

Annex 2:

Definitions and computation of main indicators

Food security exists when all people, at all times, have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Food security is divided into three aspects: food availability, food access and food utilization.

Food availability is the quantity of food that is physically present in a country or area through all forms of domestic production, commercial imports and food aid.

Food access is the households' ability to regularly acquire adequate amounts of food through a combination of their own stock and home production, purchases, barter, gifts, borrowing or food aid.

Food utilization refers to: a) households' use of the food to which they have access, b) intra-household food distribution, and c) individuals' ability to absorb nutrients – the conversion efficiency of food by the body.

Food security is an outcome of the **livelihood strategies** adopted by a household. It includes the activities required for a means of living. The livelihood strategies are based upon the **assets** or capital available to the household, which include its human, social, natural, physical and financial resources. A livelihood strategy 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, while not undermining the natural resource base."¹

Food Consumption Score (FCS): The frequency weighted diet diversity score or "food consumption score" is an internationally used WFP standard score calculated by the frequency of consumption (number of days per week) of different food groups consumed by a household during the seven-day recall period. Information on the different food items was reorganized into specific food groups (see the table below).

Consumption frequencies of food items belonging to the same group were added up and values above 7 were recoded as 7². The value obtained for each food group was multiplied by its weight. The food consumption score is the sum of the weighted food groups.

The table below illustrates collected food items, food groups and their relative weights internationally used by WFP³.

¹ DFID (1999) sustainable livelihoods guidance sheet

² As 7 is the maximum number of days per week

³ "Standard" food group weights and score thresholds have been test piloted and used in a few WFP assessments. Tufts University and IFPRI are currently conducting external validations.

Collected food items, food groups and relative weights for the calculation of the FCS

Food items	Food groups	Weight
1 Maize, sorghum, other cereals, cooking banana, cassava, other roots and tubers (sweet potato, yam, taro)	Cereals and tubers	2
2 Pulses (including beans, tofu, bean curd)	Beans	3
3 Vegetables (including green, leafy vegetables, shoots and mushrooms)	Vegetables	1
4 Fruits	Fruit	1
5 Meat (poultry, pork, beef),fish, eggs	Meat and fish	4
6 Milk / milk products	Milk	4
7 Sugar	Sugar	0.5
8 Oil, lard	Oil	0.5

Source: CFSVA and Nutrition Survey, 2012

Two FCS thresholds were identified to distinguish different food consumption levels. A score of 21 was set as a bare minimum: the value comes from an expected daily consumption of staples (frequency * weight, $7 * 2 = 14$) and vegetables ($7 * 1 = 7$). Below 21, a household is expected to not eat at least staple and vegetables on a daily basis and therefore considered to have poor food consumption.

The second threshold was set at 35, and is composed by daily consumption of staples and vegetables complemented by a frequent (4 days/week) consumption of oil and pulses (staple*weight + vegetables*weight + oil*weight + pulses*weight = $7*2+7*1+4*0.5+4*3=35$). Between 21 and 35, households can be assumed to have borderline food consumption, meaning that they are vulnerable to becoming food insecure should a small decrease in their access to and availability of food occur. Households that score above 35 are estimated to have an acceptable food consumption consisting of sufficient dietary diversity for a healthy life.

Collected food items, food groups and relative weights for the calculation of the FCS

Food consumption score (FCS)	Consumption profiles (diversity and nutritional density)
0-21	Poor
21.5-35	Borderline
> 35	Acceptable

Source: CFSVA and Nutrition Survey, 2012

The questionnaire did not take into account that food items could have been consumed in very small quantities. This applies mostly to animal protein consumption. It was difficult for the enumerators to decide when a fish was a substantial meal and when it was a condiment. A small fish may be substantial for one person, but when shared amongst 6-7 household members, the dietary contribution from this food item is minimal. Due to such limitations, there might have been an overestimation of the household consumption of particularly animal protein.

A **household** is a group of people who share their resources in order to jointly provide for their basic needs, at a minimum their food consumption ("eating from the same pot"), on a daily basis. Following the definition of the National Institute of Statistics, a household is composed of a person or group of persons living together during at least 6 months and sharing at least one meal a day. The NISR definition also considers as a household member somebody new in the household who plans to stay

there more than 6 months and people who return in the household after having been away a long time.

The head of the household is the person who runs the household and looks after those living in it. In order to qualify as a head of household, the designated household must be located at the person's home. However, if this person stays temporarily outside of the household for specific reasons (for example in jail) the person is still considered head of household.

Vulnerability is "the probability of an acute decline in access to food, or consumption, often in reference to some critical value that defines minimum levels of human well being".⁴ It is a function of:

1. **Exposure to risk:** the probability of an event that, if it did materialize, would cause a welfare loss (e.g. drought); and

2. **Risk management:** the ability to mitigate the possible consequences of a probable event. This can in turn be divided into ex-ante risk management (preparedness) and ex-post risk management (ability to cope). The ability to cope is the response after an event occurred; it can be negative and affect the resource base of the household, such as the selling of assets, or positive (non negative response such as migration). The ability to cope is undermined by the intensity of the event itself but also by poor structural and societal conditions such as poverty.

Nutritional Security: is achieved when a household has a secure physical, economic and environmental access to a balanced diet and safe drinking water, a sanitary environment, adequate health services, and knowledgeable care to ensure an active and healthy life at all times for all its members.

Nutritional status: is the balance between the intake of nutrients by an organism and their expenditure in the processes of growth, reproduction, and health maintenance. Consequently, **malnutrition** is any condition caused by excess or deficient nutrient intake. The indicators used to assess the nutritional status of children aged between 6 and 59 months old in this survey were based on anthropometric measurements of the mid-upper arm circumference (MUAC) and Z scores of anthropometric indices (weight-for-height, weight-for-age or height-for-age) with or without bilateral pitting oedema.

Anthropometric Measurements: the variations of the physical dimensions and the gross composition of the human body at different age levels and degrees of nutrition. Common anthropometric measurements include weight and length or height.

Mid-Upper Arm Circumference (MUAC): is a measurement of the circumference of the mid-upper arm and an indication of upper arm muscle wasting. MUAC is a common measure of child nutritional status that is fast, does not hinge on the accuracy of age reporting, and is quickly interpretable using a MUAC tape with colours for severe acute malnutrition (RED or a measurement <11cm), moderate acute malnutrition (YELLOW or a measurement between 11.0 - 12.5cm) and normal nutritional status (GREEN or a measurement of >12.5cm). MUAC is also used to measure wasting for pregnant women.

⁴ WFP 2002, VAm standard analytical framework

Cut off values used for the calculations of women malnutrition.

Stunting	Height < 145 cm
Underweight*	Weight < 45 kg
Wasting (BMI)*	BMI= 18.5 -24.9 Kg m ⁻²
GRADE I	BMI = 17.0-18.4 Kg m ⁻² (Mildly thin)
GRADE II	BMI = 16.0-16.9 Kg m ⁻² (Moderately thin)
GRADE III	BMI < 16 Kg m ⁻² (Severely thin)
Overweight (BMI)*	BMI > 25 Kg m ⁻²
Wasting (MUAC)	MUAC < 221 mm
SEVERE:	MUAC < 214 mm
For pregnant women	MUAC < 221

*not valid for pregnant women

Weight-for-Height (wasting): an indication of the current nutritional status of a child and reflects recent nutritional intake and/or episode of illness. Severe wasting is often linked to acute food shortage.

Weight-for-age (underweight): a measurement that combines information from stunting and wasting. Children can therefore be underweight because they are stunted, wasted or both.

Height-for-age (stunting): a measure of linear growth, and as such, an indicator of long term effect of under nutrition not affected by seasonal changes.

Standard Deviation (SD) or Z score: is the measure of an individual's value (based on their anthropometric measurement) with respect to the distribution of the reference population, i.e., the deviation of the individual's measure (of weight-for-height, weight-for-age and height-for-age) from the reference median.

Livelihoods are the resources used and the activities undertaken in order to live. The resources can consist of individual skills and abilities (human capital), land, savings, and equipment (natural, financial and physical capital, respectively) and formal support groups or informal networks that assist in the activities being undertaken (social capital). Livelihood strategies are activities and choices that people make, using their asset base, in order to achieve the most optimal livelihood outcomes. Such livelihood outcomes may include food security, general well-being, ensuring schooling for children, or being able to afford or access health services. A livelihood group is composed of people who utilize similar livelihood strategies.

For the CFSVA and Nutrition Survey 2012, principal component and cluster analyses were used to group households that share similar patterns of activities and the relative importance of those activities to the overall household livelihood. They were further regrouped so that groups were as comparable as possible to the CFSVA and Nutrition Survey 2009. This resulted in a total of nine livelihood groups: (1) agriculturalists (2) agriculture and unskilled daily labourers, (3) agro-

pastoralists, (4) agricultural workers, (5) employees and business, (6) agro sellers, (7) others marginal livelihoods, (8) informal sellers, (9) agro artisans.

Since the group of agriculturalists was very large it was further separated into two livelihood groups: 'agriculturalists low income' (calculated based on a per capita expenditure below 118,000 RWF – the national poverty line), and 'agriculturalists medium and high income', with per capita expenditure above the national poverty line.

Coping strategies are the ways a community, household, or individual adjusts their livelihood strategies in response to a shock or risk. This does not describe a regular situation but a response to a shortfall of food that can be described as a shock. These coping strategies can be short-term alterations of consumption patterns or one-off responses such as asset sales. Long-term alterations of income earning or food production patterns might also be a response to a shortfall of food, but will not be included in the term "coping strategy" in this report.

Coping strategies may involve short-term changes in behaviour, such as switching diets, consuming less expensive foods, or borrowing money. When normal coping and response strategies are exhausted, households will use negative crisis strategies, such as selling productive assets (e.g. female livestock). Repeated shocks and the use of crisis strategies to manage their effects can lead to increased vulnerability and a decrease in food security at the individual and household levels.

Coping Strategies Index (CSI): The CSI is a continuous variable based on the frequency and severity of coping strategies for households reporting food consumption problems. Households are asked to report how many days in the 7 days preceding their interview they used each mentioned coping strategy. The sum of the weighed frequencies (see table below) is the household's CSI score. CSI scores are often used as a proxy variable for food insecurity. Higher CSI scores indicate a more serious food security situation, and lower scores, a better one. Typical coping strategies include "changing the diet to less preferred food types," reducing portions, and reducing the number of meals.

Coping strategy weights for calculation of the reduced CSI

Coping strategies		Weight
1.	Rely on less preferred and less expensive foods	1
2.	Borrow food, or rely on help from a friend or relative	2
3.	Limit portion size at mealtimes	1
4.	Restrict consumption by adults in order for small children to eat	3
5.	Reduce number of meals eaten in a day	1

Livelihood zones: Since many districts have large geographical differences, an additional geographical grouping of the survey results was considered beneficial. Thus, based on a FEWS NET livelihood map, Livelihood zones are used to present results. These zones are based on sectors, where sectors are assigned to a zone based upon indicators related to agricultural potential and ecological similarity. The livelihood zones are further described in Annex 8.

Sloping class: In order to explore differences between villages situated in flat areas and villages located in more sloped or mountainous areas, MINAGRI's classification on the suitability of the land based on sloping levels of the terrain was used.

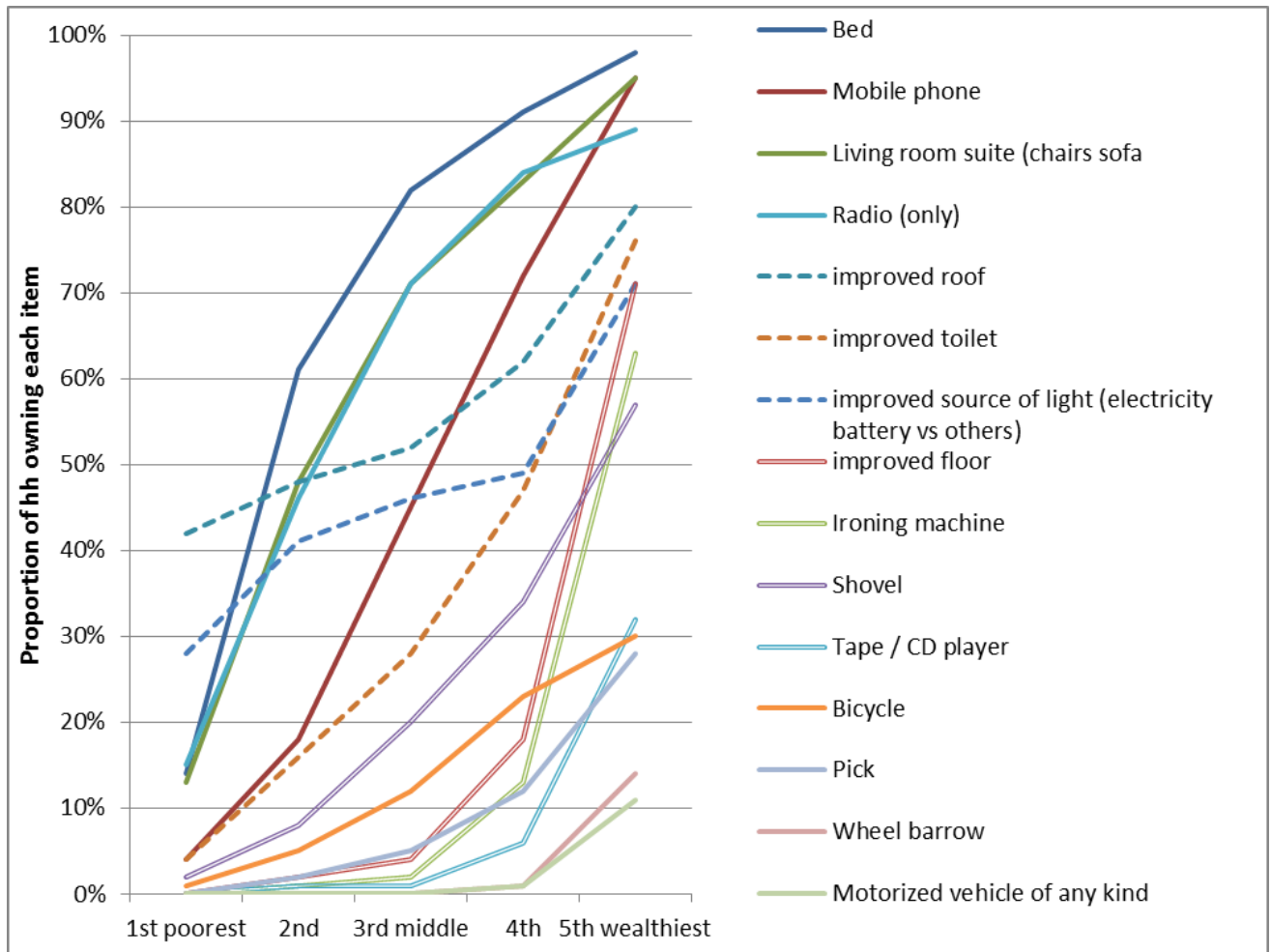
MINAGRI land use suitability classes

Slope	Suitability	Comment
0 – 6%	Suitable	The erosion hazard is not creating any serious problem
0 – 16%	Suitable	Cutoff drain is proposed to intercept the surface runoff from the higher slopes of the catchment
16 – 40%	High slope	Radical terraces recommended in order to be cultivated
40 – 60%	Very High slope	Depending on soil depth can be cultivate with radical terraces
>60%	Not suitable	Recommended for forest planting

Wealth index Wealth is the value of all natural, physical, and financial assets owned by a household, reduced by its liabilities. Although measuring wealth is possible, it requires making assumptions about the value of assets. The wealth index is a composite index that combines the ownership of key assets; it is used as a proxy indicator of household-level wealth. This variable can provide an idea of the relative wealth situation of a household. Often, the wealth index can be used as proxy for vulnerability/resilience.

For this CFSVA and Nutrition survey 2012 the wealth index took into account the ownership of the following items: improved source of light (electricity battery vs others), improved roof, improved floor, improved toilet, shovel, pick, wheel barrow, ironing machine, radio (only), tape / CD player, mobile phone, living room suite (chairs sofa), bed, bicycle, motorized vehicle of any kind.

Percentage of households owning each asset by wealth quintile



Source: CFSVA and Nutrition Survey, 2012