Food and nutrition security: short and long term drivers – definition and indicators

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Short Summary

This issue brief reviews the drivers (long term and short term), their impacts, and indicators of food and nutrition security (FNS). The FAO defined food and nutrition security as a situation “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (FAO 2006). This definition of FNS highlights four dimensions of food security: food availability, access to food, the utilization of food, and the stability of these three dimensions. FNS is clearly an individual-specific outcome, but many of its indicators and of its drivers (causes) are measured at macro level and can only serve as proxies for FNS (individual) outcomes. Availability, accessibility and stability reflect the issue of the adequacy of dietary intake and a number of existing indicators can be used to approximate it, like per capita net calories available in a given country, share of food in total household expenditures, or per capita food supply variability. Individual level indicators like stunting and over- and underweight can cover the utilization dimension of FNS.

Fluctuating food prices (volatility) are to some extent a natural phenomenon, what matters more for FNS are abrupt and unanticipated price changes that prevail for several months. On the other hand, long term market drivers of FNS such as food prices, or aggregate supply and demand can have positive or negative impacts depending on the characteristics of the specific households.

Full summary

Introduction

The FAO defined food and nutrition security as a situation “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (FAO 2006). We follow this definition, which considers food quantity and quality as...
depicted by the four dimensions of food security: food availability, access to food, the utilization of food, and the stability of these three dimensions. Indicators of FNS covering these four dimensions are needed in order to generate information about the current absolute and relative status and evolution of FNS, the causes of change in FNS, possible actions and their impacts in the short and long term.

Approaches and Results: Food and Nutrition Security Indicators

In the 1970s food security interventions were driven by the idea that food security is ensured with enough food supply. In 1981, Sen pointed out that the structure and the processes governing entire economies and societies to ensure an optimal distribution of food are crucial. The FAO-definition of FNS highlights the issues of food and caloric intake, of the quality of food and of the ability to (metabolically and practically) utilize all macro and micro nutrients.

This multidimensionality of FNS and its various drivers draw a complex picture of interactions, all of which should be captured for effective FNS projections. Also, though FNS is clearly an individual-specific outcome, many of its indicators and of its drivers (causes) are captured at community or national level. They can serve as proxies for FNS (individual) outcomes, but the different levels of measurement need to be clear for analytical purposes. The next paragraph quickly discusses FNS indicators.

FNS indicators

The main composite indicators of FNS (e.g. the Global Hunger Index, the Global Food Security Index, the Hunger Reduction Commitment Index, etc.) all rely on macro level proxies of individual FNS and its causes and cannot be used as complements due to differences in their constructions and to their partial overlaps (Pangaribowo et al., 2013). Where possible, the individual level single indicators such as anthropometrics (stunting, wasting, under- or overweight) should be used, along with Medical Biomarker Indicators (i.e. measuring micronutrient deficiencies, such as anaemia). Anthropometrics and biomarkers reflect broad interactions between food deficit, food intake reductions due to food price shocks, intra-household food distribution, health and environmental quality. They comprehensively cover the dimension of food utilisation. The dimensions of availability, accessibility and stability reflect the issue of the adequacy of dietary intake and a number of existing indicators can be used to approximate it (per capita net calories available in a given country, share of food in total household expenditures, or per capita food supply variability).

Approaches and Results: Long term drivers of FNS

Laborde et al. (2013) separate between the individual and household drivers and the market equilibrium drivers of FNS in the long term. At the household level FNS is
compounded out of two factors, food quantity and quality. Both factors depend on a set of drivers.

**Individual and household drivers:**
The level of income is a key driver of FNS: increased income results in a higher purchasing power of the household, simultaneously decreasing the share of income spent on food products and the household’s vulnerability to food insecurity. The distribution of national income among and within the households is a mitigating factor of these positive impacts. Higher income levels can also result in improved sanitary conditions, which improve FNS (e.g. a household better equipped with a fridge and a water filtering system can improve food quality). Prices signal changes of underlying FNS drivers: price increases signal scarcity of food and price volatility indicates high uncertainty about food supply and demand in the short term. Prices affect the level of disposable real income: Low prices can improve FNS through an increase in purchasing power as a result of lower prices of non-food or food products. Yet low prices can have a negative impact on the FNS of net food producers. Infrastructure (access to electricity, water quality, sewages) can provide better conditions for food consumption and utilisation. Education and dissemination of information can improve FNS in the way that households consume healthier products. Finally, transaction and markets access costs affect FNS: households in remote areas may face higher product prices due to higher transaction costs.

**Market equilibrium drivers:**
We divide them in three categories: prices, aggregate food demand, aggregate food supply.

**Prices:** Interventions that can generate a gap between world and domestic prices are policy measures like domestic taxation or trade policy measures (import and export restrictions or non-tariff measures (NTM)). They can increase domestic prices relative to the world prices and thus increase the costs of achieving FNS for consumers, in exporting or importing countries depending on the nature of the NTM. On the other hand, NTMs can increase food quality and safety worldwide in both countries and the net impact on FNS is ambiguous. Other factors such as market concentration, competition policy or the exchange rate can also impact food prices.

**Global food demand:** firstly, it will increase due to population growth, which lowers the overall FNS. Secondly, income growth changes diet patterns towards protein rich products, which improves FNS, but also leads to higher staple food prices due to higher feed demand, which tends to affect FNS negatively (in particular for poor people).

**Aggregate food supply:** lower food waste and improved value chain efficiency and investments in transportation and storage can improve FNS. Similarly, the increase in overall land for food production could increase global food supply. This could be supported by higher yields and shift agricultural supply, thus reducing food prices and easing the constraints on FNS. Finally, climate change will have uneven effects among crops and among countries, generating winners and losers.
Short term drivers of food price volatility

Volatility captures the idea that prices are fluctuating. On the one hand, volatility can measure realized (historic) short-term fluctuations (daily, weekly or monthly) around long-term prices and trends. On the other hand, volatility can also be a forward-looking indicator of the risk of excessive future price changes (in the short-run). Volatility in prices is to some extent a natural phenomenon. It affects FNS due to abrupt and unanticipated price changes that prevail for several months. This in turn affects poor consumers’ capacity to ensure sufficient food and nutrient intake. Volatility, however, also affects food producers adversely if production risks increase. As this tends to reduce investments and production, food supply is reduced in the long-run. Recently IFPRI has developed a forward-looking measure of excessive volatility, which aims at the early identification of periods of excessive volatility, based on extreme (excessive) returns on the futures markets for food commodities (Martins-Filho, 2015).

Kalkuhl et al. (2013) distinguish between the domestic and international drivers of domestic food price volatility. Domestic food supply is affected by the domestic agricultural production (area planted, yields and their determinants such as weather patterns and shocks), the domestic storage policy and infrastructure (if stocks are high, they can absorb supply and demand shocks, but they can also lead to increases in prices in times of re-stocking), commodity imports (difficult for many developing countries who are not fully integrated in the international market), political interventions such as taxations or subsidies, conflicts and political instability. Most food crises are in fact caused by natural disasters as well as political instability and policy failures. Like the domestic determinants, international causes include supply shortages and low levels of grain stocks at the international level, but also transportation costs (driven by fluctuating oil prices) and price transmission and trade openness, which can all increase domestic prices.

Similarly to the analysis of the long term drivers, food price volatility can have direct and indirect impacts on FNS. If domestic prices increase the consumers’ real income will decrease. The direct impact is a reduced calorie intake, which is the income effect. The substitution effect represents a changing spending pattern due to a reduced real income. Therefore, households can consume less micro nutrient rich food products and might even increase the consumption of staple foods. A further indirect impact is the reduced spending for health or child care to ensure the purchasing of food.

Implications and Recommendations

Many long term drivers can have contrasted effects on FNS among households and countries through direct and indirect effects. On the demand side for instance, if dietary patterns increase food prices (through increased consumption of meat and milk products), this will deteriorate the FNS of the most vulnerable consumers, although FNS impact for people with rising income will be positive (improved quality
of food). Such differentiated impacts greatly enhance the complexity of forward-looking FNS models.

References

