

Rising food costs & global food security: Key issues & relevance for India

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Rising food costs can have major impact on vulnerable households, pushing those least able to cope further into poverty and hunger. On the other hand, provided appropriate policies and infrastructure are in place, higher agricultural prices can also raise farmers' incomes and rural wages, improve rural economies and stimulate investment for longer-term economic growth. High food prices since 2007 have had both short-term impacts and long-term consequences, both good and bad. This article reviews the evidence of how rising costs have affected global food security since the food price crisis of 2007-2008, and their impact on different categories of households and countries. In light of recent studies, we know more about how households, and countries, cope or not with food price shocks but a number of contentious issues remain. These include the adequacy of current estimates and the interpretation of national and household food and nutrition security indicators. India is a particularly important country in this regard, given the high number of food insecure, the relative weight of India in global estimates of food and nutrition insecurity, and the puzzles that remain concerning the country's reported declining per capita calorie consumption. Competing explanations for what is behind it are not in agreement, but these all point to the importance of policy and programme innovation and greater investment necessary to reach the achievable goal of food and nutrition security for all.

Key words Food costs - food security - India

Introduction

The soaring global food prices of 2007-2008 wreaked havoc on millions of families, led to political unrest and contributed to reversing the complacency of governments around the world regarding the unconscionably high levels of chronic hunger¹. Not all countries or all poor households suffered equally at that time, of course, and a several countries, including India, were largely able to cushion domestic food prices from the dramatic surge in global prices. Following declines

in global food prices in 2009, even higher and more volatile prices have returned, with high food inflation in India and China that did not exist in 2007-2008². As before, the food and nutrition security impact of high prices falls disproportionately on those who can least afford it. Rising food costs, along with other shocks such as drought, floods and economic crises can have a major impact on food and nutrition security as these push the most vulnerable households further into poverty and weaken their ability to access adequate

food. These hardships can force poor families to sell off assets or forego other essentials that create a long-lasting poverty trap that becomes ever harder to escape. Particularly for children, even short-term worsening of nutrition can lead to permanent detrimental effects.

On the other hand, a background factor of the high and volatile food prices has been the lack of investment in agriculture and insufficient attention to food and nutrition security issues and to the plight of small-scale farmers, especially in agro-ecologically poor areas. Low and declining agricultural prices had contributed to this omission and high prices can raise farmers' incomes, improve rural economies, create jobs and help lift rural wages. Around three-fifths of the world's poor work in agriculture and another one-fifth works in rural non-farm employment that is dependent on agriculture, so the long-term impact of high prices on food and nutrition security should not be overlooked². However, the potentially positive impacts of high prices in the long term depend critically on whether appropriate policies and infrastructure are in place to allow the rural poor to benefit.

With some notable exceptions around the world, progress in meeting the Millennium Development Goal (MDG) of cutting chronic hunger in half has been woefully inadequate. While the challenge is formidable, there is no reason that we cannot achieve food security so that all people, at all times, have access to sufficient, safe and nutritious food. High and volatile prices make things much more difficult for the poor. These may also stimulate greater investment flows to agriculture and lead to expanded social safety net programmes, as in the case of India.

The dramatic price rise of 2007-2008 changed things as the unrest, particularly in urban areas where media attention was more easily focused, caused political leaders to see the connection between hunger and security and to take notice of longstanding problems. It was a wakeup call that renewed worldwide concern about global food and nutrition security. The experience and the current volatility around higher prices have also led to more research and analysis of their causes and remedies. There has been considerable research on the vulnerability of households and countries, examining how high and volatile food prices can lead to more hunger and poverty. There is also a lot that we do not yet fully understand on the actual impact of high prices over the past four years, and what is in store for the future. The present paper provides a

brief overview of some of the main points on how high prices and price volatility affect the food security of the poor, what the impact has been and what are seen as directions for the future. High food prices create both winners and losers, with immediate impact in the short term and consequences, both positive and negative, over the long term. A review of the factors that affect global impact may also add to understanding of the way these forces play out in India.

India remains enormously important in the global food and nutrition security equation. In addition to the size of its food-insecure population, India is perhaps the world's largest food security puzzle. In spite of its unparalleled household survey data and other data sources, it is difficult to reconcile seemingly contradictory trends in rapid income growth and per capita expenditure along with declining per capita calorie consumption and stalling progress in nutritional improvements. As Deaton and Drèze pointed out in their review of evidence on food intake and nutrition in India³, undernutrition levels in India are higher than many other countries that are much poorer and that have not reached near the economic growth. While high food prices are only one factor, a review of how food prices affect vulnerable households, and the varying impacts this has had around the world, may help illuminate the issues.

Who wins and loses from high prices? Vulnerability across households and countries

High prices, especially for the most vulnerable can have a devastating impact on their welfare, nutrition and food security. The impact on poor households varies considerably across countries and among different groups of people. How these impacts balance out depends on the context; there are winners and losers, both among households and among countries. The place to start in examining the impact of high and volatile prices on food security is the recognition that crises hit the poor the hardest. The greater the vulnerability, the greater the impact. There are different concepts of vulnerability depending on their application in economics, sustainable livelihoods, disaster management, and others, which make it difficult to measure. As Prakash⁴ suggests, in its simplest form, food vulnerability can be measured as the probability that expected future consumption will fall below some minimum level. This can also apply to countries, some of which are much more exposed to the impact of high prices than others.

As the recent report on Price Volatility and Food Security by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security⁵ points out, as food consumption is relatively price inelastic, it takes relatively a large change in price to adjust demand. Also, food demand becomes less sensitive to price changes as income increases because wealthier people, and wealthier nations, are willing to pay more to maintain the amount the food they consume. Not everyone, of course, is able to pay more when prices rise so, in the most basic terms, “when prices rise, populations in poor countries eat less food”⁵.

Household characteristics and vulnerability: net food buyers and other constraints

There are two features that stand out among the most vulnerable households: they spend a disproportionate amount of their income on food, mostly on staple cereals, and they are net buyers of food. This applies even if they are farmers and produce their own food and sell part of what they grow. Households in high income countries typically spend only a small portion of their income on food, around 10 per cent in the case of the United States, compared to 70 per cent in Tanzania and 50 per cent in India⁵. The poorest households, regardless of their country’s gross domestic product (GDP), spend a much higher proportion of their income on food. Similarly, in wealthier households, a much smaller share of food expenditures goes for staples. A rise in the price of maize, wheat or rice will consequently have a much smaller impact on the cost of the food they consume. In contrast, in countries such as Bangladesh, Malawi and Viet Nam, the poor often spend 35 per cent or more of their income on staple cereals. On average in developing countries, total food purchases represent about 70 per cent of the expenditures of the bottom population fifth, or poorest 20 per cent of families. An increase in food prices of almost any magnitude will have a major impact. This may result in consuming less food, buying lower cost food, selling assets to purchase food or foregoing other vital spending on health care or education for example.

Rural households’ vulnerability to high prices relates to the extent they sell and/or buy food. Rather than look at “subsistence” producers versus “commercial” ones, it is more meaningful to divide agricultural households between net buyers and net sellers. Net buyers are those whose value of the food they produce is less than the value of food they consume. We tend to think of

rural populations as farmers and assume they are both producers and net sellers but, contrary to conventional wisdom, a large portion of farm households are net food buyers. Many of these households sell agricultural commodities during part of the year, often at harvest when prices are low, and buy food at other times. Even households that produce more than they consume in quantity may be net buyers if the value of what they sell is less than the amount they spend on food. Poor households tend to be net buyers of food, even among those who own land and whose livelihoods derive from agriculture. Being a net seller or buyer is directly related to farm size and the smaller the landholding the more vulnerable the household, with landless labourers at the bottom.

Female-headed households are also among the most vulnerable, they are harder hit by food price increases and benefit less as producers from price increases. As consumers, these households tend to spend more of their income on food than male-headed ones, so higher prices affect their total expenditures more. As producers, they face a number of gender-related constraints, such as more limited access to credit and land, which limit their ability to produce more food for the market and take advantage of higher prices⁶.

Using what we know about households and livelihoods, a number of analyses came out after the spike in 2008 that simulated how the higher prices would likely play out in terms of poverty and welfare across different groups and different countries. These studies plugged in reference data from existing household surveys and other variables and estimated what the impact was likely to be for price increases of a certain magnitude. While some positive impacts were expected for farm households that were net sellers and who had access to more land, in all cases, the negative impacts were much greater than the positive ones.

An FAO study of five countries⁷ used detailed information on household characteristics from its Rural Income Generating Activities (RIGA) database to estimate the impact of higher prices. It illustrates the importance of rural households’ status as net food sellers or buyers in the welfare impact of price increases. In Guatemala, for example, 32 per cent of the families in the poorest fifth are net sellers and 56 per cent of their income comes from crop production and agricultural wages. In Bangladesh, where the poorest fifth earns 63 per cent of its income from on and off farm wages, only 12 per cent are net sellers. Even starker, in the poorest fifth of Malawi households, where 63 per cent

of income comes from crop production and agricultural wages, only six per cent of households are net food sellers. Throughout the developing world, the poorest 20 per cent of the population are net sellers only in unusual circumstances.

An April 2008 World Bank study by Ivanic and Martin⁸ used household survey information on supply, demand and net sales of food products from nine countries (Bolivia, Cambodia, Madagascar, Malawi, Nicaragua, Pakistan, Peru, Viet Nam and Zambia) and applied statistical experiments to see what the impact of higher prices would be from the food price increases observed in 2007-2008. Of the nine, seven showed increases in poverty, greater among urban than rural households, even taking into consideration the increased labour demand. Only in Viet Nam and Peru was the net poverty impact estimated to be positive, due to a higher percentage of rural households who are net sellers (and in the case of Viet Nam where land is more equitably distributed and where rice is the staple crop of smallholder producers). On the other hand, the expected negative impact was estimated to have been largest in Nicaragua. Under the scenario of the 2007-2008 price increases the overall poverty rate would have risen by 7.8 per cent and the urban poverty rate by 10.7 per cent⁸.

Another FAO study⁹ analysed expected impact for a different set of nine countries (Albania, Bangladesh, Ghana, Guatemala, Malawi, Nicaragua, Pakistan, Tajikistan and Viet Nam). It was particularly interested in identifying the categories of households most affected by price spikes and assessed how household characteristics, access to assets and markets, and livelihood strategies relate to the impact of rising food prices on household welfare. Across the nine countries, 97 per cent of urban households are net food buyers and about three-quarters of the rural ones. It looked at the relative impact on household groups depending on their location (urban or rural), welfare level (as expressed by expenditure fifths), land ownership and livelihood strategy. As the authors emphasised, this differentiation “matters more from a policy perspective than just estimating the average gains or losses to society. If the rich lose somewhat, but the poor gain, such that the rising food prices trigger a progressive redistribution of resources, the concerns for governments to act (particularly if their policy objective is reducing poverty) may not be so high. If, on the other hand, the negative impact is greatest among those that are already poor or have the least means to adjust to a price

shock, then the concerns are, from a poverty reduction perspective, clearly more urgent”⁹.

The study⁹ looked at what the impact would be of a 10 per cent rise in the price of internationally traded staple foods on the income of these household types. It also found that, with the exception of the rural population in Viet Nam, the poor were hurt by high prices in all the countries studied. The poorest households suffered more from higher prices and, as would be expected, landless households were hit the hardest. On the other hand, the analysis revealed that, for some countries, agriculture-based households (those deriving more than 75 % of their income from farming) gain, or suffer less, from increases in staple food prices. This depended on the extent to which they produced staple crops. This was particularly true in the case of Viet Nam but also in Nepal, Pakistan and Bangladesh where agricultural “specialisers” benefit from higher staple prices, even among some of the poorer households⁹.

Country characteristics and vulnerability: importer or exporter and ability to cushion domestic prices

When we look at the impact of high prices at the country level, a similar dynamic holds: exporters benefited and importers suffered, with Low-Income-Food-Deficit-Countries (LIFDCs) that import staple foods suffering most. These countries had a few reserves and inadequate budgets to procure imported food at higher prices. Some were required to resort to food aid as they lacked sufficient foreign exchange to purchase food. The importance of imported staple foods and dietary diversification is also critical. As Prakash has stated, “the lack of dietary diversification is also the single most important variable influencing vulnerability (as well as political sensitivity) to unstable food prices, as it limits the potential to shift to other staples using trade as a means to moderate volatility in prices”⁴.

The countries that were least affected in 2007-2008, whether or not they were deficit producers, were those that, like India, were able to cushion the impact of global food prices on domestic prices, through release of stocks, subsidies or export restrictions. Both factors relate directly to what happened to domestic prices, which matter more to consumers, of course, than the prices of internationally traded food commodities. Neither producers nor consumers interact directly with world markets so the degree to which changes in the world price of food commodities carried through to domestic prices matters a great deal. This “price

transmission,” varied considerably across countries in the 2007-2008 price surge⁵.

Between January 2007 and the peak of international prices in mid-2008, rice prices rose 224 per cent, wheat 118 per cent and maize 77 per cent. In most cases, high international prices led to much higher prices domestically, although not by as much and not much at all in some countries. Dawe analysed domestic rice prices in April 2008¹⁰. He found that from the end of 2003 to the end of 2007, the “pass-through” of world prices to domestic ones was only nine per cent in India, six per cent in the Philippines and 11 per cent in Viet Nam. Similarly, Feng¹¹ described how China stabilised domestic grain prices. The international rice price reached a peak of USD 963/ton in May 2008, almost three times as high as it was a year earlier, but the price of rice in China only rose by nine to 12 per cent. Similarly small increases were seen for China’s domestic prices of wheat and maize. This contrasts to what Minot found in Sub-Saharan Africa where on average, 71 per cent of the international price of food commodities was transmitted to domestic prices between June 2007 and June 2008¹². Prices in Malawi and Ethiopia went even higher than world prices. There is no mystery why the impact on food and nutrition security in 2007-2008 was much greater in Africa than in Asia.

Impact of high prices on food and nutrition security

Coping strategies and nutritional outcomes

Although there is still a lot that is unclear about the nutritional outcomes of the recent periods of high prices, there is considerable experience with previous shocks of one kind or another and the impact that these have had. Households cope with high prices, drought, economic crises and other shocks that limit their access to food in a variety of ways. Some of these are food-based coping strategies and some are non-food-based. Food-based strategies include changes in quality, quantity and diversity and often start with reducing the number of foods consumed from different food groups, shifting from higher-cost calories to lower cost ones. Where food prices of staple cereals go up dramatically there are often very few other cheaper alternatives, as prices of other foods also rise. Eating fewer meals per day and shifting the distribution within the household is another strategy. Non-food coping strategies include spending less on health and education, selling off assets, and seeking other income-generating activities.

When the latter includes increased female employment it can lead to less or lower-quality child care at home. It can interfere with breastfeeding, home-based food preparation, sanitation practices and seeking medical attention when children are sick. Increased child labour, at home or outside can have additional nutritional consequences.

Shocks such as these can result in poverty traps, whereby a short-term event causes permanent damage. These can be caused by a range of factors - natural disasters such as hurricanes or droughts, an economic slowdown or adverse price shocks. Regardless of the immediate cause, any reduction in the purchasing power of the poor can have similar effects. There have been a number of studies looking at the impacts of shocks. The annual editions of the FAO publication series *The State of Food Insecurity in the World*¹³ have reported on studies from different parts of the world that illustrate the damage. Examples include the following:

Indonesia: During the Asian financial crisis in the late 1990s, households reduced purchases of more nutritious foods in order to continue to buy rice leading to an increase of anaemia in mothers and children. Mothers reduced their own dietary energy intake in order to feed their children better, resulting in increased maternal undernutrition¹⁴.

Indonesia: Lower rainfall in the year of birth significantly reduced attained adult height of women, their number of years of schooling as well as their adult earnings and led to poorer adult health¹⁵.

Bangladesh: A negative correlation between rice prices and nutritional status was observed¹⁶.

Burkina Faso: School enrolment was negatively affected by shocks such as drought, and a shock to cocoa prices led to a similar decline in Côte d’Ivoire¹⁷.

Brazzaville, Congo: After the 1994 Central African Franc (CFS) franc devaluation, routine health activities, such as child growth monitoring and immunizations, declined due to mothers’ decreased capacity or willingness to take their children to health centres. Child stunting and wasting rose and the nutritional quality of infant complementary foods declined. This led to a measurable decline in blood haemoglobin levels in young children (and in their mothers)¹⁸.

Zimbabwe: During drought in the mid-1990s, young children living in the poorest households suffered a substantial reduction in growth rate, and these children

remained shorter than would otherwise be expected several years later¹⁹.

El Salvador: Height for age scores among children under three declined during the 2006-2008 food crisis, although the effects were mitigated to some extent for families with access to remittances from family members overseas²⁰.

Nicaragua: Sick children in areas affected by Hurricane Mitch in 1998 made fewer visits to the doctor than children in areas not touched by the storm²¹.

Estimated increases in the number of food insecure

Monitoring global food insecurity is a complex challenge even under stable economic conditions, and there are important limitations and a number of controversies; the results of different approaches give considerably different outcomes, particularly for changes in poverty and hunger since 2007-2008. FAO's estimate of the number of undernourished provides estimates at the global and country levels. Its approach is built on three parameters: (i) the mean calorie consumption per capita, (ii) the coefficient of variation of calorie consumption, describing the distribution of calorie consumption across the population, and (iii) the population's mean dietary energy requirement²². Data from household surveys are necessary for the last two but due to their limited availability in many countries, per capita calorie consumption has typically been estimated by FAO using national food availability data from its food balance sheets (FBS). Based on these estimates it derives the proportion of people falling below the minimum requirement. There are strengths and weaknesses in this approach. It has allowed an updated estimate almost every year for almost all countries using a common methodology across all of them. It is better, however, at estimating availability of food than changes in access to food, which became the key concern following the 2007-2008 price crisis.

Up to the crisis of 2007-2008 FAO provided a three-year moving average of the global and national estimates in order to show the trend over time rather than circumstances in a particularly good or bad year²³. Given the steep price rise, the financial crisis that followed and higher volatility since then, it has incorporated input from other FAO databases and the US Department of Agriculture's Economic Research Service²⁴ to come up with provisional estimates for each of the most recent years. Partly in response to concerns regarding the limitations of this approach, the methodology for monitoring food security is under

review and the Secretariat of the Committee on World Food Security organized a meeting in Rome on the topic in September 2011 as part of this process and eventual modification.

Based on this approach, FAO's estimate of the global number of undernourished went from about 848 million food insecure in 2005-2007 (the three-year moving average) to an estimated 915 million in 2008, increasing to 1023 million in 2009 with the global economic crisis, and then back down to 925 million in 2010²². The 2005-2007 average is the last point for which FAO has estimated country-level prevalence of undernourishment. For India in that period the estimate was 238 million people, 21 per cent of the population²².

The World Bank estimates refer to the impact of high prices and the other shocks on global poverty levels. The study by Ivanic and Martin⁸ was the first to calculate the impact of the food price crisis, using simulations based on the Living Standards Measurement Study (LSMS). They estimated that 100 million people were thrown into poverty. A subsequent World Bank study by de Hoyos and Medvedev²⁵ using data from 73 countries revised that estimate upwards, to 160 million, 90 million of them rural. A more recent World Bank study by Tiwari and Zeman²⁶ simulated the impact on incomes and calorie intake from the food price shock and the 2009 financial crisis. They estimated that 63 million people were thrown into hunger from these shocks.

These studies are based on sophisticated simulations to show how different categories of households within and across countries would be affected by a change in food prices. The characteristics of countries will also affect how well their food security can be cushioned from the impact of high prices, between importers and exporters, or those with strong government capacity for action or not. The analyses are important to help us understand how times of stress lead to more poverty and hunger for groups that are exposed to different types of vulnerability. But what do we know about what actually happened to food security and poverty as a result of the crises? Here the evidence is less abundant and more open to controversy.

The July 2011 Report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security⁵ provides an overview of the evidence. It is critical of the scarcity of studies providing evidence of the actual consequences

ex post relative to the large number of models elaborated to simulate the *ex ante*. Acknowledging that we only have a “very fragmented vision of the situation”, it summarises a number of studies on the impact of recent high prices⁵:

(i) Devereux²⁷ studied the volatile effect of food market seasonality in Ghana, Namibia, Malawi, and Ethiopia and pointed out how damaging this price volatility was for nutrition. In Malawi, for example, the causal linkage between maize prices and child malnutrition was dramatic: between October 2004 and January 2005, during which time maize prices doubled, admission for severe acute malnutrition increased by a factor of 7, falling back when maize prices started decreasing.

(ii) Robles *et al*²⁸ reported that 21 million people were pushed into poverty because of rising food prices in middle-income Latin America from January 2006 to March 2008. This number may reflect the inadequacy of social safety nets in some of these countries.

(iii) Compton and colleagues²⁹ compared evidence from field studies with predictions made at the beginning of the 2007-2008 price spike and found that poor net food importing countries - island nations such as Haiti, countries in conflict, and rice-importing areas of West Africa - were among the first to feel the effect of rising world food prices. However, high food prices were also recorded as having a serious impact on poor consumers in net food exporting areas such as Thailand, Uganda, and northern Mozambique.

(iv) Compton *et al*²⁹ found that the prevalence of underweight and wasting in young children went up by about half in surveys in Bangladesh, Cambodia and Mauritania following food price rises (from 17 to 26 % wasting in rural Bangladesh). Among the factors responsible were cutbacks on special complementary (weaning) foods, as well as reduced consumption of more expensive and nutritious foods.

(v) Bibi *et al*³⁰ analyzed the impact of the increase in food prices on child food poverty in Mali following the food crisis. They measured food poverty by comparing each individual's real food expenses to the expenditures required to satisfy respective caloric requirements. They found that increases in food prices led to an increase in food poverty among children (0-14 years old) from 41.5 to 51.8 per cent.

(vi) Action Contrele Faim (ACF)³¹, a study in Ethiopia, the Central African Republic, Sierra Leone

and Liberia by Action Against Hunger in 2008 provides some information about the impact of the price rise on food security. The data show that in Ethiopia high prices were closely followed by an increase in malnutrition and under-five mortality rates.

(vii) Dialo and colleagues³² showed that root and tuber prices in West Africa (largely non-tradables) were not affected much by the high world grain prices, and that the use of these staples may have offered some protection to consumers from the high cereal prices.

(viii) Hossain and Green³³ in one of the first studies on the consequences of the 2010-2011 price rise, studied the food security situation in eight communities in Bangladesh, Indonesia, Kenya and Zambia that had previously been visited in 2009 and 2010. They noticed a more varied impact than during the 2007-2008 price spike but also an overall pattern of ‘weak losers and strong winners’.

Do the estimates tally with self-reporting? Questioning the hunger and poverty estimates

There have long been conceptual and methodological issues related to the estimates of food and nutrition security. Discussion of the limitations and possible ways to overcome them is an important current topic, including by the Committee on World Food Security (CFS)³⁴. There are two other very different approaches that have received attention more recently, based on what people report about themselves or about what their behaviour indicates about their preferences - regardless of what the statistical analyses say. Both report radically different results and explicitly call into question the severity of the impact of the price rise and financial crisis on hunger.

The first comes out of the experimental approach to development economics of the Abdul Latif Jameel Poverty Action Lab (J-PAL) at the Massachusetts Institute of Technology and the work of Esther Duflo and Abhijit Banerjee and their colleagues³⁵. The application of this perspective to the problem of hunger is summarized in a 2011 article entitled “More Than 1 Billion People Are Hungry in the World, But what if the experts are wrong?”³⁵ It is worth quoting at some length: “Are there really more than a billion people going to bed hungry each night? ... What we’ve found is that the story of hunger, and of poverty more broadly, is far more complex than any one statistic or grand theory; it is a world where those without enough to eat may save up to buy a TV instead, where more money doesn’t necessarily translate into more food, and where

making rice cheaper can sometimes even lead people to buy less rice.... What if the poor aren't starving, but choosing to spend their money on other priorities? Development experts and policymakers would have to completely reimagine the way they think about hunger. And governments and aid agencies would need to stop pouring money into failed programs and focus instead on finding new ways to truly improve the lives of the world's poorest.... So the poor, even those whom the FAO would classify as hungry on the basis of what they eat, do not seem to want to eat much more even when they can. Indeed, they seem to be eating less. What could explain this? Well, to start, let's assume that the poor know what they are doing. After all, they are the ones who eat and work³⁵.

The authors do not imply that hunger is not a problem. Indeed, when looking specifically at India they state "While Indians may prefer to buy things other than food as they get richer, they and their children are certainly not well nourished by any objective standard. Anemia is rampant; body-mass indices are some of the lowest in the world; almost half of children under 5 are much too short for their age, and one-fifth are so skinny that they are considered to be "wasted"³⁵.

What they emphasise is that poor households, like everyone else, make choices on how to spend their income and often prioritise other things beyond food, like weddings, funerals and consumer goods. Their point is that interventions to reduce hunger and poverty pay much more attention to the choices that people actually make. For example, Sukhtankar *et al*³⁶ reported on their work with the Government of Bihar on the design of a pilot Public Distribution System (PDS) innovation programme. They carried out a survey asking households about their interest in cash transfers as an alternative. In the survey 94 per cent of respondents said they would like to participate in a pilot where cash was given in lieu of current PDS entitlements. The authors recommend a pilot that would give households a choice between cash and in-kind transfers. It would keep PDS as the default programme but leave open the option for households to try an alternative, choosing what they found most appropriate.

The idea that poverty is defined socially, and the concept of socially determined needs, are not new. This has always been the case, no doubt everywhere, but why then did socially determined needs in Bangladesh not prevent their average calorie intake from increasing by 3.6 per cent from 2005-2010³⁷ and by 15 per cent from 1990-1992 to 2005-2007³⁸ while India's average

calorie intake declined or stagnated over the same periods? The underlying reasons are not very clear. The randomized trial approach to development economics is controversial, particularly with regard to its ability to get at structural problems of poverty and food insecurity.

Listening to what people say is at the heart of the other alternative assessment approach to understand the impact of high prices on food and nutrition security. In a May 2011 International Food Policy Research Institute (IFPRI) paper Headey asks the question: *Was the global food crisis really a crisis?*³⁹ The basis of this question is self-reporting in the surveys collected by the Gallup World Poll (GWP) before, during and after the 2007-2009 food crisis in over 100 countries. The surveys contained two food-security related questions: (i) whether the household had any problems affording food over the last 12 months, and (ii) whether the household had experienced episodes of hunger in the last 12 months. As Headey reports: "Our findings are spectacular for the degree to which they differ from simulation-based estimates. In contrast to the various USDA, FAO, and World Bank global simulation estimates, we find that global self-reported food insecurity went down from 2005/06 to 2007/08, not up. Moreover, most of our estimates suggest that it went down by a huge margin"³⁹. The survey results lead to his conclusion that the number of food insecure went down by between 60 and 340 million people.

Drawing conclusions from self-assessing welfare measures also presents a number of problems. For example, in a study of four countries and the relationship between self-reporting and other measures of food insecurity, Migotto *et al*⁴⁰ found that "overall, calorie consumption, dietary diversity and anthropometry are at best weakly correlated to subjective perceptions of food consumption". The paper also presents a review of the shortcomings of the simulation-based estimates of hunger and poverty. It calls attention to the fact that the simulation estimates do not take into account very well what happens in large countries such as India and China, particularly the impact of economic growth and inflation. This does not, of course, negate the impact of the food price crisis all together.

The impact of the high food prices in 2007-2008 had very serious consequences in many countries, but according to this analysis, not on a truly global scale, as the other methodologies found, given the fast economic growth in the world's largest countries. Likewise, Headey³⁹ points out that as India and China

are now experiencing much higher inflation than in the earlier period, so the global impact of the current crisis (2010-2011) may be significantly worse than that of the 2007-2008 crisis.

In summary, the HLPE (High Level Panel of Experts) Report states, “the recent world food price swings have certainly pushed many consumers into poverty in developing countries and led to a crisis of food access”⁵, but there is a lot that we have not captured adequately, particularly with regard to access to food as prices rise, often very rapidly and unevenly. Higher prices and volatility are expected to continue for a number of reasons: population and income growth, urbanization, environmental degradation and climate change. Improving the monitoring of food and nutrition security to better account for these impacts needs to remain a high priority.

Both of the alternative approaches mentioned above call to mind the well known discrepancy in India between self-reported hunger and other measures of food and nutrition security. Except for the 1987-1988 round, the National Sample Survey (NSS) consumption surveys have included a question on food adequacy. In 1983 and 2004-2005 the question was whether everyone in the household got “two square meals a days”, while in 1999-2000 and 2004-2005 the question was whether everyone in the household got “enough food every day.” The results are discussed by Deaton and Drèze³: “Insofar as they are reliable, these figures show that the fraction of rural persons going hungry has fallen from 17.3 per cent in 1983 to 2.5 per cent in 2004-2005”.

What do high food prices mean in the Indian context?

The discussion of households’ vulnerability and the impact that shocks, such as high food prices can have on poverty and hunger applies to poor households in India as it does elsewhere. The Indian food security and nutrition situation remains a puzzle and the effect of higher food prices needs to be looked at within that context. The very high rates of economic growth, the decline in per capita calorie consumption over this period, as well as the relatively poor improvements in nutrition indicators are all difficult to reconcile.

The 2009 paper by Deaton and Drèze³ provides an overview of the issues, and the debate that preceded and followed their paper will no doubt continue. In brief, undernutrition levels in India remain higher than for most countries of sub-Saharan Africa, even though

those countries are currently much poorer, have grown much more slowly, and have much higher levels of infant and child mortality. The FAO food balance sheet methodology indicates an increase in per capita calorie consumption from about 2,220 kcal in the early 1990s to about 2,270 by the mid-2000s²². The NSS and NNMB (National Nutrition Monitoring Bureau) surveys, however, show a sustained decline in per capita calorie consumption during the past 25 years³. According to NSS data, average calorie consumption in rural areas was about 10 per cent lower in 2004-2005 than in 1983. The decline was larger among better-off sections of the population, and close to zero for the bottom quarter of the per capita expenditure scale. In urban areas there was little change in average calorie consumption. The decline of food intake is not confined to calories or proteins, but also applies to many other nutrients, except for fats³. Why this is not so easy to fathom. As Deaton and Drèze³, raise the issues of prices but find little evidence that it had much impact on the decline in calorie consumption. In rural India, food price changes were in line with general prices from 1983-2000, and then fell somewhat less than five per cent relative to general prices. In urban India, there was a slow increase in the relative price of food, by less than 5 per cent from 1983 until the late 1990s, followed by a decline of more than ten per cent. In both sectors, the relative price of food was lower in 2005 than in 1983. “The decline in calorie consumption cannot therefore be attributed to any increase in the relative price of food”³.

To make sense of these trends, they propose as a possible explanation worthy of further study, a “somewhat speculative hypothesis” that calorie requirements have declined, due to better health and lower activity levels¹. There is evidence of this happening elsewhere as economies have developed. Clark *et al*⁴¹ examined Great Britain’s food consumption between 1770 and 1850 and found that in spite of a 65 per cent increase in income per person, data indicate that food consumption per person may have stagnated or even declined during this period. However, presumably similar forces would be at work in Bangladesh where average calorie intake increased substantially over the same periods.

To strengthen the methodology used for its estimates in the annual State of Food Insecurity, FAO is working with governments to incorporate complementary household expenditure surveys (HES), like those in India. As part of this effort, FAO has been

collaborating with the Ministry of Agriculture, the Ministry of Statistics and Programme Implementation, and the National Statistical Commission to revise the Organization's food balance sheet (FBS)-based estimates for India of per capita calorie availability and undernourishment⁴².

Over the period of 1987 to 2005, the FBS-derived estimates show much different results from the HES estimates, and from World Bank poverty estimates for India, again for reasons that are not entirely clear. A forthcoming report by Lisa Smith⁴³, commissioned by FAO, looks at the discrepancies between the food balance sheet estimates and those based on NSS household expenditure surveys, applying the two to a common cut-off point in calorie requirements. She finds that the India undernourishment estimates from FBS data show very little variation over the period, beginning at 20 per cent and ending at 21 per cent. The estimates based on NSS data show a steadily increasing trend, rising from 25 per cent undernourished in 1987-88 to 34 per cent in 2004-2005, a nine percentage point increase. By contrast, the poverty estimates - derived from the same source - show a robust declining trend, falling by 12 percentage points.

She proposes another possible explanation for the difference in results: the underreporting in the household surveys of meals eaten away from home. She points to evidence in the 2005 India Human Development Survey that 28 per cent of households spent cash income on foods consumed away from home. It found the prevalence of eating purchased food higher in urban areas and among high-income households, but it was not limited to those segments of the population, including 46 per cent of urban slum households. As food consumed away from home partially substitutes for food consumed at home, the underestimation of this category of food consumption in household survey data (which may indeed be the case in India) could have a significant effect on the estimates of food intake⁴³.

Tandon and Landes⁴⁴ add to the understanding of how something like underreporting of food consumed away from home (and other consumption elements) can influence national estimates. They discuss the difficulties of deriving the estimated number of food insecure in India, given the sensitivity of the final result to relatively small changes in assumptions needed to estimate its components, particularly the number of calories consumed. These include calories from processed foods, foods consumed away from home and meals given to non-household members. As they report,

in the sample used in the 61st NSS round, "over 30 days each household consumed 13.9 meals outside the household on average, gave an average of 0.67 meals to non-household members, and spent approximately ₹ 132 on processed foods which do not have precise calorie information available"⁴⁴. Depending on how calories are estimated for this consumption, along with other key assumptions, it can lead to an astonishing difference of 175 million food insecure people between their high and low estimates.

How do these findings and hypotheses relate to food prices? First, they highlight the need to look at more than just calories when discussing food and nutrition security. They point to the need to combine different types of estimates, including consumption surveys, aggregate food availability studies, and anthropometric data. Calories are not the only determinant of nutrition and may not in fact be a very good measure for nutritional assessment. As the nutrition community in India has been advocating for many years, the availability of cereals, even at the household level, is not the only factor - and probably not the main factor - that holds back improvement in nutritional status⁴⁵. Care and feeding practices, vaccinations, clean water, and consumption of protein, fats and micronutrients are all critical. Using availability of calories as a proxy for nutrition may have been adequate at one time, but it no longer tells us all that we need to know. This diminishes the importance of the price of those calories in nutritional status, even though price shocks and high prices for food can have very large impact on poor households.

The studies also point to the fact that other larger social and economic factors play a major role in food consumption. Decreasing calorie requirements, for example, are largely unrelated to food prices. Similarly, the price of commodities is only one element in the price of food purchased out the home, so increases in global or domestic prices of cereals, for example, may have less relative impact on that element of food consumption⁴⁶.

Short-term problems that lead to worsening child nutrition can have permanent consequences in India. High prices are certainly among these dangerously detrimental factors. The relationships between food prices, calorie and other nutrient consumption, incomes, expenditure choices and nutrition and food security are much more complex than many assume. Combined with that, there no doubt are measurement problems all

along the way that currently limit our understanding of how the various pieces fit together.

This brings us back to the importance of rising food prices and their impact on agricultural incomes and employment. Some of the latest NSSO (National Sample Survey Organization) data for 2005-2010 support the idea that agriculture still plays a large role in achieving faster and more inclusive growth. As recently reported by Alok Ray⁴⁷, for casual women workers in rural areas, annual growth in money wage rates increased from 3.5 per cent during 1990-2004 to 14.6 per cent during 2005-2010. Despite higher inflation during the past several years, the growth in the overall real wage rate was higher in the more recent high-growth period. Real per capita monthly expenditure in rural areas went up by 1.4 per cent per year, as compared with 0.8 per cent per year over 1993-2004. Expenditure on vegetables, eggs, fish, meat and beverages is growing faster in rural areas as compared to urban ones, an indication of improving rural prosperity.

Historically, Indian policy makers have relied more on price incentives and input subsidies to increase agricultural production and less on agricultural production-related infrastructure development, as other countries have done. This has worked well in some areas but not very well in agro-ecologically poorer regions of the country. The growth of India's agriculture sector has lagged behind other parts of the economy for many years. Given the size of the rural population and the importance that rising agricultural incomes can have on poverty reduction and overall economic growth, this has become a critical policy and political issue. The associated problems are not unique to India, as pointed out by Schmidhuber and Bruinsa⁴⁶.

Higher agricultural prices stimulate investment, and instability caused by high prices stimulates politicians to act on needed social safety net improvements. New initiatives by the Government of India and State governments in agricultural investment, a shift to cash subsidies, and changes in the food and employment security safety nets do not all stem from concern over high prices, but there is an important connection.

Concluding remarks

Global food prices are expected to remain higher in the coming decade than in the period prior to the food price shocks of recent years. Given this backdrop and the relatively low level of stocks that need rebuilding, higher volatility may also continue, exacerbated by increased climate risk. Understanding how high and

volatile prices affect food and nutrition security is necessary to protect the most vulnerable. For most of these households, improving the productivity and profitability of agriculture is the key to greater resilience. Ultimately, however, eliminating the threat of hunger depends on the commitment of society, at all levels, to address the issue and make it a continuing priority. The trauma caused by high prices since 2007 reawakened interest and stimulated new approaches and investment by government, the private sector and civil society. As we eventually look back on our current period of high food prices, this may be the most important legacy.

References

1. Food and Agriculture Organization of the United Nations. HLC/08/INF/1 (Soaring Food Prices: Facts, Perspectives, Impacts and Actions Required) during the High-Level Conference on World Food Security: The Challenges of Climate Change and Bioenergy, Rome, 3-5 June 2008. Available from: http://www.fao.org/fileadmin/user_upload/foodclimate/HLCdocs/HLC08-inf-1-E.pdf, accessed on August 31, 2013.
2. Food and Agriculture Organization of the United Nations. The state of food and agriculture 2009. Livestock in the balance. Rome: Food and Agriculture Organization of the United Nations; 2009. p. 108. Available from: <http://www.fao.org/docrep/012/i0680e/i0680e00.htm>, accessed on August 31, 2013.
3. Deaton A, Drèze J. Food and nutrition in India: facts and interpretations. *Econ Polit Wkly* 2009; 44 : 42-65.
4. Prakash A. Why volatility matters. In: Prakash A, editor. *Safeguarding food security in volatile global markets*. Rome: Food and Agriculture Organization of the United Nations; 2011.
5. HLPE. Price volatility and food security. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome: Food and Agriculture Organization of the United Nations; 2011. Available from: www.fao.org/fileadmin/user_upload/hlpe/hlpe_documents/HLPE-price-volatility-and-food-security-report-July-2011.pdf, accessed on August 30, 2013.
6. Food and Agriculture Organization of the United Nations. The state of food and agriculture 2010-2011. Women in agriculture: closing the gender gap for development. Rome: Food and Agriculture Organization of the United Nations; 2011.
7. Karfakis P, Velazco J, Moreno E, Covarrubias K. Impact of increasing prices of agricultural commodities on poverty. ESA Working Paper 11-14. Rome: Food and Agriculture Organization of the United Nations; 2011. Available from: www.fao.org/docrep/013/am320e/am320e00.pdf, accessed on August 31, 2013.
8. Ivanic M, Martin W. Implications of higher global food prices for poverty in low-income countries. World Bank Policy Research Working Paper 4594. Washington DC: World Bank; 2008.

9. Zezza A, Davis B, Azzarri C, Covarrubias K, Tasciotti L, Anriquez G. The impact of rising food prices on the poor. ESA Working Paper 08-07. Rome: Food and Agriculture Organization of the United Nations; 2008. Available from: <ftp://ftp.fao.org/docrep/fao/011/aj284e/aj284e00.pdf>; accessed on August 31, 2013.
10. Dawe D. Have recent increases in international cereal prices been transmitted to domestic economies? The experience in several large Asian countries. ESA Working Paper 08-03. Rome: Food and Agriculture Organization of the United Nations; 2008. Available from: <ftp://ftp.fao.org/docrep/fao/010/ai506e/ai506e00.pdf>, accessed on August 30, 2013.
11. Fang C. How China stabilized grain prices during the global price crisis. In: Dawe D, editor. *The rice crisis: markets, policies and food security*. London and Rome: Earthscan and Food and Agriculture Organization of the United Nations; 2010.
12. Minot N. Transmission of world food price changes to African markets and its effects on household welfare. Washington DC: International Food Policy Research Institute; 2011. p. 34.
13. Food and Agriculture Organization of the United Nations. The state of food insecurity in the world. Rome: Food and Agriculture Organization of the United Nations; 1996-2012.
14. Block S, Kiess L, Webb P, Kosen S, Moench-Pfanner R, Bloem MW, *et al*. Macro shocks and micro outcomes: child nutrition during Indonesia's crisis. *Econ Hum Biol* 2004; 2 : 21-44.
15. Maccini S, Yang D. Under the weather: health, schooling, and economic consequences of early-life rainfall. *Am Econ Rev* 2009; 99 : 1006-26.
16. Torlesse H, Kiess L, Bloem MW. Association of household rice expenditure with child nutritional status indicates a role for macroeconomic food policy in combating malnutrition. *J Nutr* 2003; 133 : 1320-5.
17. Grimm M. Does household income matter for children's schooling? Evidence for rural sub-Saharan Africa. *Econ Edu Rev* 2011; 30 : 740-54.
18. Martin-Prével Y, Delpeuch F, Traissac P, Massamba P, Adoua-Oyila G, Coudert K, *et al*. Deterioration in the nutritional status of young children and their mothers in Brazzaville, Congo, following the 1994 devaluation of the CFA franc. *Bull World Health Organ* 2000; 78 : 108-18.
19. Hoddinott J. Shocks and their consequences across and within households in rural Zimbabwe. *J Dev Stud* 2006; 42 : 301-21.
20. de Brauw A. Migration and child development during the food price crisis in El Salvador. *Food Policy* 2011; 36 : 28-40.
21. Baez JE, Santos IV. Children's vulnerability to weather shocks: A natural disaster as a natural experiment. New York: Social Science Research Network; 2007.
22. Food and Agriculture Organization of the United Nations. The state of food insecurity. <http://www.fao.org/docrep/016/i3027e/i3027e.pdf>. A more detailed description of the methodology is also found in the FAO website. Available from: <http://www.fao.org/economic/ess/ess-fs/fs-methods/fs-methods1/en/>, accessed on August 30, 2013.
23. Food and Agriculture Organization of the United Nations. The state of food insecurity, 1996-2012. Available from: <http://www.fao.org/docrep/016/i3027e/i3027e.pdf>, accessed on August 31, 2013.
24. United States Department of Agriculture Economic Research Service Website. Available from: <http://www.ers.usda.gov/data-products/state-fact-sheets.aspx>, accessed on August 30, 2013.
25. De Hoyos RE, Medvedev D. *Poverty effects of higher food prices: a global perspective*. Policy Research Working Paper Series 4887. Washington DC: World Bank; 2009.
26. Tiwari S, Zeman H. The impact of economic shocks on global undernourishment. Policy Research Working Paper 5215. Washington, DC: World Bank; 2010.
27. Devereux S. Seasonality and social protection in Africa. FAC Working Paper No. SP07 Brighton UK: Future Agricultures & Centre for Social Protection; 2009. p. 4.
28. Robles MJ, Cuesta S, Duryea T, Enamorado A, Gonzales, Rodriguez V. Rising food prices and poverty in Latin America: effects of the 2006-2008 price surge. Washington DC: Inter-American Development Bank; 2008.
29. Compton J, Wiggins S, Keats S. Impact of the global food crisis on the poor: what is the evidence? London Overseas Development Institute; 2010. p. 99.
30. Bibi S, Cockburn J, Arnault Emini C, Fofana I, Ningaye P, Tiberi L. The impact of the increase in food prices on the child poverty and the policy response in Mali. New York: UNICEF; 2009.
31. Action Contre la Faim. Feeding hunger and insecurity: the global food price crisis. New York: ACF; 2009. p. 6.
32. Dialo B, Dembele N, Staatz J, Cissé M, Adjao R. Transmission of increases in international food prices in West Africa: Lessons from the 2007-08 crisis for expanding production. International Conference on Biofuels in Africa: Biofuels, factor of insecurity or engine for development. Ouagadougou, Burkina Faso 10-12 Novembre 2009. Available from: <http://www.2ie-edu.org>, accessed on August 30, 2013.
33. Hossain N, Green D. Living on a Spike: how is the 2011 food price crises affecting poor people? London: Institute of Development Studies and Oxfam Great Britain; 2011. p. 3.
34. Food and Agriculture Organization of the United Nations. Available from: <http://www.fao.org/cfs/en/>, accessed on August 31, 2013. A more detailed description of the methodology can be found at: <http://www.fao.org/economic/ess/ess-fs/fs-methods/fs-methods1/en/>.
35. Banerjee A, Duflo E. More than one billion people are hungry in the world, but what if the experts are wrong? *Foreign Policy May/June 2011*. Available from: http://www.foreignpolicy.com/articles/2011/04/25/more_than_1_billion_people_are_hungry_in_the_world?page=full, accessed on August 31, 2013.
36. Muralidharan K, Niehaus P, Sukhtankar S. Assessing the scope for cash transfers in lieu of the TPDS in rural and urban Bihar. J-PAL South Asia 5/25/2011, p 3. Available from: <https://cas.sas.upenn.edu/system/files/3+-+Assessing+the+Scope.pdf>, accessed on August 30, 2013.
37. Bangladesh Bureau of Statistics. Preliminary report on household income and expenditure survey 2010. Statistics Division, Bangladesh Ministry of Planning. Dhaka; 2011. Available from: www.bbs.gov.bd/WebTestApplication/

- userfiles/Image/HIES/HIES-PR.pdf*, accessed on August 31, 2013.
38. Available from: www.fao.org/economic/ess/ess-fs/fs-data/ess-fadata/en/, accessed on August 31, 2013.
 39. Headey D. Was the global food crisis really a crisis? Simulations versus self-reporting. IFPRI Discussion Paper 01087. Washington DC: International Food Policy Research Institute; 2011.
 40. Migotto M, Davis B, Carletto G, Beegle K. Measuring food security using respondents' perception of food consumption adequacy. ESA Working Paper No. 05-10. Rome: Food and Agriculture Organization of the United Nations; 2005. p. 12.
 41. Clark G, Huberman M, Lindert PH. A British food puzzle, 1770-1850. *Econ Hist Rev* 1995; 48 : 215-37.
 42. Food and Agriculture Organization of the United Nations. Available from: <http://faostat3.fao.org/faostat-gateway/go/to/home/E>, accessed on August 30, 2013.
 43. Smith L. *The great Indian calorie debate: an investigation of divergent trends in poverty and undernourishment during India's rapid economic growth*. ESA Working Paper. Rome: Food and Agriculture Organization of the United Nations. In press 2013.
 44. Tandon S, Landes R. The sensitivity of food security in India to alternate estimation methods. *Econ Polit Wkly* 2011; 46 : 92-9.
 45. Gragnolati M, Shekar M, Das Gupta M, Bredenkamp C, Lee Y. India's undernourished children: a call for reform and action. Washington DC: World Bank; Health, Nutrition and Population (HNP) Discussion Paper; August 2005.
 46. Schmidhuber J, Bruinsma J. Investing towards a world free of hunger: lowering vulnerability and enhancing resilience. In: Prakash A, editor. *Safeguarding food security in volatile global markets*. Rome: Food and Agriculture Organization of the United Nations; 2011. p. 543-69.
 47. Ray A. Growth has become more inclusive. New Delhi: *The Hindu Business Line*; 2 August 2011. Available from: <http://www.thehindubusinessline.com/opinion/columns/alok-ray/growth-has-become-more-inclusive/article2313892.ece>, accessed on August 31, 2013.

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