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A Human Development and Capability Approach to Food Security: Conceptual Framework and Informational Basis

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Abstract: This paper has a twofold objective: (a) to make a comprehensive review of different approaches to food security; (b) to develop a human development and capability approach to food security following the pioneering works of Amartya Sen and Jean Dréze. To our best knowledge, no paper has yet provided a systematic survey of the major approaches to food security. Starting from the analysis of food production, we highlight the value added provided by the capability approach and the human development paradigm. Then, we propose a methodology of analysis of food security through this approach, entailing three basic steps: (1) analysis of food entitlements; (2) analysis of basic nutritional capabilities; (3) analysis of the capability to be food secure. This way, it is possible to move beyond income-, entitlement-, or livelihoods-related frameworks, and to identify the root causes of food insecurity: food insecurity can be the result of lack of education, health or other basic capabilities that constitute people's wellbeing. Therefore, it allows to situate the study within the broader topic of wellbeing, agency and freedom. Finally, we briefly discuss the role of food security for human development.

Keywords: Food security, capability approach, entitlements, human development

JEL Classification: O15, C81, Q18, D13, I15

1. Introduction

According to the latest estimates by FAO (2010), there are nearly 925 million food insecure people in the world. The number is above that of 2007 as a consequence of the food price rise and the overall economic crisis. Therefore, food security is a crucial topic within the broader fields of development economics and development studies.

The present paper engages in the debate on the theory and policy of food security. The way food security is theorized, measured, and finally analyzed affects the typology of policies that will be adopted. The paper has a twofold objective. The first one is to review critically different approaches to food security proposed either within the academic world or by international organizations. According to our best knowledge until now there has not been a systemic attempt to compare (most of) the existing approaches.

The second aim of the paper is to develop the capability approach primarily elaborated by the economist Amartya Sen during the early 1980s, in order to use it for the analysis of food security. According to us, the literature has often missed to identify the linkages existing between Sen's entitlement approach used in the specific fields of hunger and famine, his capability approach employed to analyze development and wellbeing, and the human development paradigm elaborated by UNDP. A strict connection exists and a direct reference to the book of Dreze and Sen (1989) and to the UNDP HDR on human security (1994) is needed to understand it. By combining these three approaches, we can arrive to a more comprehensive theoretical approach to food security.

As a consequence, the paper is structured in five sections. The second section reviews the approaches to food security, outlining the basic differences; the third one discusses how to analyze food

security based on the capability approach; the fourth one briefly points out the effect of food security on human development; the fifth section concludes and identifies the policy implications of using the capability framework.

2. Main approaches to food security

At the beginning of a paper discussing different approaches to food security, one would expect to have a clear definition of food security. This is not the case for this paper for two reasons: 1) though a commonly accepted definition exists, in the food security practice and actions the dimensions/factors stressed are often so diverse to highlight different views on the meaning of the "food security" term; 2) we intend to proceed by focusing on the different approaches, which have drawn attention to different components of food security, and, in turn, have contributed to modify and extend the definition. Thus, the section presents five approaches to food security: 1. Food availability; 2. Income-based; 3. Basic needs; 4. Entitlement; 5. Sustainable livelihoods. We will try to keep as much as possible a chronological and logical order moving from the oldest and narrower vision of food security to the most recent and advanced ones.

2.1 Food availability approach

The first approach to food security that we present is the "food availability" approach, because it is certainly the oldest one and still the most influential. Although the core ideas of this approach could be traced back to the Venetian thinker Giovanni Botero (1588), it was Thomas Malthus (1789) that popularized it, and, in fact, it also known as the Malthusian approach.

The approach is focused on the (dis)equilibrium between population and food: in order to maintain this equilibrium the rate of growth of food availability should be not lower than the rate of growth of population. Consequently, in this 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, while in an open economy also food trade can play a relevant role.[2]

Until the early 1970s, this was the reference approach for the international community, both at political and 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 rate of growth of population–namely the fertility rate–through appropriate policies;[3]

[2] Currently, the tool utilized to assess food availability is the "food balance sheet" (FAO 2001). «A food balance sheet presents a comprehensive picture of the pattern of a country's food supply during a specified reference period. The food balance sheet shows for each food item i.e. each primary commodity availability for human consumption which corresponds to the sources of supply and its utilisation. The total quantity of foodstuffs produced in a country added to the total quantity imported and adjusted to any change in stocks that may have occurred since the beginning of the reference period gives the supply available during that period. On the utilisation side a distinction is made between the quantities exported, fed to livestock + used for seed, losses during storage and transportation, and food supplies available for human consumption. The per capita supply of each such food item available for human consumption is then obtained by dividing the respective quantity by the related data on the population actually partaking in it. Data on per capita food supplies are expressed in terms of quantity and by applying appropriate food composition factors for all primary and processed products also in terms of dietary energy value, protein and fat content» (FAOSTAT 2011).

[3] Sen (1999: ch. 9) reviews critically various approaches and policies aimed at reducing the fertility rate.

- On the "supply side", the need to boost (per capita) food production–namely agricultural production. For such purpose, 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, besides availability, other fundamental dimensions of food security – such as access to and utilization 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 notice that after the 1970s the Malthusian ghosts of scarcity have been reinvigorated by the increasing ecological concerns, and related concepts such as "carrying capacity" and "ecological footprint."

Before moving to the next approaches, it is important to emphasize a methodological aspect that is useful for 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, to a country, a region, down to a community, a household, or a single individual. Furthermore, from the economic point of view, the approach can focus on a single sector, on a cluster of sectors (e.g. the "food system" or "chain") or can be economy-wide.

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).

2.2 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 food sector – initially only agricultural production, and also food trade later on – has been criticized by economists for being too concentrated on one single economic sector. Recognizing that the economy is composed of many interdependent sectors, food security cannot be viewed as an exclusive problem of 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 in the analysis variables such as Gross Domestic Product (GDP), economic growth, eventually, but not necessarily, highly 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 specialize 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 as a way to include within the food security framework the national "means" to increase aggregate food availability.

However, the most important shift was from food availability at macro-level to income at micro-level (Reutlinger and Selowsky 1976; Haq 1976; Griffin and Khan 1977). The approach is very similar to the one traditionally used to assess poverty. While poverty was conceived as a lack of enough income necessary to buy a bundle of goods to guarantee the survival (or minimum standard of living) of a person, food insecurity is implicitly assumed as a sub-category of poverty (often referred to as "food poverty"), i.e. lack of enough income necessary to buy at the given conditions the amount of food required (Sibrian et al. 2007; Sibrian 2008). In particular, the different foods are converted into

calories (*characteristics* of the food): if people's calorie availability is lower than a threshold identified by international nutritionists, they are considered food insecure.
Through household surveys providing information on income, it is theoretically possible to estimate the amount of food consumed, under the assumption that poorer households use a larger proportion of their income to buy food.[4] Food is, then, converted in calories: if household calorie availability is lower than the "required" minimum one, some or all the members 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.[5]

More useful are the household expenditures surveys, from which it is possible to sort out the amount of expenditures on a (limited) number of food items. Many applied economists have estimated the calorie contents of each food item and then aggregate them in order to have 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 though 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, potentially income could be estimated for individuals. However, there are problems related to children, whose food security depends also on adults' income. Furthermore, all the surveys mentioned above are

[4] As argued by Svedberg (2002: ch. 7), there seems to be relevant empirical evidence to support this hypothesis.
[5] Furthermore, most of the studies on food demand have many biases due to the fact that they consider calories as any other good, without considering the actual effect that nutrition and calories have on productivity and income. For a detailed discussion on this issue, see Svedberg (2002: ch. 4).

conducted at 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 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 realized in rural areas of low-income countries, where the dominant part of the population is in subsistence agriculture, the method is not highly reliable. As also argued by Frankenberger (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".

2.3 Basic needs approach

In the second half of 1970s, the International Labour Organization (ILO) has proposed a new model of development, the *basic needs approach*, with the intention of incorporating also 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. Later on, two economists: Streeten (1981) and Stewart (1985) contributed to re-launch this approach.

The advocates of the basic needs approach viewed development as a process aiming to ensure to all the people the satisfaction of their basic needs. The fulfillment of basic needs was a precondition for a "full-life", composed of material and non-material elements (Stewart 1985). Given the practical nature of this approach, it was necessary to give a minimal interpretation to the full life, i.e. to make a small list of basic needs that governments and development agencies could ensure. Although the list presented by different authors is slightly different, in most of the cases it 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 in different disciplines such as Maslow (1943) in psychology, and by authors in the human rights literature. In particular, the definition of "basic rights" as those necessary for the enjoyment of all other rights given by Henry Shue (1996) has led many authors to include primarily the "human right to adequate food" (Kent 2005).

This discourse in development literature, according to us, has heavily affected the debate on food security, giving birth 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 contributed to make a further step in shifting the 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).

There are different ways to assess food security coherently with this framework. The first one is the food frequency assessment, which can be realized 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 more complex to derive the calorie equivalent.

The second method is based on the direct observation of food consumption. All the household members are observed during meals in order to have a direct information on all food consumed. The final calorie availability is obtained by weighting the food

[6] To our best knowledge, none has explicitly stressed the linkage between the basic needs approach and the food first approach to food security.

items according to their nutritional contents, and aggregating them.[7] More recently, some indicators based on the quality and diversification of the diet have been elaborated, which can be 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 24 hours or 1 week). This was an important step to move away from the 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 household level, while direct observation and assessments looking at the diet are often realized at individual level (also for children). Therefore, in the last two cases, it is not necessary to assume a function of food distribution within the household. This is particularly important because by observing directly the conditions of women we do not assume that they receive the same amount of food received by men. This problem usually referred to as "gender bias" in the development and food security literature has been found in many developing countries (e.g., Chen et al. 1981; Das Gupta 1987; Harriss 1995).

The main advantage of the food first approach as compared to the (micro) income-based approach to assess food security consists in the possibility to focus directly on the commodity we are interested in (food), rather than on the income necessary 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 recognizes (and does not underestimate) the food grown at home rather than purchased in the market.

[7] Given the scope of this review we do not engage in the several debates concerning measurement problems, such as the changing behaviors of people being observed by strangers.

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 its members in a given time, or, eventually, in the past. It does not provide much information on potential food deprivations in the future.

2.4 Entitlement approach

For long time the debate on hunger and famine has been heavily affected by food availability approach rooted in Malthus' thought. Only at the beginning of 1980s Amartya Sen's *entitlement approach* contributed to challenge this perspective 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) the 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 the person can have access to through trade and production, i.e. the "exchange entitlement mapping" (Sen 1981: 435). Starting from a situation in which an individual has just enough means of subsistence, a decline of 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 the exchange entitlement mapping; for instance, a sharp reduction of the price of the commodity that the individual produces, due to external causes, reduces its capacity to buy food.

Moreover, the entitlement failure may take different forms. Given an economy in which each group, for simplicity, produces one commodity (including labor), and given a food exchange rate (commodity price/food price), any group risks to starve due to an entitlement failure either because of a reduction of 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', in the second case a 'trade entitlement failure'. This distinction is particularly relevant to examine which group is at risk of starvation if something changes. The 'direct entitlement failure' occurs for food-producers as a result of decline in their production; the 'trade entitlement failure' occurs for the groups that produce other than food when their terms of change fall or when the total availability of food declines. Furthermore, those groups living upon both 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 regular hunger and endemic undernourishment. Using the words of Dreze 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.
(Dreze and Sen 1989: 24).

The entitlement approach contributed to re-address 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, it has significantly affected the notion of food security, by adding the *access* dimension. The influence of Amartya Sen's work is visible in two important food security definitions: "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).[8]

Having enough food per capita at 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,[9] as well as information on wage, and other prices of food and non-food items should be adequately taken into account.

Furthermore, in the book "Hunger and Public Action" (1989), Dreze 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, which directly influence hunger and food security.

With respect to the unit of analysis, this approach refers to individuals as well as families.[10] However, as in the case of the income-based approach, in order to analyze the means to access food and other food-security related commodities by children, we

[8] The World Bank definition is almost the same of that given by Reutlinger (1986).

[9] Osmani (1995) has extended the entitlement approach by recognizing the importance of non-tangible resources as endowments. In particular, he draws the example of employment benefits for citizens of a country. Being citizens of that country (together with the status of unemployed) entitle people to access money through which they can buy food, or access directly food (through food-stamp-type programs).

[10] For an explanation of the concept of "family entitlements", see Sen (1999: 162).

need to consider the household as a whole. In the specific application of the entitlement approach to famine, the analysis has focused on more "macro" aspects, drawing attention to occupational groups.

Given all the considerations above, employing this approach rather than the previous ones improves the assessment from many points of view. The comparison with the food availability approach has been already made, and there is plenty of evidence of the presence of large food insecurity and undernutrition in countries with sufficient food per capita. The distance from the income-based approach is lower, being income an important means to gain 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 to access 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, while the full set of assets provides more information on a long-run wealth and vulnerability to food insecurity.

As compared to the food first approach, the entitlement approach permits to predict future food deprivations: a lower amount of assets, for example, means that the person might have more problems in the future to access enough food. Then, by examining a large entitlement set, we recognize that issue such as drinkable water and health care are as important as food for food security. Therefore, we radically move away from a food first perspective

to stress the complex and multidimensional nature of food security.

Finally, a clarification is needed concerning the terminology. In his papers and books, Sen does not use the words "food security", but rather prefers terminologies such as hunger, undernutrition or, finally, nutritional deprivations. That is because the terminology "food security" directly recalls the "food first" framework. Since we believe that, especially in a debate that does not involve only academics but also international organizations, there is a need of coherence across time without always changing titles and names, we prefer talking about food security also in the remaining parts of the paper.

2.5 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. Though 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 elements of this approach, with a focus on rural development and poverty. Subsequently, the approach has been elaborated and expanded by Chambers himself and other scholars (Chambers 1987; Chambers and Conway 1992; Chambers 1995; Ellis 2000; Scoones 2005).

The SL framework has been more successful among development organizations than in the academic world. In fact, thanks also to its flexible, holistic and pragmatic nature, it has been adopted by NGOs (e.g., CARE, Oxfam), governmental agencies (e.g. DFID, IISD, SDC, NZAP) and UN agencies (e.g., FAO, IFAD, WFP, UNDP). Some of those organizations have developed their own version of the SL approach, therefore now there is a variety of SL frameworks. Development organizations have also created a number of handbooks and guidelines to apply 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 (tangible and intangible) assets commanded by 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, social capital. Although the approach is presented as people-centered, the so-called "pentagon of assets" is actually the core concept of the SL framework.

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

1. Considering explicitly 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 1995; Maxwell et al. 1999, 2003) and famines (Howe and Devereux 2004).

Notwithstanding this approach is more comprehensive that previous approaches, and is also policy and project-oriented, it has some shortcomings in the analysis of food security. Although the term "capabilities" is cited, the actual starting point of the framework is the household's "pentagon of assets" and related livelihood strategies, and not "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 analyzing food crises and emergencies, famines, or extreme food poverty, rather than more general food security and

development issue; (2) freedom and agency issues are in fact overlooked, while we will see in the next section that they play an important role in food security analysis; (3) also the variable relationship between people and food – what use we can respectively make of a given basket of food (Sen 1985: ch. IV) – is not thoroughly analyzed, and therefore the "utilization" dimension of food security is neglected; (4) finally, as the unit of analysis of this approach is the household or the community but not the person, intra-household inequalities in the distribution and access to food – that often hit women and children – could be overlooked.

3. A human development and capability approach to food fecurity

3.1 The conceptual framework

The capability approach to food security was primarily elaborated in 1989 by Jean Drèze and Amartya Sen in the 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, based both on the capability approach of Sen (1985, 1999) and his entitlement approach, for studying hunger –chronic or transitory– and all related aspects: undernourishment, malnutrition, famines, etc. A puzzling question about this book and the proposed framework is that, notwithstanding it is much broader and far reaching than the entitlement approach, it is much less known, discussed and utilized, both by scholars and practitioners. For example, almost all those studies and reports produced after 1989 on food security that make some reference to Sen cite only the *Poverty and Famine* book and the entitlement approach but not *Hunger and Public Action*. The great popularity and success of the former book shadow the latter. This circumstance is as odd as 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 therefore why we need to move beyond food entitlements toward 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 emphasized by Sen, that applies also 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 – that is the main concern of the basic needs, entitlement and SL approaches– and includes also the "utilization" dimension. This is one of the most important innovations of the capability approach to food security.

Drèze and Sen explain why access is not sufficient and utilization 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, p. 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; basic education. However, this is not (and it could not be) an exhaustive list.

The variable relationship between food intake and nutritional achievement is a case of general theoretical issue thoroughly analyzed by Sen (1985): the 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 socioeconomic groups in unfavorable circumstances or conditions.

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

There are two recent developments that allow expanding and complementing the framework proposed by Drèze and Sen in 1989. The first is about the role of another component of the capability approach, "agency", i.e. a person's ability to pursue and realize her goals. In *Hunger and Public Action* the role of agency is not explicitly analyzed, as the book is more concerned with public action for social security. As we will discuss in the next section, a full and coherent application of the capability approach to food security should also focus on the role of people's agency, as suggested by Crocker (2008). In the SL approach, the analysis is confined to "livelihood strategies", while in the capability approach agency goes beyond the standard of living and personal well-being and includes other valuable goals.

The second development is about security. The capability approach to food security should also include the fourth dimension of food security as defined by the WFS, which is stability –that is much more than just food prices stability. This dimension is explicitly considered in the SL framework, especially through the concept of vulnerability. Although vulnerability issues are carefully analyzed also in the book by Drèze and Sen, the capability approach to food security could be enhanced by integrating the "human security" concept, firstly proposed by UNDP in the Human Development Report of 1994. As food security, according to 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 consider explicitly the time dimension, to the "capability to be food secure," that has a long term perspective and thus include the stability dimension.

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

3.2 Analyzing food security

The aim of this section is 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 projects/programs designers on how to operationalize the capability approach.

Table I presents the different informational bases, data to collect and, finally, the food security dimensions we take into account in the analysis. It entails 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, keeping in mind that each phase implies *adding* a new informational basis, new variables, and new dimensions.

In the first phase - analysis of food entitlements – it is necessary to collect information on the three key components of entitlements: endowments, exchange conditions, and production possibilities. More in detail, we ideally should have data on variables such as employment status, type of employment, assets, savings, and possible claims on the state or other local institutes for cash-transfer or food assistance. For the other two elements of the entitlements, we should collect information on the prices of the highest possible number of goods and services, and on the skills and professional knowledge of the individual or household members. Through all these data we can examine whether people have currently, and probably in the near future, access to enough food for survival.

Phase 1, according to us, should encompass also an analysis of the variations of endowments and exchange conditions in the recent period. The former could be obtained by asking directly people whether they have bought or sold some important assets, while the second one 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. 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, that is, stability. If people have a seasonal job, the prices of the commodity they offer have large fluctuations, or if they reported to sell some key productive assets, we would estimate that the person/household is largely vulnerable to food

insecurity, though maybe having enough calorie intakes at the time of survey.

The second phase consists in the 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, intended as the capability to have *enough* food/calories.[11] These are the institutional and environmental conversion factors, which are, to a high extent, beyond the person's control. Institutional conversion factors are the set of rules, norms, and customs that allow, for instance, to convert a certain amount of income into an adequate amount of food. If, for example, a woman is not "allowed" to leave the house and go to the market alone, she will not be able to spend her income to purchase food. Environmental conversions factors are those affecting, for example, the conversion of food production for food growers into actual food (in the case of subsistence agriculture) or income (in the case of food sold in the market) given the productive possibilities and the exchange conditions. Natural disasters and climate fall in this category.

Moreover, access to food is not enough to understand food security, thus we further need to move to a broader analysis of basic capabilities such as being in a good health, being educated, and being able to take part in household decision making and community life. To carry out this analysis, it is necessary to collect or find already existing data on: 1) school enrolments, educational achievements, literacy, participation to adult literacy courses and other non-formal education programmes; 2) access to health services, sanitation, morbidity to main diseases, self-reported health status; and 3) the capability to take a shared or autonomous decision within the household on subjects such as budget and food allocation (empowerment-type questionnaires), and participation in community life.

[11] This capability is linked to the concept of "undernutrition" used by FAO and WFP.

Finally, the capability to be food secure is a more complex capability, which depends on the interaction among the "basic capabilities". In this case, for "basic" and "more complex" capabilities we mean that the former are *foundational* to the latter.[12] Our interpretation of the "capability to be food secure" is close to what Dreze and Sen (1989) define "capability to be adequately nourished." According to us, this is coherent with the 2001 FAO definition of food security, which is the most advanced one as well as the one that mostly recognize the close relationship between food security and nutrition.

Enjoying all the basic capabilities is necessary but not sufficient to be able to be food secure. Further data on the *utilization* of food should be collected. These data should provide information on the nutrition knowledge of the person,[13] on the quality and variety of the diet, and possibly on her hygienic and cooking practices. As an example, having *enough* calories, but obtained from one single type of food cooked in such a way not to derive the right nutritional contents from it are likely to lead the person to be food insecure. Therefore, in this phase it is necessary to enlarge the informational basis. The questionnaire should incorporate a set of questions on knowledge about the benefits of micronutrients and other nutrition-related aspects,[14] usually whether the person has participated to nutrition programmes, specific information on

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

[13] In the case of children, the researcher should clearly analyze the nutrition knowledge of the parents or those who take care of the child.

[14] 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 of Burchi (2010), who aggregated the relevant information available in the DHS surveys to construct one indicator of nutrition and health knowledge.

different food items or food groups in order to construct an indicator of diet diversification.[15]

Finally, a person might have enough food and of the right quality, but not being able to eat it because of cultural or religious reasons, or because she does not like the taste, or she is simply not used to eat that food.[16] 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 believes and cultural attitudes especially with reference to foods and on local food habits should be collected. Most of this information can be collected at community level, employing qualitative techniques such as focus groups.

[15] See: Hoddinott and Yohannes (2002); Ruel (2002); Arimond and Ruel (2004).

[16] This is incorporated in the following part of the FAO definition of food security, "*social* … access to sufficient, safe and nutritious food" (FAO 2001, emphasis added).

Table I. Operationalization of the capability approach to food security

Steps	What is measured	Food security dimension	Informational basis	Variable
1	**Food Entitlements**	**Access to food + Stability**	**Endowments**: labour force, productive assets, wealth (non-productive assets, savings,..), non-tangible resources (e.g., memberships)	Employment status, type of employment, large set of assets (mainly livestock, land and house-related assets), right/legal claim to public provision of food or income transfer from the state. For the stability dimension: variation of endowments and strategies (coping strategies, adaptation)
			Exchange conditions: prices of food items, wages, and prices of other non-food goods and services	Wages from primary and secondary income generating activity, price of different food items/groups and prices of other goods and services.
			Production possibilities: skills and technology.	Professional skills
2	**Basic Capabilities**	**Access to food and other food security-related items + Stability**	**Being free from hunger** (meaning, following Sen, having *enough* calories for survival). This depends on another set of variables:	Quantity of food, food groups, calorie intake Sex, age. Law, rules, norms

			personal conversion factors (age, sex, metabolism,..), **Institutional conversion factors**, and **Environmental conversion factors**.	Climate, frequency of natural disasters.
			Being educated (basic education, which depends on availability and accessibility of formal and non-formal training)	School enrolments, educational achievements, literacy, participation to adult literacy courses and other non-formal education programmes.
			Being in a good health (depends among other things on health care)	Access to health services, sanitation, morbidity to main diseases, self-reported health status.
			Being able to take part in household decision making and community life	Participation in household decision making, participation in community life (questionnaire).
3	**Capability To Be Food Secure**	**Access to food and other food security-related items + Stability + Utilization**	It is given by the interaction between the capability "being free from hunger" with the capabilities "being in a good health" and "being educated". In addition, it depends on food *utilization* and *cultural/social acceptability*	Diet quality, diet diversification, nutrition knowledge (through questionnaire focusing on micronutrients,.), hygienic practices. Testes, cultural and religious beliefs with respect to food products.

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 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 behaviors. Unlike the food-first approach, the capability approach takes into account the quality, utilization 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. By analyzing the phenomenon through the three steps described in Table I, it aims at identifying the root causes of food insecurity, situating the study within the broader topic of wellbeing. Food insecurity, within the framework, can be the result of lack of education, health or other basic capabilities that constitute people's wellbeing.[17] 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 the institutional and environmental factors, which are to a high extent outside their control. However, their actions can affect their life and their likelihood to escape poverty and food insecurity. A person might choose to "help herself" by, for example, diversifying her income-generating activities or adopting coping strategies for their long-

[17] See, for instance, the study of Burchi and De Muro (2007), which recognizes the relevance of basic education for enhancing food security in the rural areas of developing countries.

run food security. To the opposite, a person could choose to "influence the wellbeing of others" like their children, at the expense of her own wellbeing. Finally, she could act just to "influence the world", by taking decisions, which could also reduce her wellbeing.[18] "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 last point, which has not been previously stressed. Table I outlines the linkages between different *capabilities*; however, we might be finally interested in knowing whether a person or a household is actually food secure, i.e. whether her *functioning* "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 that the largest proportion of the people having such capability would decide to activate the related functioning, there might be cases in which people would *choose* not to be food secure. It can be the case of an anhoressic person "deciding" to fast or, as already outlined in previous paragraphs, a person making inter-temporal choices in order to ensure long-run food security. This situation can be properly captured only by examining simultaneously capabilities and functionings (Sen 1987).[19] However, for evident reasons the attention of policy-makers should be ideally given to people having a low capability to be food secure (in the short and long run), without a further need to analyze the functionings. By following the three steps procedure described in Table I it is possible to sort out those people that result as undernourished although not having constraints to access food and food-related items.

[18] For an in-depth discussion on the relationship between agency and wellbeing, see Sen (1995).

[19] Sen (1987) used the term "refined functionings" to mean functionings adjusted according to the capabilities set.

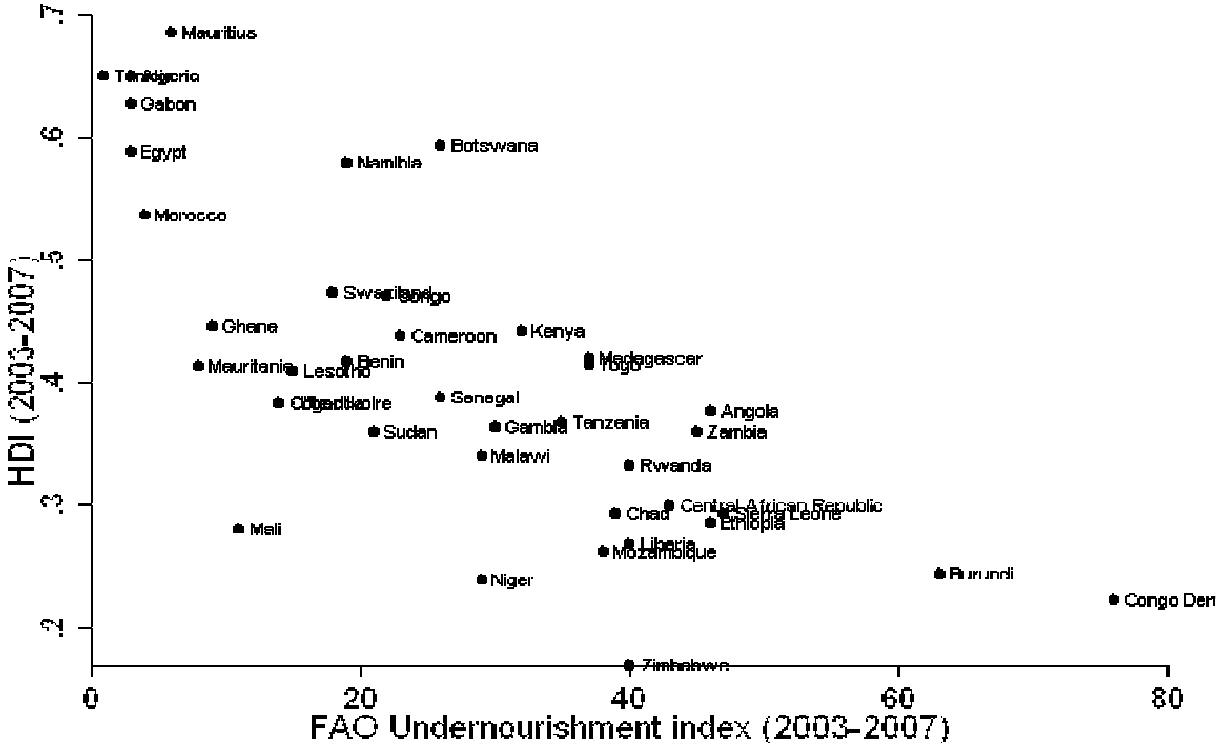
As a conclusion of section 3, the capability-based analysis of food security requires a larger informational basis than any other previous approach. However, in the previous paragraphs we have considered only the "ideal" number of variables to be used during the three phases of the study. In the field, program and project designers from international organizations or Ngos always have to face constraints in timing and costs. It is always possible to use a lower informational basis to make still a reliable analysis of food security built on the capability framework. It is only important to keep the most relevant elements, and maybe reducing the number of variables for each factor,[20] 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.

4. The effect of food security on human development

The aim of this section is to examine the complex relationship between food security and human development. In Figure 1 we display the relationship between the human development index (as proxy for human development) and the FAO undernourishment (as proxy for food insecurity) for African countries. For both the indicators the values refer to the average between 2003 and 2007. It is possible to notice that a very strong negative relationship exists, meaning that countries with lower (higher) food insecurity experience higher (lower) human development and *vice versa*. The Pearson's rho coefficient of correlation is just below 0.8.

[20] As an example, it is possible to analyze the prices of very few foods and non-food items, which are characteristic of the area or the ownership of few assets really indicating the wealth status in the area.

Figure 1. Correlation between Human Development and Food Insecurity

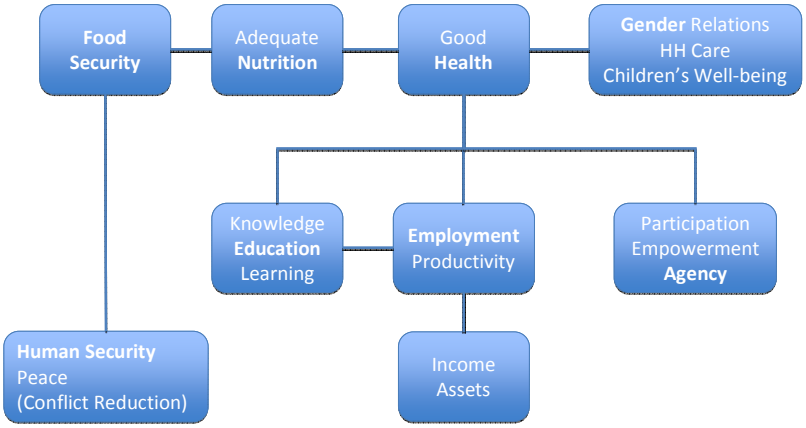


Source: UNDP Human Development Statistics and UN FAO Statistics Division.

It is more difficult to understand the side of the relationship: is it more human development affecting food security or more food security enhancing human development levels? The relationship is clearly bilateral. In accordance with the human development and capability approach, hunger and food insecurity can be considered as a (probably the worst) capability deprivation, thus food security can be viewed as one dimension of a multidimensional idea of development. In this sense, food security affects human development.

The objective of Section 4, instead, is to concentrate on the opposite direction of the association: how (if any) can food security affect human development? In Figure 2 we provide a synthetic framework which shows the main mechanisms through which food (in)security can influence different dimensions of human development, namely, education, health, nutrition, participation, and security.

Figure 2. From Food Security to Human Development



Food insecurity is a great impediment for *knowledge* and *education* in all the three crucial steps in the educative process: early childhood (children 0-5 years old), school age (boys and girls 6 to 17

years old), and adulthood (18 years old and above). During early childhood, food insecurity and undernourishment are serious obstacles to the basic learning capacities of a child in addition to limiting the stimulation she/he should receive at this age. The main negative effects of food insecurity at this stage are visible during the school-age phase (WFP 2006).

As confirmed by many empirical studies, in school-age children, food insecurity lowers school enrolment and attendance, and reduces children's ability to concentrate in school and obtain higher scores in the final tests. Since schooling is seen as an essential opportunity for learning, these are large impediments to child mental development. Moreover, in poor and food insecure households children have often some type of job, which contributes to the total household income. Thus, these families have higher opportunity costs in sending them to school. Parents' incentives to let them attend school are even lower in countries where there are school fees and other relevant costs such as uniforms and books.

Finally, adults could widen their knowledge, abilities and skills through specific programmes such as literacy training and agricultural extension programmes. Though "By adulthood, an individual's cognitive capacity to learn is already largely established" (WFP 2006: 46), these are important learning occasions for both daily life matters and employment and earning opportunities. The main obstacle consists in the larger opportunity costs since at this stage people spend the major part of the day in the workplace. This is true even when classes are organized after working hours (WFP 2006).

One typical example of an intervention which uses food security as a means to improve school-age children's education is school feeding. School feeding programmes, primarily implemented by international organizations such as WFP and FAO, aim at increasing children's school attendance/participation and concentration in the classroom by providing them with a meal at school. This

intervention further contributes to reduce the opportunity costs of food insecure families, who now have one or more household member to feed.

Moreover, access to an adequate amount of quality food, with the right properties is an essential condition for the *health* status of a person. A person debilitated from having only a meal a day or from having a monotonic diet based, say, on rice and cereals is more likely to contract diseases. First, there are several parasitic diseases which invade the body of a food insecure/malnourished person. Moreover, food insecurity and malnutrition at an early stage of life, appearing under the form of low body weight and/or height, is associated with higher frequency and severity of diarrhea (Tomkins and Watson 1989). Many empirical studies also show the strong correlation between measles and malaria mortality with previous food insecurity (and malnutrition) situations (Tomkins and Watson 1989; Aaby et al. 1988), though, as argued by Svedberg (2002: ch. 14), none has managed to provide a substantial explanation why this may be a causal relationship.

Moreover, many studies in low-income as well as in mid- and high-income countries show that a person can contrast or simply live better and longer with cancer or aids, one of the most dramatic problems in sub-Saharan Africa.

We have to point out that also the relationship between food insecurity and health (often mediated by nutrition) is bilateral: a person with a nutritious and diversified diet, with a parasitic disease (like worms in the intestine) reduces her/his ability to absorb food, and thus results as malnourished and in a chronically poor health status. Other diseases may reduce appetite, while others that manifest themselves with fever increase the energy expenditure (Svedberg 2002). The interaction among food insecurity, malnutrition and health status also creates problems in identifying the real/primary "causes" of death.

The third human development outcome affected by food insecurity is *security*. Though most of the literature has stressed the negative impact of war and conflicts on food security, there are both theoretical arguments and empirical evidence supporting the reverse side of the relationship. Quoting Teodosijević (2003: 6), "Food and economic insecurity and natural resource scarcities - real and perceived - can also be major sources of conflict. When politically dominant groups seize land and food resources, deny access to food to other culturally or economically marginalized groups, and cause hunger and scarcities, violence often flares." In the past popular rebellion and civil wars started in Mexico and Central America as a consequence of governments denying the very basic right to food to the population (Messer et al. 1998). Also in African countries like Ethiopia, Rwanda, and Sudan, lack of access to a sufficient amount of food, following a drought and mismanagement of agriculture, "led to rebellion and government collapse, followed by even greater food shortfalls in ensuing years of conflict" (Teodosijević 2003). Similarly, the 2008 food crisis that hit developing countries in Africa, Asia, and Latin America provoked rebellions and demonstrations in many countries. Finally, according to many commentators, the very recent popular uprisings in Tunisia, Egypt, Libya, Yemen, Bahrain and Algeria were "caused", among other things, by increasing poverty, hunger and unemployment as well as by an increasing demand of democracy (Siegenbeek van Heukelom 2011).

One important issue is that many governments have, especially in the past, considered food as a matter of national security. The fright of food shortages was the basis for advocating self-sufficiency policies in those countries dependent on food imports. Similar attitude has been recently noticed in a number of rich, food importing (especially in the Gulf and Asia), countries (Siegenbeek van Heukelom 2011). The concept food security is very different from (and much broader than) that of food self-sufficiency: an economy with diversified productive activities which produces only a minimal part of the food consumed in the country is able to reach

high levels of food security, as the stories of many countries show (e.g., the Asian Tigers). Thus, we do not consider lack of adequate national food production by itself as a real concern for national security.

5. Conclusions

The paper constitutes one of the first attempts to provide a comprehensive, though synthetic, review of several approaches for the analysis of food security, trying to sort out the linkages between different frameworks. In particular, we have tried to combine the debates going on since a few decades within the academic field and the debate taking place in international organizations.

Moreover, we were concerned with building a bridge between the two major areas of study of Amartya Sen – that on famine and hunger, and that on human development and wellbeing. According to us, the capability approach is a direct evolution of the entitlement approach, as well as other theoretical frameworks, and can be operationalized in the field of food security.

In Section 3 we have provided some preliminary insights on how to apply this approach. We have identified three steps of analysis, which can progressively ensure a better understanding of food (in)security in a given area. Through this procedure, we could detect whether food security is really a problem of lack of assets or purchasing power, or is mainly the result of the lack of basic capabilities such as education and access to health care.

Finally, in the last section we discuss, from both a theoretical and empirical perspective, the relationship between food security and human development. Such relationship is surely strong and bilateral since food security can be viewed as an essential element of a multidimensional concept of development. In this Section we provide some insights on the impact of food (in)security on

development outcomes such as education, health and nutrition, and security.

This paper addresses a (crucial) topic, which has not been adequately examined in the capability literature. It can potentially open a wider area of study, and we hope that new contributions in this field will appear in the next future.

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