COUNTING, SCORING AND CLASSIFYING HUNGER TO ALLOCATE RESOURCES TARGETED TO SOLVE THE PROBLEM

Ana Afonso Gallegos

Ignacio Trueba Jainaga

Mónica Tarancon Juanas

Universidad Politécnica de Madrid

Abstract

A proper allocation of resources targeted to solve hunger is essential to optimize the efficacy of actions and maximize results. This requires an adequate measurement and formulation of the problem as, paraphrasing Einstein, the formulation of a problem is essential to reach a solution. Different measurement methods have been designed to count, score, classify and compare hunger at local level and to allow comparisons between different places. However, the alternative methods reach significantly different results. These discrepancies make decisions on the targeting of resource allocations difficult. To assist decision makers, a new method taking into account the dimension of hunger and the coping capacities of countries is proposed enabling to establish both geographical and sectoral priorities for the allocation of resources.

Key Words: *Allocation of resources; Hunger; Vulnerability; Coping capacities; Priority countries.*

1. Introduction

Despite the progress in some countries, hunger remains unacceptably high and little or no progress has been achieved in the world as a whole during the last five years (FAO, 2010; UNICEF, 2010).

However, experts agree that it is entirely possible to end hunger in the world within a short period of time (Trueba, 2005; Oxfam, 2010; Sanchez et.al., 2005, FAO, 2010). "By not taking action, when it is possible and affordable, the international community is effectively condemning millions of people to a life of misery, lack of dignity and accomplishment, economic marginalization, continual exposure to sickness and, ultimately, premature death" (MacMillan, 2007).

Mankind can make hunger once and for ever a problem of its past. But only if the international community acts now to deliver the commitment and resources it has many times promised.

To increase the effectiveness of the policies and the resources addressed to eradicate hunger it is essential a proper allocation of resources that takes into account both, geographical distribution and the underlying causes.

With the aim of assisting decision makers to focus the allocation of resources geographically, The State of Food Insecurity Report (FAO, 2010) focuses on 22 countries that are currently considered to be in protracted crisis and claims that these 22 countries deserve special attention. The report determines that a country is in protracted crisis when it fulfills the three following requirements: the duration of the crisis (eight years or more); when humanitarian assistance counts for 10 per cent or more of the aid flows they have received, and when the countries are classified as low-income food-deficit countries. However, it has been argued that the report does not reflect the real trends of hunger, whose main causes are not the protracted crisis as such – even though this is important – but underlying structural problems (Ayuda en Acción et.al, 2010).

Hunger is the result of a combination of factors including lack of food in terms of quantity and quality; inadequate water, sanitation and health services; and suboptimal care and feeding practices. Until improvements are made in the different aspects that affect nutrition, progress will be limited (UNICEF, 1990; UNICEF, 2010; Smith and Haddad, 2000).

This paper measures the seriousness of hunger at country level taking into account how many people are affected and the coping capacities of each country to solve the problem. The measurement method makes it possible to establish both geographical and sectoral priorities for the allocation of resources.

159

2. The problem: hunger in the world

Severall aspects must be considered to focuss on this problem.

2.1. How it is measured

To measure hunger in the world, a range of different indicators have been proposed. But progress toward the Millennium Development Goal (MDG) of halving hunger by 2015 is currently measured by only two indicators (Millennium Project, 2000): the FAO indicator, which is an estimate of the proportion of the population that has access to fewer kilocalories than the minimum daily requirement for a healthy life (Mernies, 2003); and the prevalence of underweight children, which is an estimate of the proportion of children under five who are underweight for their age (Onis and Blössner, 2003).

FAO's estimate of the proportion of the population that falls below the minimum level of dietary energy consumption is calculated using two variables: Dietary Energy Supply (DES) per capita, and the coefficient of variation of dietary energy consumption (Mernies, 2003). It measures lack of food energy but it does not measure lack of macro- or micro-nutrients. It does not measure "hidden hunger".

The prevalence of child malnutrition is estimated from a statistically representative sample of children, assuming that malnourished children are those whose weight for age falls below two standard deviations of the median weight of a reference population. The proportion of underweight children is a simple measurement of the nutritional status of children because deficient nutrition or health problems (which are often derived from deficient nutrition) are reflected in a lower child growth rate. Thus, the growth of children is a direct indicator of the nutritional status of children and is also an indirect indicator of the nutritional status of the population as a whole (Onis and Blössner, 2003).

While the FAO's indicator only takes into account food quantity, neglecting food quality, the UNICEF indicator can reflect other dimensions of nutrition besides the quantity of energy (Smith and Haddad, 2001), being an indicator of malnutrition. Nevertheless, underweight may be an outcome of causes other than malnutrition (Osmani, 1992) and some undernourished children are not underweight (Van den Broeck, 1994). Besides, the nutritional status of children cannot always be extrapolated to the whole population (FAO, 2001).

In order to provide a comprehensive measure of hunger, considering not only lack of energy but also hidden hunger, Wiesman (2006) proposed a Global Hunger Index (GHI). GHI is a composed index that condenses the information of three complementary indicators: the two indicators described above – proportion of undernourished population and prevalence of underweight children – plus the under-five mortality rate. The three indicators are given in percentage and the GHI is obtained as a weighted mean of the three (Wiesman, 2006). In this way, the GHI encompasses the outcomes of insufficient quantity (through the FAO's indicator), quality or safety of food (through the underweight children indicator), and the consequences of a failure to utilize nutrients biologically (through the under-five mortality rate) (Wiesman, 2006).

2.2. How many are affected

The FAO's estimate claims that hunger affects to 925 million people in the world, or 14 per cent of world population.

UNICEF estimates that about 145 million of children in the world, more than a quarter of the children in developing countries and 23 per cent of the world's children, are malnourished. The extrapolation of this datum to the world population would give a figure of 1,500 million of people suffering from hunger.

The inclusion of under-five mortality rate in the calculation of the GHI plays down the importance of hunger as the under-five mortality rate is always lower than the rate of energy deficiency and the proportion of underweight children. It minimizes the measurement of hunger by assuming that the problem is less serious as long as it doesn't result in the death of children. It can be concluded that while the former indicators measure total hunger (moderate and severe), the GHI pays a little more attention to severe hunger.

Table 1: Estimation of the number of hungry in the world using different indicators

Indicator	Total Population (millions)
FAO's indicator (energy deficiency)	925
Extrapolation of underweight children to the world population	1500
Global Hunger Index	800

Source: Author's calculations. Data: FAOSTAT (2011)

2.3. Where it is located

By measuring different things, FAO and UNICEF indicators are attempts to evaluate the same problem: they both are part of the two 'hunger' targets of MDG1 and together represent a measure of nutritional status. However, as the measurement methods differ, it is not surprising that the outcomes also show considerable differences (Smith, 1998; Nubé, 2001). A comparison between the proportion of the population that is food energy deficient (as estimated by FAO), and the proportion of children who are malnourished (underweight), shows that the two indicators are not strongly correlated. In particular, the information available from South Asian countries –Bangladesh, India, Nepal, Myanmar, and Bhutan– as well as some countries of Sahel –Niger, Nigeria, Mali, Mauritania and Burkina Faso– shows that the proportion of malnourished children is higher than the undernourished population as a whole. In contrast, statistics from Sub-Saharan countries –Zambia, Zimbabwe, Bostwana, DR Congo, Mozambique or Tanzania– indicate that the prevalence of malnourished children is somewhat lower (FAOSTAT, 2010). These discrepancies between the two estimates of undernutrition are observed at both national and world levels (Nubé, 2001).

Countries can be ranked according to the seriousness of the problem. But to rank countries, a decision has to be made with regard to the criteria on which the classification is based. In this study the prevalence of hunger by country is estimated by a simple mean of the prevalence of the two former indicators. But the idea is to highlight where the majority of the hungry live. Maps of countries commonly show which countries have high levels of incidence (percentage), but not where the number of hungry is bigger. This study intends to score countries for the allocation of resources. In consequence, the relevant datum is not the prevalence but the number. The argument is that more attention has to be given in global resource allocation to the countries in which the highest numbers of hungry and malnourished people live. Within countries, there should also be more focus on numbers rather than proportions (quite often the emphasis is almost entirely on the proportion of people who are hungry, resulting in aid being focused on the areas with low population densities (for example Northern areas of Kenya), rather than the densely populated areas with the highest number of hungry (for example, highlands of Kenya, including urban slums).

Table 2 shows a comparison of the concentration of the hunger between the five top countries ranked by prevalence and by number of hungry.

Table 2: Concentration of hunger. Comparison between the five top countries by prevalence and by number

	Five top countries	Energy deficiency		Child malnutrition	
		N° (miles)	%	N°	%
Rank by prevalence of hunger	Eritrea, Burundi, Democratic Republic of Congo, West Timor, Ethiopia	81373	9	9254	6
Rank by number of hungry	India, China, Pakistan, Bangladesh, Democratic Republic of Congo	501812	54	87597	58

Source: Author's calculations. Data: FAOSTAT (2010).

Table 3 includes the 63 top countries where the majority of hungry live. They have been ranked by simply adding the number of people suffering from energy deficiency and the number of malnourished children. The resulting figure, which has been called "hunger" (last column in table 3), is not a measurement,

because that would imply a share of double-counting as it has been obtained adding two numbers that are an estimate of hungry people within two different domains (total population and under-five children). The figure "hunger" is just an indicator reflecting the seriousness of the problem and no units have to be considered. Together, the 63 countries listed in table 3 represent 85 per cent of the energy deficiency population and 91 per cent of the malnourished children in the world.

Table 3: Hunger in the world by country

Country name	N° of undernourished (miles)	N° of children malnutrition (miles)	HUNGER
India	241012	61211	302224
China	132810	6110	138920
Pakistan	44067	8788	52855
Bangladesh	41970	7924	49894
Dem. Rep. of the Congo	41952	3564	45516
Ethiopia	31424	4871	36295
Indonesia	28853	5905	34757
Philippines	13066	2940	16006
United Rep. of Tanzania	13645	1565	15211
Nigeria	8657	6508	15166
Kenya	11402	1290	12692
Brazil	11287	848	12136
Thailand	10636	436	11072
Viet Nam	9360	1496	10856
Sudan	8703	1783	10486
Myanmar	7797	1477	9274
Mozambique	8114	674	8788
Yemen	6710	1636	8345
Dem. People's Rep. of Korea	7798	373	8171
Angola	7006	963	7969
Uganda	6229	1163	7392
Nepal	4441	1624	6065
Madagascar	4527	1249	5776
Haiti	5452	273	5725
Zambia	5170	416	5586
Burundi	4716	431	5147
Colombia	4370	312	4682
Chad	3819	703	4523
Malawi	3933	527	4460
Peru	4226	149	4375
Zimbabwe	3738	289	4028
Niger	2723	1206	3929
Rwanda	3134	358	3492
Côte d'Ivoire	2755	610	3366
Eritrea	2962	304	3267
Guatemala	2736	475	3211
Uzbekistan	2927	129	3057
Bolivia	2525	75	2600
Venezuela (Bolivarian Rep. of)	2175	144	2319
Senegal	1970	331	2300
Burkina Faso	1281	846	2127
Mali	1454	672	2126
Sierra Leone	1843	271	2114
Ecuador	1980	127	2108
Somalia	1623	452	2075
Togo	1844	194	2038
Guinea	1601	410	2011
Central African Republic	1672	188	1860
Algeria	1668	129	1796

Country name	Nº of undernourished (miles)	Nº of children malnutrition (miles)	HUNGER
Ghana	1120	581	1701
Lao People's Dem. Rep.	1377	282	1658
Benin	976	315	1291
Liberia	1148	139	1286
Nicaragua	1050	47	1097
Azerbaijan	939	69	1008
Honduras	844	104	948
Paraguay	662	29	691
Mongolia	671	13	684
Armenia	675	9	684
El Salvador	547	56	603
Congo	523	75	598
Kyrgyzstan	528	16	544
Panama	493	28	521
Botswana	466	28	494
Namibia	389	57	446

Source: FOSTAT

3. Measuring coping capacities

The countries listed in table 3 deserve special attention. But to allocate resources, decision makers must consider other aspects besides the number of hungry. The coping capacity of the country to solve the problem is also important.

Vulnerability is the susceptibility to be injured, damaged or attacked. It also means to have one's guard down. "The concept of vulnerability expresses the multidimensionality of disasters by focusing attention on the totality of relationships in a given social situation which constitute a condition that, in combination with environmental forces, produces a disaster" (Bankoff et al. 2004: 11). Vulnerability is the degree to which a system is susceptible to or unable to cope with adverse effects.

Mathematically, vulnerability can be expressed as the risk minus the coping capacity. The bigger the risk and the lower the coping capacity, the higher the vulnerability. The risk is the probability of a threat to happen. In the context of the analysis carried out in this paper the risk is not really a risk (potential) but an actual fact (the hungry) and so that its probability is equal to one. The coping strategies are multidimensional and are related with the causes and determinants of hunger.

There is international consensus that the driving forces determining nutritional status are mainly related to the food security of households, the quality of care, and the healthiness of the environment. Figure 1 illustrates the different causes of nutritional status and their relationship.

In the light of the conceptual framework of figure 1, indicators related to each of the causes of nutritional status can be identified. These indicators can be used to measure the resources to solve the problem, that is, "the coping capacity". They are listed in table 4.

The indicators to measure the coping capacities are expressed as indexes. The indexes are elaborated from explanatory variables using the general following formula:

Index = (value – minimum) / (target value – minimum).

Ten indexes are described in Table 4.

Two of them have been elaborated in previous works. As the data from which they have been calculated are updated, they have been borrowed for the purposes of the present study. This is the case of the two following indexes: "inequality adjusted income index" that has been calculated by the work team of the UNDP (based on GDI and inequality in distribution) and is available at its website; and "index of economic freedom" elaborated by the think tank consisting of The Heritage Foundation and the World Street Journal and available at their website where there is also an explanation of the calculation method.

Figure 1: The UNICEF Conceptual Framework of the Determinants of Nutritional Status
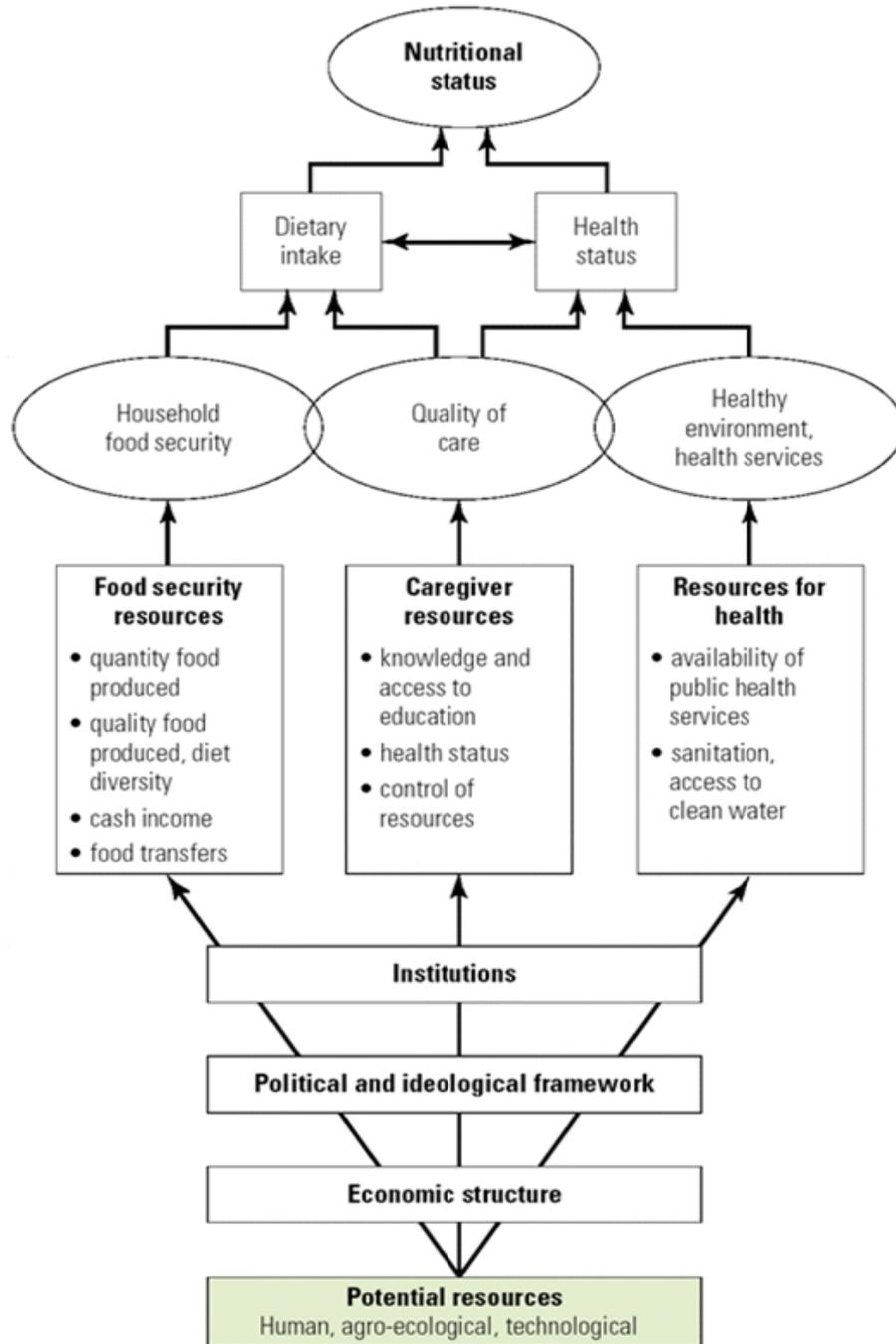
Sources: Johnson 1993; Smith and Haddad 2000; and UNICEF 1990.

Other two indexes have also been elaborated in previous works, but have been updated with current statistical data for this study. This is the case of the "diversification index" and the "sanitation index". A detailed explanation of the calculation of both indexes can be founded at (Afonso, 2008).

When the explanatory variables are expressed as percentages have a value between 0 and 100 and for the elaboration of the index it is only needed to express the values between 0 and 1. This is the case of "population with at least secondary education, female/male ratio".

The other five indexes - Dietary energy consumption, Life expectancy at birth, Expected years of schooling, Maternal mortality ratio and Democracy Indexes – have been elaborated by the authors of this study from explanatory variables. This has required the establishment of reference values or target values. The reference values are included in table 5.

Table 4: Indicators to measure coping capacities

Resources	Coping capacities	Indicators	Definition	Source
Food security resources	Quantity of food produced	Dietary energy consumption Index	The relative achievement per person of the amount of food, in kcal per day, for each individual in the total population	Author's calculations Data from: FAOSTAT.
	Quality of food produced/diet diversity	Diversification Index	The mean between the number of different food groups providing at least 90 per cent of total dietary energy supply and the contribution (percentage) of all food groups but the main one.	Author's calculations based on Afonso, 2008 Data from: FAOSTAT
	Cash income	Inequality-adjusted income index	Value of income index, a component of human development index, adjusted for inequality in income distribution	UNDP, 2010
Caregiver resources	Knowledge and access to education	Expected years of schooling Index	The relative achievement of years of schooling that a child of school entrance age can expect to receive if prevailing patterns of age-specific enrolment rates were to stay the same throughout the child's life	Author's calculations Data from: UNESCO
	Control of resources	Population with at least secondary education, female/male ratio	Percentage of the population ages 25 and older that has attained a secondary or higher level of education expressed as female-male ratio.	Barro, R.J and J.-W.Lee 2010
	Health status	Life expectancy Index	The relative achievement of a country life expectancy at birth	UNDP, 2010
Resources for health	Availability of public health services	Maternal mortality ratio Index	The relative achievement of maternal mortality ratio (deaths of women per 100,000 live births). Maternal death is defined as the death of a woman while pregnant or within 42 days after terminating a pregnancy, regardless of the length and site of the pregnancy, due to any cause related to or aggravated by the pregnancy itself or its care but not due to accidental or incidental causes.	Author's calculations Data from: UNICEF, 2010b
	Sanitation and access to clean water	Sanitary Dimension Index	The value of access to safe water or access to improved sanitation for which the supply is most in deficit	Author's calculations based on Afonso, 2008
Socio economic and political resources	Economic structure	Index of Economic Freedom	Average of ten component scores (Business Freedom, Trade Freedom, Fiscal Freedom, Government Spending, Monetary Freedom, Investment Freedom, Financial Freedom, Property Rights, Freedom from Corruption, Labor Freedom) assigning a grade in each using a scale from 0 to 1	The Heritage Foundation and the World Street Journal, 2010
	Political and Ideological framework	Democracy Index	The relative achievement of democracy as a mean of corruption score and press freedom	Transparency International, 2010

Source: elaborated by the authors

Table 5: Reference values to calculate Indexes

INDEX	Target value	Minimum or most unfavorable value	Units
Dietary energy consumption Index	3000	1800	kilocalories
Life expectancy at birth Index	85	25	years
Expected years of schooling Index	14	0	years
Maternal mortality ratio Index	1	1000	deaths per 100.000 life births
Democracy Index	1	150	position in the ranking of democracy

The resulting ten indexes are grouped into five kinds of coping strategies: nutrition, education, health, income, and socioeconomic and political. For each kind of coping strategy, a single index is calculated as an average of the components. In this way the ten indexes are transformed into five as illustrated in table 6. The mean of the five capacity index is the Global Coping Capacity Index for each country.

Table 6: The Coping Capacities Indexes and their components

Dimension	Coping capacity Indexes	Components of the Indexes
Nutrition	I_{ncc}	Dietary energy consumption Index Diversification Index
Education	I_{ecc}	Expected years of schooling Index Population with at least secondary education, female/male ratio
Health	I_{hcc}	Life expectancy Index Maternal mortality ratio Index Sanitary Dimension Index
Income	I_{icc}	Inequality-adjusted income index
Socioeconomic and political	I_{ccsp}	Index of Economic Freedom Democracy index

4. Allocating resources

Vulnerability by country is calculated through the following formula:

Index of Vulnerability = 1 - Average of Coping Capacity Indexes

That can be expressed as follows:

$$V = 1 - 1/5*(I_{cci} + I_{ncc} + I_{ecc} + I_{hcc} + I_{pcc})$$

Multiplying the amount of hunger (H) – estimated by number of energy deficiency plus the number of malnourished children – by the index of vulnerability (V), a figure is obtained (H*V) indicating the seriousness of the problem. This figure can be used both for establishing a ranking of countries for the allocation of resources and determining the share of the total resources to be allocated in each country.

The 22 top countries obtained through the calculations described above are listed in table 7. The table also includes the Index of Vulnerability and the five Coping Capacity Indexes.

4.1. Geographic priorities

As it has been stated above the 63 countries included in table 3 deserve special attention and are priority countries for the allocation of resources for hunger eradication. But different levels of priority can be established by classifying countries into 4 categories: hot countries, very high priority countries, high priority countries and medium priority countries.

The hottest country is India. According to the analysis carried out in this study, 28 per cent of the total hunger in the world is located in India. As the vulnerability index in this country is also important, to increase effectiveness in the use of resources applied for the eradication of hunger, about 27 per cent of total resources should be spent in this country.

166

Table 7: Allocation of resources

Country name	Amount of hunger (H)	I_{cci}	I_{ncc}	I_{ecc}	I_{hcc}	I_{pcc}	Vulnerability Index (V)	H*V	% of resources
India	302224	0,40	0,39	0,63	0,65	0,62	0,46	139640	27
China	138920	0,41	0,80	0,80	0,78	0,36	0,37	51608	10
Dem. Rep. of Congo	45516	0,07	0,23	0,43	0,57	0,38	0,66	30209	6
Bangladesh	49894	0,30	0,29	0,68	0,63	0,45	0,53	26467	5
Pakistan	52855	0,39	0,56	0,49	0,82	0,42	0,47	24630	5
Ethiopia	36295	0,22	0,36	0,59	0,53	0,34	0,59	21501	4
Indonesia	34757	0,42	0,57	0,84	0,78	0,57	0,36	12630	2,5
Un. Rep. of Tanzania	15211	0,27	0,44	0,49	0,58	0,51	0,54	8249	1,6
Nigeria	15166	0,30	0,62	0,64	0,36	0,47	0,52	7924	1,5
Kenya	12692	0,25	0,41	0,60	0,49	0,44	0,56	7116	1,4
Sudan	10486	0,50	0,30	0,51	0,51	0,09	0,62	6481	1,3
Philippines	16006	0,36	0,68	0,93	0,80	0,50	0,35	5578	1
Mozambique	8788	0,11	0,36	0,42	0,45	0,53	0,63	5506	1
Angola	7969	0,33	0,32	0,32	0,43	0,35	0,65	5191	1
Myanmar	9274	0,46	0,49	0,56	0,70	0,02	0,56	5160	1
Yemen	8345	0,34	0,28	0,46	0,66	0,32	0,59	4904	1
Viet Nam	10856	0,37	0,62	0,81	0,85	0,33	0,41	4396	0,9
Thailand	11072	0,40	0,57	0,86	0,65	0,54	0,40	4383	0,9
Uganda	7392	0,29	0,38	0,57	0,62	0,51	0,53	3894	0,8
Burundi	5147	0,10	0,17	0,63	0,31	0,32	0,69	3569	0,7
Zambia	5586	0,26	0,19	0,55	0,47	0,47	0,61	3425	0,7
Haiti	5725	0,14	0,27	0,56	0,68	0,47	0,58	3305	0,6

Source: Author's calculations

China ranks second and is classified as a very high priority country. Although vulnerability in China is not so high, and the prevalence of hunger is about 6 per cent, more than 12 per cent of total hunger in the world is located in China, since China is the most populated country in the world. Democratic Republic of Congo, Bangladesh, Pakistan, Ethiopia and Indonesia are also very high priority countries. Countries classified as high priority are Tanzania, Nigeria, Kenya, Sudan, Philippines, Mozambique, Angola, Myanmar, Yemen, Viet Nam, Thailand, Uganda, Burundi, Zambia and Haiti. The 41 countries remaining from the 63 included in table 3 are classified as medium priority. The share of total resources to be allocated in each country is shown in the last column of table 7 and in the figure below (figure 2).

Figure 2. Allocation of resources (share) by country
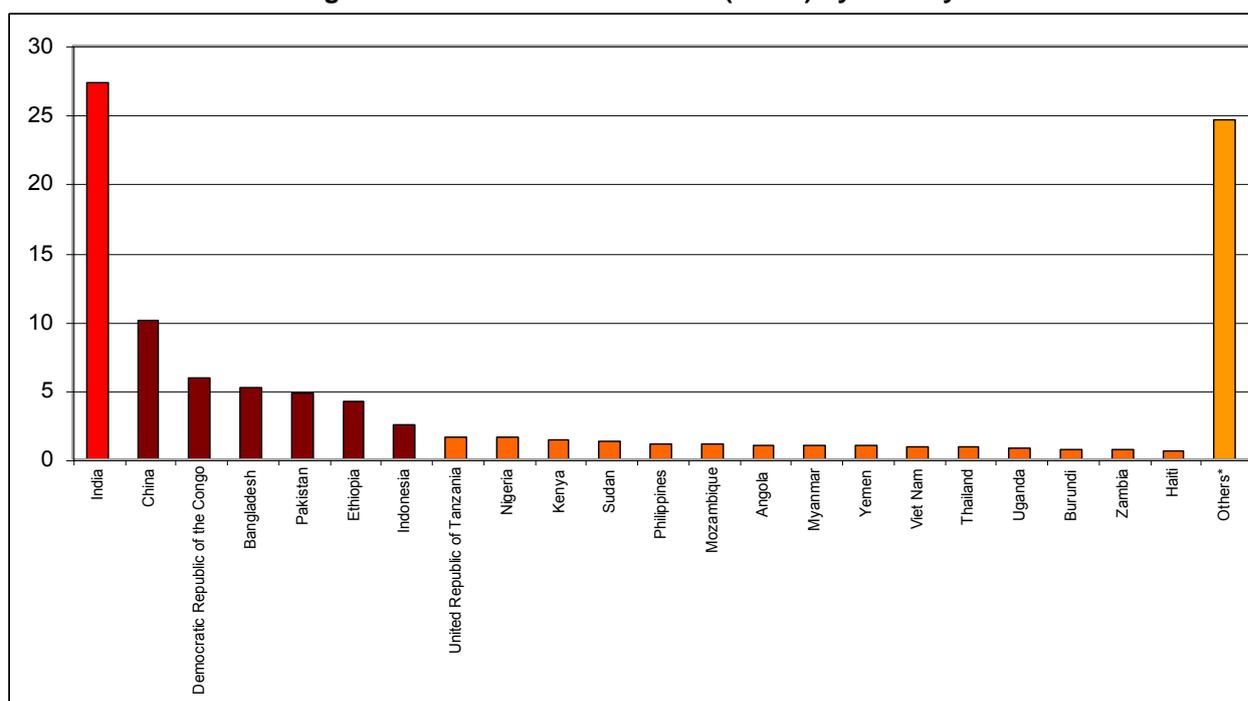
Source: Author's calculations from the data included in table 7 (last column). (*) Includes the 41 countries remaining from the 63 included in table 3

167

4.2. Priorities by sector

By examining the relative scores of each of the coping capacity indexes, different profiles of countries can be identified and clues are given that can be useful to determine the main causes of hunger and to define priorities for the allocation of resources by sector at country level.

Examples of some country profiles are illustrated in figure 3. Democratic Republic of Congo, Mozambique, Ethiopia, Burundi, Haiti and Kenya (graph in the left top) are very vulnerable countries, with scarce coping capacity in every dimension, but especially in the income and nutrition dimensions.

The main factor of vulnerability in Myanmar, Sudan, Yemen, Vietnam and China (graph in the right top) is the socio political dimension, as they are countries with very low levels of democracy and freedom. So the main share of the resources to fight against hunger in these countries should be addressed to promote democracy and a more equitable distribution of income (without neglecting other dimensions in the case of Sudan).

Indonesia and Vietnam (graph in the bottom of figure 3) are examples of countries that have achieved progress in health and education but attention should be given to income, nutrition and socio-political dimensions.

Figure 3: Profiles of countries regarding coping capacities by sector
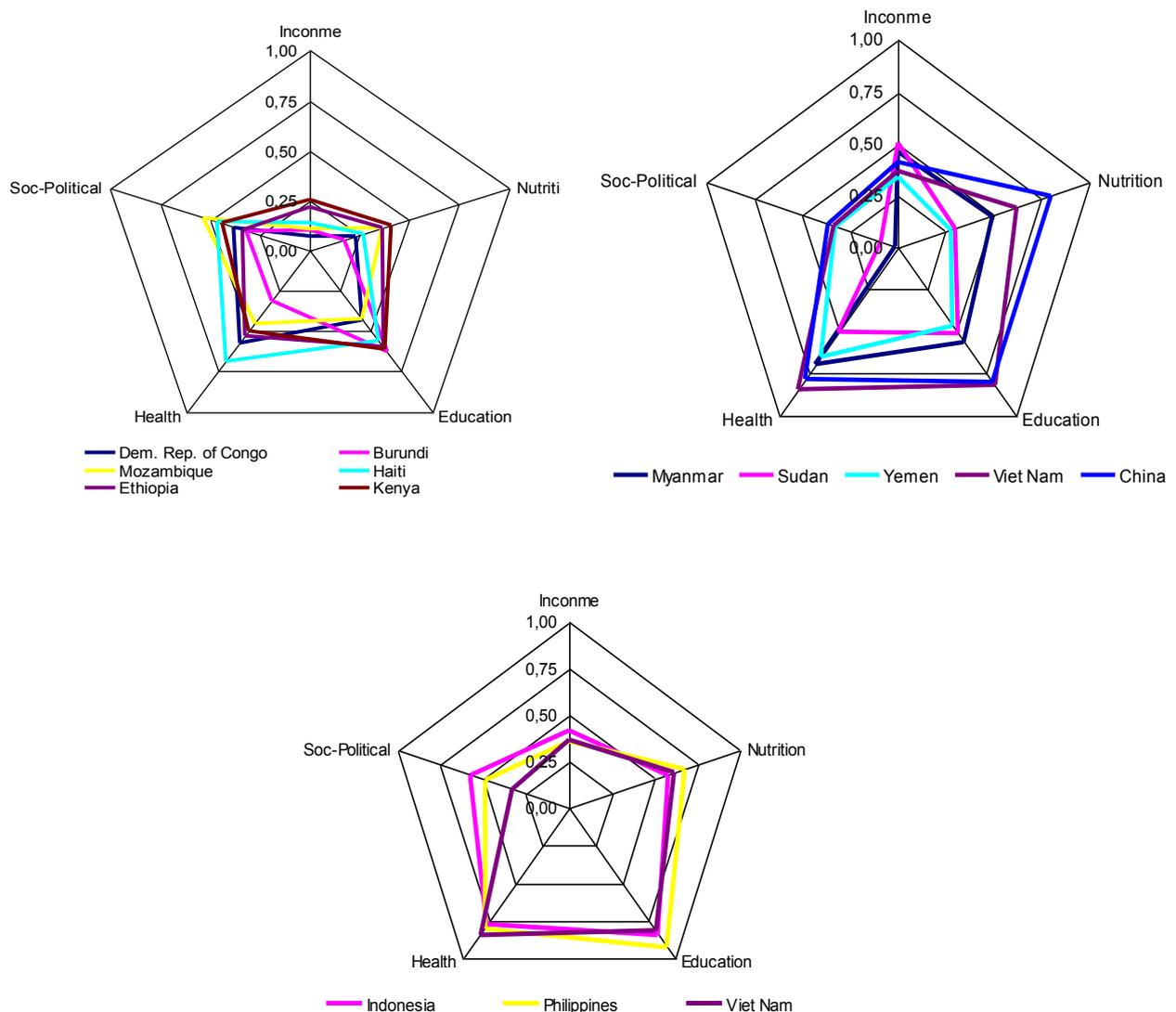
Source: Elaborated by the authors with the data included in table 7

5. Conclusions

The conclusions described above have major implications for the design of effective national food security and nutrition strategies.

But, it is important to highlight that the "resources" here are understood as any kind of means that, if needed, could be used to achieve what is intended or as the set of elements available to solve a particular need or carry out a project. This includes various kinds of "resources" aside from financial resources. In some cases, the link between the level of effort or attention and financial resource needs could be quite weak. For instance, promoting democracy and reducing corruption may have lower financial demands, whereas improving sanitation or putting in place social protection programs could be more costly. So the argument is where to allocate efforts and attention. To allocate financial resources it would be necessary a more detailed analysis taking into consideration other aspects that are not treated in this paper.

Finally, it is opportune to add a reflection on the subject of the origin of the resources relating to the extent of international resource needs. Clearly, even if they are high priority countries in terms of global resource needs, China, India and probably Indonesia do not need external resources to eradicate hunger, whereas other countries, as for example Congo or Ethiopia, do. Allocating external resources in China, being China the owner of the debt, and an important donor of international aid itself, is paradoxical. Nevertheless, China continues to be an important recipient of international aid in absolute terms (although the aid received in per capita terms is very little) and it is highlighted as a priority country for Europe aid.

Further analysis to determine the priorities for allocation of international financial aid for hunger eradication would be worthwhile.

6. References

Afonso, (2008). Incidencia de la Seguridad Alimentaria en el Desarrollo. Análisis y Síntesis de indicadores. Entimema, 2008.

Ayuda en Acción, Cáritas Española, Ingeniería sin Fronteras y ApD – Prosalus, (2010). Valoracion de la campaña sobre el informe del estado de la inseguridad alimentaria en el mundo 2010. Campaña por el derecho a la alimentación

Bankoff, Greg, George Frerks and Dorothea Hilhorst, (2004). Mapping Vulnerability. Sterling: Earthscan

Barro, R.J and J.-W.Lee, (2010). A New Data Set of Educational Attainment in the World, 1950-2010. NBER Working Paper No. 15902.

FAO, (2001). Committee on World Food Security. Twenty-seventh Session. Rome, 28 May - 1 June 2001. The World Food Summit Goal And The Millennium Development Goals

Kovacevic, M. (2010). Measurement of Inequality in Human Development-A Review." Human Development Research Paper 35. PNUD-HDRO, Nueva York.

MacMillan, (2007). Personal communication in the presentation of the book: "Trueba, 2005. El Fin del hambre en 2025. Un desafío para nuestra generación. Mundiprensa"

Mernies, J., (2003). Measurement of food deprivation. FAO Statistics Division.

Millennium Project, (2000). Millennium Development Goals. Targets and indicators.

Nubé, M., (2001). Confronting dietary energy supply with anthropometry in the assessment of undernutrition prevalence at the level of countries. World Development 29 (7) 1275-1289.

Onis, M. and Blössner, M., (2003). The World Health Organization Global Database on child growth and malnutrition: methodology and applications. International Journal of Epidemiology (32) 518-526

Osmani. S. R., (2003). Synthesis of the five methods for measuring hunger and malnutrition. In Measurement and Assessment of Food Deprivation and Undernutrition. 25-27. FAO: Rome.

Oxfam, (2010). Reducir el hambre a la mitad: ¿aun es posible? Informe 139. Intemón Oxfam.

Sánchez, P. y Swaminathan, M.S., Dobie P. y Yusel, N, (2005). Halving Hunger : It can be done: UN Millenium Project, New York

Smith, L.C. and Haddad, L., (2000). Overcoming Child Malnutrition in Developing Countries: Past Achievements and Future Choices. IFPRI Food, Agriculture and Environment Discussion Paper. Washington, D.C. (2000).

The Heritage Foundation and the World Street Journal, (2010). Economic Freedom Index <http://www.heritage.org/Index/explore >

Transparency International, (2010). Democracy Index Ranking < http://www.worldaudit.org/democracy.htm >

Trueba, (2005). El Fin del hambre en 2025. Un desafío para nuestra generación. Mundiprensa

UNDP, (2010). Human development report

UNESCO, (2010). Correspondence on education indicators. March. Montreal.

UNICEF, (2010). The State of the World's Children 2010. New York: UNICEF

Van den Broeck, J., Meulemans, W. & Eeckels, R. (1994) Nutritional assessment: the problem of clinical-anthropometrical mismatch. Eur. J. Clin. Nutr. 48: 60-65.

Wiesman, D., (2006). A Global Hunger Index: Measurement Concept, Ranking of Countries, and Trends. FCND Discussion Paper 212. International Food Policy Research Institute.

Contact details (For further information, please contact)

Ana Afonso Gallegos

E-mail : ana.afonso@upm.es