

## rozprawy i studia

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### EXPERIENCE OF FOOD SECURITY – VULNERABILITY ANALYSIS.

#### WWW i.e. WHO, WHY, WHERE

**Abstract:** The article takes as its starting point a discussion of “conventional wisdom” that asserts there is an equation that “poor = vulnerable”, i.e. “to be poor” means necessarily “to be vulnerable” and vice versa, and provides several examples confuting the above assumption. The author traces a conceptual and methodological approach frequently used in [food security] vulnerability analysis which follows the path of a WWW itinerary (i.e. Who, Why, Where). This is an acronym used by several international and regional agencies when addressing Vulnerability Analysis. The author quotes several examples related to his professional experiences in Africa and Asia.

**Key words:** food security and insecurity, vulnerability, malnutrition, undernourished, agricultural development planning

Before addressing the subject of this paper it necessary to deal with the “conventional wisdom” that asserts there is an equation where “poor = vulnerable” (and in general with an additional specification when “more poor = more vulnerable”).

The above “wisdom” is well established, and is so difficult to remove, that even in recent analyses and/or publications it happens that the two adjectives (poor and vulnerable) are often considered synonymous, “to be poor” means necessarily “to be vulnerable” and vice versa, or – at least – the differences between them have become blurred.

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More than thirty years have passed since Simon Maxwell showed a diagram in which poverty, vulnerability and under nutrition (named by him “malnutrition”<sup>2</sup>) were represented by three partially overlapping circles (Plate 1)<sup>3</sup>, implying that it is possible that each of these conditions can exist alone or can be combined with any other. From Maxwell’s diagram it is evident that to be “vulnerable” not necessarily means to be either “poor” or “undernourished” (or simultaneously both of them), as well as – for instance – to be “undernourished” doesn’t necessary mean to be “poor” and “vulnerable”.

Maxwell added a significant comment specifying that people that are poor are also vulnerable when there are *large fluctuations in real income over relatively short periods* and/or if they lack of *off-setting mechanisms to stabilise purchasing power or nutritional intake*.<sup>4</sup> Only the areas 1 and 4 of the “poor” cycle) are not affected by the above fluctuations.<sup>5</sup>

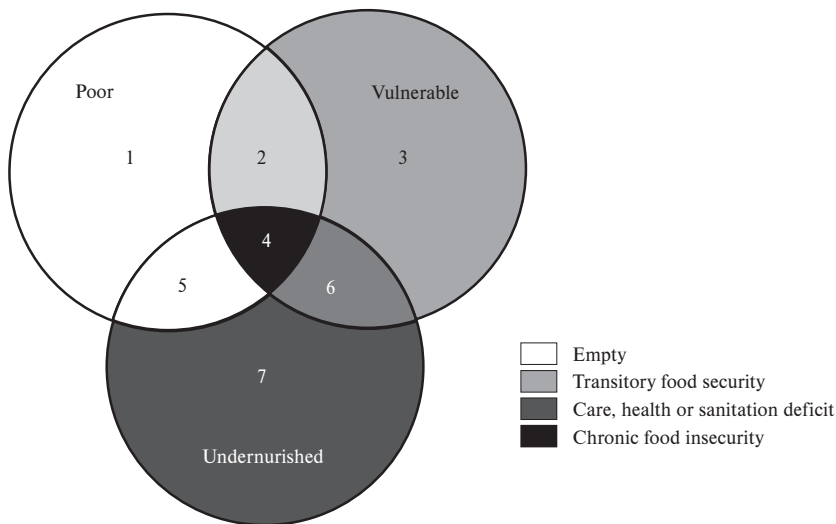


PLATE 1. Poverty, Vulnerability and Undernutrition

RYSUNEK 1. Bieda, podatność na zagrożenia i niedożywienie: model braku bezpieczeństwa żywnościowego

Source: Adapted from S. Maxwell, T.R Frankenberger, 1992: *Household Food Security...*, Unicef/IFAD, w.d., 18.

<sup>2</sup> Maxwell used the noun “malnutrition”, a generic and ambiguous word used for identifying both the “undernutrition” and the “overnutrition” (obesity). It is evident that Maxwell used “malnutrition” as a synonym of “undernutrition” because at that time the obesity was not yet a serious nutritional problem in developing countries, as it is now in several of them.

<sup>3</sup> The plate is a modified version of figure 1.6 published in: S. Maxwell and T. R. Frankenberger, 1992: *Household Food Security, Concepts, Indicators, Measurements – A Technical Review*. Unicef/IFAD, w.d., 18. (The modification take into consideration also the information included in the “Errata” of the above volume).

<sup>4</sup> S. Maxwell, T.R Frankenberger, 1989, 1992: *Household Food Security...*, Unicef/IFAD.

<sup>5</sup> According to his diagram Maxwell named *transitory food insecurity* when poverty and vulnerability exist, but undernutrition does not (area 2 in the diagram); and named *chronic food insecurity* when *poverty, vulnerability coincide* (area 4).

Robert Chambers observed, in the same period, **that** *Vulnerability concerns the propensity of groups of people to experience changes as a result of a hazard such as flood, drought, conflict, earthquake* specifying: *Vulnerability represents not simply defenselessness, insecurity and exposure to risks, shocks and stress but also difficulty in coping with them*, and consequently defined Vulnerability with the following synthetic equation:

$$\text{Vulnerability} = \text{Exposure to Risk} + \text{Inability to Cope}$$

On another occasion Chambers defined vulnerability as *exposure to contingencies and stresses and the difficulty which some communities experience while coping with such contingencies and stresses*.<sup>6</sup>

In 1993 Michael J. Watts and Hans G. Bohle enhanced Chamber's definitions and defined vulnerability as a *multi-layered and multidimensional social space defined by the determinate political, economic and institutional capabilities of people in specific places at specific times*.<sup>7</sup> More recently Chambers's original synthetic definition was slightly rephrased by Mark Pelling when he defined *vulnerability as the exposure to risk and inability to avoid or absorb potential harm*.<sup>8</sup> According to this definition acute fluctuations in consumption are the primary concern in vulnerability analysis, as they result from an inability to cope with the variety of risks that may affect households' access to food. Fluctuations in food consumption levels are primarily determined by changes in home production of food commodities and the variability of cash incomes from a variety of sources combined with fluctuations in the prices of primary goods.

It is obvious that, *ceteris paribus*, households relying only on a single, very risky source of income, or on a range of income sources for which risk is highly correlated, are likely to be highly vulnerable. Exposure to multiple risks (and their frequency, duration and intensity) is a factor affecting the household's capacity to cope with future crises. It is appropriate to additionally comment that understanding the critical interaction of risk and behaviour is important not only for food security but also for agricultural development planning. Identification of the way households behave under various conditions and of the constraints under which development operates can make a valuable contribution to better planning.

According to the already quoted Watts and Bohle's definition it was/is evident that vulnerability must be investigated in *specific places at specific times*. The above awareness probably inspired several international and regional agencies to use the

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<sup>6</sup> Chambers distinguished between the external and the internal aspects of vulnerability. He described defenselessness and insecurity as "internal vulnerability" while exposure to risk and stress as "external vulnerability". R. Chambers, 1989: "Vulnerability. Editorial introduction". [In:] *IDS Bulletin*, Vol. 20, no.2, Sussex, p. 1-7.

<sup>7</sup> See: M.J. Watts and H.-G. Bohle, 1993: "The Space of Vulnerability, the Causal Structure of Hunger and Famine". *Progress in Human Geography*. Vol. 17, no. 1, p. 43-67.

<sup>8</sup> See: M. Pelling, 2003: *The Vulnerability of Cities: Natural Disasters and Social Resilience*. Earthscan Publications, London.

WWW acronym<sup>9</sup> for summarising the path they followed trying to identify vulnerable areas/population/households.

## ABOUT THE WHO

In strengthening the assumption that poor not necessarily means vulnerable, it is worth noting that poor populations/groups/households have frequently developed “adequate” coping mechanisms.

Poor populations/groups/households that normally are not poor, however, can only seldom develop – when and if necessary – such mechanisms; consequently they are, to a certain extent, more vulnerable than the previously quoted groups.

Even between the same groups the development or the inability to develop “adequate” coping mechanism is fundamental and discriminatory.

A case example can be provided by the Sudanese (Kordofan and Darfur) herders and in the way they faced the notorious 1984 drought and a subsequent drought in 1987.

In 1984 these herders had not conceived of any coping mechanism to save what was still saveable, for instance – at the first appearance of a risk of drought – bringing at least part of their livestock (still able to walk with their legs) to the nearest market and exchanging them for cereals (namely sorghum). On the contrary they consumed all their available cereals watching – at the same time – all their animals dying.

At this “specific place at a specific time” all the herders were vulnerable. However, even disasters can teach.<sup>10</sup> When in 1987 a second, although not so serious, drought occurred in the same geographic areas several herders – at the first signs of an incoming drought – changed their market strategy and went to sell part of their livestock to buy sorghum.<sup>11</sup> At that moment, it should also be noted, that sorghum was still sold at an affordable price, i.e. the TOT (Terms of Trade) were still favorable to the herders. They never tried to replant this sorghum, but – on the contrary – they planted watermelon (that is, notably, an extremely drought-resistant crop, and it is full of water and sugar) for feeding their remaining animal stocks. In the mean time they could, in some cases, even save enough seeds for the next planting season.

At this “specific place at another specific time” not all the herders were vulnerable, because a part of them had learnt some ability to cope with drought.

Another case is related to Cambodia (Myanmar), when the country was affected by tremendous human tragedy under the Khmer regime. Pol Pot ordered the depopulation

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<sup>9</sup> WWW is an acronym originally used by several International and Regional Agencies when dealing with Vulnerability Analysis to describe the sequence “Why, Who, Where”. However by many analysts the Ws sequence was/is sometimes covered in a different way as I did/do in my field practices and in this text; i.e. I prefer to follow the sequence Who, Why, Where.

<sup>10</sup> Several changes in African cropping systems were/are due to lessons learned from disasters, see for instance: P. Santacroce, 2007: “Farming systems and coping strategies – Changing patterns”, published in *Crop and Rangeland Monitoring in Eastern Africa* (D. Rijks, M. Massart, F. Rembold, R. Gomme and O. Léo (eds.), Proceeding of the workshop organized by EU-JRC and UN-FAO, Nairobi, 2007, 231–239.

<sup>11</sup> A detailed description of the above behaviours were provided by F. Riely, 1991: *Drought responses to the Kababish pastoralists in Northern Kordofan, Sudan: Implication for famine early warning, 1888/89*, Andre Mayer Research Fellow, FAO, Rome.

of the cities, and in particular out of Phnom Penh (the capital city) most of the residents (it has been estimated that about 2 million people) were forcibly expelled from the urban areas). The most targeted people were those identified by the use of spectacles (i.e. civil servants and intellectuals, both defined by the regime as “urban parasites”). The forced urban to rural migration concerned also urban people with a humble origin (farmers without land, unemployed rural people who had migrated to cities, beggars and other socially vulnerable groups also classified as “urban parasites”). When both groups were deported to the forced-labour camps in the countryside, one of these two groups had the higher probability of surviving, saving themselves from “starving”. These were the “urban parasites” with a humble rural origin, because they still had some knowledge how to survive, particularly looking for and eating wild food. The fatal destiny of “urban parasites with spectacles” had been already signed when they were deported from the cities, due to their lack of such rural knowledge.

These two examples have been used in “vulnerability analysis” training for beneficiaries of several international agencies. In some cases even the noun “vulnerability” has proven to be not easily translated in local languages.

In China with WFP a “Provincial Vulnerability Analysis” was presented to assist WFP/IFAD in their discussion/confrontation with the “Poverty Stricken Committee” of the Chinese Government. The Chinese counterparty had difficulty with the difference between poor and vulnerable. Skilled translators in the Beijing WFP Office found it difficult to find a right translation into Chinese of “vulnerable” as apparently this adjective doesn’t exist in the currently used language. The problem was solved using a circumlocution: the Achilles’s heel; even the Chinese knew that Achilles was a Greek strong warrior, but if injured in the heel he could be terribly “vulnerable”. The advantage of this circumlocution was that “strong warrior” was used as a synonymous of “not poor”, “exposure to risk” occurred when fighting the Trojan war, and “inability to cope” was the existence of that damned heel making Achilles “vulnerable”.

However the most striking example of the discrepancy between poor and vulnerable is offered by the Cambodian Tonle Sap area. In this area the lake area increases, between the dry and the wet season, from 2,500 km<sup>2</sup> up to 15,000 km<sup>2</sup> in a typical flood season. The average depth increases from the typical 1 m up to 6–9 m; and consequently the water volume increases from 1,5 km<sup>3</sup> up to 60–70 km<sup>3</sup>. In other terms the lake during the dry season is about 35 km wide and about 120 km long, during the wet season these dimensions can respectively increase to 100 and 250 km. Inundated forest and rice fields occupy the surrounding floodplains for an extent of 25–45 km. Fish and rice are the main outcome of these extraordinary natural phenomena, offering an as much extraordinary balanced local diet. This system represents one of the most productive ecosystems in the world, and supports the livelihood of most of the Cambodian people. More than 25% of Cambodians, living in six provinces, directly depend on the lake and its floodplains for their livelihood. About 5% of Cambodia GDP comes from Tonle Sap fish catch. However, despite being the richest area in terms of food availability this system is also extremely vulnerable. Drought episodes occur (for instance in 1998) due to a lower level of the upstream Mekong, provoking a reduced inflow through the Tonle Sap River and consequently any natural or manmade change in the upstream could have a dramatic

impact on the local population<sup>12</sup>; on the other hand the seasonal flood dimension and the dynamic of the spatial change increase the vulnerability of this area.

Additionally the lake system has an extraordinary role on regulating the floodwater in the lowest Mekong (delta). In August the Mekong average discharge at Phnom Penh (upstream the confluence with the Tonle Sap River) is six times higher than the average mean discharge to south of the above confluence: it means that more than 80% of the Mekong River waters are naturally diverted into the Tonle Sap Lake. Consequently the Mekong delta (geographically starting south of Phnom Penh) is more protected by flood hazards during the wet season; and conversely benefits of providential water floods (outfilling of the Tonle Sap River) during the subsequent dry season (the so called [providential] “hydrological regulation”). In the Vietnamese Mekong delta this hydrological regulation, assisted by very complicated system of hydrological infrastructures, has offered the possibility of managing three growing seasons (wet, wet/dry, dry) and consequently to achieve extraordinary annual rice crops (up to 5.5t/ha).

The possibility of getting high/very high yields have provoked, as is usual, a greater concentration of population and a higher exposure to risk in case of specific natural disasters. The strong dependency from the upstream Mekong floodwater and its interannual variability make this area particularly prone to flood and drought. For instance the 2000 disastrous flood and the serious, although not so dramatic, 1998 drought represent the most recent evidence of this double-faced vulnerability.

A comparison between plate 2 and 3 showing the Cambodian Flood plain and the Mekong Delta derived from VGT Spot images, 1km resolution offer an impressive visual assessment of these two opposite disasters. In the images the internal waters and the rivers are identified as the darkest areas. The same palette has been used when processing the two images.<sup>13</sup> Plate 2 makes reference to September 1998, 2nd decade (the driest in the recent years), while Plate 3 shows the extents of 2000 large flood (October, 1st decade).

More emphasis has been given to the human costs of the 2000 flood (about 800 people died) than to the environmental costs of the 1998 drought, but these costs should not be under evaluated. As most of the delta lower part is tidal, in 1998 the saltwater intrusion was extreme (28,500 km<sup>2</sup> against the normal 15–20,000 km<sup>2</sup>: nearly half of the delta total area. This disaster affected for many years rice yields (namely rice is strongly sensitive in a negative way to saline water) and for this reason one of the three seasons (the dry one) couldn't be exploited. Interestingly and as a demonstration that disasters teach and suggest new coping mechanisms, a new farming system was adopted due to there being a new equilibrium between fresh and saline water: an extensive rotating rice-shrimp system has been developed. The approximate spatial borderlines of the “greater than 1 gram x litre” salt concentration in the water that occurred in 1998 according to their duration are shown by plate 4. The black line borders the areas affected by the above salt concentration for more than five months, while the red one identifies the border of one week concentration.

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<sup>12</sup> In this optic any transnational water development project should be attentively evaluated at regional level.

<sup>13</sup> Data processing and rendering are due to Prof. Silvio Griguolo.



PLATE 2. Southern Mekong Area – dry situation  
RYSUNEK 2. Okolice południowego Mekongu: sytuacja suszy  
Source: VGT Spot image – September 1998, 2<sup>nd</sup> decade.

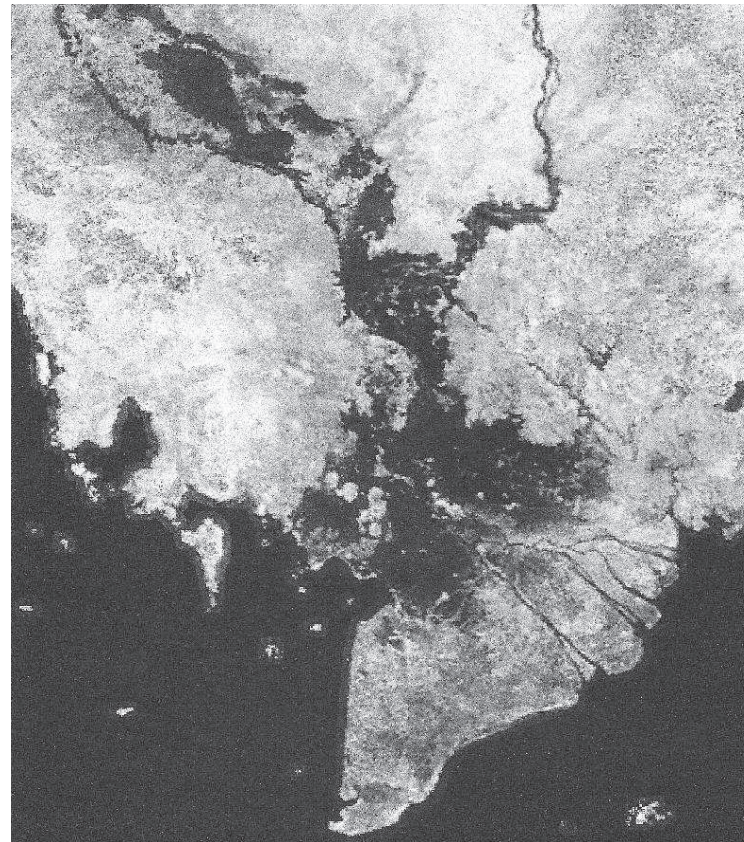


PLATE 3. Southern Mekong Area – flood situation  
RYSUNEK 3. Okolice południowego Mekongu: sytuacja powodzi  
Source: VGT image – October 2000, 1<sup>st</sup> decade.

The map is a detail of a VGT cycles classified image<sup>14</sup>; interesting is the frequent matching between borderlines and vegetation cycles classes.

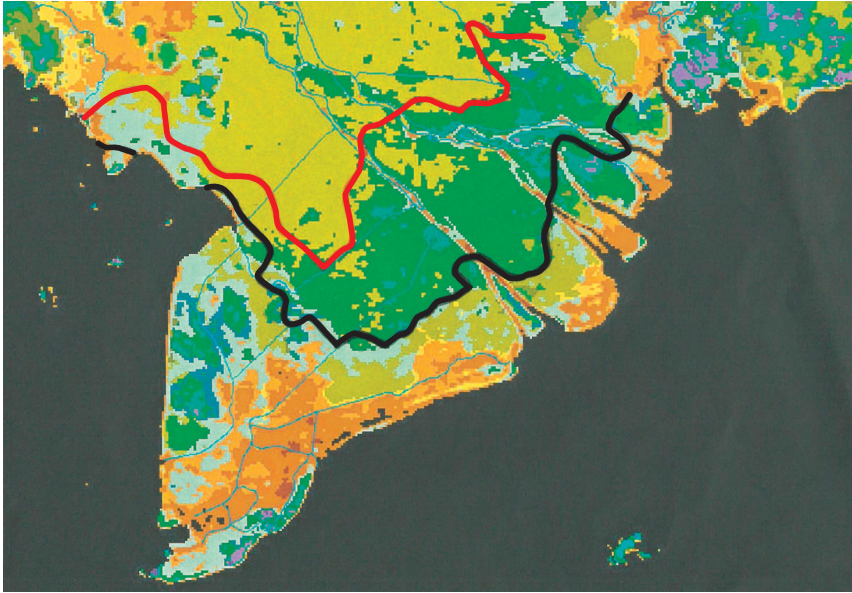


PLATE 4. Mekong delta, salt concentration intensity  
RYSUNEK 4. Delta Mekongu: intensywność stężenia soli

Source: P. Santacroce and S. Griguolo, “Identification of major poverty related hotspots in the SEA region, using hotspots most relevant global studies and synthetic environmental indicators”, chapter 2 of FAO/NRCB, *SEA Poverty Hotspots* (unpublished).

Another component of the “conventional wisdom” of vulnerability analysts, in general, is the “conventional” assumption that households (HHs) headed by females are more vulnerable than those headed by males. However in several countries, a “gender fine-tune analysis” has frequently demonstrated that it’s not necessary true. For instance MIMAP found out that in The Philippines the household headed by female had *its average regional estimate of poverty incidence lower than that of the general population*.<sup>15</sup> More detail comes from processing the FIES 2000 survey: *Philippines Income and Expenditure Survey*, and a U shaped distribution (in terms of Income deciles) is particularly evident for the rural households. It was true that a higher percentage of female-headed households (compared with the male-headed ones) was included in the lowest income decile, but the presence of such households was very significant in the highest four deciles (Plate 5). These investigations also report that, contrary to the conventional wisdom, the presence of rural household headed by female is less relevant in the lower deciles.

<sup>14</sup> The VGT (from Spot images, 1 km resolution) classified cycle image was produced by Prof. Griguolo, author of another unpublished document expected to be included in the already quoted FAO study on *Hotspots in SEA (Southern Easter Asia)*.

<sup>15</sup> MIMAP, “Measuring Poverty Incidence among Specific Groups”, MIMAP Project Updates, Vol.5, N.1, 1998.



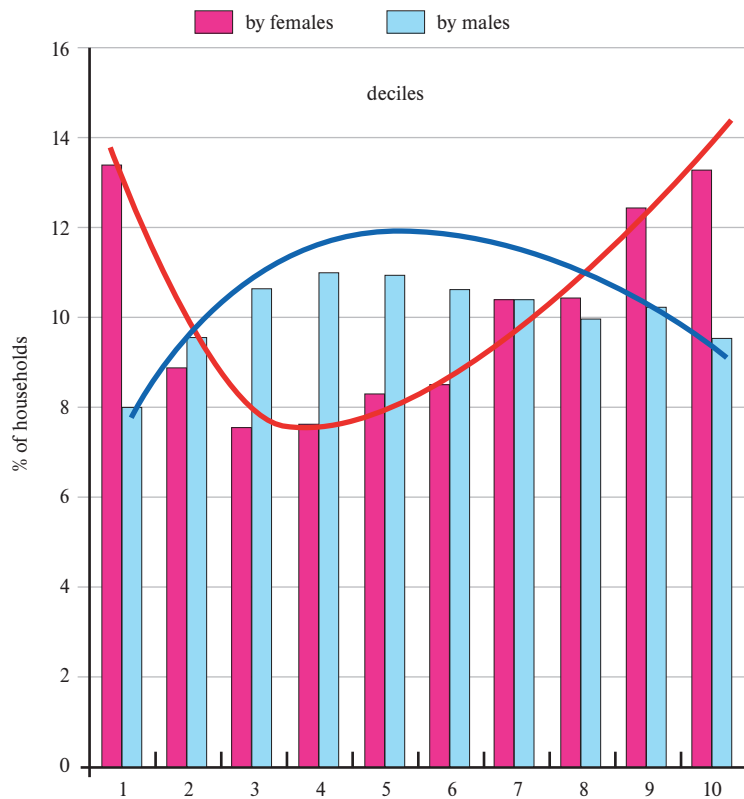


PLATE 5. HHs headed by females versus males by income deciles

RYSUNEK 5. Gospodarstwa domowe kierowane przez kobiety w porównaniu do prowadzonych przez mężczyzn według grup decylowych dochodów

Source: adapted from Santacroce, "The Philippines FIVIMS report", 2001, 28.

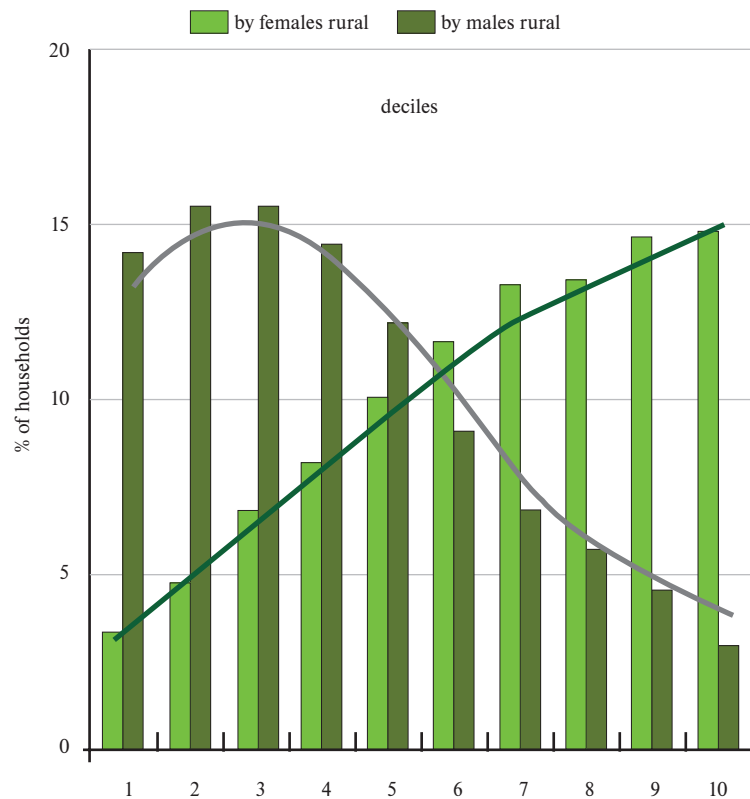


PLATE 6. Rural HHs headed by gender and income deciles

RYSUNEK 6. Wiejskie gospodarstwa domowe według płci głowy gospodarstwa i grup decylowych dochodów

Source: adapted from Santacroce, "The Philippines FIVIMS report", 2001, 29.

Similar conclusions have been reached in several Asian and African countries<sup>16</sup>; the related gender policy implications are important, as for the lowest decile it should be recommended a safety-net policy, while for the other low deciles a more “small-credit approach” is more advisable.

Since Chambers formulated his equation, several relevant analysts have insisted on his concepts and have improved his approach, in particular discussing the “conventional wisdom” related to the “poverty line” approaches. For instance a notable example was provided by a paper on Cambodia produced by SIDA Asia Development in 2001. Poverty was defined as *a lack of command of resources* and it was observed that – on the contrary – *Vulnerability follows not only from a lack of command of resources (poverty) but also from a perceived or real lack of control over one’s own situation and excessive exposure to unpredictable external forces and circumstances, over which one has no control*, commenting: *(...) while the majority of the poor are also vulnerable, the latter also include significant groups whose incomes may not always fall below the poverty line.*<sup>17</sup>

Another collateral lesson from the above experiences is that to estimate the number of poor people (and, if you want, the presumed strictly related vulnerable ones) gauging it simply on the basis of a pre-defined poverty threshold, and ranking countries/area/household according to the so famous \$ 1 per person (at Purchasing-Power-Parity, in 2008 updated to \$ 1.25), seems too simplistic, rather unsatisfactory, even when more sophisticated poverty formulae (taking into account the distances below the “poverty line”) are used because these approaches lose the second term of the equation: i.e. the “ability to cope”.

## ABOUT THE WHY

Having focused the attention on the conceptual differences between “poor” and “vulnerable”, the already quoted examples have contained the “why” question.

It is evident that in practice when dealing with vulnerability, it is assumed that there is no overall, generic vulnerability, but an area, a population, a peculiar group/household, that is/are “vulnerable to something” i.e. to some factors (for instance climate hazards or climate changes, social and economic events/incidents, political changes, and so on) or, in many cases vulnerable to the “concomitance” of

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<sup>16</sup> See for instance the already quoted SIDA Asia Development paper on Cambodia, 2001: *In general the poverty incidence in HHs headed by females is smaller than in the men’s ones.*

<sup>17</sup> SIDA, Asia Development, “Cambodia, Country Analysis Paper”, September 2001, 26. Another, let say, “anti conventional wisdom” approach has been offered by Celia M. Reyes in his *Movement In and Out of Poverty* in which the author, using a panel of The Philippines IES, could reconstruct the history of the households located just above the poverty line and demonstrat an intense “move-in move-out the poverty” including what is governing these movements, i.e. emphasising the inability to cope with *exposure to risks, shocks and stress* (using Chambers’s wording); see: Celia M. Reyes, 2002: *Movement In and Out of Poverty in the Philippines*, a paper presented at a conference on “Assessment of Poverty Reduction Policies” organized by INSEA and IDRC under the MIMAP Project, January 28–31, 2002, Rabat, Morocco.

some of them. In practice, only once roughly identified different “risk scenarios”<sup>18</sup> it is possible to discriminate between ability/inability to cope with them, and consequently to try to identify which indicators should be the most suitable, verify if and in which way they could/are available and, if unavailable, which proxy-indicators could be used instead of them.

It is also evident that this “second W” step of the WWW sequence is the more difficult. It is hampered by the fact that frequently, (most of the time), the analyst has at his disposal only “secondary data”, i.e. data collected by other institutions according to their specific needs, and due to high costs and/or time constraints “primary data” cannot be collected.

Field experiences suggest the need to try and combine household information extracted for instance from Income and Expenditure (or similar names) Surveys frequently carried out in most countries even in a sequential way (several rounds<sup>19</sup>), with a few field data (defined as “primary data”) collected through Rural Rapid Appraisals (RRAs). Fortunately, in several countries, the IE Surveys collect some information directly or indirectly related to some aspects of coping mechanisms; however the “primary data” collection through RRAs were necessary for contextualising (particular in geographic terms) the set of the “secondary data” (The Author refers particularly to his field experience in Ethiopia, Niger, Cambodia/Myanmar).

Once identified and compiled in a database a set of indicators (and as already stated these are seldom the most suitable, but they are, forcibly, the only ones available) an (apparently technical) decision must be taken as to which way to analyse the data (i.e. which statistically sound method should be used).

The history of the food security vulnerability analysis shows – at the beginning – the criteria of “a concomitance of fact” (formulated by the USAid/FEWS) was implemented either through overlaying maps (let say: a visual criteria) or attributing to each indicator a score (let to say: from 1 to 10) and then, making a sum of the scores of each geographical area, to produce a final outcome in the form of a ranking table (for instance: from “not at all vulnerable” up to “very vulnerable”), frequently accompanying it with a nicely coloured map, simply to be appended to the wall in the room of some decision maker. It was evident, from this method, that any specific information about the composition of the above overall outcome was definitely lost, in particular identical or similar levels of overall vulnerability could be a result of a complete different “concomitance of facts” (using the FEWS terminology); the decision makers – on the contrary – needed a detailed description of the vulnerability-components in order to intervene!

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<sup>18</sup> For instance the “risk scenarios” in the previous pages were: “drought prone areas” (Sudan), “political upsetting” (Cambodia), “hydrological hazards” (Southern Mekong area) and so on. See also, in the last page of this text, some short descriptions of other “risk scenarios” I could analyse during my field experiences, for instance: “[Perverted] effects of the 'Oil-for-Food programme' (Kurdistan under Sadam Hussein regime), “the impact of a sudden rise of cereal prices in 2008” (Cambodia).

<sup>19</sup> In several countries two or three rounds of surveys related to Income and Expenditure (IESurveys, SESurveys, LSMSurveys or similar) are frequently available.

The “score” approach unfortunately, however – even when it is carried out using very sophisticated composite indicators – still continues to be the current practice, used by several institutions in order to “popularise” their outcomes. Instances include the HDI (Human Development Index), the HPI-1 (Human Poverty Index for developing countries), the GDI (Gender-related development index), the GEM (Gender empowerment measure) the EPI (Environmental Performance Index), and so on: a mushrooming of indicators. The Author does not want to deny some pragmatic results of their final ranking tables, however he would repeat they these are rather useless for decision makers.<sup>20</sup> Twenty years ago (1995) (i.e. when the *Atlas Demograficzny i Społeczno-Zawodowy Obszarów Wiejskich w Polsce* was published including<sup>21</sup> it a set of “Typological maps”) the ranking methods were already under critical fire and the importance of clustering methods was already being emphasised.

A FAO/IAWG document (published in 2000) titled: *A Comparison of Vulnerability Analysis Methods and Rationale for their Use in different Contexts* it was stated that: *Cluster analysis opens interpretation of the data to decision-makers in a simple and straightforward fashion...* [The profiles defined by a cluster analysis] *are highly descriptive of both similarities and differences in and across households and regions. (...) The use of cluster methods provides some important insights into the causes of vulnerability. In addition, the characteristics of the individual clusters, or typologies, often provide sufficient information for analysts and decision-makers to draw their own conclusions regarding the relative level of vulnerability across clusters. In contrast, with the simple index approach, where indicator weights may be similarly subjective, the subjective interpretation of cluster analysis results is transparent and, if done properly, defensible.*<sup>22</sup>

Since this time “Clustering analysis” had been frequently applied by several UN related institutions. The original multifactorial analysis statistical package was written by Silvio Griguolo<sup>23</sup> and used for producing, for example, the already quoted Polish Atlas “Typological maps” and was subsequently improved and adapted for different needs (for example a FAO/IGADD Early Warning Version, and a new Window version in which several, very useful, innovative and very effective graphic procedures are included). Finally Prof. Griguolo produced a version for analysing remote sensing images time series and this was used by the EEA/PELCOM Project.<sup>24</sup>

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<sup>20</sup> In reality there is a “political use” of the above indicators; they are frequently used either in a “selfish” approach (“How our policies are good as we improved our position in the ranking table!”), or in a “disparaging” approach (“How you are bad, you worsened your condition!”).

<sup>21</sup> *The Atlas* is the result of co-operation between Italian and Polish authors: three from the Institute of Rural and Agricultural Development (I. Frenkel, A. Rosner and B. Andrychowicz) and two “from the University of Venice” (P. Santacroce and A. Conte), S. Griguolo (Cidoc, University of Venice) “kindly provided the authors with his [multifactorial analysis] software package” used by the project team. *The Atlas* was completed end of 1993 and published by ZWS in 1995.

<sup>22</sup> See: IAWG 5/12, “A comparison of Vulnerability Analysis Methods and Rationale for their Use in Different Contexts”, by F. Riely, August 8, 2000 (preliminary draft).

<sup>23</sup> Prof. Silvio Griguolo unfortunately, prematurely, died in 2015. This paper is particularly dedicated to his memory.

<sup>24</sup> European Environmental Agency/PELCOM [Pan-European Land Cover Monitoring] is a 1-km pan-European land cover project.

## ABOUT THE WHERE

The “Where” is the Fairy Tale element in so many macro-approaches to Vulnerability, which then underestimate the “space” components and its important meaning for decision makers.

The “space” should not be considered simply a complementary one. In many vulnerability analyses at macro-level, once identified **Who** is vulnerable and **Why** it is vulnerable, it seems that its locations is rather a logistic problem more than a conceptual one. In this type of macro-analysis the space is assumed to be “at post” condition; for instance, let go back to the example of households headed by females in the Philippines. In this case it was enough to disaggregate the data into rural and urban for demystifying the “conventions wisdom”. Unfortunately, however, in many cases the “space” is considered, by the analysts, important only in logistic terms; in some “food aid” practices, only once identified the type of vulnerable (the beneficiaries), the “access to them” is considered, without taking into account other indicators which could discriminate between the “beneficiaries” categories.

On the contrary the space component (the “Where”) should be considered from the beginning of a vulnerability analysis as a determinant variable: it can assume a different meaning in different time and in different space, as Watts and Bohle had already emphasised many years before.

A simple example can be given related to Tigray, one of the most frequently drought-affected regions in Ethiopia. It is evident that in this case a household vulnerability analysis uses agromet and basic agronomic data and combines them with livelihood information (for instance consumption patterns and so on) in order to identify availability/unavailability of coping mechanisms. According to the above criteria, in the past, the role of the market was not an important indicator to be used, because rural areas were mainly characterised by households based on self-consumption. For identifying and monitoring the vulnerable households it was particularly important to analyse in which way the above households could or could not satisfy their food needs particularly at the occurrence of a risk. In recent years, on the contrary, in Tigray due to an impressive development of a road network, and consequently the accessibility to the urban markets this has become an important indicator for vulnerability analysis. Farmers living near a main road (at the maximum distance of about a walking day using a donkey, for example) have – at least partially – changed their cropping systems, as they now can sell part of their produce to merchants regularly transiting with their pick-up along the road. In this case the indicator “access to the main road” should be added to the set of indicators to be used for vulnerability analysis.

The Author has also observed a further modification of these changing patterns in other African countries (for instance in Kenya and Niger). Until recently, in these countries (and it still happens in Ethiopia), farmers selling horticulture produce were victims of a extortion process imposed by itinerant middlemen merchants where they were obliged to accept a low price for their produce, an extortion imposed by these motorized and rapacious people. Now, however, due to easy access to mobile phones combined with daily free information about produce prices in different markets

available from the phone network, several villages start to delegate one of its people to go straight to the market (finding for instance a logistic solution like a truck transiting along a main road) and take care, directly, of the village interests, avoiding a middleman extortion. It's evident that for a vulnerability analysis we need to include new variables related to the above novel behavior.

As an overall conclusion: for vulnerability analysis there is not any pre-defined recipe, the ingredients (indicators) should be identified (and tested<sup>25</sup>) according to the purpose of the analysis.

\* \* \*

The sequence WHO → WHY → WHERE has been explicitly or implicitly the backbone of a myriad of vulnerability analysis carried out by UN Agencies and/or bilateral Agencies, and applied to many different geographic and socio-economic contexts.

The Author presents below five examples with which he was involved. These are synthetically mentioned.

### **A – The implementation of an Early Warning and Food Security Monitoring System in presence of a short growing season, the Horn of Africa**

In 1989 a Project of “Early Warning and Food Information System for Food Security Monitoring System” was established in the Horn of Africa.<sup>26</sup> The main objective was to produce, particularly during the most critical periods of the growing cycle(s), a map of “at risk areas” for assisting the decision makers to take the appropriate actions. The map was expected to provide a timely overview of local situations and, at the same time, to be regularly up-dated/modified to offer them further elements to be used to confirm/modify their decision. Due to limited resources the system used “secondary data” (i.e. collected by several institutions working in each IGADD countries) that were analysed using appropriate techniques, either comparing the observed trends during the current season with the expected ones<sup>27</sup>, or monitoring particular indicators in order to find out if and when they reached significant thresholds.<sup>28</sup> The above separate assessments were then merged together to produce a “current season composite vulnerability assessment”. Once produced it, the Project tried to evaluate its impact

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<sup>25</sup> When the Author says he “tested” he refers to the fact that sometime the analysts use “redundant” ingredients, strongly correlated between them. This practice, apparently enriching the recipe, is – on the contrary – affecting the results and risk to be a confirmation of “conventional wisdom”. For this reason the “exploratory” phase of a multifactorial analysis should be considered the most relevant, in order to discard too much correlated “ingredients” and reach more significant and useful results for decision makers.

<sup>26</sup> FAO GCPS/RAF/256/ITA, HQ Djibouti, The Project covered the IGADD Region (Djibouti, Ethiopia [subsequently divided into Ethiopia and Eritrea], Kenya, Somalia, Sudan, Uganda), P. Santacroce, assisted by team of regional experts, was the Project Manager from 1989 up to beginning 2002.

<sup>27</sup> The above technique was mainly applied when the 10 km resolution “dekadal” NDVI images received by the Project were compared with the historical “averages”.

<sup>28</sup> The above approach was mainly applied to market prices and nutritional indicators.

according to two criteria: a) the performances of the previous year and b) the structure of the so called “chronic vulnerability” of the area (districts); and finally, assisted by an ad hoc multifactor statistical package<sup>29</sup> the Project regularly produced final maps of “at risk areas”. Plate 7 (see: p. 28) shows the flowchart of the overall procedure<sup>30</sup>.

## **B – Identification of Vulnerable Counties in China versus “Poverty Stricken counties” as identified by the Chinese Government, as a demonstration of a partial overlapping of vulnerability and poverty**

In 1997 WFP and IFAD agreed to assist the Chinese State Council in his “National 8.9 Poverty Alleviation Plan”. The Chinese “Poverty Alleviation Group” (PAG) had already identified 598 [rural] *poverty stricken* counties, *located deep in mountain areas, rocky mountain areas, desert areas. High and frigid mountain areas, loess highland areas (...)* as wrote in Chinese official documents. When a WFP/IFAD “Vulnerability Analysis Assessment Mission” arrived in China, the PAG Committee provided a list of 18 indicators, used by them to identify the above countries, but however both the criteria and the detailed account of the methodology used for the above identification were not provided. The “vulnerability assessment mission” emphasised the difference between poverty and vulnerability; they are concepts only partially overlapping (see the reference to the Achilles’ heel in the previous pages of this text) and in order to indentify in which area the two Agencies intended to assist the Chinese Government it was necessary to carry out a preliminary vulnerability analysis. A counties level huge database was implemented at the WFP Office in Beijing; 16 indicators were used for clustering the counties in order to identify which were vulnerable and the causes of their vulnerability.

When PAG and VAM/IFAD’s lists were compared and mapped, the outcome was only a partial matching of the counties. It is evident that the result was due to the use of some different indicators combined with the way of using them. *Ceteris paribus* the PAG had used absolute figures<sup>31</sup> while the Mission – on the contrary – had privileged per capita figures and crop performances<sup>32</sup>. It was finally agreed with the

<sup>29</sup> Prof. S.Griguolo provided FAO/IGADD an “ad hoc” version of his original statistical package.

<sup>30</sup> The flowchart is extracted from “Introductory Guide to MYCOUNTRY Methodology, page 8. An extensive description of the MYCOUNTRY Methodology was presented by P. Santacroce (Project Manager) to the “Second IGADD Early Warning Methodology Workshop”, Rome 22–23 November 1993, FAO HQ, Rome. The decision of naming in this way the above methodology was due to the need of offering an example not related to an identifiable area or country of the IGADD region, emphasizing the methodology conceptual approach and at the same time avoiding any reference to a specific area/condition. But, obviously, it was a simple “aseptic expedient”, a few people knew/know that both data and the related districts map were true: in truth the REPUBLIC of MYCOUNTRY was a part of Ethiopia (Lake Tana and a part of the Blue Nile basin). The map was simply shown in the outcomes with a rotation of 900. James Mansabu (Head of the MYCOUNTRY EWUnit) was used as a pseudonymous of Paolo Santacroce.

<sup>31</sup> i.e. Number of ..., Product value of ..., remoteness and so on.

<sup>32</sup> Worth noting that the Mission, while using per-capita figures and performance indexes, included in its data set also the MCI (Multiple Crop Index), a very significant proxy indicators in terms of vulnerability.

Early warning and food security system components

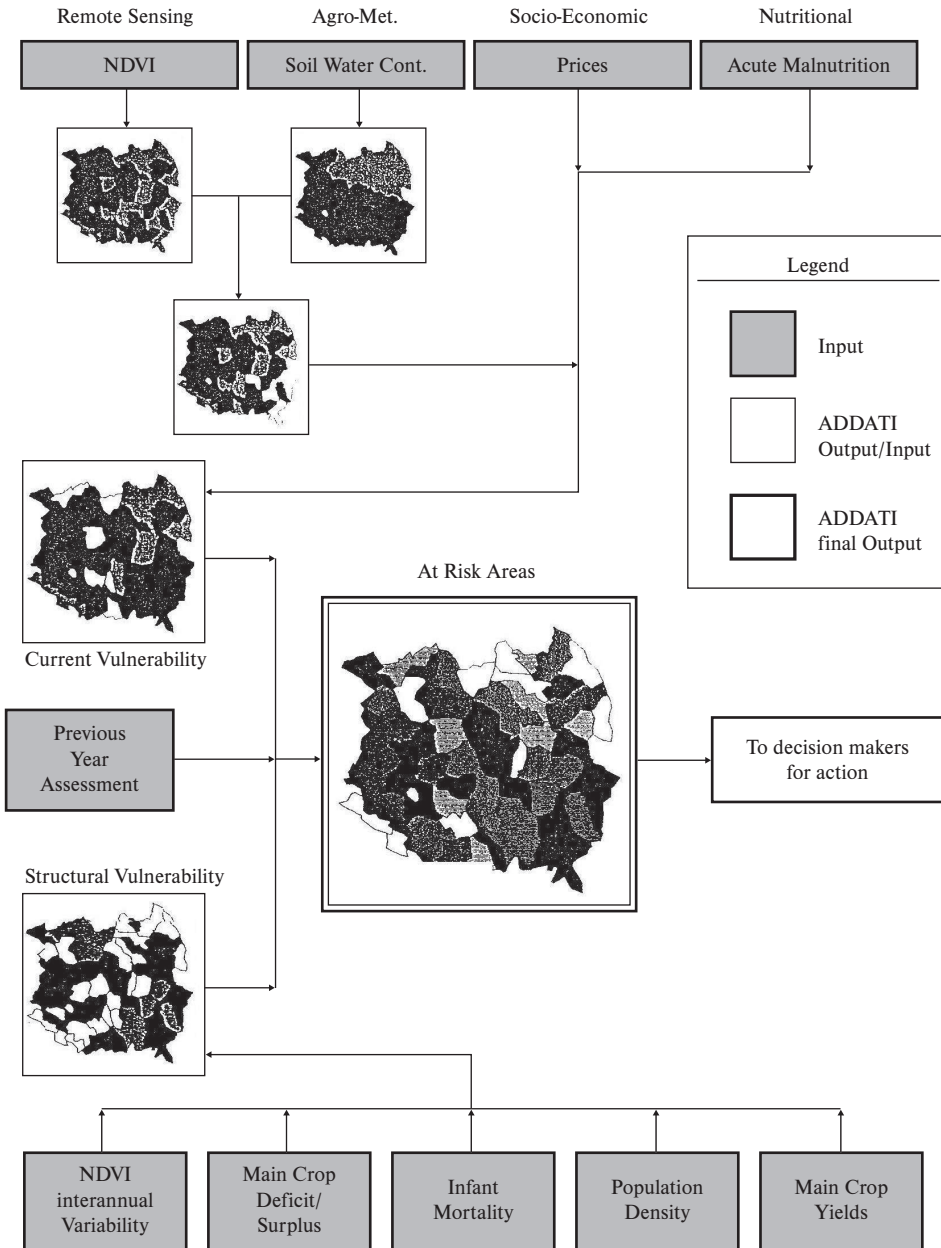


PLATE 7. MYCOUNTRY Methodology – a flowchart

RYSUNEK 7. „MyCountry”: schemat wczesnego ostrzegania i elementy systemu bezpieczeństwa żywnościowego

Source: P. Santacroce, 1993: *MYCOUNTRY Methodology* a paper presented at the “Second IGADD Early Warning Methodology Workshop”, 22–23 November 1993, FAO HQ, Rome.



Chinese Government that WFP/IFAD's future joint development programmes should be focused on a list of counties matching both criteria (poverty and vulnerability).

In the WFP/IFAD map the warm colours (dark red, pink and dark orange) identified clusters with different types and level of vulnerability.<sup>33</sup>

### **C – Impact of rising prices of essential goods, mainly food and fuel in 2008 into the Cambodian rural economy, with particular attention to the identification of vulnerable people according to their livelihood and location (Plate 8)**

In early 2008, Cambodia, like many countries worldwide, experienced rising prices of staple goods. A spike of food prices at the end of April 2008 was primarily due to the huge increase in the rice price, the staple food of the country, exacerbating the already existing structural and seasonal limitations to local livelihoods. In this situation it became necessary to analyse the food security and vulnerability conditions of the population groups and communities, and to provide baseline information to WFP decision makers and other actors focusing on food aid and food insecurity. A joint activity with the CRDI (Cambodia Research Development Institute) was carried out consisting into a primary data collection (a 2,235 households survey through the country) and the WFP requested to add a questionnaire for 149 villages in order to contextualize the data collected by the HH Survey.

The outcomes of the above related surveys were sufficient to create two independent and different reports: the CFSVA (Kingdom of Cambodia: Comprehensive Food Security and Vulnerability Analysis (by WFP/VAM)<sup>34</sup>, and “The Impact of High Food Prices in Cambodia: survey report” (by CDRI).<sup>35</sup> The CFSVA analysis investigated several variables such as the changes in prices of milled rice, qualitative information on the costs for milling rice, and changes in the terms of trade of households, to better understand the impact of rising food prices on Cambodian population. Elements of economic capital, such as income and expenses were also explored, so providing “a wealth of information to understand the impact of food price increases”. Particular attention was dedicated to Cambodian households in remote areas as they frequently rely, during the lean seasons, on the forest not only for timber but also for a large variety of non-timber products, including wild foods. Access to wild resources through fishing, gathering, and hunting represents a significant source of both income and food for the rural population. This provides most of the animal proteins and fat components of their diet and fodder for their domestic animals. For the first time in Cambodia, using the Village survey results, it was possible to identify villages where two types of vegetables were frequently collected ‘in case of food shortage’: wild cassava and wild vegetable leaves (see Plate 8, p. 30).

<sup>33</sup> See P. Santacroce, 1997: *China, a Preliminary vulnerability assessment*. WFP/IFAD, part III, p. 58–125.

<sup>34</sup> P. Santacroce, 2008 (December): *Kingdom of Cambodia: Comprehensive Food Security and Vulnerability Analysis*. WFP/VAM, Rome.

<sup>35</sup> CDRI (Cambodia's Leading Independent Development Policy Research Institute).

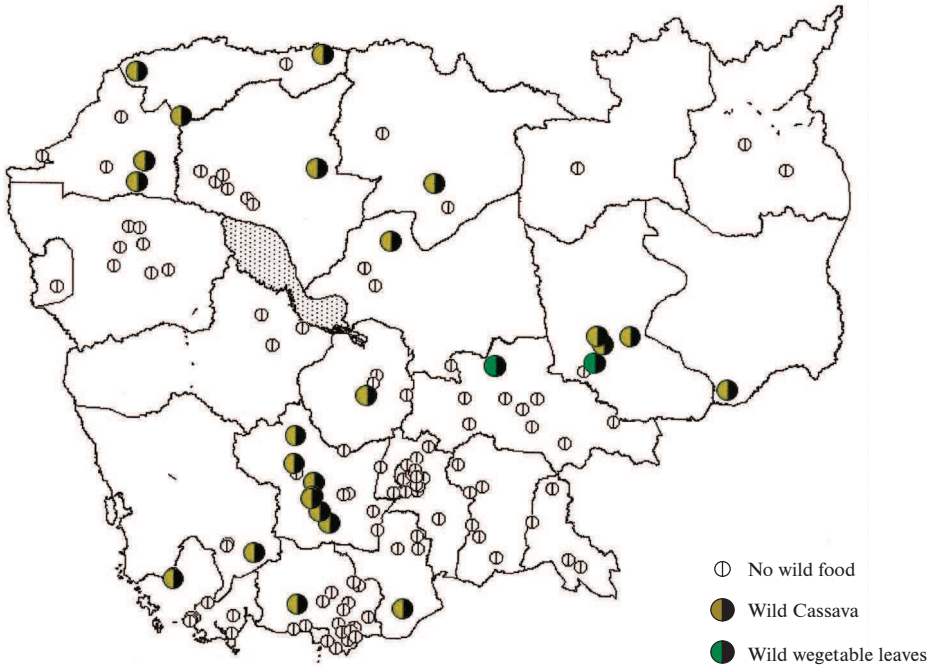


PLATE 8. Wild food consumption during food shortage periods, by prevalent types  
 RYSUNEK 8. Konsumpcja dzikiej żywności w okresach niedoboru żywności (typy przeważające)

Source: P. Santacroce, 2008: *Kingdom of Cambodia: Comprehensive Food Security and Vulnerability Analysis*. WFP/VAM, Rome.

**D – Identification of perverted effect of the “Oil-for-Food programme” emerging from an analysis of Kurdistan villages agro and socio-economic patterns, with particular reference to those aspects that could hamper a return to “normal condition” in rural areas<sup>36</sup>**

The study includes a typological classification of 2228 villages using a set of 24 indicators of their cropping system and composition in view of a comparison with the socio-economic patterns as emerged from the “Northern Iraq Settlement Household Survey (SHS)” which had demonstrated that the SCR 986 Ration system<sup>37</sup> had affected the rural life and the agro-pastoral system in several ways. In particular it appeared that “the food ration system” had significantly decreased planted areas due to the fact that “it was not worth to plant” (no need of money for buying several important items as already include in the ration-basket) and the rural population had moved toward a living system more dependent on an external, temporary food supply, posing a big question mark for the future

<sup>36</sup> See in particular: P. Santacroce, a *Summary on Northern Iraqi Rural Settlement*, UN/ Habitat, Erbil/Venice, 2001.

<sup>37</sup> UN Security Council Resolution (SCR) number 986 (1995).

**E – Constraints in implementing the “poppy eradication programme” including the difficulties encountered when trying to reintroduce in Golden Triangle (Myanmar, Shan State) some “local” crop (i.e. buckwheat (*Fagopyrum esculentum*, Moench), the Polish “Gryka zwyczajna”)**

In 2006 due to urgent needs of collecting vulnerability and food insecurity indicators as a priority action in order to define an effective development and humanitarian assistance to Myanmar, a “Baby Project” was implemented.<sup>38</sup> As an additional task the Project team was requested to carry out a case study on the poor and the vulnerable population in Northern and Eastern Shan states, the justification was the concerns that the various efforts to eradicate poppy had led many households in the region toward chronic poverty and had negatively affected their food security; it was expected that a better understanding of the key factors leading the vulnerable population toward poverty, as well as their coping mechanisms and capacity were expected to contribute to improve targeting. An extensive survey was carried out in the areas, in spite of logistic and security constraints, with the full support of WFP; the results were distributed in January 2007 but the report was never published and it is available only through WFP.<sup>39</sup>



PLATE 9. Golden Triangle, Shan State, Region 2, MYANMAR – Agricultural Landscape  
RYSUNEK 9. Żółty Trójkąt, stan Shan, Region 2, MYANMAR – Krajobraz rolniczy

Photo by P. Santacroce

<sup>38</sup> FAO and EC, Project CGP?INT?952?EC-MYA(8).

<sup>39</sup> documents.wfp.org/stellent/groups/public/documents/ena/wfp213400.pdf

The mission noted the risk of an “addiction to food assistance” provoked by the policy related to the “poppy cultivation ban”. In particular the attempts made by UNODC<sup>40</sup> to introduce new crops (like buckwheat) or reintroduce “secondary crops” abandoned during the most profitable poppy period – when it was not worth planting because there was sufficient cash flow, derived from selling poppy, for buying rice – seem to be a “tilt to windmills”. Due to poppy eradication the skill and knowledge even about previous “secondary crops” have been lost, and in addition the people have modified their mouth taste, as a result of an intensive food aid with a large portion of rice: a big question mark about the future of their nutrition.

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The above text is a revised and updated version of a conference held at PAN/IRWIR, Warszawa 31.03.2015

Most of the quoted reports can be downloaded linking to:

<https://independent.academia.edu/PaoloSantacroce>

or to: <http://www.paolosantacroce.net/Welcome.html>

## **ANALIZA ZAGROŻEŃ BEZPIECZEŃSTWA ŻYWNOŚCIOWEGO: KONCEPCJE I DOŚWIADCZENIA KDG, CZYLI KTO, DLACZEGO, GDZIE**

**Streszczenie:** W artykule przyjęto za punkt wyjścia „konwencjonalną mądrość”, z której wynika równanie *biedni = narażeni na biedę*, a więc że *być biednym* zawsze znaczy *być podatnym na zagrożenia* i odwrotnie, ale na podstawie kilku przykładów podważono powyższe założenie. Autor zakłada koncepcyjne i metodologiczne podejście często stosowane w analizie zagrożeń [bezpieczeństwa żywnościowego], szukając odpowiedzi na pytania: „WWW: Who, Why, Where”, co można przedstawić jako KDG, czyli: Kto, Dlaczego, Gdzie. Jest to skrótowiec używany przez kilka agencji międzynarodowych i regionalnych, zajmujących się analizą podatności na zagrożenia. Autor przytacza kilka przykładów związanych z jego doświadczeniami zawodowymi w Afryce i Azji.

**Słowa kluczowe:** bezpieczeństwo żywnościowe i zagrożenie bezpieczeństwa żywnościowego, podatność (wrażliwość) na zagrożenia, niedożywienie, niedożywiony, planowanie rozwoju rolnictwa

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<sup>40</sup> UN Office on Drug and Crime.