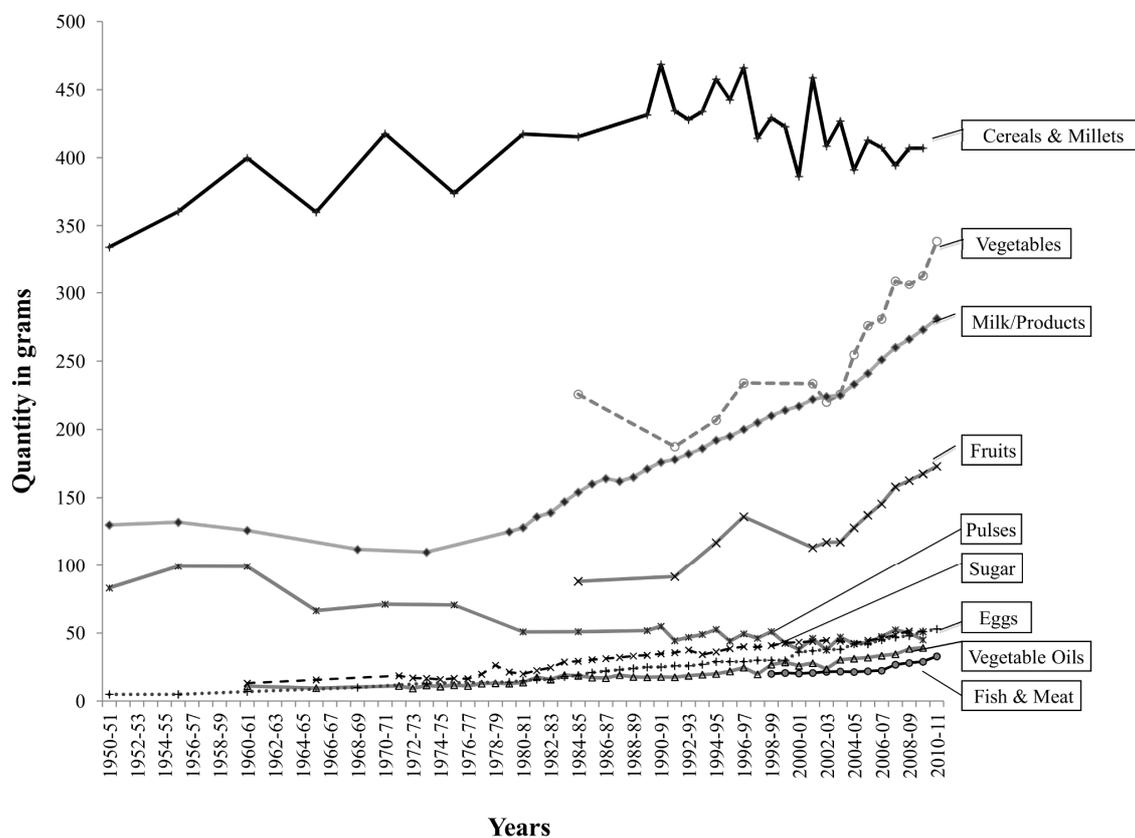
After the green revolution passed, agricultural policy has shifted towards securing gains in productivity and

sustaining agriculture solely through subsidies on power, fertilizers and increases in minimum support prices for procurement from farmers. The last two decades for example, have seen no major innovations in agricultural technology, nor any major projects to improve irrigation or power facilities. Yield rates of major crops including rice and wheat have become stagnant in the last decade, though production has not fallen. Oil seeds, sugar cane and horticultural crops, along with non-food crops are being increasingly promoted and have been encroaching upon the total land under cultivation, which has remained more or less unchanged. This has led to a decrease in the area under food grains cultivation from 75.5% of total cropped area in 1970-71 to 63.5% in 2007-08.<sup>40</sup> Increasing diversion of surface water towards water-intensive sugarcane farming and processing is perceived to contribute to water shortages in the drought prone areas of Maharashtra; with implications for local food crop production. Projected demand for most food groups is higher than projected growth in domestic production and sizeable gaps are evident, especially in case of pulses and vegetables;<sup>42</sup> the sustainability of the current policy approach in meeting the nutritional needs of the country's growing population, especially with uncertainties brought on by global climatic change is debatable.

Figure 3 depicts trends in per capita daily net availability (production plus imports minus exports) of certain foodstuffs. Per capita availability represents how far food production trends have been able to keep pace with population growth. Availability of the major cereals, rice and wheat has increased since independence. Quantity of oils and sugar available per day has more than tripled.<sup>21</sup> From less than 130 g per day, the quantity of milk available per



**Figure 2.** Trends in production of food groups, India, 1951 to 2012. — Cereals and Millets, —\*— Pulses, —●— Vegetables, —x— Fruits, —▲— Vegetable Oils, —x— Sugarcane, —◆— Milk, —+— Eggs, —●— Fish and Meat. Production of all food groups in million metric tonnes, except i) Vegetable Oils (x 10,000 metric tonnes); ii) Eggs ('million numbers); and iii) Fish and Meat (x 10,000 metric tonnes). *Data Sources:* 21, 41.



**Figure 3.** Per capita daily availability of food groups, India, 1950-51 to 2010-11. — Cereals and Millets, —\*— Pulses, —●— Vegetables, —x— Fruits, —▲— Vegetable Oils, —x— Sugarcane, —◆— Milk, —+— Eggs, —●— Fish and Meat. Net availability (after accounting for industrial uses and trade) is plotted for cereals & millets, pulses, sugar and vegetable oils; estimates for other food groups are based on production alone. Quantity in gram for all food groups, except Eggs (in numbers). *Data Sources:* 21, 41.

**Table 1.** Comparison of recommended daily intakes of major food groups for moderately active adult males with per capita net availability and reported daily consumption

SN	Food Groups	Recommended Daily Intake (g/day) <sup>43</sup>	Per capita daily availability <sup>†</sup> , 2009-10 (g/day) <sup>21,41</sup>	Per capita daily consumption (g/day), 2009-10 <sup>46</sup>	
				Rural	Urban
1	Cereals and Millets	400	407	375	308
2	Pulses	80	45	21	26
3	Milk and dairy products	200 <sup>‡</sup>	273	139	181
4	Vegetables	300	381	133	135
5	Fruits	100	90	-- <sup>§</sup>	-- <sup>§</sup>
6	Eggs, fish and meat	60	18	17	21
7	Oils	30	39	21	27
8	Sugar	40	51	23	27

<sup>†</sup> Net availability accounting for trade and industrial uses for cereals and millets, pulses and oils; estimates for other groups are based only on production <sup>‡</sup> 300 g/day for vegetarians

<sup>§</sup> Estimates not available

day has more than doubled to reach 273 g in 2009-10. The quantity of eggs available has grown more than ten times, while in the past decade or so, availability of meat has also registered an increase.<sup>41</sup> On the other hand, availability of millets and pulses has almost halved since 1950-51.<sup>21</sup>

When compared against the recommended dietary allowances of various food groups for Indians,<sup>43</sup> the per capita daily availability of cereals (407 g) is just about enough to meet suggested daily intakes for a moderately active adult male (400 g), while there is about 55% deficiency in availability of pulses (31.6 g) compared to recommended intake (70 g). The net daily availability of vegetables (401 g) and fruits (199 g) is more than sufficient to meet recommended levels of intake (300 and 100 g respectively), but large inter-state variations in their production and distribution exist, and wastage rates are high. Average per capita milk production (285 g/day) also exceeds the recommended intake level of 230 g.<sup>44</sup> (Table 1)

### Food access

The persistence of undernutrition despite huge gains in agricultural productivity and self-sufficiency in food production indicates a systematic failure in distribution of food grains and inability of the population to procure enough food. There has been over 3-fold increase in food grains procurement by the government since 1991 and the stocks available in the central pool for public distribution are double the buffer stock norms prescribed.<sup>21</sup> Yet while inefficiencies in storage and public food grains distribution, coupled with corruption, ensure that the poor in the most needy states do not receive adequate grains to meet their calorie needs on a daily basis, market pressures prevent offloading these stocks into the general market, leading to an extraordinary paradox of rotting and wastage of food grains, amidst chronic hunger.<sup>45</sup>

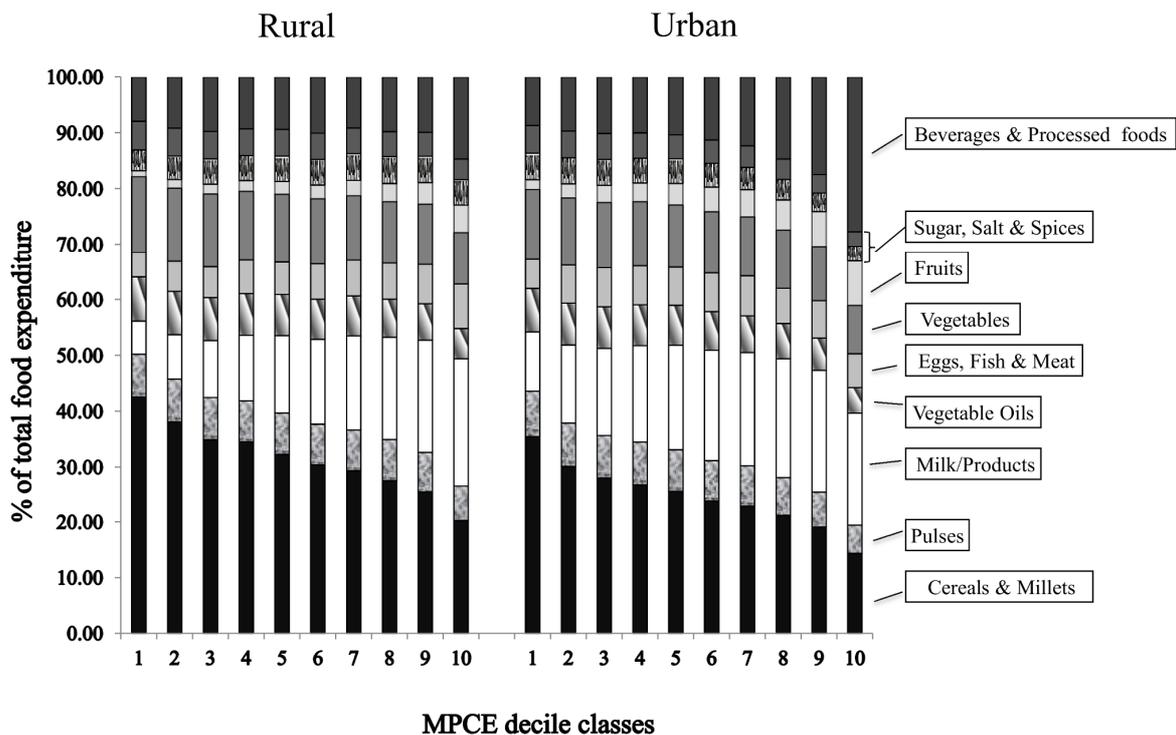
As observed from the household consumer expenditure surveys conducted between 1987-88 and 2009-10 by NSSO, the pattern of household expenditure has under-

gone a change. The share of non-food items has climbed slowly over the years, reflecting changing lifestyles as well as increased private spending for health and education. Non-food expenditure has overtaken spending on food in urban areas (59% and 41%), while for rural households food continues to be the major avenue for spending (57%). However, when disaggregated by economic status, the share of food as a proportion of total expenditure decreases when moving from the lowest to highest decile of monthly per capita expenditure (MPCE); even in rural areas, individuals in the topmost decile spent only 40% of their total expenditure on food, while for urban residents in the two lowest deciles, 60% of expenditure went towards food.<sup>46</sup>

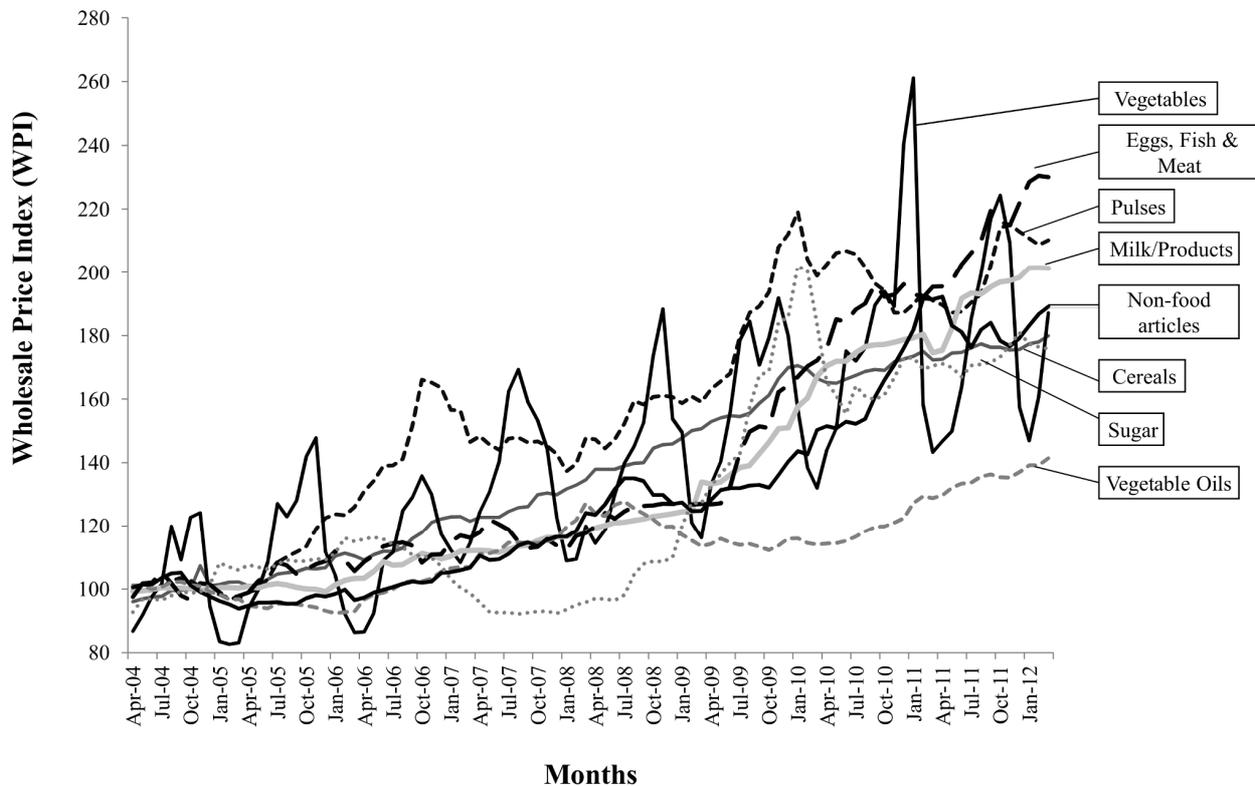
Within the food basket, between 1987-88 and 2009-10, spending on cereals and millets has decreased around threefold in both rural (40% to 14%) and urban (22% to 8.2%) settings. Percentage of MPCE spent on pulses has decreased in urban areas, but has remained almost unchanged in rural areas. Increasing spending on processed foods and eating out has also been noted and is thought to account for the decreasing spending and reported consumption of cereals; such categories are not included in the NSSO estimation methodology for estimation of cereal intakes.<sup>46</sup>

The proportions of monthly per capita food expenditure spent on cereals, pulses and vegetables drops and those spent on milk and dairy products, fruits and eggs, meat and fish increases, moving from low to high socioeconomic groups, in both rural and urban areas (Figure 4).<sup>46</sup> These changes in the food basket point towards diversification of the diet to some extent in both rural and urban areas, as is expected with economic progress. However, differences in spending do not accurately reflect actual consumption due to price differentials in space and time.

Food prices and their inflation exert a major influence on the purchasing capacity of people. While rising food prices have always been a concern, the last three years or so have witnessed unprecedented levels of price volatility of individual food commodities, in the background of



**Figure 4.** Variation in share of food groups to total monthly per capita food expenditure across different MPCE decile classes, India, 2009-10. ■ Cereals, Millets and Cereal substitutes, ■ Pulses and Pulse products, □ Milk and Dairy products, ■ Vegetable Oils, ■ Eggs, Fish and Meat, ■ Vegetables, □ Fruits, ■ Sugar, ■ Salt and Spices, ■ Beverages, Processed foods etc. MPCE = Monthly Per Capita Expenditure. *Data source: 46.*



**Figure 5.** Trends in food price inflation, India, 2004 – 2012. — Cereals and Millets, - - - Pulses, — Vegetables, — Milk, — \*Eggs, Fish and Meat, - - - Vegetable Oils, \* \* \* \* \* Sugar, — Non-food articles. The base year of the current series of Wholesale Price Index (WPI), used as a measure of inflation in India, is 2004-05 and the corresponding value of WPI is 100 for all items. *Data Source: 47.*

high food inflation persisting since 2008. Trends in Wholesale Price Index (WPI) of various commodities during the seven years from 2004-05 to 2011-12 are plotted in figure 5, showing that WPI for food articles has

been higher than that for non-food articles during most years. This diagram also shows that increases in WPI for food groups such as pulses and vegetables is higher and show greater degrees of fluctuation than other common

food groups such as rice, sugar and edible oils. The association of food price inflation with spending on cereals in urban and rural areas is shown in Figure 6. As inflation continued to rise between 2004-05 and 2009-10, the proportionate spending on cereals declined among all economic groups, with the greatest decrease noted in rural and urban poor (11% and 8% respectively), invoking the spectre of chronic energy deficiency.<sup>46,48-51</sup>

Figure 7 shows the trends in consumption of different food groups in rural and urban India across the four recent NSSO surveys from 1993 to 2009. Intake of cereals and millets has notably decreased both in rural and urban areas. The consumption of edible oils, vegetables, milk, eggs and meat has shown an increasing trend, with current consumption levels more in urban than rural areas. Consumption of pulses has doubled (but is still low) across these decile groups in both rural (13 to 31 g) and urban (16 to 34 g) areas.<sup>46</sup> A comparison of these average consumption data with dietary recommendations for Indians indicate deficient intakes of all major food groups, across all economic strata, but more pronounced in the lower classes.

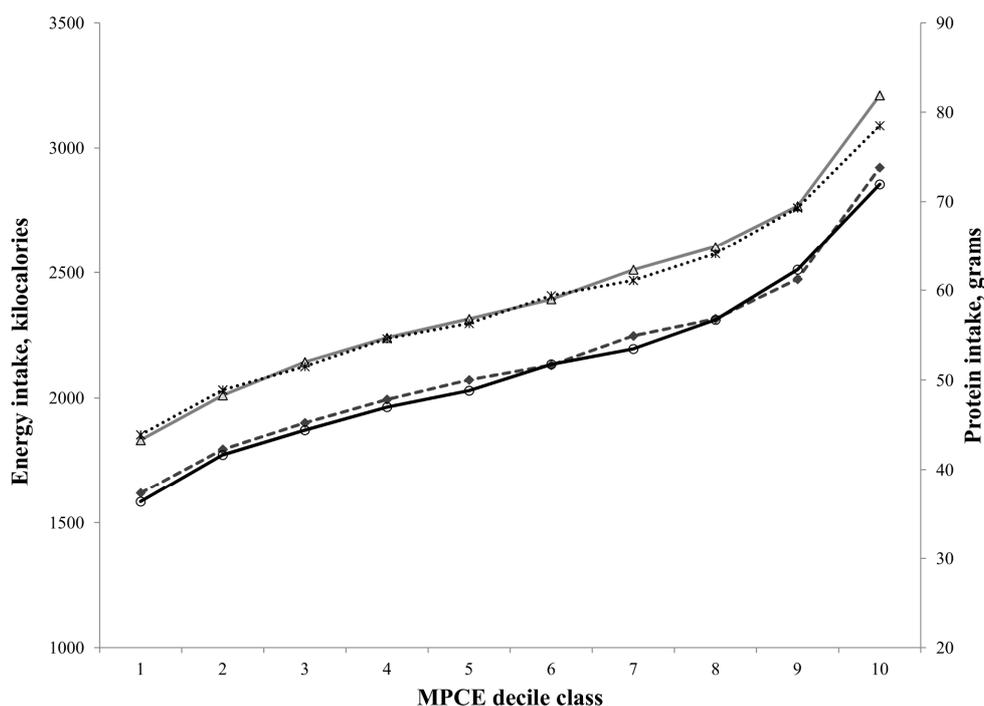
Nutrient intakes estimated from NSSO consumption data have indicated a steady but small drop (6% decrease between 1993-94 and 2009-10) in daily consumption of calories in both rural and urban India.<sup>52</sup> This decline has been discussed previously; even accounting for shortcomings in NSSO estimation procedures, it has been argued to reflect, at least partly, changes in energy requirements due to decreasing activity levels.<sup>53</sup> Rural and urban Indians consumed about 55 and 54 g protein/day respectively in 2009-10 and the drop in daily per capita protein intake was 8.6% for rural areas and 6.4% for urban areas between 1993-94 and 2009-10.<sup>52</sup> Current intakes are lower than the RDA for energy and protein for moderately active Indians and are broadly in agreement with rural in-

takes obtained from other recent surveys such as the NNMB. Energy and protein intakes are even lower among the poor (Figure 8).

Cereals are still the mainstay of energy and protein intake in India. About 60% and 50% of rural and urban energy and protein intakes respectively are through cereals. Cereals also constitute over two-thirds of the dietary energy intake and protein for lower economic groups. Pulses account for 9% and 10% of protein intakes, while milk and other dairy products contribute 9% and 13% in rural and urban Indians respectively.<sup>52</sup> Vegetables and fruits are the major sources of minerals, vitamins and fibre in Indian diets. Cereals and pulses provide contributions to minerals such as calcium and iron, but their bio-availability is likely to be low. Such dietary profiles are similar to the rural cereal-based diets obtained in the NNMB surveys, whose protein quality adjusted protein-energy ratios fall below 9%, indicating deficiency in quality protein intake. Consumption of pulses, which have higher quantities of essential amino acids in comparison to cereals, is falling, as noted above, due to decreased production and increasing prices. Milk and dairy products are increasingly consumed across all classes, but their affordability is still problematic for the poor. Other sources of animal proteins such as eggs, meat and fish are nutritively superior, but their availability and costs preclude wider consumption. In addition to its superior protein content, milk is also a good source of many micronutrients and improving its affordability may provide solutions to the twin problems of protein and micronutrient deficiency.

#### Food utilization

From a brief biological perspective, which is relevant here, the consumption of food, its nutritive value and ultimately its utilization in the body are affected by



**Figure 8.** Daily energy and protein intake across MPCE decile classes, India, 2009-10. —◆— energy intake in rural areas, —●— energy intake in urban areas, —△— protein intake in rural areas, \* \* \* \* protein intake in urban areas. MPCE = Monthly Per Capita Expenditure. *Data Source:* 46.

**Table 2.** Poverty alleviation schemes (centrally sponsored) in India

SN	Programme	Beneficiaries	Components
Poverty alleviation and employment generation			
1	Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) Scheme	Rural poor (BPL)	100 days of guaranteed wage employment (unskilled manual work) per year to every household (one-third participation of women)
2	National Rural Livelihood Mission (NRLM) / Swarnjayanti Gram Swarozgar Yojana (SGSY) – Aajeevika	Rural poor (BPL)	Bank credit and government subsidy for income-generating assets, formation of self help groups, training and skills development (50% beneficiaries from SC/STs, 15% from minority groups, 3% from persons with disability)
3	Swarnajayanti Shahari Rozgar Yojana (SJSRY)	Urban unemployed/ underemployed /poor	Creation of self-employment or wage employment opportunities
Social protection Programmes			
1	Aam Aadmi Bima Yojana (AABY)	Individuals aged 18 to 59 years BPL or marginally APL	Life and disability insurance, with 50% premium provided by central government
2	Rashtriya Swasthya Bima Yojana (RSBY)	BPL families in unorganized sector	Smart-card based cashless health insurance on a family floater basis with 75% central assistance towards premium
Infrastructure development			
1	Indira Awas Yojana (IAY)	Rural households	Housing assistance
2	Pradhan Mantri Gram Sadak Yojana (PMGSY)	NA	Road connectivity
3	Nirmal Bharat Abhiyan	Rural households	Construction of sanitary latrines
4	Rural water supply programme	Rural households	Safe drinking water through piped water supply
5	Jawaharlal Nehru National Renewal Mission	Urban poor	Creation of housing and other basic amenities

NA – Not Applicable, BPL – Below Poverty Line, APL – Above Poverty Line.

Data Sources: 59, 60

knowledge and cooking practices, as well as access to safe water, sanitation and hygiene. Knowledge of nutritive values of foods and healthy cooking practices has been reported to be low among children, adolescent girls and women in individual studies across the country.<sup>54-56</sup> While access to safe drinking water has improved substantially in urban as well as rural areas, due to initiatives such as the Accelerated Water Supply Programme, 96% urban and 84% rural households had access to an improved water source in 2008; however, India's achievement in securing access to sanitary toilets for households is dismal, especially in rural areas where only 21% had access in 2008.<sup>57</sup> Open-air defecation is a major contributor to the burden of food and water-borne enteric infections and geohelminthiasis, which not only cause morbidity and mortality, but also lead to malabsorption and malnutrition.

#### STRATEGIES TO ADDRESS MALNUTRITION AND POVERTY

The bidirectional relationships between poverty and malnutrition are well established. Both are capable of exerting intergenerational influences and poverty alleviation programs can help reduce hunger, undernutrition and their effects over generations. The neglect in provision of

primary education, a basic anti-poverty tool, in India, especially for females, is well known. It is therefore not surprising that other strategies focussed primarily at poverty alleviation, have yielded modest benefits at most,<sup>58</sup> (summarized in Table 2). Recent efforts towards achieving universal access to primary education are welcome, even if delayed.<sup>61</sup>

Wage employment programmes have received renewed attention in India recently. Originally introduced in 1980-85 to help the rural poor tide over agricultural lean seasons as well as droughts and famine, these suffered from top-down planning and implementation, a non-participatory approach and corruption, and were soon deemed failures.<sup>58</sup> A careful reappraisal of these schemes has led to the recent launch of the Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) Scheme, enacted through a central legislation in August 2005. This flagship scheme of the government provides for a legal guarantee of at least 100 days of employment in every financial year to adult members of any rural household willing to do unskilled manual work at statutory minimum wages. Despite reports of poor implementation and corruption, there is some evidence from the NSSO and independent evaluations that the MNREGA scheme may have increased rural incomes and curbed distress migra-

tion. About 24% of rural households accessed the scheme and on average each household received wage employment for 37 person-days, during 2009-2010.<sup>62</sup> The impact of this scheme on nutritional and health outcomes in beneficiary households is yet to be studied.

India's Public Distribution System (PDS) was designed as a general entitlement scheme for the entire population, but it predominantly served urban consumers until 1992. In the post-economic reform era, it was revamped as the targeted PDS (TPDS) in 1997 to benefit households below the poverty line, which are eligible to receive 20 kg of cereals per month at subsidized rates. Several states have included other provisions such as sugar, pulses and kerosene through PDS. In the last quarter of 2012, the central government had also approved distribution of pulses at subsidized rates to those below the poverty line through the PDS, though no progress has been made in implementation yet. While traditionally beset with problems such as poor quality and diversion of grains to the open market, recent data show that the utilization of PDS has increased from 24.4% in 2004-05 to 39.1% in 2009-10 in rural areas, while in urban areas it increased from 13.1% to 20.5%. The share of PDS to total food grain consumption also seems to have increased,<sup>63</sup> however, estimates based on NSSO 2009-10 data reveal that only 41% of PDS grain actually reached beneficiaries.<sup>64</sup>

Nutritional supplementation schemes have targeted pregnant women and children, who are at higher risk of undernourishment due to increased needs. The Integrated Child Development Services (ICDS) provides food supplements for pregnant and lactating women, as well as pre-school children. Coverage under the scheme has gradually increased over the years due to judicial and civil society interventions, yet utilization of services remains low, reflecting low awareness levels or poor quality of service delivery. NFHS 3 data reveal that while over 80% of under five children and pregnant/lactating women lived in areas with an ICDS centre, even among the poorest sections, less than 30% of under-five children and 25% of women had received food supplements.<sup>24</sup> The National Programme for Nutritional Support to Primary Education (NPNSPE) launched in 1995 is a centrally sponsored scheme that entitles all primary school children in the country to hot cooked meals that provide 450 Calories and 12 g of protein along with adequate quantities of micronutrients at lunch time.<sup>65</sup> Increasing coverage and overall improvements in school enrolments and retention have been reported, but nutritional benefits achieved have been far less than the educational benefits.<sup>66,67</sup>

Other strategies that could impact food security and poverty are those directed towards improving access to health systems. Improved utilization and quality of care have been reported in public health facilities after the launch of the National Rural Health Mission in 2004, especially for services targeting women and children. However, coverage of essential strategies such as delaying childbirth, comprehensive antenatal care, breastfeeding, immunization, iron folate supplementation and management of infections is still suboptimal.<sup>6</sup> Iron and folate supplementation during pregnancy is only around 65% overall, with significant socioeconomic differentials; less than 50% of women from the poorest stratum receive

supplements, compared to 86% of those in the richest stratum. Access to iron supplements and deworming medication for under-five and school-age children remains low despite their provision by a number of government agencies.<sup>24</sup>

The intersectoral nature of the problems of poverty and malnutrition require a coordinated response from various governmental departments and non-governmental agencies. Dealing with malnutrition, for example requires that several links in the chain be fixed; these include agriculture, food distribution, water, sanitation, health and care. This entails an enormous challenge for countries such as India, where intersectoral coordination is still far from optimal. Instead, it is likely for malnutrition to be left out of the development debate, especially since much of it has become invisible. The fear that nutrition is becoming everybody's business, but nobody's responsibility, seems not entirely baseless.<sup>68</sup>

## RECENT DEVELOPMENTS AND CONCLUSIONS

Recent debates over the state of nutrition in India have centred on the proposed National Food Security Bill (NFSB), a comprehensive piece of legislation that entitles every citizen to the right to food security. Despite calls from nutrition and food security experts to make coverage universal and provide cereal entitlements of 14 kg per month per capita, the final version of NFSB to be tabled in the Parliament only provides for 5 kg of grains per month per individual for 67% of the population (75% rural and 50% urban) at 1-3 Indian Rupees per kilogram, while the poorest of poor households (10%) would be able to buy 35 kg of cereals per month.<sup>69</sup> Regrettably, the NFSB is still cereal-centric, with no mention of pulses and other food groups such as vegetables and fruits.

Arguments for universal coverage focus on anticipated nutritional benefits, drawing on the experience of increased utilization of PDS in states such as Tamil Nadu and Kerala which have universal PDS, as well as on the difficulties involved in identifying beneficiary households for targeted PDS schemes.<sup>63,64</sup> Against these arguments is the realization on the government's part that such a rights-based approach would require enormous amounts of government intervention to increase production, and improve procurement and storage systems that may adversely affect overall efficiency of the PDS; besides causing a ballooning of food subsidies and indirectly, open market prices.<sup>69,70</sup> The unique ID system that has been launched recently is perceived as a solution to problems in the identification of target households. Computerization of TPDS and integration with the unique ID system has already started; this may reveal its actual utility in targeting.

A related development is the contentious issue of substitution of food subsidies with cash transfers, an idea that seems to be increasingly favoured by a government under pressure from international agencies to cut subsidies that are difficult to target. Conditional cash transfers (CCTs) have been shown to have a positive impact on health and education and helped families break out of the vicious cycle of poverty in many Latin American and African countries. CCTs have also been linked to diet diversification.<sup>71-74</sup> There is some evidence that CCTs can work in India too; the Janani Suraksha Yojana under NRHM has

resulted in an increase in institutional deliveries.<sup>75</sup> In the era of unique ID systems, the transfer of cash through computerized systems could actually help target the really needy and weed out corruption. It has been estimated that if all of the money the government spends in subsidies for poor families through various state and central schemes is instead provided in cash to the beneficiary, a poor household will on average receive Rs 2140 (US \$ 39) per month.<sup>76</sup> A partial pilot of this strategy, wherein government funding for some 29 schemes, excluding food and fertilizer subsidy, will be directly transferred to bank accounts of beneficiaries, has already been kick-started in 51 districts across the country.

However, cash transfers proposed as replacements to food subsidies are hardly conditional and the example of CCTs do not seem directly applicable in case of food subsidies. The behaviour of food prices in the open market and its impact on the poor, after the removal of the buffering effect of PDS is unclear. Further, assumptions that such cash transfers may lead to wasteful expenditures may not be totally baseless. However, a small pilot 'cash-for-food' project in urban slums of Delhi sponsored by the UNDP has found that cash transfers in place of PDS entitlements, could promote dietary diversity without compromising food security or increasing wasteful expenditures.<sup>77</sup> Similar studies on larger samples are required before any conclusion on cash transfers for food is made.

While the developmental effects of economic reforms continue to be debated, the Indian government has opened yet another sector for foreign direct investment (FDI) in retailing, which accounts for 14% of GDP and employs about 3.3% of the population. Much of the retailing industry presently is informal: only 4% of retail outlets in 2010 were in the organized sector and these were concentrated in big cities.<sup>78</sup> While its informal nature ensures livelihoods for millions, it has also meant limited cold chain infrastructure development in the country, resulting in the perishing of a variably reported 5-72% of horticultural produce. On the one hand, FDI could possibly increase availability of fruits and vegetables from the nutritional standpoint. It is also claimed that organized retail could enhance agricultural revenues through the abolition of middlemen.<sup>79</sup> On the other hand, concerns such as the loss of livelihoods for small traders and middlemen, price controls, monopolistic practices and the dumping of cheaper goods remain to be addressed, in addition to the potential disease burdens that come with increased access to refined and processed foods in supermarkets. In addition, the procurement practices of farm products by foreign supermarkets could also reinforce the cycle of low wages, poverty and economic insecurity.<sup>80</sup> Predatory pressures on developing country food suppliers to reduce costs or production rates at short notice, in effect, transfer costs and risk burdens back to the supplier.<sup>80</sup>

In conclusion, there is little doubt that almost every benevolent policy to improve the state of nutrition in poverty has been considered and passed into legislation in India. These range from micronutrient supplementation in pregnancy, early childhood and adolescence, to cooked food provisions for very young and for school children, to the provision of subsidized grain and employment for the families in poverty. Notwithstanding the several criti-

cisms that could be made of its different facets, policy-making has responded to the situation. But the persistence of poverty and malnutrition are symptoms of a systemic failure of implementation in India that needs immediate redress. Given the conflicting forces that drive the economy, it is unlikely malnutrition will disappear in the near future. As pressures such as environmental sustainability, climate change and international trade in commodities increase, the challenge for Indian agriculture and food distribution systems to keep up with production and access will become ever greater. India is a large country, and judgement of progress by aggregated indicators will inevitably hide inequalities. Even so, some of the national programs proposed could be great instruments of change if properly implemented. However, other policies that may lead to general economic volatility along with increased migration will mean that predictions of results in the state of nutrition will be difficult.

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## Review Article

## Poverty and the state of nutrition in India

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### 印度的貧窮與營養狀況

印度在過去幾年有相當高的經濟成長率，但在平均餘命、教育及生活水平方面的進展卻較緩慢，故常被視為發展的矛盾。雖然成長、發展及機會的嚴重不平等解釋了國家層次的矛盾假象，印度的貧困人口及營養不良兒童仍佔世界的一大部分。貧窮與營養不足共存，貧乏的飲食品質與不良的孩童生長及主要的微量營養素缺乏攸關。糧食安全特別容易受到經濟狀況及財富分配不均而改變。從鄉村移居到都市區域者，大多數找不到正式工作，因此造成移居者繼續生活在糧食不安全的狀態。雖然糧食生產大部分跟得上日益增加的人口數，但那是指穀類，豆類及小米生產卻不盡然。含油種子類、甘蔗及蔬果作物，及非食用作物也被推廣，但這對營養保障並無多大助益。且由於預製食品的消費增加，可能朝向營養不良的雙頭負擔。貧窮及不平等對於食物的可近性也深具影響。很多措施及政策已被提出，以解決印度的營養不足，但是它們的執行卻沒有一致性，要評估它們有規模的持續效應仍為時太早。

**關鍵字：**貧窮、糧食安全、營養不足、印度、農業