



From food availability to nutritional capabilities: Advancing food security analysis



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ARTICLE INFO

Article history:

Available online 1 May 2015

Keywords:

Food security
Capability approach
Human development
Livelihood
Entitlement
Low-income countries

ABSTRACT

This paper has a threefold objective. First, it provides a comprehensive review of different approaches to analysing food security. Second, it highlights the added value provided by the capability approach and the human development paradigm. Third, it proposes a methodology to assess food security through this approach. Our proposal entails three basic steps: (1) analysis of food entitlements; (2) analysis of nutritional capabilities and (3) analysis of the capability to be food secure. In this way, we can move beyond income, entitlement or livelihood related frameworks, and identify the root causes of food insecurity. Food insecurity can be the result of a lack of education, health or other basic capabilities that constitute people's wellbeing. This, therefore, allows situating the study within the broader area of wellbeing and development.

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Introduction

This paper engages in the debate on the theory and policy of food security, a crucial topic within the broader fields of development economics and development studies. The way food security is theorised, measured and finally analysed affects the typology of policies that will be adopted. This paper has a threefold objective. The first one is to critically review different approaches to the analysis of food security proposed either in the academic world or by international organisations. To the best of our knowledge, there has not yet been a systemic attempt to compare the many existing approaches.

The second aim of this paper is to use the capability approach, primarily established by the economist Amartya Sen in the early 1980s, for the analysis of food security. In our opinion, the literature has often failed to identify the linkages between Sen's entitlement approach used in the specific fields of hunger and famine and his capability approach employed to analyse (human) development and wellbeing. While the central pillars of a capability approach to food security may be visible in the pioneering work of Drèze and Sen (1989), in this paper we try to extend it to

recognise the crucial role of factors such as participation in political life and women's empowerment.

Last but not least, we provide preliminary programmatic guidance on how to implement this approach in the field. Our method entails three steps that gradually allow a better understanding of food security and could eventually be used in the future to identify new ways of measuring this phenomenon.

Consequently, this paper is divided into four sections. The second section reviews the approaches to food security, outlining the basic differences, the third provides guidelines for an analysis of food security based on the capability approach, and the fourth section concludes and identifies the policy implications of using the capability framework.

Main approaches to the analysis of food security

At the beginning of a paper discussing different approaches to food security, one would expect a clear definition of food security. Here, this is not the case for two reasons: (1) although a commonly accepted definition exists (FAO, 1996), in food security practice and actions the dimensions/factors stressed are often so diverse that they highlight different views on the meaning of the term “food security”; (2) we intend to focus on the different approaches that have drawn attention to different components of food security and, in turn, have contributed to modifying and extending the definition. Thus, this section presents five approaches to food security:

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(a) food availability; (b) income-based; (c) basic needs; (d) entitlement and (e) sustainable livelihoods. We will try to maintain a chronological and logical order as far as possible by moving from the oldest and narrower view of food security to the most recent and advanced ones.

Food availability approach

We start our review with the “food availability” approach, because it is undoubtedly the oldest and still the most influential. Although the core ideas of this approach can be traced back to the Venetian thinker Giovanni Botero (1588), it was Thomas Malthus (1789) who popularised it and hence it is also known as the Malthusian approach.

The approach focuses on the balance or imbalance between population and food: In order to maintain this balance, the growth rate of food availability should not be lower than the growth rate of the population. Consequently, from this point of view, food security is merely a matter of aggregate (per capita) food availability. In a closed economy, this depends mainly on food production and stocks whereas in an open economy, it also depends on food trading.²

Until the early 1970s, this was the reference approach for the international community, both at the political and the academic level. This is well-reflected in the definition of food security given at the World Food Conference of 1974: ‘*Availability at all times of adequate world food supplies of basic foodstuffs to sustain a steady expansion of food consumption and to offset fluctuations in production and prices*’ (UN, 1974).

The policy implications of this approach are twofold:

- On the “demand side”, the need to reduce the growth rate of population – namely the fertility rate – through appropriate policies.³
- On the “supply side”, the need to boost (per capita) food production, namely agricultural production. For such purposes, the foremost policy that is generally prescribed and implemented is to increase agricultural productivity.

Although in 1996 the World Food Summit adopted, with a large consensus, a much broader and advanced definition of food security that includes, in addition to availability, other fundamental dimensions of food security – such as access to and utilisation of food, a narrow sectoral focus on agricultural supply, productivity and technology still dominates the international food security discourse and practice.

Whereas this is not the place to discuss the reasons why this narrow view persists in spite of its evident flaws and failures, it is interesting to note that after the 1970s, the Malthusian ghosts of scarcity have been reinvigorated by increasing ecological concerns and related concepts such as “carrying capacity” and “ecological footprint.”

Before moving on to the next approaches, it is important to emphasise a methodological aspect that is useful in our analysis. One main characteristic of any approach to food security is its units of analysis. Generally speaking, the unit of analysis can range from the world in total, to a country, a region, down to a community, a household or a single individual. Furthermore, from an economic point of view, the approach can focus on a single sector, a cluster

of sectors (e.g. the “food system” or “chain”) or can be economy-wide.⁴

Considering these characteristics, the units of analysis generally used in the food availability approach are the country (and its food balance sheet) or the world and the agricultural sector (its production and productivity).

Income-based approach

The long-lasting view of food security as a problem of food availability has been partly re-visited within a more macro-economic approach. The focus on the food sector – initially only agricultural production, but also food trading later on – has been criticised by economists for being too concentrated on one single economic sector. Recognising that the economy is composed of many interdependent sectors, food insecurity cannot be viewed as a problem that is exclusive to the agricultural/food sector. That is why the first attempt to broaden the discipline was actually an attempt to shift the analysis towards national economies as a whole. This meant bringing into the analysis variables, such as Gross Domestic Product (GDP), economic growth, not necessarily dependent on food production. In a market-economy, a stronger economic system can allow the import of goods such as food.

This macro-economic framework was also more consistent with old and very influential economic theories such as Ricardo’s comparative advantages, according to which each country has to specialise in the sector in which it has an advantage, given by the abundance of a specific productive asset or by lower costs of production. This whole approach might be considered a way to include the national means of increasing aggregate food availability within the food security framework.

However, the most important shift was from food availability at the macro-level to income at the micro-level (Griffin and Khan, 1977; Haq, 1976; Reutlinger and Selowsky, 1976; Reutlinger, 1977). The approach is very similar to the one traditionally used to assess poverty. While poverty was conceived as a lack of sufficient income needed to buy a bundle of goods to guarantee the survival (or minimum standard of living) of a person, food insecurity is implicitly assumed to be a sub-category of poverty (often referred to as “food poverty”), i.e. lack of sufficient income needed to buy the amount of food required for survival at the given conditions (Sibrian et al., 2007; Sibrian, 2008). In particular, different foods are converted into calories: If people’s calorie availability is lower than a threshold identified by international nutritionists, they are considered to be food insecure.

Through household surveys providing information on income, it is theoretically possible to estimate the amount of food consumed, given the assumption that poorer households use a larger proportion of their income to buy food.⁵ Food is, then, converted into calories: if household calorie availability is lower than the “required” minimum, some or all the members of that household are food insecure. The specific problem related to this method consists in the assumption of a given income-calorie elasticity. Taking, for example, an elasticity measured in the same country in previous studies, requires making very strong hypotheses.

² Currently, the tool utilised to assess food availability is the “food balance sheet” which gives a picture of the amount of food available for human consumption in a country as a result of food production, imports, exports, aid, wastes, and alternative uses (FAO, 2001).

³ Sen (1999, Ch. 9) critically reviews various policies aimed at reducing the fertility rate.

⁴ Though increasingly popular, in our review of different approaches to food security we do not include “food sovereignty” as an approach in its own right. This is because it is a political discourse emerged in mid-1990s about the agrifood system rather than an analytical approach to food security. Considering its focus on food production, agriculture and natural resources, as well as its emphasis on the autonomy of local communities, food sovereignty is actually very close to the concept of food self-sufficiency. Therefore, food sovereignty may be considered a localist and communitarian version of the food availability approach.

⁵ As argued by Svedberg (2002, Ch. 7), there seems to be relevant empirical evidence to support this hypothesis.

Household expenditure surveys are more useful and can be used to sort out the amount of expenditures on a number, albeit limited, of food items. Many applied economists have estimated the calorie contents of each food item and then aggregated them in order to obtain the total amount of calories available for household members.

The main shortcomings of both these procedures are the several assumptions made to move from income to food security: (1) from income/expenditure to food through price per unit information; (2) from food to calorie through equivalence tables; (3) from calorie availability to food security/insecurity depending on the threshold. With respect to the unit of analysis, income could potentially be estimated per individual. However, there are problems related to children whose food security also depends on adults' income. Furthermore, all the surveys mentioned above are conducted at the household level. For all these reasons, we might reasonably state that the household is the unit of analysis within this approach. This implies assuming a certain distribution, usually equal distribution or distribution according to biological needs, among the household members.

Finally, this method could better suit an ideal market economy in which nobody works in subsistence agriculture. Given the fact that these measurements are often realised in rural areas of low-income countries where the majority of the population is in subsistence agriculture, this method is not highly reliable. As also argued by Frankenberg (1992: 96), 'expenditure surveys tend to underestimate expenditures on food because the value of food produced at home or gathered locally is often not recorded.'

Basic needs approach

In the second half of the 1970s, the International Labour Organization (ILO) proposed a new model of development, the *basic needs approach*, with the intention of incorporating non-economic dimensions of development (ILO, 1976). The problems of poverty, unemployment and under-employment, registered in periods of rising economic growth, were the primary causes of the policy shift. The ILO and, later on, economists such as Streeten (1981) and Stewart (1985) viewed development as a process concerned with the satisfaction of basic needs for all human beings.

Given the practical nature of this approach, a limited list of basic needs that governments and development agencies could ensure was needed. Although the lists presented by different authors differed slightly, in most cases they included food, together with shelter and clothing (see Denton, 1990). As argued by Magrabi et al. (1991: 65), 'Food is a basic need – probably the most basic need of all.' Similar conclusions were drawn by authors from different disciplines such as Maslow (1943) in psychology and by authors in the human rights literature. In particular, the definition of "basic rights" given by Henry Shue (1996) as those necessary for the enjoyment of all other rights has led many authors to primarily include the 'human right to adequate food' (Kent, 2005).

This discourse in the development literature has heavily affected the debate on food security, giving rise to the so-called *food first* view (Maxwell and Smith, 1992; Maxwell, 1996).⁶ This approach focuses directly on whether people eat *enough* food and has contributed to making a further step in shifting analysis from the macro level to the micro level. Food is seen as the priority (and probably the only) element of food security. This is the main approach behind the view of food security as "Consumption of less than 80% of WHO average required daily caloric intake" (Reardon and Matlon, 1989) and as "The ability ... to satisfy adequately food

consumption needs for a normal healthy life at all times' (Sarris, 1989).

With this framework, there are different ways of assessing food security coherently. The first one is a food frequency assessment, which can be performed by simply asking people the number of meals eaten per day or even the frequency of consumption of different food items. These surveys are easy to conduct; however, focusing on the frequency and not on the quantity consumed makes calculating the calorie equivalent more complex.

The second method is based on a direct observation of food consumption. All household members are observed during meals in order to obtain direct information on all food consumed. The final calorie availability is obtained by weighting the food items according to their nutritional contents and aggregating them.⁷ More recently, some indicators based on the quality and diversification of diet have been developed, which are in line with the food first approach (Hoddinott and Yohannes, 2002). An example is the "dietary diversity score", indicating the number of food groups that have been consumed regularly (usually over 24 h or one week). This was an important step towards moving away from an exclusive focus on the quantity of food consumption.

The individual unit of analysis is perfectly compatible with the food first approach. However, food frequency assessments are usually conducted at the household level, whereas direct observation and assessments that look at diet are often effected at the level of the individual (also for children). Therefore, in the last two cases, a function of food distribution within the household does not need to be assumed. This is particularly important because by observing directly the conditions of women, we do not assume that they receive the same amount of food as men. This problem, usually referred to as the "gender bias" in the development and food security literature, has been observed in many developing countries (Chen et al., 1981; Das Gupta, 1987; Harriss, 1995).

The main advantage of the food first approach compared to the (micro) income-based approach to assess food security consists in the possibility of focusing directly on the commodity we are interested in (food), rather than on the income needed to buy it. This way we do not need information on current price per unit and, at the same time, we do not have to look at whether the person has physical or social problems in purchasing food. Finally, by concentrating on what is actually eaten, the food first approach implicitly recognises (and does not underestimate) the food grown at home rather than purchased in the market.

As a conclusion of this brief review, this approach draws attention to short-term food security. It tells us whether households have enough food to feed all their members in a given time or in the past. However, it does not provide much information on potential food deprivations in the future.

Entitlement approach

In the 1980s Amartya Sen's *entitlement approach* contributed to challenging the Malthusian view of famine and hunger, and shifted the focus from national food availability to people's *access* to food. 'The entitlement approach concentrates on each person's entitlements to commodity bundles including food, and views starvation as resulting from a failure to be entitled to any bundle with enough food' (Sen, 1981: 434). Entitlements depend on two elements: (1) personal endowments, which are the resources a person legally owns, such as house, livestock, land and non-tangible goods (Osmani, 1995); (2) the set of commodities a person has access to through trade and production, i.e. the "exchange entitlement

⁶ To the best of our knowledge, no one has explicitly stressed the linkage between the basic needs approach and the food first approach to food security.

⁷ Given the scope of this review, we do not engage in the many debates concerning measurement problems, such as the changing behaviour of people while being observed by strangers.

mapping” (Sen, 1981: 435). Starting from a situation in which an individual has just enough means of subsistence, a decline in endowments can obviously lead the person to starvation. However, with the same endowments, a person can still fall into the hunger trap because of a decline in exchange entitlement mapping; for instance, a sharp reduction in the price of the commodity that the individual produces, due to external causes, reduces her/his capacity to buy food.

Moreover, the entitlement failure may take different forms. Given an economy in which each group, for the sake of simplicity, produces one commodity (including labour), and given a food exchange rate (commodity price/food price), any group risks starvation due to an entitlement failure either because of a reduction in food production for personal consumption or because of a fall in the food exchange rate (Sen, 1981). In the first case, there is a ‘direct entitlement failure’, whereas in the second case there is a ‘trade entitlement failure’. This distinction is particularly relevant when examining which group is at risk of starvation if something changes. The ‘direct entitlement failure’ occurs for food producers as a result of a decline in their production; the ‘trade entitlement failure’ occurs for groups that produce products other than food when their terms of exchange fall or the total availability of food declines. Furthermore, groups that live on both the consumption of the produced good (e.g. meat) and its sale to obtain other food, risk suffering from both direct and trading entitlement failures.

This approach has been primarily proposed and tested for famine analysis, but the same rationale works for chronic hunger and endemic undernourishment (Burchi, 2011). In the words of Drèze and Sen:

If people go hungry on a regular basis all the time, or seasonally, the explanations of that have to be sought in the way the entitlement system in operation fails to give the persons involved adequate means of securing enough food. Seeing hunger as entitlement failure points to possible remedies as well as helping us to understand the forces that generate hunger and sustain it

[Drèze and Sen, 1989: 24.]

The entitlement approach has contributed to re-addressing the problem of hunger and famine by diminishing the role of aggregate food supply and giving more relevance to the socio-economic conditions of people. ‘Starvation is a matter of some people not *having* enough food to eat and not a matter of there *being* not enough food to eat’ (Sen, 1981: 434). Therefore, adding the *access* dimension has significantly affected the notion of food security. The influence of Sen’s work is visible in two important definitions of food security: ‘All people at all times have both physical and economic access to the basic food they need’ (FAO, 1983), and ‘Access by all people at all times to enough food for an active, healthy life’ (World Bank, 1986: 1).

Having enough food per capita at the national level is a necessary but not sufficient condition for food security. Therefore, in order to make a food security assessment, we need to extend the informational basis. Variables related to people’s endowments such as productive and non-productive assets, with particular emphasis on employment and non-tangible resources such as education or membership of an association,⁸ as well as information on wages and other prices of food and non-food items, should be adequately taken into account.

⁸ Osmani (1995) extends the entitlement approach by recognising the importance of non-tangible resources as endowments. In particular, he draws the example of unemployment benefits for citizens in a given country. Being citizens of that country (together with the unemployed status) entitles people to access money with which they can buy food or access food directly (through food stamp-type programmes).

Furthermore, in their book *Hunger and Public Action* (1989), Drèze and Sen extend the analysis from food entitlements, i.e. the set alternative bundles of food items over which a person can have command, to broader entitlements, i.e. the set alternative bundles of commodities such as drinkable water or services such as sanitation and health care over which the person can have command. This more recent contribution outlines the need to consider access not only to food, but also to these other goods and services that directly influence hunger and food security.

With respect to the unit of analysis, this approach refers to individuals as well as families.⁹ However, as in the income-based approach, in order to analyse the means of accessing food and other food-security related commodities by children, we need to consider the household as a whole. In the specific application of the entitlement approach to famine, analysis has focused on more “macro” aspects, drawing attention to occupational groups.

Given all the above considerations, employing this approach rather than the previous ones improves assessment from many points of view. The comparison with the food availability approach has already been made and there is plenty of evidence for the presence of major food insecurity and undernutrition in countries with sufficient food per capita. The distance from the income-based approach is shorter, since income is an important means of gaining access to food. As argued by Sen (1983: 756), ‘In dealing with starvation and hunger, the focus on incomes – though defective – is not entirely disastrous. And of course it is a good deal better than the focus on total food output and population size. The weighting system of real income and cost-of-living pays sufficient attention to food in a poor community to make real income a moderately good “proxy” for entitlement to food in most cases.’ However, given that income is not the only, and not necessarily the most important, instrument for accessing food, and given that income is hardly measured in rural areas of developing countries, a focus on entitlements is preferable. Moreover, income reflects the short term economic status of an individual/household, whereas the full set of assets provides more information on long-run wealth and vulnerability to food insecurity.

As compared with the food first approach, the entitlement approach allows future food deprivations to be predicted: a smaller amount of assets, for example, means that the person may have more problems accessing enough food in the future. By examining a large entitlement set, we can see that issues such as drinkable water and health care are as important to food security as food per se. Therefore, we emphatically move away from a food first perspective to stress the complex and multidimensional nature of food security.

Finally, clarification is needed with regard to terminology. In his papers and books, Sen does not use the words “food security”, but prefers terms such as hunger, undernutrition or, finally, nutritional deprivations. This is because the term “food security” directly recalls the “food first” framework. Since we believe that, especially in a debate that involves international organisations as well as academics, there is a need for coherence across time without constantly changing titles and names, we prefer to continue talking about food security in the remaining parts of this paper.

Sustainable Livelihoods approach

The Sustainable Livelihoods (SL) framework is not just an approach to food security, but is a more general approach to development and poverty. Although the concept was certainly used previously, the “emphasis on livelihood” was given in the 1980s by Chambers (1983) who, in his seminal book, introduced the basic

⁹ For an explanation of the concept of ‘family entitlements’, see Sen (1999: 162).

elements of this approach, with a focus on rural development and poverty. Subsequently, the approach has been elaborated and expanded by Chambers himself and by other scholars (Chambers, 1987, 1995; Chambers and Conway, 1992; Ellis, 2000; Scoones, 1998).

The SL framework has been more successful among development organisations than in the academic world. Indeed, thanks also to its flexible, holistic and pragmatic nature, it has been adopted by nongovernmental organisations (e.g. CARE, Oxfam), governmental agencies (e.g. DFID, IISD, NZAP and SDC) and UN agencies (e.g. FAO, IFAD and WFP). Some of these organisations have developed their own version of the SL approach and there are now several different SL frameworks. Development organisations have also created a number of handbooks and guidelines on applying the SL framework in practice, and this has contributed to the popularity of the approach among practitioners.

The SL framework has many communalities with the basic needs approach and the entitlement approach. Like the former, it focuses on ‘gaining a living’ (Chambers and Conway, 1992: 5), that is ‘the necessities of life’ rather than on human development in a broader sense – i.e. human flourishing. With the entitlement approach it shares the focus on the “means” of securing a living: In fact, the SL framework is mainly concerned with the assets, tangible and intangible, at the disposal of a household which are very similar to the concept of “endowments” in the entitlement approach. The assets are classified in five categories: natural capital, physical capital, human capital, financial capital and social capital. Although the approach is presented as people-centred, the so-called “pentagon of assets” is actually the core concept of the SL framework.

This approach has been applied to a variety of development issues, including food security (Devereux et al., 2004; Hussein, 2002; WFP, 1998; Young et al., 2001). There are two distinctive features of the general SL framework that give it some advantages in the analysis of food security over previous approaches. The first is its long term perspective; the second is its focus on the context (political, economic, physical, social, cultural, etc.), although the latter is often confined to agricultural activities and rural areas, and seldom considers macroeconomic or economy-wide issues. The combination of these two analytical features with the study of the household assets brings three interrelated concepts to the analysis of food security that are peculiar to the SL framework and neglected in previous approaches:

1. Explicitly considering risks and shocks, adverse trends and seasonality leads to the concept of *vulnerability* that according to Chambers (1995: 175) ‘means not lack or want but exposure and defenselessness. It has two sides: the external side of exposure to shocks, stress and risk; and the internal side of defenselessness, meaning a lack of means to cope without damaging loss’.
2. The idea of *sustainability*, strongly related to vulnerability and resilience, is one of the core principles of the SL framework: ‘a livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future’ (DFID, 1999).
3. *Coping strategies*, that ‘represent a set of activities that are undertaken, in a particular sequence, by a household in response to exogenous shocks that lead to declining food availability’ (Curtis, 1993: 3, based on Davies, 1993). Coping strategies are included in the more general *livelihood strategies* which are the combination of activities that people choose to undertake in order to achieve their livelihood goals.

The SL concepts have been also widely used for food security measurement, especially in humanitarian emergencies (Maxwell,

1996; Maxwell et al., 1999, 2003) and famines (Howe and Devereux, 2004).

Notwithstanding the fact that this approach is more comprehensive than previous approaches and is also policy and project-oriented, it has some shortcomings in food security analysis. Although the term “capabilities” is cited,¹⁰ the actual starting point of the framework is the household’s “pentagon of assets” and related livelihood strategies, rather than ‘what life we lead and what we can or cannot do, can or cannot be’ (Sen, 1987: 16). Consequently, (1) the SL approach, like the entitlement approach, is more suitable for analysing food crises and emergencies, famines, or extreme food poverty, rather than more general food security and development issues; (2) freedom and agency issues are in fact overlooked, while we will see in the next section that they play an important role in the analysis of food security; (3) the variable relationship between people and food – what use we can each make of a given basket of food (Sen, 1985, Ch. IV) – is also not analysed thoroughly, and therefore the “utilisation” dimension of food security is neglected; (4) finally, since the unit of analysis of this approach is the household or the community but not the person, intra-household inequalities in the distribution of and access to food – that often affect women and children – may be overlooked.

A human development and capability approach to food security

The capability approach to food security was primarily developed in 1989 by Jean Drèze and Amartya Sen in their pioneering book *Hunger and Public Action*. Although the authors do not make any reference to the concept of food security, they develop a general analytical framework for studying hunger, chronic or transitory, and all related aspects, based both on the capability approach of Sen (1985, 1999) and his entitlement approach: undernourishment, malnutrition, famines, etc. A puzzling point about this book and the proposed framework is that, although it is much broader and more far reaching than the entitlement approach, it is much less known, discussed and utilised both by scholars and practitioners. For example, almost all the studies and reports on food security produced after 1989 that make reference to Sen cite only the book *Poverty and Famine* and the entitlement approach, but not *Hunger and Public Action*. The great popularity and success of the former book overshadows the latter. This circumstance is as odd as it is baffling.

In the beginning of the book, the authors explain why the entitlement approach is not sufficient for a general approach to hunger issues and why we therefore need to move beyond food entitlements towards nutritional capabilities: ‘The focus on entitlements, which is concerned with the command over *commodities*, has to be seen as only instrumentally important, and the concentration has to be, ultimately, on basic human capabilities’ (Drèze and Sen, 1989: 13). This change of perspective derives from the crucial distinction between *means* and *ends* of development emphasised by Sen that also applies to the study of hunger: ‘A more reasoned goal would be to make it possible to have the capability to avoid undernourishment and escape deprivations associated with hunger’ (Drèze and Sen, 1989: 13), i.e. the capability to be free from hunger. By switching the focus from “command over food” to “nutritional capabilities,” this approach goes beyond the “access” dimension of food security – which is the main concern of the basic needs, entitlement and SL approaches – and also

¹⁰ See also Bebbington (1999).

includes the “utilisation” dimension. This is one of the most important innovations of the capability approach to food security.¹¹

Drèze and Sen explain why access is not sufficient and utilisation is crucial: ‘The object, in this view, is not so much to provide a particular amount of food for each. Indeed, the relationship between food intake and nutritional achievement can vary greatly depending not only on features such as age, sex, pregnancy, metabolic rates, climatic conditions, and activities, but also access to complementary inputs’ (Drèze and Sen, 1989: 13).

In the book they cite a number of fundamental complementary inputs: health care and medical facilities, clean drinking water, sanitation, eradication of infection epidemics and basic education. However, this is not (and could not be) an exhaustive list.

The variable relationship between food intake and nutritional achievement is a general theoretical issue thoroughly analysed by Sen (1985): conversion factors and rates, i.e. the fact that the conversion of personal income, resources and commodities into well-being and freedom ‘depends crucially on a number of contingent circumstances, both personal and social’ (Sen, 1999: 70), such as personal heterogeneities, environmental diversities, variation in social climate, differences in relational perspectives, distribution within the family. Paraphrasing Sen (1999: 71), these different sources of variation in the relation between resources and well-being make income, entitlements or livelihoods a limited guide to food security. This problem is particularly relevant when we deal with the food security of disadvantaged people or of socio-economic groups in unfavourable circumstances or conditions.

The above mentioned features of the capability approach to hunger make it the one that better entails three dimensions – availability, access, utilisation – of food security, as defined at the 1996 World Food Summit.¹²

There are two recent developments that allow the framework proposed by Drèze and Sen in 1989 to be expanded and complemented. The first is about the role of another component of the capability approach: “agency”, i.e. a person’s ability to pursue and achieve goals. In *Hunger and Public Action*, the role of agency is not explicitly analysed since the book is more concerned with public action for social security. As suggested by Crocker (2008), a full and coherent application of the capability approach to food security should also focus on the role of people’s agency (see section ‘Food security analysis through the capability approach’). In the SL approach, the analysis is confined to “livelihood strategies”, whereas in the capability approach, agency goes beyond the

standard of living and personal well-being, and includes other valuable goals.

The second development concerns security. The capability approach to food security should also include the fourth dimension of food security, as defined by the World Food Summit, which is *stability* that is much more than just food price stability. This dimension is explicitly considered in the SL framework, especially through the concept of vulnerability. Although vulnerability issues are also carefully analysed in the book by Drèze and Sen, the capability approach to food security could be enhanced by integrating the “human security” concept first proposed by the UNDP in the Human Development Report of 1994. Since food security, according to the UNDP, is one of the seven areas of human security, introducing human security into the capability approach allows us to advance from the “capability to avoid undernourishment,” that does not explicitly consider the time dimension, to the “capability to be food secure,” that has a long term perspective and thus includes the stability dimension.

One of the main reasons why the capability approach to food security has not been commonly utilised after 1989 in food security studies and policies by researchers and policy-makers, probably consists in the lack of significant efforts to develop guidelines to operationalise it. The ambitious and risky aim of the next section is to start sketching out such guidelines.

Food security analysis through the capability approach

This Section aims to provide useful preliminary insights in order to carry out an in-depth analysis of food security at the household/individual level, following the capability approach. In other words, it intends to give broad guidelines to policy-makers and project/programme designers on how to operationalise the approach in the field.

While the core assessment of food security should focus on the “micro” level, an analysis of macro food availability can still be valuable. This is because an insufficient amount of food per capita would necessarily result in food insecurity and because the food market affects the price, which in turn affects people’s entitlements. The FAOSTAT database, for example, offers plenty of information on the production, trade and price of several food items, as well as the synthetic picture of food availability provided by the food balance sheets.¹³

Table 1 presents the different informational bases, data required, possible data sources, and, finally, the food security dimensions we take into account for our central analysis based on the capability approach. It consists of three phases: (1) analysis of *food entitlements*; (2) analysis of *basic capabilities* for food security; (3) analysis of the *capability to be food secure*. In the next paragraphs we explain each of them, bearing in mind that each phase implies *adding* a new informational basis, new variables and new dimensions.

In the first phase – analysis of food entitlements – information must be gathered on the three key components of entitlements: endowments, exchange conditions and production possibilities. In more detail, we should ideally have data on variables such as employment status, type of employment, assets, savings and possible claims to the state or other local institutions for cash-transfer or food assistance. These data can often be extracted from existing sources, such as the World Bank Living Standard Measurement Surveys (LSMS), the Demographic and Health Survey (DHS) financed by USAID and the UNICEF-supported Multiple Indicator Cluster Survey (MICS).

¹¹ In this paper we do not discuss the “right to food” approach for two main reasons. First, to some extent the human right approach is closely linked to the capability approach: as argued by several scholars (e.g., Sen, 2004b; Nussbaum, 2011), most of the human rights can be expressed in terms of rights to capabilities (e.g., right to health). The human right terminology, however, brings new insights as it considers freedom in a wider perspective: while the capability approach only focuses on the “opportunity” side of freedom, the human rights also consider the “process” aspect of freedom (Sen, 2004b). This is because it recognises as intrinsically important procedural aspects: the duty holders have, for example, the correlate obligations to respect the principles of non-discrimination and participation (UNDP, 2000). The second and most important reason for not concentrating on the human rights to food relates to the way it is operationalised by international organizations. These organizations refer to the “right to food”, where food is viewed as a basic need, a commodity to deliver to people. Moreover, they tend to use a legalistic framework for the enforcement of the human right to food (e.g., FAO, 2006; Künnemann and Epal-Ratjen, 2004). This is in contradiction especially with Sen’s view: he argues that a legal framework is only one way for the enforcement of human rights, and that an ethical recognition of these rights or political campaigning can often be more effective. In conclusion, the human rights to food, as implemented world-wide, is more an approach to enhance food security by means of legal tools than an analytical framework to assess food security.

¹² Based on this definition, ‘Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life’ (FAO, 1996).

¹³ See: <http://faostat3.fao.org/home/index.html> (accessed on 17 June 2014).

Table 1
Food Security analysis through the capability approach.

Step	What is measured	Food security dimension	Informational basis	Variables	Existing data sources
1	Food entitlements	Access to food + stability	<p>Endowments: labor force, productive assets, wealth (non-productive assets, savings, others), non-tangible resources (e.g., memberships)</p> <p>Exchange conditions: prices of food items, wages, and prices of other non-food goods and services</p> <p>Production possibilities: skills and technology</p>	<p>Employment status, type of employment, extended set of assets (mainly livestock, land and house-related assets), right/legal claims to public provision of food or income transfer from the state</p> <p>For the stability dimension: variation of endowments and strategies (coping strategies, adaptation)</p> <p>Wages from primary and secondary income generating activities, price of different food items/groups and prices of other goods and services</p> <p>Professional skills</p>	<p>Demographic and Health Survey (DHS-USAid); Living Standard Measurement Survey (LSMS-World Bank); Multiple Indicator Cluster Survey (MICS-UNICEF)</p> <p>LSMS Data on prices can be taken from FAOSTAT or from national sources</p>
2	Basic capabilities	Access to food and other food security-related items + stability	<p>Being free from hunger (i.e. following Sen, having <i>enough</i> calories for survival). This depends on another set of variables: personal conversion factors (e.g., age, sex, and metabolism), institutional conversion factors, and environmental conversion factors</p> <p>Being educated (basic education, which depends on availability and accessibility of formal and non-formal training)</p> <p>Being in a good health (depends among other things on health care)</p> <p>Being able to take part in household decision making and community life</p>	<p>Quantity of food, food groups, calorie intakeSex, ageLaw, rules, normsClimate, frequency of natural disasters</p> <p>School enrolments, educational achievement, literacy, participation in adult literacy courses and other non-formal education programs</p> <p>Access to health services, resistance to main diseases, self-reported health status</p> <p>Access to drinkable water and sanitation</p> <p>Participation in household decision making and participation in community life</p>	<p>DHS, MICS</p> <p>UNESCO Institute of Statistics, DHS, LSMS; MICS</p> <p>DHS, MICS and, to a lower degree, LSMS</p> <p>DHS, LSMS, MICS</p> <p>DHS (since 1999)</p>
3	Capability to be food secure	Access to food and other food security-related items + stability + utilisation	It is given by the interaction of the capability “being free from hunger” with the capabilities “being in a good health” and “being educated”. In addition, it depends on food <i>utilisation</i> and <i>cultural/social acceptability</i>	Diet quality, diet diversification, nutrition knowledge (through questionnaire focusing on micronutrients), hygienic practices Testes, cultural and religious beliefs about food products	DHS, MICS National/local sources

Source: authors' elaboration.

In bold are the main elements of the informational basis for the analysis of food security.

For the exchange conditions, we should obtain information on the prices of the highest possible number of goods and services from national and local sources or from international databases such as FAOSTAT. More difficult is it to gather information on the skills and professional knowledge of the individual or household members. Through all these data, we can examine whether people have access to enough food for survival now and probably in the near future.

Phase 1 should also include an analysis of the variations in endowments and exchange conditions in the recent past. Unfortunately, there are no standard household surveys where households are asked this type of question. Information on a change in endowments could be obtained by directly asking people whether they have bought or sold important assets, while changes in exchange conditions could be ascertained through other official or non-official statistics. This is just an example of a broader study of “coping” and “adapting” strategies to understand the set of strategies people employ during crises and “normal” periods as suggested by the SL framework (Corbett, 1988; Maxwell, 1996; Maxwell et al., 2003). Through this complex analysis, we can

incorporate not only what people *have*, but also what people *do* as agents of their future. This provides information on another food security dimension, i.e. stability. If people have a seasonal job, the prices of the commodity they offer would be subject to great fluctuations, or if they are known to have sold key productive assets, we would estimate that the person or household is largely vulnerable to food insecurity although she/he or they may have sufficient calorie intake at the time of survey.

The second phase consists of an analysis of some basic capabilities. First of all, we need to take into account other factors beyond food entitlements that affect the capability to be free from hunger, considered as the capability to have *enough* food/calories.¹⁴ These are the institutional and environmental conversion factors, which are, to a large extent, beyond a person's control. Institutional conversion factors are the set of rules, norms and customs that allow, for instance, a certain amount of income to be converted into an adequate amount of food. If, for example, a woman is not “allowed” to

¹⁴ This capability is linked to the concept of “undernutrition” used by the FAO and the WFP.

leave the house and go to the market alone, she will not be able to spend her income to purchase food. An in-depth institutional analysis is required to gather such information.

Environmental conversion factors are ones affecting, for example, the conversion for food growers of food production into actual food (for subsistence agriculture) or income (for food sold in the market) given the productive possibilities and exchange conditions. Natural disasters and climate fall into this category. It is possible to obtain information on environmental conversion factors through basic national or international sources, or by employing ad hoc qualitative/participatory tools (e.g., focus groups or “life stories”) at the community level.

Moreover, access to food is not enough to understand food security and we therefore need to move to a broader analysis of basic capabilities, such as being in good health, being educated and being able to take part in household decision making and community life. To carry out this analysis, already existing data must be collected or found on: (1) school enrolment, educational achievements, literacy, participation in adult literacy courses and other non-formal education programmes; (2) access to health care services, sanitation, morbidity from major diseases, self-reported health status; and (3) the capability to make a shared or autonomous decision within the household on issues such as budget and food allocation (empowerment-type questionnaires), and participation in community life. While data on education and health for many developing countries (at the national and regional/provincial levels) are available in many databases such as DHS, LSMS and MICS, data on participation in household decision making and on women's empowerment and autonomy has only been available in the DHS database since 1999.

Finally, the capability to be food secure is a more complex capability that depends on interactions between the “basic capabilities”. In this case, by “basic” and “more complex” capabilities, we mean that the former are *foundational* to the latter.¹⁵ Our interpretation of the “capability to be food secure” is close to what Drèze and Sen (1989) define as the ‘capability to be adequately nourished’. This is coherent with the 2001 FAO definition of food security as a ‘A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life’ (FAO, 2001: 49). This is probably the most advanced definition as well as the one that best recognises the close relationship between food security and nutrition, though not the best known and most accepted.

Enjoying all the basic capabilities is necessary but not sufficient to be food secure. Further data on the *utilisation* of food should be collected. These data should provide information on the nutritional knowledge of the person,¹⁶ the quality and variety of the diet and, if possible, hygienic and cooking practices. As an example, having *enough* calories obtained from one single type of food cooked in a way that does not derive the right nutritional contents from it is likely to cause the person to be food insecure. Therefore, in this phase, the informational basis must be widened. The questionnaire should incorporate a set of questions on knowledge of the benefits of micronutrients and other nutrition-related aspects,¹⁷ whether the person has participated in nutrition programmes and specific

information on different food items or food groups in order to construct an indicator of diet diversification.¹⁸

Finally, a person may have enough food of the right quality, but not be able to eat it because of cultural or religious reasons, or because they do not like the taste or are simply not used to eating that food.¹⁹ Drawing from Crocker (2008):

For example, the taste of an available grain may be too different from that to which they are accustomed. Evidence exists that people who receive extra cash for food sometimes fail to improve their nutritional status, apparently because they choose to consume nutritionally deficient foods. If food is to make a difference in people's nutritional and wider well-being, it must be food that the individuals in question are generally willing and able to convert into nutritional functioning. This is not to say that food habits cannot be changed. Rather, it underscores the importance of nutrition education and social criticism of certain food consumption patterns. If people find food distasteful or unacceptable for other reasons, even nutritious food to which people are entitled will not by itself protect or restore nutritional well-being

[Crocker, 2008, Ch. 8.]

That is why information on religious beliefs and local food habits should be collected. Most of this information can be collected at the community level by employing qualitative techniques such as focus groups.

The analysis of food security through the capability approach allows a more comprehensive examination of the phenomenon. While the income-based approach would take income as a focal variable, the entitlement/capability approach provides information on how income is used to ultimately reach the capability to be food secure, depending on personal and external conversion factors, food choices and behaviours. Unlike the food-first approach, the capability approach takes into account the quality, utilisation and social acceptability of food, and the interaction with other basic capabilities such as health and education. The capability approach also differs from the “mechanical” view of food insecurity as a lack of micronutrients or other food properties generally advocated by nutritionists.²⁰ By analysing the phenomenon through the three steps described in Table 1, it aims to identify the root causes of food insecurity, situating the study within the broader topic of well-being. Food insecurity, within the framework, can be the result of a lack of education, health or other basic capabilities that constitute people's well-being.²¹ Using the words of David Crocker (2008, Ch. 8), ‘Instead of identifying hungry people simply by a lack of food intake and mechanically monitoring individuals or dispensing food to them according to nutritional requirements, the focus should be on nutritional functioning and those “nutrition-related capabilities that are crucial to human well-being.”’

Another element that is implicitly incorporated in all the steps of the capability framework for food security is *agency*, i.e. ‘the ability of people to help themselves and also to influence the world’ (Sen, 1999: 18–19). People are clearly constrained by institutional and environmental factors which are to a high degree beyond their control. However, their actions can affect their life and their likelihood of escaping poverty and food insecurity. A person may choose to “help themselves” by, for example, diversifying

¹⁵ See, for example, Terzi (2007). In the capability literature, the terminology “basic” has also been seen in different ways: see, among others, Alkire (2002), Nussbaum (2003), and Sen (2004a).

¹⁶ In the case of children, researchers should clearly analyse the nutrition knowledge of the parents or those who take care of the child.

¹⁷ See, for example, the questions asked to interviewees in Indonesia by the NGO Helen Keller International, used by Webb and Block (2004). Alternatively, see the study by Burchi (2010) who aggregated the relevant information available in the DHS surveys to construct one indicator of nutrition and health knowledge.

¹⁸ See: Hoddinott and Yohannes (2002) and Arimond and Ruel (2004).

¹⁹ This is incorporated in the following part of the FAO definition of food security, “social ... access to sufficient, safe and nutritious food” (FAO, 2001: 49, emphasis added).

²⁰ Lack of vitamins or other micronutrients is the cause of the so-called “hidden hunger” (see Burchi et al., 2011).

²¹ See, for instance, the study of Burchi and De Muro (2007) that recognises the relevance of basic education for enhancing food security in rural areas of developing countries.

their income-generating activities or adopting coping strategies for food security in the long run. Conversely, a person may choose to “influence the well-being of others” such as their children, at the expense of their own well-being. Finally, they may act just to “influence the world”, by taking decisions that could also reduce their well-being.²² ‘As individual and collective agents we decide how to respond to inner urges, external forces, and constraining circumstances, and whether or not to enhance or sacrifice our well-being to some higher cause’ (Crocker, 2008, Ch. 8).

The discussion on agency leads us to examine a final point, which has not previously been discussed. Table 1 outlines the linkages between different *capabilities*; however, we might after all be interested in knowing whether a person or a household is actually food secure, i.e. whether their *functioning* of “being food secure” is activated. Whether or not the capability moves into the functioning depends exclusively on people’s *choice*. Although being food secure is such a basic capability for which the largest proportion of people with such a capability would decide to activate the related functioning, there may be cases in which people might *choose* not to be food secure. It can be the case of an anorexic person “deciding” to fast or, as already outlined in previous paragraphs, a person making inter-temporal choices in order to ensure long-term food security. This situation can be properly captured only by simultaneously examining capabilities and functionings (Sen, 1987). However, for evident reasons, policy-makers should concentrate on people with a low capability to be food secure (in the short and long run), without further need to analyse functionings. By following the three-step procedure described in Table 1, we can identify people that are undernourished but do not have constraints to access food and food-related items.

As a conclusion to this section, the capability-based analysis of food security requires a larger informational basis than any other previous approach. However, in the paragraphs above, we considered only the “ideal” number of variables to be used during the three phases of the study. In the field, programme and project designers from international organisations or NGOs always face constraints in time and cost. A lower informational basis can still be used to perform a reliable analysis of food security built on the capability framework. It is only important to keep the most relevant elements, and maybe reduce the number of variables for each factor²³ or the complexity of data collection. The key point is not *how many* variables we should focus on, but *which* variables: in this sense, the capability approach provides new important insights.

Conclusions

The paper constitutes one of the first attempts to provide a comprehensive but synthetic review of several approaches for the analysis of food security, and attempts to identify the linkages between different frameworks. In particular, we have tried to combine the debates that have been going on for a few decades in the academic field and within international organisations.

Moreover, building on the pioneering work of Drèze and Sen (1989), we extended the capability approach to food security by highlighting the importance of factors such as participation in household decision making and empowerment, and distinguishing between the capability and the functioning to be food secure. In our opinion, the capability approach directly evolved from the entitlement approach, as well as other theoretical frameworks,

and its operationalisation in the field of food security allows a more comprehensive analysis of its direct and indirect drivers.

We then provided some preliminary insights into how to apply this approach. We identified three steps of analysis that can progressively ensure a better understanding of food (in)security in a given area. Through this procedure, we can detect whether food insecurity is really a problem of lack of assets or purchasing power, or if it is mainly the result of the lack of basic capabilities such as education and access to health care. Therefore, it places food security in the broad area of studies on well-being and (human) development, as opposed to the area of agriculture. It finally opens the space to a different type of programmatic guidance on food security analysis, which could be used by UN organisations as well as NGOs, and constitutes the basis for a different way of measuring this phenomenon. We hope that new contributions in this field will follow these directions.

Acknowledgments

This paper is a revised version of the background paper for the African Human Development Report 2012 “Towards a Food Secure Future”, commissioned by the UNDP, Regional Bureau for Africa. The authors acknowledge the financial support of UNDP and would like to thank for helpful comments Ricardo Fuentes, Sebastian Levine, Pedro Conceicao, all the participants in the 2010 HDCA conference on “Human Rights and Human Development” held in Amman and the participants in the 2009 Garnet conference on “Food Security and Sustainable Development: Challenges for the Governance of International Relations”, held in Rome.

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²² For an in-depth discussion on the relationship between agency and well-being, see Sen (1995).

²³ As an example, we can analyse the prices of very few foods and non-food items which are characteristic of the area, or the ownership of a few assets that truly indicate the wealth status in that area.

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