

Norwegian University of Life Sciences
Faculty of Landscape and Society
Department of International Environment and Development Studies, Noragric

2018

ISSN: 1892-8102

Noragric Report No. 83

Food security indicators: How to measure and communicate results

By Ruth Haug



**Food security indicators:
How to measure and communicate results**

by
Ruth Haug

Noragric Report No. 83
January 2018

**Department of International Environment and Development Studies,
Noragric
Faculty of Landscape and Society
Norwegian University of Life Sciences**

The Department of International Environment and Development Studies, Noragric, is part of the Faculty of Landscape and Society at the Norwegian University of Life Sciences (NMBU). The Department's activities include research, education and assignments.

This report is prepared for the Norwegian Agency for Development Cooperation, Norad, under the Frame Agreement between NMBU and Norad.

The findings, interpretations and conclusions expressed in this publication are those of the author and cannot be attributed directly to the Department of International Environment and Development Studies or the Norwegian University of Life Sciences.



Norwegian University
of Life Sciences



Norad

Ruth Haug. Food security indicators: How to measure and communicate results.

Noragric Report No. 83 (January 2018).

Department of International Environment and Development Studies, Noragric

Norwegian University of Life Sciences (NMBU)

P.O. Box 5003

N-1432 Aas

Norway

<https://www.nmbu.no/en/faculty/landsam/department/noragric>



This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License (CC BY-NC 4.0).

ISSN: 1892-8102

Photo (cover): Bishal Sitaula.

Cover design: Berit Hopland/NMBU

CONTENTS

Summary	1
1. INTRODUCTION	3
2. FOOD SECURITY	4
3. GLOBAL FOOD SYSTEM(S)	6
4. MEASUREMENTS AND INDICATORS	7
5. DEFINITION OF CONCEPTS	8
6. SDG 2- ZERO HUNGER	9
7. FAO: STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD	12
8. THE GLOBAL HUNGER INDEX AND GLOBAL NUTRITION REPORT	14
9. FAMINE: INTEGRATED FOOD SECURITY PHASE CLASSIFICATION	15
10. TOP-DOWN, BOTTOM-UP OR BOTH	16
11. COMMUNICATING FOOD SECURITY RELATED RESULTS	18
11.1. DFID: Communication of nutrition results	18
11.2. Noragric: Communicating food security related results	19
12. INTERNATIONAL AGRICULTURAL RESEARCH: CGIAR	21
13. COUNTRY INDICATORS AND COMMUNICATION OF RESULTS: MALAWI	24
14. LESSONS LEARNED	30
15. CONCLUSION	34
16. REFERENCES	35

SUMMARY

The purpose of this paper is to assess how to measure food security and how to communicate results of activities that have improved food security as a goal. There are many challenges in measuring and communicating food security results. Food security is a multidimensional concept that involves a whole range of different factors such as social inequalities and environmentally sustainable food systems. In the definition of food security, *access to food* is the core component. Food security consists of the four pillars; *availability, physical and economic access, utilization and stability*. To find appropriate indicators to measure food security have been difficult. *Chronic undernourishment* has been the main indicator comprising estimates based on average availability of calories per person at national level. Attribution is another challenge; the degree to which improvements in the food security situation can be attributed to the outcome and results of particular policies, programs and actions. There is broad agreement that the main cause of chronic undernourishment in the world today is poverty and that protracted conflicts are contributing towards more hunger. As 60 per cent of the chronic undernourished people live in conflict affected areas, focus has now been put on the link between food security and peacebuilding. In this regard, measuring processes and not only results, is a new challenge. The SDGs provide an opportunity for new and better food security indicators. The SDG2 on zero hunger, sets out to measure agricultural area under *sustainable* production, and FAO is currently working on finding appropriate *sustainability* indicators. Regarding food security and socio-economic groups, the *UN Inter Agency Expert Group* is on the task of how to go about disaggregating data according to sex, age, urban, rural and vulnerable groups. This means that both the *access* by different socio-economic groups and the *stability* pillars of the food security definition could be better covered, if appropriate indicators are developed through the SDG process.

The views differ on how to understand the food security situation in the world, and accordingly, how to communicate food security related results. The two extremes on a communication continuum, could be categorized as the *good news narrative* and the *bad news narrative*. These two narratives put the emphasis on different factors such as what have been achieved in relation to the decline in number of people going hungry, and on the other hand, challenging the indicators and numbers as well as the sustainability of the global food system that food security is based upon. The below table illustrates the different perspectives that the two narratives represent:

Good news food narrative	Bad news food narrative
World hunger is decreasing (except the increase in 2016) and MDG1 (cutting hunger in half) was achieved (almost)	The real number of hungry people is higher than what is recorded by FAO et al., and the way food security is measured needs to be improved (re lack of indicators on social equality and sustainable food systems).
There is no food scarcity at global level	Hunger is a serious problem in 52 countries and protracted conflict is contributing to increasing the problem
Science and technology is keeping up with population increase as regards availability of food	The current global food system is not sustainable
More food will be available if food waste is reduced	Reducing food losses will not change the fundamental problems in the global food system
Climate change is going to negatively affect food production and poverty – adaptation to climate change urgently needed	Climate change is going to negatively affect food production and poverty – a radical and real green shift in consumption patterns are needed
Investment in social protection will help the poor in achieving food security	Social inequalities and power relations need to be addressed in the global food system to improve the situation for poor and vulnerable people
New technological innovations will keep food scarcity away	The industrial food regime is not sustainable, agro-ecological approaches should be promoted and uneven power relation changed
Private sector will take on more corporative social responsibility and contribute towards improving the food security situation	The current food regime based on market liberalism will have to change
The global food system will be able to feed more people in 2050 and beyond (with some minor reforms)	The global food system will have to be fundamentally transformed to ensure sustainability and long-term ability to feed the world.

The *good news* and the *bad news narrative* shape the way we understand global food security as well as the way we communicate food security results. The good news narrative calls for more of the same policies and actions, while the bad news narrative calls for radical changes in the way the current global food system works. Another element of *the good news* and *the bad news narrative* is that when communicating food security

results, we might want to show the success of current policies and interventions, while at the same time communicate that food security is still in “crisis”, in order to attract funding. In that regard, having two opposite narratives to choose among might work well; stating that things are going in the right direction, but that there is an urgent need for more support and funding to keep it that way.

1. INTRODUCTION

The purpose of this paper is to provide an updated review of how to measure food security and how to communicate results of activities that have improved food security as a goal. Food security is a difficult concept to measure and it is accordingly difficult to communicate food security results. This paper includes assessment of the different approaches to measure food security by international organizations such as UN (SDGs), FAO (State of Food Security and Nutrition in the World) and CGIAR (Strategy and Result Framework, Global Hunger Index, Global Nutrition Report). FAO operationalizes food security into *food availability, physical and economic access, utilization and stability*. Historically, FAO has measured food security as availability of calories at the national level in relation to the population in the country. The SDGs demand new sets of food security indicators to measure results according to the targets defined under SDG2 (no hunger). Another frequently used food security measure is the *Global Hunger Index (GHI)*, where IFPRI *et al.* combine the four indicators: *undernourished people, child wasting, child stunting and child mortality*. In addition to the general review described above, this paper includes two specific cases. One case is the international agricultural research for development organization CGIAR, taking CGIAR’s Strategy and Result Framework (SRF) as a point of departure. The other case is Malawi, where the government and various international organizations are supporting activities aimed at improved food security at national and local levels. CGIAR is selected because it states improved food security as one of its main goals. Malawi is selected because of recurrent hunger and famine in the country, and the various efforts towards improving its food security. The paper aims to be useful for organizations that support activities with improved food security as a clearly defined goal, and organizations that would like to assess how to communicate results in the field of food security.

More specifically, this paper reviews scientific and grey literature on the different approaches and lessons learned regarding how to measure food security and how to communicate results of activities for which improved food security is a goal. In addition, key informants have been interviewed about their perceptions of how to communicate food security-related results.

The following study questions are being addressed:

- How do different international and national organizations measure food security?
- How do different international and national organizations report results from activities for which improved food security is a goal?
- How do CGIAR measure and communicate food security results (re: CGIAR's Strategy and Results Framework)
- How is food security measured in Malawi by the Malawian government, and by different organizations with projects aimed at improving food security?
- What are the lessons learned from different ways of measuring food security and of communicating results of activities that have improved food security as a goal?

2. FOOD SECURITY

There are many definitions of food security. The most internationally used definition is that *food security exists when all people at all times have both physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life* (WB, 1986; FAO, 1996). FAO explains that food security consists of the following four pillars: *food availability, physical and economic access, stability and utilization*. FAO is responsible for assessing the food security situation in the world. In 2017, FAO have included not only IFAD and WFP in the report *State of Food Security in the World*, but also the sister UN organizations WHO and UNICEF, realizing the important link between food and agriculture with nutrition and health. In the world today, FAO *et al.* (2017) report that the number of undernourished people increased from 777 million people in 2015 to 815 million people in 2016. This means that world hunger is increasing after several years of decline. In addition, there are around two billion malnourished people in the world and two billion people categorized as overweight or obese (WHO 2017). FAO *et al.* (2017) explain the recent increase in the number of food insecure people is associated with violent conflicts, climate-related shocks and economic slowdown. It is interesting to note that 60% of the food insecure people live in countries with conflicts (FAO *et al.* 2017). Figure 1 illustrates that global food production is keeping up with population increase and food utilization (FAOSTAT 2017). In other words, scarcity of food at the global level is not the reason why 815 million people are going hungry in 2016; there is enough food in the world for everybody to live a healthy life, but still 815 million people are going hungry.

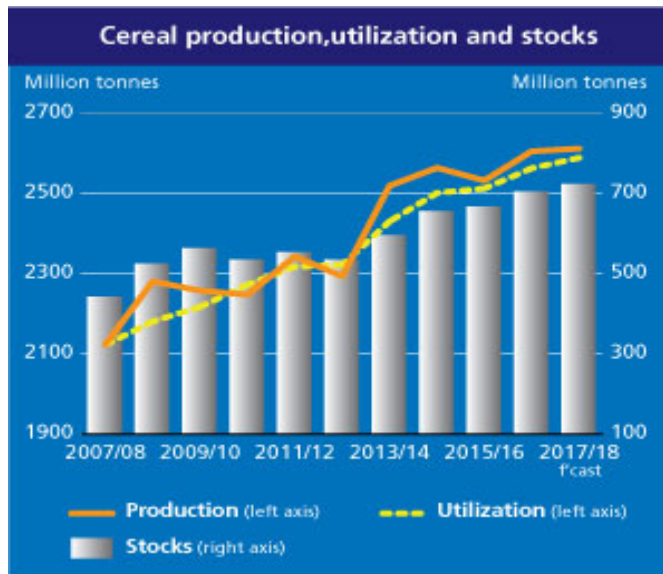


Figure 1. Cereal production, utilization and stocks (Source: FAOSTAT 2017. Cereal Supply¹, accessed 05.10.2017)

In 2015, when the UN assessed the hunger situation in relation to MDG1, cutting the proportion of poverty and hunger by half, the result appeared promising. The proportion of hungry people was down to about one out of every nine persons in the world (FAO *et al.* 2015). In 2015, when the world's leaders committed themselves to the SDGs, there was optimism about the possibility of reaching zero hunger in 2030 (UN 2015). There is still optimism, in spite of the recent food insecurity numbers indicating that hunger is on the rise again, although the sustainability of the global food system is questioned by many voices in areas such as climate change and other planetary boundaries, inequality, power relations, economic growth and political stability (McMichael 2009; Clapp 2014; iPES-Food 2016; Steffen *et al.* 2015; Hickel 2016; HLPE 2017).

Understanding global food security also needs to be contextualized in a world of changing drivers and new trends. Some new trends that influence global food security are:

- 60% of the food insecure people in the world live in countries with protracted conflicts
- Increase in urbanization and a rising middle class
- Increasing occurrence of overweight and obese individuals in populations
- Climate change - expected to have a significant negative affect on food security
- De-globalization tendencies, e.g. USA and UK's Brexit
- New technologies such as digitalization, robots in agriculture, vertical indoor farming, gene editing with CRISPR, meat produced in laboratories
- Value chain changes, e.g. power relations and the role of supermarkets

¹ <http://www.fao.org/worldfoodsituation/csdb/en/>

3. GLOBAL FOOD SYSTEM(S)

The global food system(s) is defined as *system(s) that encompass the entire range of activities involved in the production, processing, marketing, retail, consumption and disposal of goods that originate from agriculture, including food and non-food products, livestock, pastoralism, fisheries and forestry* (CFS 2014). The outcome of the global food system(s) is supposed to ensure food security for all, and include both social and environmental welfare (Ingram 2011). iPES-Food (2016) describe a *sustainable food system* in relation to *social equity, environmental sustainability, vibrant local economy and good health*. Figure 2 (Ingram 2011) illustrates how different activities such as production, processing, distribution and consumption, contribute towards the four food security pillars (*food availability, food access, utilization and stability*).

Another way of illustrating the relationship between the global food system(s) and food security is presented in the framework suggested by CFS's *High Level Panel of Experts* (2017) (Figure 3). HLPE (2017) show how the five drivers (biophysical/environmental, technology/innovation/infrastructure, political economy, socio-cultural and demographic) influence the food supply chain, the food environment, consumer behaviour, diets and nutrition/health outcomes (conceptual framework of food systems for diets and nutrition). These examples of frameworks for understanding the global food system and its relation to food security indicate the complexity in drivers, policies, actions and outcomes to achieve food security.

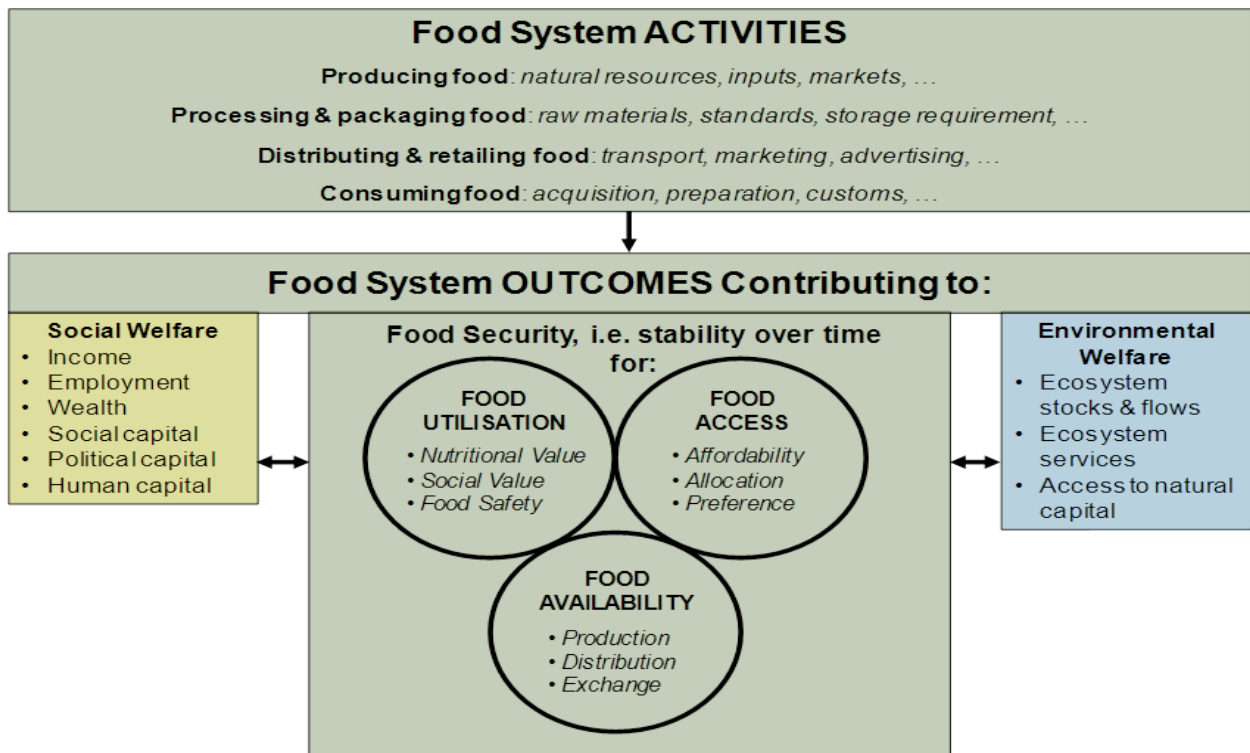


Figure 2. Food System Activities (Source: Ingram 2011).

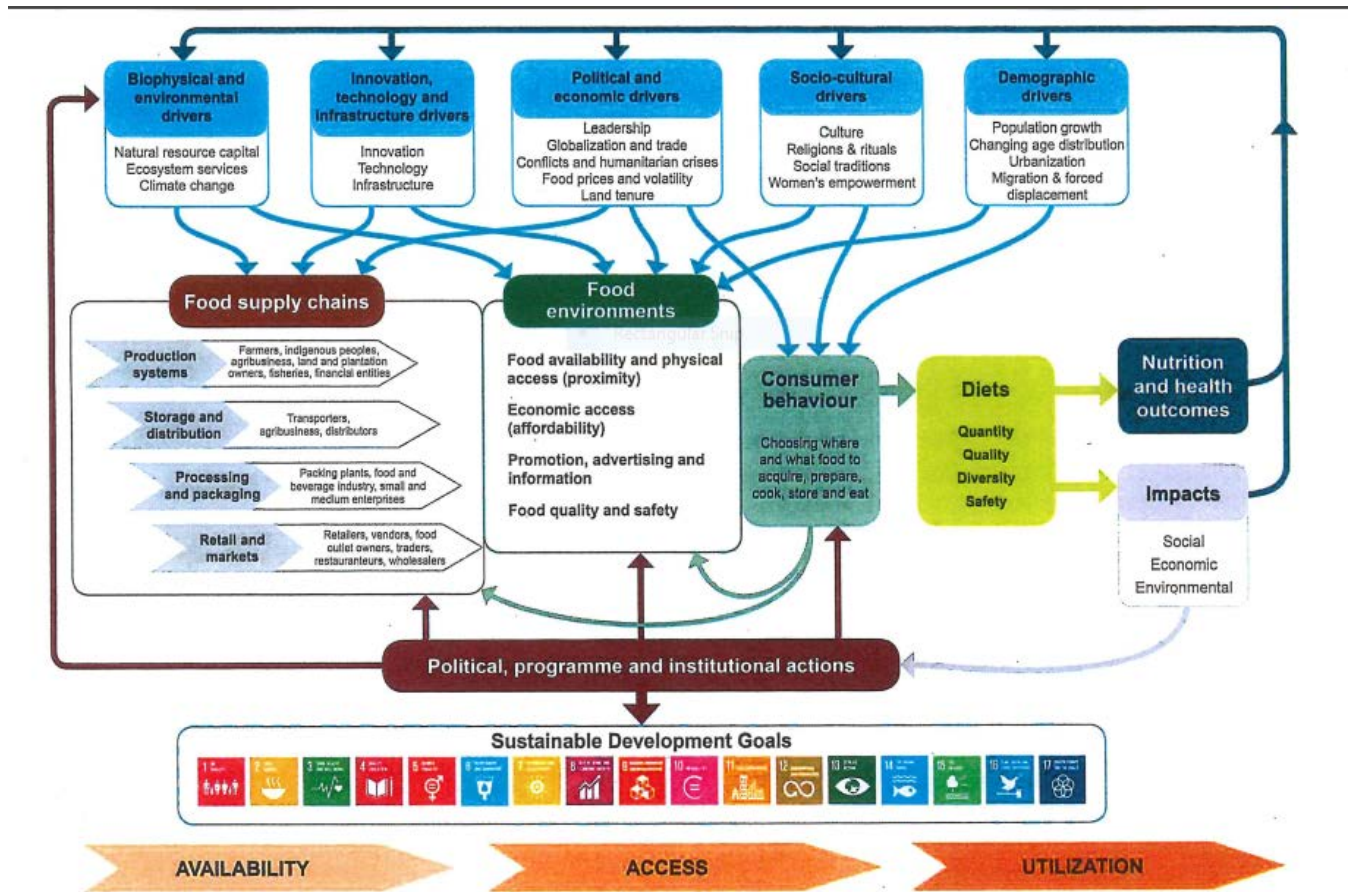


Figure 3. Suggested framework by CFS's High Level Panel of Experts (Source: HLPE 2017).

According to HLPE (2017), one person in three is malnourished and the trends indicate that one person in two could be malnourished in 2030. HLPE (2017) analyse how food systems influence diets and nutrition and recommend efforts towards more sustainable food systems.

4. MEASUREMENTS AND INDICATORS

Food security can be measured in different ways. The most frequently used source for assessing the number of food insecure people in the world is probably the report [The State of Food Security and Nutrition in the World](#) (FAO, IFAD, WFP, UNICEF & WHO 2017). The approach and indicators in this report have been partly changed from MDG1 to accommodate SDG2 (regarding nutrition). In 2015, the report focused on communicating the results according to MDG1, cutting hunger in half, and WHO and UNICEF were not included as authors. Since the importance of nutrition and health have become more relevant in recent years in connection with food and agriculture, WHO and UNICEF have been included and nutrition has been added in the title of the report. Another source that is used frequently to understand food insecurity is the International Food Policy Institute (IFPRI)'s [Global Hunger Index](#), published annually in collaboration with *WeltHungerHilfe*

and *Concern Worldwide*. In addition, IFPRI's [Global Nutrition Report](#) (in collaboration with partners) provides country-level indicators that are useful for understanding food security.

5. DEFINITION OF CONCEPTS

In order to be able to understand what the indicators mean, we define the different concepts that the indicators should measure:

<i>Definition of food security concepts</i> (UN 2015, 2017; FAO et al. 2017; IFPRI 2017; WHO 2017; IPC 2017)
Food security: <i>A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.</i>
Food insecurity: <i>A situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life.</i>
Severe food insecurity: <i>Indicator 2.1.2 in SDG2 assesses the prevalence of moderate or severe food insecurity in the population based on the Food Insecurity Experience Scale (FIES), which is a qualitative measure of how people perceive their food security situation.</i>
Malnutrition. <i>An abnormal physiological condition caused by inadequate, unbalanced or excessive consumption of macronutrients and/or micronutrients. Malnutrition includes undernutrition and over-nutrition as well as micronutrient deficiencies.</i>
Dietary energy supply (DES). <i>Food available for human consumption, expressed in kilocalories per person, per day (kcal/person/day). At the country level, this is calculated as the food remaining for human use after deduction of all non-food utilizations (i.e. food = production + imports + stock withdrawals – exports – industrial use – animal feed – seed – wastage – additions to stock). Wastage includes loss of usable products occurring along distribution chains from the farm gate (or port of import) up to retail level.</i>
Undernourishment: <i>A state, lasting for at least one year, of the inability to acquire enough food, defined as a level of food intake insufficient to meet dietary energy requirements (depending upon age and sex, e.g. less than around 1800 kcal/person/day).</i>
Hunger: <i>Hunger is synonymous with chronic undernourishment.</i>

Famine: Famine is regarded as the extreme form of food insecurity and can be illustrated as hunger that kills (Waal, de 1997). According to UN's *Integrated Food Security Phase Classification (IPC)*, a famine can be declared only when certain measures of mortality, malnutrition and hunger are met: at least 20 % of households in an area face extreme food shortages with a limited ability to cope; acute malnutrition rates exceed 30 %; and the death rate exceeds two persons per day per 10,000 persons².

Stunting (as reported in FAO et al. 2017): *Height for age: The national prevalence of stunting is the percentage of children aged 0-59 months who are below -2 standard deviations from the median height for age of the WHO Child Growth Standards.*

Wasting (as reported in FAO et al. 2017): *Weight for height: Wasting is the percentage of children aged 0-59 months who are below -2 standard deviation from the median weight-for-height of the WHO Child Growth Standards.*

Underweight: *In adults, underweight is defined as a BMI of less than 18.5, a current condition resulting from inadequate food intake, past episodes of undernutrition or poor health conditions. In children under five years of age, underweight is defined as weight-for-age less than -2 standard deviations below the WHO Child Growth Standards median, and is thus a manifestation of low height for age and/or low weight for height.*

Overweight and obesity: *Body weight that is above normal for height because of an excessive accumulation of fat. In adults, overweight is defined as a BMI of more than 25 but less than 30, and obesity as a BMI of 30 or more. In children under five years of age, overweight is defined weight-for-height greater than 2 standard deviations above the WHO Child Growth Standards median, and obesity as weight-for-height greater than 3 standard deviations above the WHO Child Growth standards median.*

6. SDG 2- ZERO HUNGER

Goal 2 of the Sustainable Development Goals addresses food security or, more precisely, sets out *to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture* (UN 2015). The zero hunger goal consists of eight targets with several indicators, some of which are not yet decided (negotiation is still ongoing). Whilst there is a consensus behind the first five targets and accompanying indicators, some targets still miss a complete set of indicators e.g. *sustainable agriculture*. How to find appropriate indicators to measure sustainable agriculture is a challenge. Targets 2 A, B and C are non-committed targets and indicators. *Non-committed* means that countries have reserved their right not to follow up on these targets/indicators or referring to other

² <http://www.un.org/apps/news/story.asp?NewsID=39113#.WdpNn00Uncs>

processes such as trade negotiations (e.g. WTO, regional and bilateral trade agreements). The targets and indicators defined under SDG2 are presented as follows (UN 2017):

2.1 By 2030, end hunger and ensure access to safe, nutritious and sufficient food all year round, by all people, in particular the poor and people in vulnerable situations, including infants.

2.1.1 Prevalence of undernourishment.

2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES).

2.2 By 2030, end all forms of malnutrition, including, by 2025, achieving the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.

2.2.1 Prevalence of stunting (height for age <-2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age.

2.2.2 Prevalence of malnutrition (weight for height $>+2$ or <-2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type [wasting and overweight]).

2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including (through secure and equal access to land) other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.

2.3.1 Volume of production per labour unit, by class of farming/pastoral/forestry enterprise size.

2.3.2 Average income of small-scale food producers, by sex and indigenous status.

2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

2.4.1 Proportion of agricultural area under productive and sustainable agriculture.

2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including soundly managed and diversified seed and plant banks at the national, regional and international levels; promote access to- and fair and equitable sharing of, benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed.

2.5.1 Number of plant and animal genetic resources for food and agriculture secured in either medium or long-term conservation facilities.

2.5.2 Proportion of local breeds classified as being at risk, not-at-risk or at unknown level of risk of extinction.

2.A Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular the least developed countries.

2.A.1 The agriculture orientation index for government expenditures.

2.A.2 Total official flows (official development assistance plus other official flows) to the agriculture sector.

2.B Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round.

2.B.1 Producer Support Estimate.

2.B.2 Agricultural export subsidies.

2.C Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility.

2.C.1 Indicator of food price anomalies.

A new indicator that is included in the SDG2 is the qualitative assessment of how people themselves perceive their food security situation. This indicator is explained in Box 1, below.

Indicator 2.1.2 assesses the prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES), which is a qualitative measure of how people perceive their food security situation. The following questions are posed³:

During the last 12 MONTHS, was there a time when:

- *You were worried you would run out of food because of a lack of money or other resources*
- *You were unable to eat healthy and nutritious food because of a lack of money or other resources*
- *You ate only a few kinds of foods because of a lack of money or other resources*
- *You had to skip a meal because there was not enough money or other resources to get food*
- *You ate less than you thought you should because of a lack of money or other resources*
- *Your household ran out of food because of a lack of money or other resources*
- *You were hungry but did not eat because there was not enough money or other resources for food*
- *You went without eating for a whole day because of a lack of money or other resources*

Box 1. Source: FAO-FIES

The expectation is that most countries and international organizations will align their use of measurements and indicators with the SDG indicators. Already, we see that FAO has aligned some of their indicators with SDG2 in their report *State of Food Security and Nutrition in the World* (FAO et al. 2017). SDG2 on zero hunger does not draw attention to the ways in which different groups are affected by malnutrition, although SDG10 does target inequalities, but without mentioning hunger and nutrition. According to Hussain (2017), inequalities in the food system needs to be addressed to better understand food insecurity and ways to eliminate hunger, malnutrition and over-nutrition.

7. FAO: STATE OF FOOD SECURITY AND NUTRITION IN THE WORLD

In the *State of Food Security and Nutrition in the World*, the following eight indicators are used (FAO et al. 2017):

- a) *Number of undernourished people in regions and at country level*
- b) *Number of severely undernourished people*

³ http://icirah.ac.uk/sites/default/files/D1-S3-3_Ballard.pdf

- c) *Number of children affected by wasting*
- d) *Number of children who are stunted*
- e) *Number of children who are overweight*
- f) *Number of adults who are obese*
- g) *Number of women affected by anaemia*
- h) *Number of children age 0-5 months exclusively breastfed.*

By applying the indicator *number of undernourished people in regions and at country level*, FAO *et al.* (2017) estimate that global food insecurity has increased from 777 million people in 2015 to 815 million people in 2016. This is an increase of 38 mill (11%) since 2015. The increase in food insecurity is explained by violent conflicts, climate-related shocks and a general economic slowdown in the world (FAO *et al.* 2017). About 60% (or 489 million people) of the 815 million food insecure people live in countries with conflicts and the number of food insecure people are distributed in the following regions (FAO *et al.* 2017):

- Asia: 520 mill (11.7%)
- Africa: 243 mill (20%) Eastern Africa 34%
- Latin America: 42 mill (6.6%)

FAO *et al.* (2017) also include FIES (re: SDG2, indicator 2.1.2), comparing the result of the qualitative FIES indicator with the calculated number of undernourished people in regions and countries, and find that these two indicators correspond well with each other.

The main food insecurity or hunger indicator used by FAO (chronic undernourishment calculated as kilocalories per person per day according to food availability at national level) does not include different socio-economic groups (only gender and age). Hence, we do not know how the available food is distributed within the country since the indicator is based on average food availability per person calculated at the national level, and does not tell us anything about social inequality. At the country level, consumption and expenditure surveys are regularly carried out and include socio-economic data, but FAO does not use these data. Since the FAO data do not include socio-economic groups, the *access* part of the food security definition is not sufficiently followed up on in the main food security (hunger) indicator.

The SDG2 on zero hunger sets out to measure agricultural areas under sustainable production. It is not yet decided what kind of indicators to use to assess to what degree the production is sustainable. Regarding sustainability, it is decided that sustainability should include not only environmental factors, but also economic and social dimensions in accordance with the definition of sustainability. This means that both the *access* and *stability* pillars of the food security definition could be covered, if appropriate indicators are developed through the SDG process. FAO could benefit from using the SDG indicators to better assess the global food security in the world, not only by quantifying calories and

presenting other nutrition indicators, but also by assessing access by different socio-economic groups and the environmental sustainability of the global food system.

8. THE GLOBAL HUNGER INDEX AND GLOBAL NUTRITION REPORT

There exists more than one food security index, but the *Global Hunger Index* (GHI) by IFPRI, WeltHungerHilfe and Concern Worldwide, is probably the most known. The GHI index score is based on the four indicators *undernourishment, child wasting, child stunting and child mortality* (IFPRI et al. 2016). The GHI index provides an opportunity to monitor progress and to compare how countries fare in relation to other countries. In addition, the GHI index indicates which countries are facing serious hunger. In 2016, 52 out of 119 countries included in the index fell into the serious or alarming food security category. It is interesting to note that the relative rank of a country such as India (31.4) is poorer than the rank of, for example, North Korea (28.2) or Nepal (22.0) (IFPRI et al. 2017). India's relative rank and score improved between 2011 and 2014, but declined the years after. Malawi, with a score of 27.2, also ranked better than India and neighbouring countries such as Tanzania, Mozambique and Zambia (IFPRI et al. 2017). The *Global Hunger Index* is a useful tool for assessing food security at the country level over time, and for comparing progress among countries.

The Global Nutrition Report was first published in 2014 by an independent expert group and provides a comprehensive annual review of the state of the world's nutrition (IFPRI 2016). IFPRI oversees the development and dissemination of the report and runs a virtual GNR secretariat. The Global Nutrition Reports include tables on country level nutrition status and progress. Countries are being ranked from highest to lowest in different areas such as stunting, wasting, overweight, obesity, anemia in women, breastfeeding, and adult diabetes. In 2016, the Global Nutrition Report was launched in Oslo by co-chair Lawrence Haddad. The main theme of the report varies from year to year. The theme of the 2017 Global Nutrition Report is *nourishing the SDGs*. The 2017 GNR report highlights five core areas where nutrition can contribute and have a multiplier effect across the SDGs (IFPRI 2017):

- *sustainable food production*
- *infrastructure*
- *health systems*
- *equity and inclusion*
- *peace and stability.*

9. FAMINE: INTEGRATED FOOD SECURITY PHASE CLASSIFICATION

Famine is the extreme form of food insecurity and is defined according to mortality, malnutrition and hunger. According to UN, *A famine can be declared only when certain measures of mortality, malnutrition and hunger are met. They are: at least 20 per cent of households in an area face extreme food shortages with a limited ability to cope; acute malnutrition rates exceed 30 per cent; and the death rate exceeds two persons per day per 10,000 persons*⁴. The Integrated Food Security Phase Classification (IPC), which includes specialists from humanitarian agencies, including FAO and WFP, as well as leading non-governmental organizations (NGOs) and government aid agencies, have developed the scale below (IPC 2017):

Phase Number	Phase	Description
1	Generally Food Secure	More than 80% of households can meet basic food needs without atypical coping strategies
2	Borderline Food Insecure	For at least 20 percent of households, food consumption is reduced but minimally adequate without having to engage in irreversible coping strategies. These households cannot fully meet livelihoods protection needs.
3	Acute Food and Livelihood Crisis	At least 20 percent of households have significant food consumption gaps OR are marginally able to meet minimum food needs only with irreversible coping strategies such as liquidating livelihood assets. Levels of acute malnutrition are high and above normal.
4	Humanitarian Emergency	At least 20 percent of households face extreme food consumption gaps, resulting in very high levels of acute malnutrition and excess mortality; OR HH households face an extreme loss of livelihood assets that will likely lead to food consumption gaps. Extreme loss of livelihood assets that will likely lead to food consumption gaps.
5	Famine/Humanitarian Catastrophe	At least 20 percent of households face a complete lack of food and/or other basic needs and starvation, death, and destitution are evident; and acute malnutrition prevalence exceeds 30% ; and mortality rates exceed 2/10000/day

Source: IPC 2017.

⁴ <http://www.un.org/apps/news/story.asp?NewsID=39113#.WdpNn00Uncs>

10. TOP-DOWN, BOTTOM-UP OR BOTH

In the above, general macro level food security indicators have been reviewed and assessed. However, it is questionable to what degree these indicators sufficiently capture realities at the local level, in particular, FAO's measure of availability of calories at the national level in relation to population size. The SDG indicators that assess progress towards zero hunger are more diverse, but the universality that the SDGs are based on is being questioned regarding country specificity and local conditions. Food security at the household and individual level are more challenging to assess, and the general indicators used do not necessarily reflect the local situation. Sometimes food production and food availability might be directly correlated to food security, other times not. Income from increased food production by small-scale farmers can be used in so many different ways, such as sold to repay debt or used by the household head for acquiring commodities that do not contribute towards improved food security. Anthropometric measures (nutrition indicators such as stunting and wasting) are regarded as a way to provide a better understanding of the food security situation by going beyond calories. However, malnutrition can have other causes than food insecurity, e.g. poor health or poor childcare (Nyborg & Haug 1995). Parents, usually mothers, or other female members of the household might, for different reasons, not be able to cook for, feed or sufficiently take care of children. Time constraints are often given as a reason for poor childcare, as well as lack of day care opportunities for working mothers (and fathers). In addition, the low status of women/girls in some societies, social inequalities such as cast systems, food norms and taboos might also be considerations in the contextual understanding of household food insecurity.

Local perceptions of food security can be an important supplement to the more general indicators used at the national level and provided by national and international institutions. Based on vulnerability analysis, Dfid's livelihood framework can be used to assess inequalities in access to resources as possible reason for food insecurity e.g. with regard to wealth and gender. Women empowerment in agriculture index (WEAI (developed by IFPRI)) can be used to analyze gender differences. To capture the complexity of food insecurity, SDG2 indicators need to be combined with other SDG indicators e.g. when it comes to gender and inequality. Different kinds of participatory approaches can be used to improve our understanding of food security perceptions at household and individual levels, including people's own definitions of appropriate indicators. Such indicators can also be used to understand the causes of improvements or deterioration of the food security situation. For specific projects or programs, such participatory approaches might be used to isolate effects of project activities from other factors. In relation to the Norwegian funded SSE program that was established after the Sahel famine in the mid-eighties, Noragric provided backstopping support to several NGOs in Mali, Sudan, Ethiopia and Eritrea. Through participatory approaches in the drylands of these four countries, the following food security indicators were identified to capture the local understanding of food security improvements (Nyborg & Haug 1994; Nyborg & Haug 1995:48):

- Increase in the number of weeks/months that food stores last (households dependent upon own production)
- Decrease in the number of weeks/months that the hunger period lasts
- Increase in yield per person in households
- Increase in women's income and savings after harvest
- Increase in the number of meals per day
- Increase in herd numbers (buffers that could be sold in difficult times)
- Improvements in infant mortality
- Improvements in anthropometric indicators
- Improved availability of seed
- Reduced food prices during hunger periods
- Increased employment opportunities and wage rates
- Different kinds of diversification (crops, income, etc.)

Food security indicators at the local level should reflect local realities, measure relevant outcome objectives and be based on context analysis and needs for different socio economic groups. Seasonal hunger is a problem that might not be well reflected in general food security indicators at the national level. In Figure 4, Vaitla *et al.* (2009) suggest a framework for how to address seasonal hunger that combines agricultural livelihood development with social protection and emergency assistance. These kind of combinations of social protection with long term development activities require indicators that capture how such interventions might result in mutual reinforcement and better overall results on the food security situation.

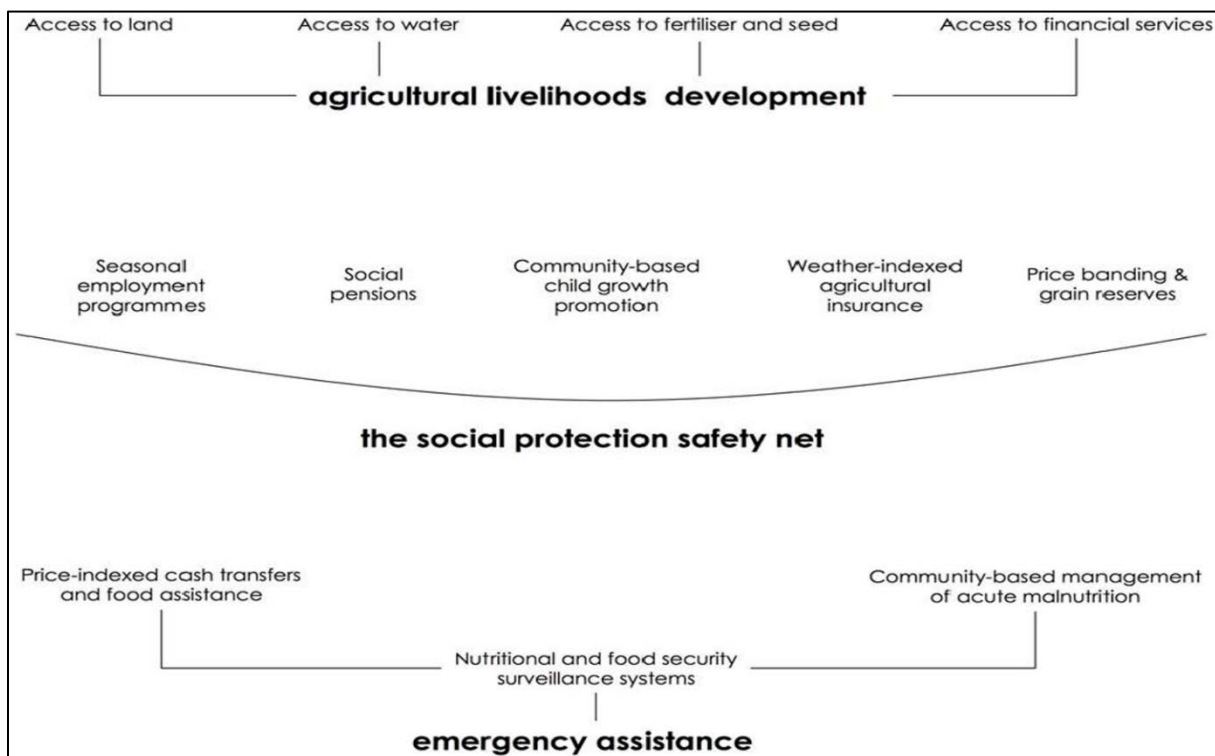


Figure 4. Framework for how to address seasonal hunger (Source: Vaitla, Devereux & Swan, 2009).

11. COMMUNICATING FOOD SECURITY RELATED RESULTS

Above, I have reviewed important indicators used to assess food security and different channels used for communication of the results on these assessments. However, I have not included the many international NGOs, which have used effort and time to develop food security indicators to measure change at impact and outcome level, e.g. organizations such as Oxfam and CARE. The SDGs and the reporting expecting to take place as a follow up to measure SDG results will probably be the most important source of food security information in the future. FAO and sister UN organizations will take the lead in the communication of results, according to the agreed targets and indicators in the SDGs. In addition, regional and country level initiatives will establish mechanisms to monitor changes and communicate SDG2 results.

There are many challenges in measuring and communicating food security results. Some of these are captured below:

- Food security is a multidimensional concept that involves a whole range of different drivers and variables (e.g. social inequalities, sustainable food systems, power relations).
- The degree to which the definition of food security is accurate for what we want to assess and communicate.
- Complexity in measurements: It may be difficult to understand how concepts are defined and how indicators are measured.
- The quality of the statistics and the whole issue of “*ruling the world by numbers*” (Jerven 2015).
- Causal relationship and attribution: The degree to which improvements in the food security situation can be attributed to particular policies, programs or actions.
- As 60% of the food insecure live in conflict affected area and fragile states, a particular focus has now been put on the link between food security and peacebuilding (re last CFS on food security in protracted crisis) or how food security interventions/strategies/policies might contribute to efforts towards peacebuilding. In this regards, measuring PROCESSES and not only RESULTS is a new challenge.

11.1 DFID: Communication of nutrition results

The last bullet above addresses the challenge of how to assess the impact of programs that have improved food security as a goal. Recognizing the four dimensions of food security as *food availability, physical and economic access, stability and utilization*, assessing impact can be quite a challenge, as discussed in the previous chapters. Compared to the health sector, where for example the GAVI initiative counts the number of children vaccinated as

a result of GAVI, food security faces difficulties in attributing and quantifying impact in the same way. DFID has moved in the direction of giving priority to one of the four dimensions of food security: *utilization* (nutrition), and is regarded as a donor champion when it comes to promoting nutrition in development. In 2015, the UK government made a commitment *to improve nutrition for 50 million people who would otherwise go hungry by 2020 and disbursed a record US\$ 1 billion of ODA to nutrition*⁵. DFID has supported nutrition initiatives and programs, such as SUN (see the box below), and also in the field of biofortification, such as the CGIAR program *HarvestPlus*. Biofortification is *the process of increasing the density of vitamins and minerals in a crop, through plant breeding or agronomic practices, so that when consumed regularly they will generate measurable improvement in vitamin and mineral nutritional status*⁶. Biofortified seed is distributed to different countries in the world with the aim of improving the nutritional status of people, in particular poor men, women and children. In 2016, DFID published a methodology to assess the impact of their nutrition programs, measuring it as high, medium, or low intensity. DFID has not yet reported on the impact using this methodology, but is expected to do so by 2018. From a ‘communication of results’ point of view, nutrition programs might be more ‘doable’ regarding quantifiable and attributable impact assessments than programs that have the more complex food security as a goal.

*Scaling Up Nutrition (SUN)*⁷. Since 2010, the SUN Movement has inspired a new way of working collaboratively to end malnutrition, in all its forms. With the governments of SUN Countries in the lead, it unites people—from civil society, the United Nations, donors, businesses and researchers—in a collective effort to improve nutrition. The SUN Movement Strategy and Roadmap (2016-2020) has helped illuminate the importance of nutrition as a universal agenda – and one which is integral to achieving the promise of the Sustainable Development Goals (SDGs). To realise the vision of a world without hunger and malnutrition, the SUN Movement Principles of Engagement guide actors as they work in a multi-sectoral and multi-stakeholder space to effectively working together to end malnutrition, in all its forms. These principles ensure that the Movement is flexible while maintaining a common purpose and mutual accountability

11.2 Noragric: Communicating food security related results

Five purposely-selected key informants at Noragric were asked about their views on how to communicate food security related results. The purpose of this question was to learn what would be the immediate reaction on such a rather wide question. The answers vary from the need to define the purpose of the communication to give more priority and resources to communication. Two informants advised that the message in the

⁵ www.bond.org.uk/news/2017/10/improving-dfids-nutrition-impact-for-50-million-people-by-2020

⁶ www.harvestplus.org/

⁷ www.scalingupnutrition.org/about-sun/the-vision-and-principles-of-sun

communication should change from the number of hungry people in the Global South and increases in agricultural production, to efforts towards promoting sustainable food system(s) both in the North as well as in the South. According to one informant, in a Norwegian development cooperation context, food security appears to be narrowly perceived as small-scale farmers in Africa increasing their production without considering to what degree production increases lead to higher income or better livelihoods. To make the communication more interesting, a suggestion was to challenge myths such as that food security is caused by food scarcity. Two of the key informants highlighted the importance of clarifying target groups and defining communication channels such as social media; who is communicating what and to whom? To attract attention, it is important to create news with a pitch that raises awareness and empathy, whilst considering the saturation of target groups in the West. A view was to avoid using '1984 like' hunger photos unless they can illustrate what might happen if we do not act. To sum up, the brief round of interviews at Noragric provided the following advice regarding communicating food security related results:

- Review current communication activities to learn a lesson
- Define any communication problems
- Define communication channels
- Define targets (policy makers, youth, etc.)
- Use recognized indicators, e.g., the SDGs
- Less on agricultural production and more on income, livelihoods, poverty, inequality, power relations and institutions
- More on the global food system and sustainable food systems both in North and South
- Challenge myths
- Less photos of starving children and less focus on famine (do not use famine as a selling point)
- Balance global and national food security indicators with success cases/pitch a story

From these responses, we can obviously not generalize anything, but it appears that some renewal in accordance with the above suggestions could be needed in the way food security is being communicated. On the other hand, the informants had not gotten the opportunity to update themselves on how food security related results are communicated today. Hence, they might not be aware of the latest communication efforts.

12. INTERNATIONAL AGRICULTURAL RESEARCH: CGIAR

CGIAR is an international organization consisting of 15 autonomous agricultural research centres around the world. The main reason for selecting CGIAR as a case in this paper is that one of the main goals of CGIAR is to contribute towards improved food security (re: system level outcome 2 – improved food and nutrition security for health). The CGIAR Strategy and Results Framework 2016-2030 (SRF) aims to reduce the number of hungry people by 150 million people by 2030 (CGIAR 2017). More specifically, CGIAR defines its food security outcome as follows:

CGIAR 2030 TARGETS – System level outcome 2

- *Improve the rate of yield increase for major food staples from current <2.0 to 2.5%/year*
- *150 million more people, of which 50% are women, meeting minimum dietary energy requirements*
- *500 million more people, of which 50% are women, without deficiencies of one or more of the following essential micronutrients: iron, zinc, iodine, vitamin A, folate, and vitamin B12*
- *33% reduction in women of reproductive age who are consuming less than the adequate number of food groups*

Source: CGIAR 2017

CGIAR has put considerable efforts into finding appropriate indicators to report on results of its research activities. Several indicators have been developed and many impact studies have been carried out over the years of CGIAR's existence since 1972, e.g., by SPIA (the Standing Panel on Impact Assessment). Results are assessed and reported both at the centre level and at the CGIAR system level. The defined system outcomes such as *system level outcome 2 – improved food and nutrition security for health*, demand the reporting of results of joint efforts by the 15 centres and partners. CGIAR runs into the same challenges as other organizations regarding finding quantifiable indicators that can measure results in accordance with the objectives, and that can attribute impact to CGIAR actions including science and technology as well as social science research in the field of policy, institutions and governance. As a research institution, CGIAR faces problems in attributing results to its own research, since putting the findings of their research into practice often depends on implementing actors others than CGIAR, as well as enabling environments and conducive policies that CGIAR does not control. Securing results (and funds) has driven CGIAR sometimes to become a development actor in addition to its core activity of research and capacity development. Success stories can often be attributed to a whole range of different actors and they are often based on more anecdotal evidence than large-scale statistical data. In general, scaling-up technology is a problem that is difficult to address by CGIAR alone, since adoption depends on so many other factors than promising technology. CGIAR is still capitalizing on the impact of the green revolution in its communication efforts, but also has numerous success stories to report.

SPIA⁸: *The Standing Panel on Impact Assessment is a sub-group of the [CGIAR Independent Science and Partnership Council \(ISPC\)](#), which has an advisory role, primarily to CGIAR members through the System Council, on issues relating to the quality, relevance and impact of CGIAR research activity. The Panel is supported by a Secretariat and each Centre/CRP has an impact assessment focal point (IAFP).*

Result-reporting was discussed at CGIAR's *System Council Meeting* in Cali, Colombia in November 2017. The purpose of the discussion was to assess a proposal for *common CGIAR progress reporting indicators* across all 15 centres and an *Annual Performance Report*. The selection of the common result indicators was based on the following seven principles⁹:

- a. *Aggregable indicators relevant to all parts of the CGIAR System that produces diverse outputs (for example, 'people benefiting' rather than 'varieties released')*
- b. *A representative range of indicators sufficient to demonstrate progress in the spheres of control, influence and interest of CGIAR*
- c. *Indicators which include current and projected results from the ongoing research program, to complement adoption and impact data collected on past research*
- d. *Demand from Funders for some specific indicators*
- e. *Finding an optimal balance between transparent reporting and maintaining a focus on cost-efficiency*
- f. *Availability of credible, robust data based on checkable evidence (note: a guidance manual will specify definitions, data sources, quality and responsibility for quality checks)*
- g. *Indicators can be reported on through (in future) automated Management Information Systems, not as a separate exercise (as well as reducing the work required, this will also allow dis/aggregation and reporting against areas of interest, such as sub-IDOs, Funders, or flagships)*

These principles appear to capture the interests of the CGIAR centres as well as the demand from donors regarding annual result reporting. Both centres and donors are struggling to find appropriate and cost-effective indicators that can communicate how and to what degree people are benefitting from CGIAR research. In the suggested indicators, CGIAR will align with the SDG indicators when appropriate. An *Annual Performance Report on CGIAR Research* is expected to be published for the first time in mid-2018, which will be made available annually in future. In the table below, proposed indicators for the Cali meeting in November are presented. It is important to note, however, that these indicators still need to be further refined:

⁸ ispc.cgiar.org/workstreams/impact-assessment/community

⁹ www.cgiar.org/wp-content/uploads/2017/10/SC5-05_ResultsReporting-1.pdf

SLO2: Improved food and nutrition security for health	Potential indicator to track international progress (examples – specific indicators still under discussion)
<i>2.1. Improve the rate of yield increase for major food staples from current <1% to 1.2-1.5% per year</i> Volume	<i>Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size (SDG indicator) Yield per hectare by country and commodity – FAOSTAT</i>
<i>2.2. 30 million more people, of which 50% are women, meeting minimum dietary energy requirements</i>	<i>Share of population / women whose caloric intake is sufficient. (SDG indicator – FIES)</i>
<i>2.3. 150 million more people, of which 50% are women, without deficiencies in one or more of the following essential micronutrients: iron, zinc, iodine, vitamin A, folate and vitamin B12</i>	<i>Percentage of women of reproductive age (15-49) with anaemia (DHS data)</i>

Source: CGIAR System-Level Results Reporting: Progress and Plans¹⁰

The CGIAR System Council Meeting in Cali in November 2017 supported the efforts towards developing CGIAR system level indicators that the fifteen centres should align with and report on. At centre level, boards are having the same discussions of appropriate indicators and how to communicate results in a better way. The same challenges that are facing FAO as regards how to measure food security, is also affecting CGIAR. Food security is, as we know by now about food availability, physical and economic access by all people, utilization and stability. In order for CGIAR to assess its contribution towards improved food security, all four of these dimensions should be addressed not only production and nutrition data as indicated in the above table. Rather than production and productivity, income should be emphasized in accordance with SDG target 2.3 (double the agricultural productivity and income of small-scale producers in particular women...etc.) and indicator 2.3.2: *Average income of small-scale food producers by sex and indigenous status*. It would be important for CGIAR to report on what socio-economic groups are benefitting from their science and technology to be able to better assess the *access* part of food security. When the SDG indicator(s) 2.3.2: *Proportion of agricultural area under productive and sustainable agriculture* are being decided upon, CGIAR could probably benefit from alignment with this/these indicator(s). In spite of CGIAR having had food security as a goal for decades, still, CGIAR has a way to go to agree on appropriate food security indicators at system level.

¹⁰ http://www.cgiar.org/wp-content/uploads/2017/10/SC5-05_ResultsReporting-1.pdf

13. COUNTRY INDICATORS AND COMMUNICATION OF RESULTS: MALAWI

In this chapter, I will assess how to measure and communicate food security at the country level in Malawi. The reason why Malawi is selected is that it has faced recurrent disastrous famine situations and is a country that Norway supports in the field of climate, food security and agricultural development.

Between 1967 and 2016, Malawi suffered eight serious droughts and 20 floods that adversely affected food security in the country (Government of Malawi 2015). The last two disasters were the 2015 flooding and the 2016 El Niño related drought. In April 2016, WFP declared that almost half of the Malawian population would be in need of food relief that year. Luckily, 2017 appears more promising than the previous two years when it comes to food availability and food security. According to IPC-Info (2017-July/August), *the overall food security situation for Malawi is generally positive, with most of the districts in the northern and central regions classified in IPC Phase 1 (none or minimal) and the remaining districts especially in the south in IPC Phase 2 (Stressed). These households in the northern and central districts saw a good production from 2016/2017 growing season. Nationally, staple maize production increased by 46% over the last year and by 6% over five-year average¹¹.*

In 2016, Norway contributed NOK 527 million to Malawi in financial support directed towards economic growth, education, health and good governance (Norad 2017). In addition, Norway supports climate, food security and agricultural development (see the box below).

Norwegian support to improved food security in Malawi (Norad 2017).

The Norwegian support to Malawi in 2016 amounted to NOK 527 million. Norway is the second largest donor to the agricultural sector program in Malawi and supports twelve other projects within the field of climate change, food security and agricultural development. All projects aim at 50 % women targeting. Norway also supports Norwegian NGOs in Malawi, such as the Development Fund and the Norwegian Church Aid, as well as Multilateral organizations with country presence in Malawi, e.g. WFP, which collaborated closely with the Government during the 2015 flooding and 2016 drought. Norway also co-funds UN projects that provide education, school feeding and support to local farmers in producing food for school meals.

Norway has provided long-term support to the National Statistical Office (NSO), amongst others to improve the statistics in the field of food and agriculture to get better data for formulating policy, monitoring results and facilitating planning. NSO provide statistics

¹¹ www.ipcinfo.org/ipcinfo-detail-forms/ipcinfo-map-detail/en/c/1045261/

that monitor the effect of the Fertilizer and Input Subsidy Program (FISP), amongst other things. Figures 5 and 6 show surplus maize production in relation to national requirement after FISP was introduced in the period 2005-2015, and the decline in the number of people in need of food relief in the same period, which then sharply increased after the 2015 flooding and 2016 drought (Haug & Wold 2017).

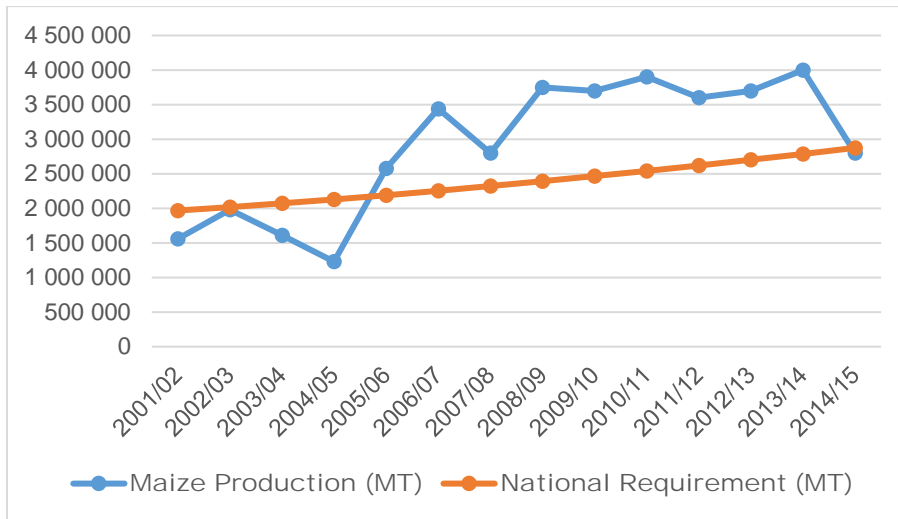


Figure 5. Total maize production against national requirement (Government of Malawi 2016 in Haug & Wold 2017)

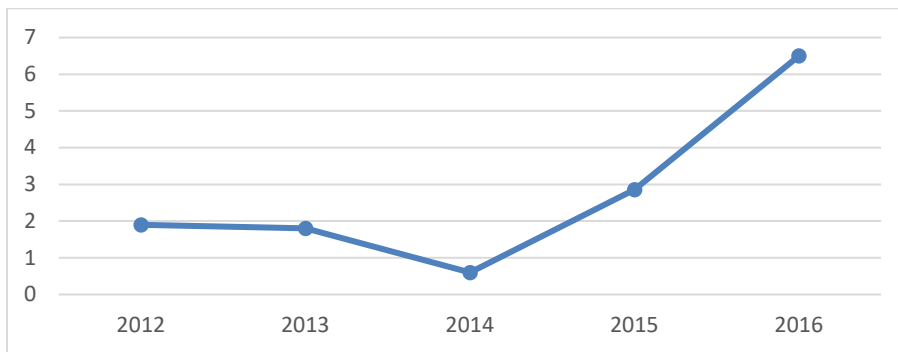


Figure 6. Trends in people in need of food assistance (Government of Malawi 2016 in Haug & Wold 2017)

Agricultural production is of huge importance for food security in Malawi where around 85 % of the population live in rural areas and are heavily dependent upon rain-fed agriculture for their livelihood (Haug & Wold 2017). The Government of Malawi has invested substantial resources and prestige in the Fertilizer and Input Subsidy Program as the main measure to improve the food security situation in the country. FISP has been a costly program for the Malawian government, in 2014, agriculture accounted for around 20 % of government spending and FISP received around 70 % of this amount (Government of Malawi 2016). FISP has been greatly contested for a whole range of

different reasons and both the government and the donors have been eager to measure the results of FISP (Haug & Wold 2017). Figure 5 illustrates that food availability was satisfactory in the decade from 2005 to 2015, indicating that FISP worked well. However, the flooding in 2015 and the drought in 2016 revealed that Malawi is in dire need of more effective measures than FISP to achieve food security (Haug & Wold 2017). Figures 7 and 8 show how total maize production and maize productivity have change over time.

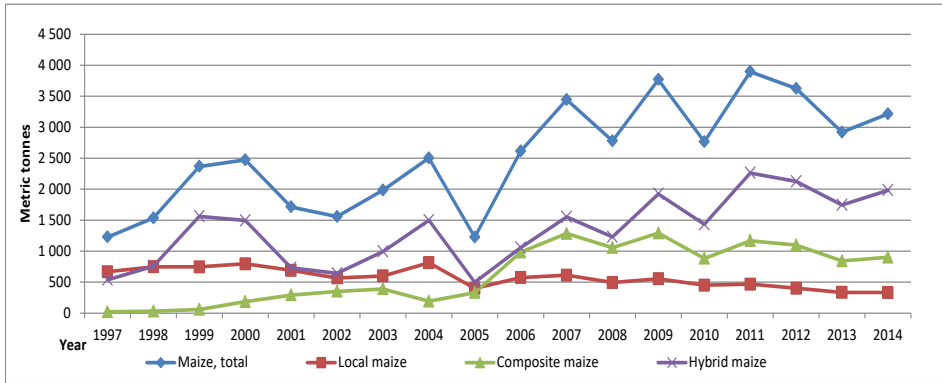


Figure 7: Total maize production of smallholders and estates (MOAIWD, 1997-2015 in Haug & Wold 2017).

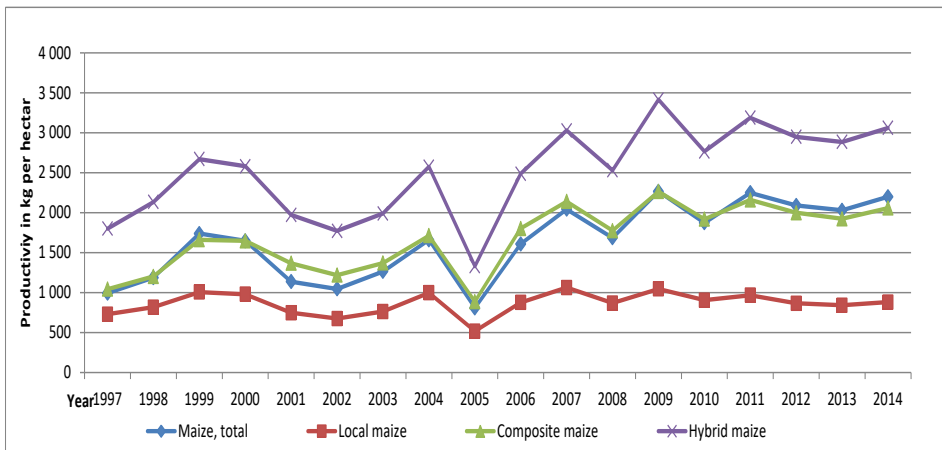


Figure 8: Maize productivity of smallholder and estates (MOAIWD, 1997-2015 in Haug & Wold 2017).

In addition to statistics on previous production and productivity, the Ministry of Agriculture is also providing food-forecasting data, predicting the future food availability situation. Malawi is also assessing the current/next six months food security situation by applying the *Integrated Food Security Phase Classification (IPC)*. The map in Figure 9 shows the expected phase classification in the period October 2017 to March 2018.

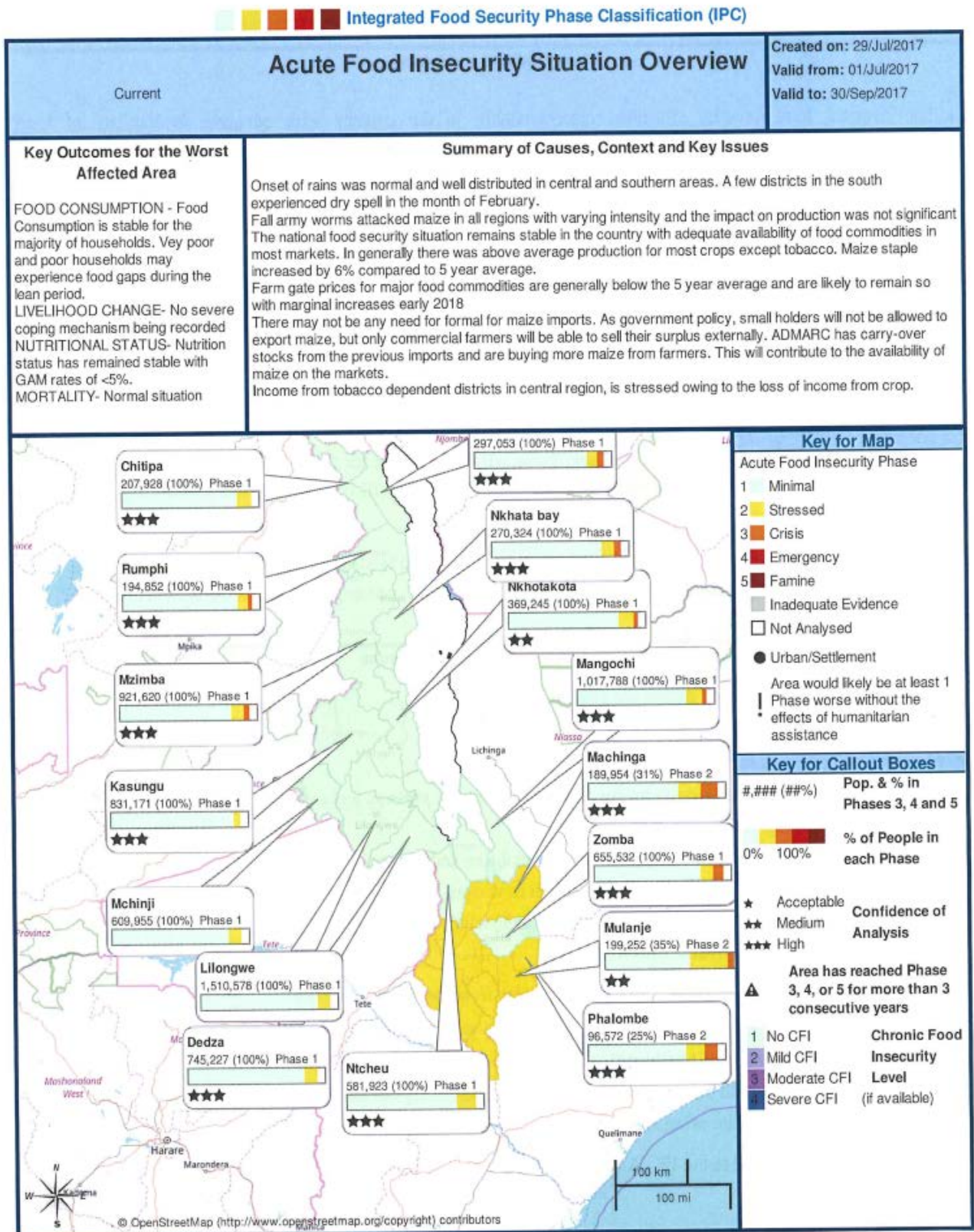


Figure 9: Acute Food Security Situation Overview. Source: Integrated Food Security Phase Classification (IPC)¹²

¹² http://www.ipcinfo.org/fileadmin/user_upload/ipcinfo/docs/IPC_Malawi_AcuteFI_Situation_2017JulySept.pdf

The *State of Food Security in the World* provides nutrition information about the food security situation in Malawi (FAO *et al.* 2017). The table below shows that during the last decade, the food security situation (measured in availability of calories) has improved in percentage, but not in actual numbers of people. Stunting has decreased, but is still at a very high level.

Malawi	2004-2006	2014-2016
<i>Prevalence/Number of undernourished in the total population</i>	26.2 per cent 3.3 million	25.9 per cent 4.5 million
<i>Prevalence/Number of severe food insecurity in the total population</i>	-	-
<i>Prevalence/Number of wasting in children under 5</i>		3.8 per cent (?)
<i>Prevalence/Number of stunting in children under 5</i>	52.5 per cent	42.4 per cent
<i>Prevalence/Number of overweight in children under 5</i>	10.2 per cent	5.1 per cent
<i>Prevalence/Number of adults who are obese</i>	2.4 per cent	4.0 per cent
<i>Prevalence/Number of women affected by anaemia</i>	35.2 per cent 1.0 million	34.4 per cent 1.4 million
<i>Prevalence/Number of children age 0-5 months exclusively breastfed</i>	52.8 per cent	61.2 per cent

Source: FAO *et al.* 2017.

In addition to the *State of Food and Nutrition Security in the World*, the *Global Hunger Index* shows how Malawi is faring regarding food security, and also how Malawi scores on the index in relation to other countries, based on the four indicators *undernourishment (insufficient calorie intake)*, *child wasting*, *child stunting* and *child mortality* (IFPRI *et al.* 2017). Malawi's global index score improved from 58.2 in 1992 to 27.2 in 2017 (or number 90 out of 119 countries). Malawi scores better than the neighbour countries Tanzania (no 97), Mozambique (no 98), Uganda (no 103), Ethiopia (no 104) and Zambia (no 115). Malawi also scores higher than India, which is no. 100. It is interesting to note that the under five-mortality rate in Malawi has declined from 22.7 % in 1992 to 6.4 % in 2015 (IFPRI *et al.* 2017). The *Global Hunger Index* provides helpful insights into Malawi's food security situation, but has the same shortcomings as the *State of Food and Nutrition Security in the World* regarding indicators such as social inequality and sustainable food production. The text in the *Global Hunger Index 2017* particularly addresses the inequalities of hunger and pinpoints the power dimensions as a cause of food insecurity

(Hussain in IFPRI *et al.* 2017). However, what Hussein states in the text is not yet reflected in the indicators used to calculate the Global Hunger Index.

It is expected that the SDG2 indicators will contribute towards a better understanding of all four pillars in the food security definitions, including a sustainable food system. Under target 2.3 there is agreement on the indicators, but not yet on how they are going to be measured (2.3.1. *Volume of production per labour unit by classes of farming/pastoral/forestry and enterprise size* and 2.3.2. *Average income of small-scale food producers by sex and indigenous status*). In the case of Malawi, it will probably be possible to use existing data to measure volume per labour unit, and to develop a proxy for the indicator on income. These two indicators will yield valuable information of importance to food security. If indicators(s) are being decided upon in relation to target 2.4 *Proportion of agricultural area under productive and sustainable agriculture*, it might be possible to assess environmental factors such as drought, flooding, climate change, soil degradation and agro-biodiversity as well as socio-economic factors. Then it would be possible to measure food insecurity in all its four pillars including social groups and sustainable food systems. FAO's main food insecurity indicator is calories at the national level, which does not include socio-economic groups (except for gender and age). The other anthropometric indicators used by FAO *et al.* (2017) do not include socio-economic groups, and neither does the Global Hunger Index. The SDGs have, as agreed, the aim of disaggregating data on *sex, age, urban, rural and vulnerable groups*. The UN Inter Agency Expert Group works on how to include social groups in a way that can be measured.

It is in the interest of both the Malawian government and donors to document that the country is able to achieve good results in relation to food security. In this context, statistics can be controversial if the results are not in accordance with expected success. Both the government and the donors would like to show that their policies and actions are making a difference and that the food security situation is improving. At the same time, both the government and donor representatives in the field of agro-food would like to get more ODA in support of food security. Thus, it might be necessary to highlight the importance of the food security problem to attract attention and funds. Communicating positive results will provide the success story that the government and the donors would like to receive, while at the same time, serious food insecurity will reveal the great need for continued and increased support. Finding the right balance between success and continued need for support might not necessarily be that difficult. However, it is important to underline that statistical offices and evaluation units need to be independent with sufficient freedom to communicate both positive and negative results based on high quality data and rigor in their methods and analysis.

14. LESSONS LEARNED

The following lessons emerge from what have been reviewed and assessed in the previous chapters of this paper:

Challenges in indicators and measurements

- The complexity of the food security concept makes it difficult to identify measurable and quantifiable indicators that capture the full meaning of food security. The currently used food security indicators do not fully measure what we want them to measure.
- The quality of the numbers and the analyses that the indicators are based on might be questionable or not up to standard. The Statistical Bureaus around the world might be constrained by lack of capacity and resources, and both the national and international organizations might use methods that have their weaknesses.
- The independence of national and international statistical agencies might be threatened as political actors prefer numbers that provide support of their policies and actions.
- Finding the “right” indicators that are universal for all situations is difficult, for example at the local level, there might be a need for a more contextual understanding of food insecurity than what general international or national indicators can offer. In order to understand seasonal hunger and seasonal variations, more appropriate indicators might be needed than the ones used today.
- Finding appropriate indicators that fully measure food security is costly and not always feasible. Hence, finding the right balance between practical implementation and cost efficiency in the selection of food security indicators is important.
- When measuring results or impact of a certain activity or program intervention on food security, attribution is usually a problem. It is often difficult to distinguish what leads to what. Many agencies want to take credit when activities go well. Regarding the result of research such as CGIAR’s, attribution is difficult to assess, as so many actors are involved in the process, from knowledge and technology to usage and food security improvements.
- Not everything that counts can be counted, hence, operating quantifiable food security indicators in combination with anecdotal evidence could be one way of providing a better understanding of food security results. Governing the world by numbers has its limitations, but governing the world without numbers would probably be even more problematic.

Food security versus food systems

There is a question of what to focus on: food security or a sustainable food system? The outcome of the global food system(s) is supposed to ensure food security for all including both social and environmental welfare (Ingram 2011). iPES-Food (2016) describe a

sustainable food system in relation to social equity, environmental sustainability, vibrant local economy, good health and cultural appropriateness. The food security definition includes the four pillars availability, access, utilization and stability, but the indicators used by FAO (FAO et al. 2017) have so far focused on nutrition indicators without including socio-economic groups or the environmental sustainability of the food system. By applying the concept of a sustainable food system, important dimensions such as social equality and environmental soundness will be added. However, the definition of indicators and to what degree the measurements are doable will be a challenge. As the conceptual framework of food systems for diets and nutrition in Figure 10 (HLPE 2017) illustrates, focusing on the food system, food security and nutritional outcomes cuts across all of the SDGs.

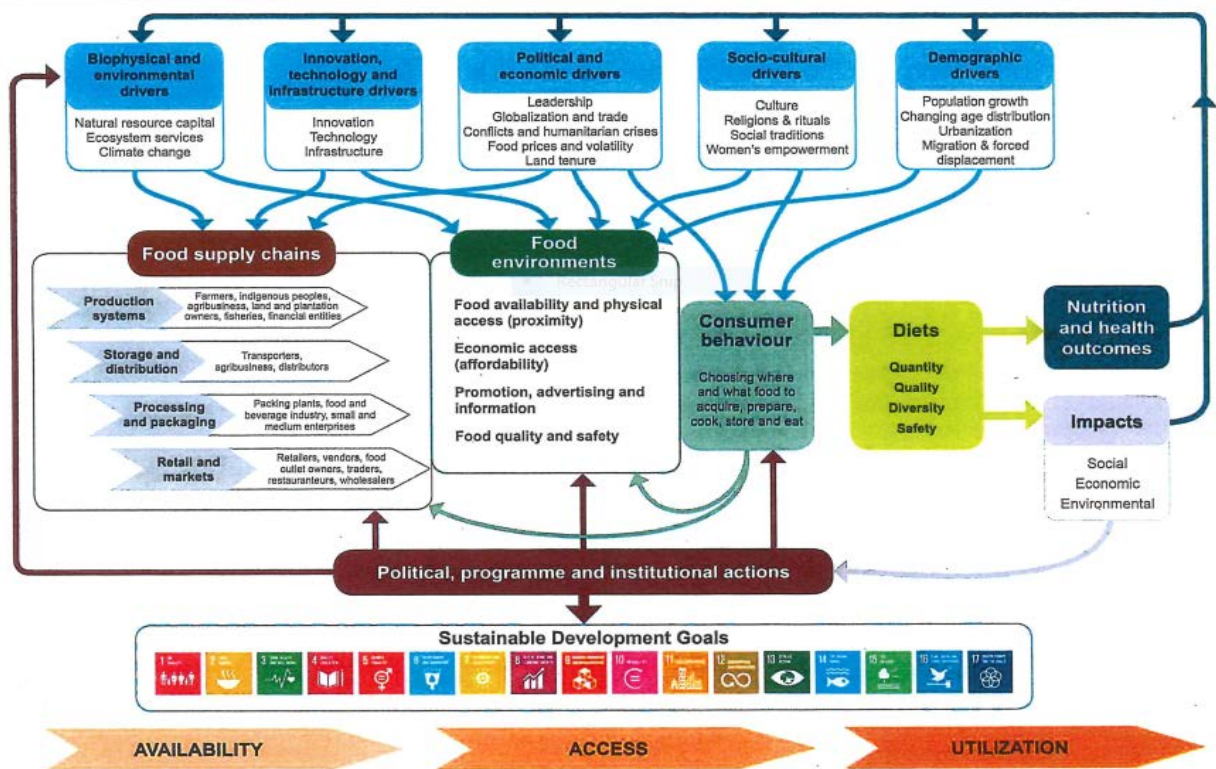


Figure 10. Conceptual framework of food systems for diets and nutrition (Source: HLPE 2017).

SDGs – indicators in progress

In spite of decades of efforts towards measuring food security, work remains to develop indicators that fully capture the complexity embedded in the food security definition. However, the SDGs provide an opportunity to improve current measurements by introducing new and better indicators. For example, a weakness with the indicators currently used in the *State of food security and nutrition in the world* relating to the non-

inclusion of socio-economic groups, will be addressed by the *UN Inter Agency Expert Group* as the SDGs will disaggregate data on sex, age, urban, rural and vulnerable groups. Although SDG2 gives no attention to the ways in which different groups are affected by malnutrition, SDG 10 targets inequalities, though without mentioning hunger and nutrition (Hussain 2017).

The SDG2 on zero hunger sets out to measure agricultural area under sustainable production. As there is no agreement on what can be defined as sustainable production, to define these indicators is a challenge. It is not yet decided what kind of indicators to use to assess to what degree the production is sustainable, but FAO is on the task. To complicate the matter, apparently the consensus is that sustainability should include not only environmental factors, but also economic and social dimensions in accordance with the definition of sustainability. This means that both the *access* by different socio-economic groups and the *stability* pillars of the food security definition could be covered, if appropriate indicators are developed through the SDG process.

In the years to come, there will probably be alignment around the SDG indicators. It is important that the SDG indicators are trusted, both from the understanding that they measure what they are supposed to measure and that the models and statistics can be trusted. To take the example of Hickel (2016), who claims that the real numbers of poverty and hunger are higher than what the MDG1 recorded, and that statistical manipulation has compromised the MDGs. Hickel asks for improvements to avoid the same situation being repeated, regarding the SDGs (Hickel 2016).

Communication of results: The good news and the bad news narratives

There are different views on how to understand the food security situation in the world. These views can be categorized in the *good news narrative* and the *bad news narrative*. The good news narrative highlights that the proportion of people going hungry has been dramatically reduced from the 1950-1960's to today (FAO *et al.* 2015). Fifty-sixty years ago, around one out of every third person was going hungry, while today only one out of every nine persons in the world is going hungry (Haug 2011). There has been an enormous increase in production and productivity; while fifty-sixty years ago, around two billion people were fed, today more than six billion people are being sufficiently fed (FAO *et al.* 2015, 2017). On the other hand, the bad news narrative challenges the definition of food insecurity and the way food insecurity is being measured; the quality of the food insecurity numbers; the importance of malnutrition, overweight and obesity being included in measuring and understanding food insecurity; the new famines; the possible unsustainable global food system regarding, for example, environmental factors, social inequalities and power relations (McMichael 2009; Gimenez & Shattuck 2011; Clapp 2014; Hickel 2016; Jerven 2015; iPES-Food 2016; HLPE 2017). The below table illustrates the main differences between the *good news* and the *bad news food narrative* and the different paths communication might take according to what narrative is being selected.

Good news food narrative	Bad news food narrative
World hunger is decreasing (except the increase in 2016) and MDG1 (cutting hunger in half) was achieved (almost)	The real number of hungry people is higher than what is recorded by FAO et al., and the way food security is measured needs to be improved (re indicators such as social equality, livelihood resilience, and sustainable food system).
There is no food scarcity at global level	Hunger is a serious problem in 52 countries and protracted conflict is contributing to the problem
Science and technology is keeping up with population increase as regards availability of food	The current global food system is not sustainable
More food will be available if food waste is reduced	Reducing food losses will not change the fundamental problems in the global food system
Climate change is going to negatively affect food production and poverty – adaptation to climate change urgently needed	Climate change is going to negatively affect food production and poverty – a radical green shift in consumption patterns are needed
Investment in social protection will help the poor in achieving food security	Social inequalities and power relations need to be addressed in the global food system to improve the situation for poor and vulnerable people
New technological innovations will keep food scarcity away	The industrial food regime is not sustainable, agro-ecological approaches should be promoted and uneven power relation changed
Private sector will take on more corporative social responsibility and contribute towards improving the food security situation	The current food regime based on the market liberalism will have to change
The global food system will be able to feed more people in 2050 and beyond (with some minor reforms)	The global food system will have to be fundamentally transformed to ensure sustainability and the long-term ability to feed the world.

The *good news* and the *bad news narrative* shape the way we understand global food security and food security communication. The good news narrative might call for more of the same policies and measures, while the bad news narrative might call for radical changes in the way the current global food system works.

Another element of the good news and the bad news narrative is that when communicating, we might want to show the success of current policies and interventions, while at the same time communicate that food security is still in “crisis”, in order to attract attention and more funding. In that regard, having two opposite narratives to choose among might work well; stating that things are going in the right direction, but that there is an urgent need for more support and funding to keep it that way. As in most communication, pertinent questions are: what is the purpose of the communication and for whom are we communicating?

A way to make food security communication easier might be to select parts of food security that are more easily measured, such as the impact of biofortification on anthropometric indicators, or the impact of fertilizer subsidies on maize production. However, there is a demand for communication that includes not only food production, but also income; not only hunger measured in calories, but also malnutrition, overweight and obesity; not only average food availability, but distribution of hunger among different socio-economic groups as well as the overall sustainability of the food systems that food security is based upon.

15. CONCLUSION

In spite of substantial efforts that have gone into how to measure food security and how to communicate results of activities with improved food security as a goal, quite some work remains to come up with appropriate indicators and doable measurements. The complexity of the food security concept makes it difficult to identify quantifiable and measurable indicators that capture the full meaning of food security. However, the SDG indicators that have been identified and agreed upon so far, and those that are still in process, will probably contribute towards a better way of measuring and communicating food security results in the years to come. Such communication will need to include the social, economic and environmental sustainability of the global food system(s) that food security is based upon in order to fully address all four pillars of food security namely availability, access, utilization and stability. To what degree the good news or the bad news narrative will dominate future food security communication is still to be seen, but the chances are that both will continue and mutually challenge each other.

16. REFERENCES

Clapp, J. 2014. Financialization, distance and global food politics. *The Journal of Peasant Studies*. 41 5: 797-814.

CFS 2014. Principles for Sustainable Investment in agriculture and food systems. www.fao.org/fileadmin/templates/cfs/Docs1314/rai/CFS_Principles_Oct_2014_EN.pdf.

CGIAR. 2017. Strategy and Result Framework. <https://cgspace.cgiar.org/bitstream/handle/10947/3866/2pager.pdf?sequence=6>.

FAO, IFAD, UNICEF, WFP and WHO. 2017. *The State of Food Security and Nutrition in the World 2017. Building resilience for peace and food security*. Rome: FAO.

FAO, IFAD and WFP. 2015. *State of Food Security in the World*. Rome: FAO.

FAO 1996. *World Food Summit*. Rome: FAO.

FAOSTAT. 2017. <http://www.fao.org/worldfoodsituation/csdb/en/>.

Gimenez, E. H. and A. Shattuck. 2011. Food crisis, food regimes and food movements: rumblings of reform or tides of transformation. *Journal of Peasant Studies*. 38 1. pp 109-44.

Government of Malawi. 2016. *The National Resilience Plan. Breaking the Cycle of Food Insecurity in Malawi*. Malawi: Office of the Vice President.

Government of Malawi. 2015. *Malawi 2015 Floods Post Disaster Needs Assessments Report*. Ministry of Disaster Management Affairs. Malawi.

Haug, R. 2011. In the policy maze of food dilemmas. In: Kjosavik, D.J. & P. Vedeld. (Eds.). *The Political Economy of Environment and Development in a Globalised World*. Trondheim: Tapir Academic Press. pp 219-237.

Haug, R. 2016. Emergency preparedness and early recovery for enhanced food security in Africa. *Noragric report 79*. Norwegian University of Life Sciences. pp 1-46.

Haug, R. and B.K.G. Wold. 2017. Social Protection or Humanitarian Assistance: Contested Input Subsidies and Climate Adaptation in Malawi. *IDS-Bulletin*. 48:4 pp 93-110 (DOI: 10.19088/1968-2017.155).

Hossain, N. 2017. Inequality, hunger, and malnutrition: power matters. In IFPRI et al. *The Global Hunger Index*. Washington DC: IFPRI. pp 25-31.

Hickel, J. 2016. The true extent of global poverty and hunger: questioning the good news narrative of the Millennium Development Goals. *Third World Quarterly*. 37 5:749-767.

HLPE. 2017. Nutrition and food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome.

IFPRI, Deutsche Welthungerhilfe and Concern Worldwide. 2016. Global Hunger Index. Getting to zero hunger. Washington DC, Bonn and Dublin.

IFPRI, Deutsche Welthungerhilfe and Concern Worldwide. 2017. Global Hunger Index. The inequalities of Hunger. Washington DC, Bonn and Dublin.

IFPRI. 2017. Global Nutrition Report. Nourishing the SDGs. International Food Policy Research Institute, Washington DC.

IFPRI. 2016. Global Nutrition Report. From promise to Impact: Ending Malnutrition by 2030. International Food Policy Research Institute, Washington DC.

Ingram, J. 2011. A food systems approach to researching food security and its interactions with global environmental change. *Food Security*, 3, 417-431.
doi:10.1007/s12571-011-0149-9.

IPC 2017. The Integrated Food Security Phase Classification
<http://www.un.org/apps/news/story.asp?NewsID=39113#.WdpNn00Uncs>.

iPES-Food. 2016. From uniformity to diversity: a paradigm shift from industrial agriculture to diversified agro-ecological systems. International Panel of Experts on Sustainable Food Systems.

Jerven, M. 2015. Africa - Why Economists get it wrong. London: Zed Books.

MOAIWD. 1997-2015. Annual National Crop Estimates, spreadsheets available from MOAIWD, Malawi: Ministry of Agriculture, irrigation and Water Development.

McMichael, P. 2009. A food regime genealogy. *The Journal of Peasant Studies*. 36 1: 139-169.

Norad 2017. Lansider Malawi. www.norad.no/landsider/afrika/malawi

Nyborg, I and R, Haug. 1995. Measuring Household Food Security: A participatory Process Approach. *Forum for Development Studies*. No 1. pp 29-59.

Nyborg, I and R, Haug. 1994. Food security indicators for development activities by Norwegian NGOs in Mali, Ethiopia and Eritrea. *Noragric*. Aas. pp 1-40.

Steffen et al. 2015. *Planetary Boundaries: Guiding human development on a changing planet*. *Science* Vol. 347 no. 6223.

UN. 2015. Sustainable Development Goals. New York: United Nations.

UN. 2017. Sustainable Development Goals (SDGs). New York: United Nations.

Vaitla B., S. Devereux, and S.H. Swan. 2009. Seasonal Hunger: A Neglected Problem with Proven Solutions. PLoS Med 6(6).

Waal, de, A. 1997. Famine Crimes: Politics and the disaster relief industry in Africa. Oxford: African Rights and the International African Institute in association with James Carrey.

WB 1986. Poverty and Hunger: Issues and Options for food security in developing countries. Washington DC: World Bank.

WHO 2017. Factsheet. <http://www.who.int/mediacentre/factsheets/fs311/en/>.