

Indicators for the Post-2015 Sustainable Development Agenda
Joint proposal of the Rome Based Agencies (RBAs)
of indicators for GOAL 2:
End hunger, achieve food security and improved
nutrition and promote sustainable agriculture

Prepared by

FAO

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Draft: 25 February 2015

Introduction

With resolution A/RES/68/309, the UN General Assembly has received and endorsed the proposal of a set of Sustainable Development Goals (SDG) and related Targets formulated by the Open Working Group (OWG) on SDGs. This list of goals and target has been identified as the reference document to inform further discussions on the Post-2015 Development Agenda.

This document presents a proposal of indicators that could be considered to monitor progress towards Goal 2: “End hunger, achieve food security and improve nutrition and promote sustainable agriculture”. For this Goal, the OWG document defines five targets aimed towards various outcomes, as well as three additional targets addressing related Means of Implementation.

The set of indicators included in this document reflects the current shared thinking of the three UN Rome Based Agencies. The selection of indicators has been guided by considerations related to the relevance, methodological soundness, measurability and understandability of the indicators, as identified in the report titled “Lessons Learned from MDG Monitoring of the IAEG-MDGs.”

One guiding principle in the selection of the proposed indicators has been the need to keep the list of indicators that will form the core of the SDG monitoring framework as manageable as possible, while trying to preserve the multidimensional and complex nature of the targets in question. When more than one indicator is presented for a given target, an effort has been made to clarify whether they should comprise “core” or “tier 1” indicators, which could be included in a core set of indicators for a globally relevant monitoring framework, or as “additional” or “tier 2” indicators, which countries could use for specific national or regional monitoring needs.

Each indicator is described through a detailed factsheet presenting answers and comments to the following questions:

- 1) What is the precise definition of the indicator?
- 2) How is the indicator linked to the specific TARGET as worded in the OWG report?
- 3) Does the indicator already exist and is it regularly reported?
- 4) Comments on the reliability, potential coverage, comparability across countries, and the possibility to compute the indicator at sub-national level; and
- 5) Can a meaningful numerical target for 2030 be set? Is there already a baseline value for 2015?

Moreover, even if not always explicitly stated, we believe that – whenever possible and meaningful – all indicators should be disaggregated by age, sex, and rural/urban areas, not only for the indicators listed in this proposal but also for indicators used to monitor other proposed Goals.

The list of proposed indicators is organized according to the Targets as defined in UNGA document A/68/970 of 12 August 2014, which incorporates the OWG report. For each Target, the indicators’ factsheets are preceded by a short narrative that explains the rationale for the selection made.

We look forward to comments, constructive critique, and any other suggestions.

Box 1. List of proposed indicators by target

Target 2.1:	By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round	
Tier 1	Indicator 2.1.1:	<u>Prevalence of Undernourishment (PoU)</u>
Tier 1, Potential	Indicator 2.1.2:	<u>Prevalence of population with moderate or severe food insecurity, based on the Food Insecurity Experience Scale (FIES)</u>
Tier 1, Potential	Indicator 2.1.3:	<u>Percentage of household with inadequate food consumption, based on the Food Consumption Score (FCS)</u>
Target 2.2:	By 2030, end all forms of malnutrition, including achieving, by 2025, 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.	
Tier 1	Indicator 2.2.1:	<u>Prevalence of Stunting (low height-for-age) in children under 5 years of age</u>
Tier 1	Indicator 2.2.2:	<u>Prevalence of overweight children under 5 years of age</u>
<i>Additional</i>	<i>Indicator 2.2.3:</i>	<i><u>Women Dietary Diversity Score</u></i>
Target 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	
Tier 1	Indicator 2.3.1:	<u>Value of agricultural production per hectare (measured in constant USD/hectare, disaggregated for the two lowest quintiles of countries' farm size distribution, as well as for female-headed smallholder producer households)</u>
Target 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	
Tier 1	Indicator 2.4.1:	<u>Emissions of greenhouse gases in agriculture (per hectare of land and per unit of output, separately for crop and livestock sectors)</u>
<i>Additional</i>	<i>Indicator 2.4.2:</i>	<i><u>Absolute levels of emissions in relevant sectors and sub-sectors</u></i>
Target 2.5:	By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and ensure access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed	
Tier 1	Indicator 2.5.1	<u>Ex-situ crop collections indicator</u>
Tier 1	Indicator 2.5.2	<u>Number/percentage of local breeds classified as being at-risk, not-at-risk, and unknown-levels of risk of extinction</u>
Target 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 productivity capacity in developing countries, in particular in least developed countries.	
Tier 1	Indicator 2.a.1:	<u>Agriculture Orientation Index for Government Expenditures</u>
Target 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	
Tier 1	Indicator 2.b.1:	<u>Evolution of potentially trade restrictive and distortive measures in agriculture</u>
Target 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	
Tier 1	Indicator 2.c.1:	<u>Indicator of (food) Price Anomalies (IPA)</u>

Note:

Tier 1 indicators (part of the core set of indicators for a globally relevant monitoring framework)

Potential tier 1 indicators (might be adopted once established at the global level)

Additional indicators (which countries could use for specific national or regional monitoring needs)

Target 2.1

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

The prevalence of undernourishment (listed here as indicator 2.1.1.) is an established indicator used to monitor progress against the 'hunger' target of the Millennium Development Goals. It is maintained and published regularly by the FAO with reference to the average of the last three-year period, and it will allow monitoring progress in continuity with the past, a reason why it supported as a core indicator for this target.

It is believed, however, that there is a clear need to develop and use indicators capable of providing more timely assessments, that can be meaningfully disaggregated at subnational level by population groups and/or by geographic areas and that can be informed by easy to collect data.

For these reasons we also propose two other indicators which show high promise for being adopted as core indicators for Target 2.1, once established on a global scale:

- *the percentage of individuals experiencing moderate or severe levels of food insecurity, as measured through the Food Insecurity Experience Scale (FIES) (listed here as indicator 2.1.2) and*
- *the percentage of households with inadequate food consumption, as measured through the Food Consumption Score (FCS) (listed here as indicator 2.2.3.)*

Indicator 2.1.1

“Prevalence of Undernourishment” (PoU)

1. Precise definition of the indicator

The Prevalence of Undernourishment (PoU) is defined as the probability that a randomly selected individual from the reference population is found to consume less than his/her calorie requirement for an active and healthy life. It is written as: $PoU = \int_{x < MDER} f(x) dx$ where $f(x)$ is the probability density function of per capita calorie consumption and MDER is a Minimum Dietary Energy Requirement. The MDER threshold is computed on the basis of normative energy requirement standards referred to a minimum level of physical activity. Estimates of the number of undernourished (NoU) - calculated by multiplying the PoU by the size of the reference population - are used to monitor progress towards the World Food Summit goal of reducing by half the number of people suffering from undernourishment. The parameters needed for the calculation of the indicator are: the mean level of dietary energy consumption (DEC); a cut-off point defined as the Minimum Dietary Energy Requirement (MDER); the coefficient of variation (CV) as a parameter accounting for inequality in food consumption; and a skewness (SK) parameter accounting for asymmetry in the distribution. The DEC as well as the MDER are updated annually, with the former calculated from the FAO Food Balance Sheets. The MDER is calculated as a weighted average of energy requirements according to sex and age class, and is updated each year from UN population ratio data. The inequality in food consumption parameters are derived from National Household Survey data when such data is available and reliable. Due to the limited number of available household surveys, the inequality in food access parameters are updated much less frequently over time than the DEC and MDER parameters¹.

2. How is the indicator linked to the specific TARGET as worded in the OWG report and copied above?

The indicator refers to food available for consumption over a period on one year. It refers to a severe condition of lack of food. In this respect, it is fully consistent with the spirit of the developmental goal. Energy intake is a very specific aspect of food insecurity, which applies where conditions are more severe.

Ideally, undernourishment should be assessed at the individual level by comparing individual energy requirements with individual energy intakes. This would enable the classification of each person in the population as undernourished or not. However, this approach is not feasible for two reasons: individual energy requirements are practically unobservable with standard data collection methods; and individual food consumption is currently measured with precision in only a few countries and for relatively limited samples. The individual-level consumption data that can be estimated from National Household Survey data are largely approximated owing to disparities in intra-household food allocation, the variability of individual energy requirements, and the day-to-day variability of food consumption that can arise for reasons independent of food insecurity. The solution adopted by FAO has been to estimate the PoU

¹ More detailed information on the indicator can be found in: Wanner N., C. Cafiero, N. Troubat, P. Conforti (2014), Refinements to the FAO Methodology for estimating the Prevalence of Undernourishment Indicator, FAO Statistics Division Working Papers Series 14-05, Rome 2014 (available at: <http://www.fao.org/3/a-i4046e.pdf>) and in: Cafiero, C. Advances in hunger measurement. Traditional FAO methods and recent innovations FAO Statistics Division Working Papers Series 14-04, Rome 2014 (available at <http://www.fao.org/3/a-i4060e.pdf>).

with reference to the population as a whole, summarized through a representative individual, and to combine available microdata on food consumption with macrodata.

The Prevalence of Undernourishment indicator is still one of the most reliable tools to monitor progress towards reducing global hunger. Recent innovations to the methodology, such as those presented in Wanner et al. (2014) allow to improve the quality of global monitoring, and to capture more accurately progress in reducing hunger and how the problem is currently distributed globally. In 2012 the functional form of habitual food consumption was modified. The Skewed Normal functional form was introduced to take into account the asymmetry of the distribution. This was a major improvement, as it allowed better capturing the characteristics of the distribution, and how this would change when calories consumption increases. At the same time, a strong increase was promoted in the number of Household Budget Survey employed in the calculation of the CV and SK parameter. Household Budget Survey now cover about 70 percent of the total number of undernourished estimated. Another main recent refinement, introduced in 2014, is a data-driven flexible selection criterion for the choice of the functional form of the distribution of per capita habitual calorie consumption that maintains the probability framework. Further improvements to the calculation of inequality in food access parameters, both directly and indirectly, have been made in 2014 to allow for time-varying parameters that take into account economic progress and demographic changes.

At the same time, the indicator does not convey information on the quality of food, nor on its nutritional value. The reason is that it focuses on the most severe aspect of hunger, and it is therefore solely based on the number of calories consumed through food. The parametric approach adopted by FAO allows obtaining reliable estimated for relatively large population groups.

Information about the sufficiency of calories from food for specific population groups, such as the poor and the vulnerable, can be derived if such groups can be identified within the population, and if sampling allows drawing inference on the habitual food consumption of these groups.

In principle, the indicator can be computed for specific population groups, such as the poor and the vulnerable. However, this requires that such groups are clearly identifiable in the population, and that sampling allows drawing inference on their habitual food consumption. In fact, such information is seldom available.

3. Does the indicator already exist, and is it regularly reported?

Yes, the indicator exists. The FAO maintains the data and reports on it annually.

Metadata are available at the FAO Statistics website <http://www.fao.org/economic/ess/ess-fs/ess-fadata/it/#.VM89cGjF-VM> as Excel sheets associated with the data; and from the FAOSTAT website, at http://faostat3.fao.org/download/D/*/E.

4. Comment on the reliability, potential coverage, comparability across countries, and the possibility to compute the indicator at sub-national level.

Reliability

Reliability depends on the quality of the background data, specifically on Dietary Energy Supply, the distribution of habitual food consumption in the population – which is derived from household budget

surveys whenever possible -- the population, its structure and height distribution. No statistical margin of error can be determined for the prevalence of undernourishment.

The ability of the indicator to approximate access to food depends upon the extent to which existing data allow characterizing effectively the probability distribution of habitual food consumption in the reference population. As mentioned, the FAO methodology combines available microdata on food consumption derived from surveys with macrodata from food balance sheets. Food balance sheets provide information on the amount of food that is available for consumption after taking into account all the possible alternative uses of the food items; hence, they provide approximate measures of per capita consumption, which are available for a large number of countries and are homogenous. The methodology adopted for computing these data is currently under revision, together with the estimates of waste parameters employed to derive the DEC, so the level of accuracy is expected to increase in the next few years. Survey data, where available and reliable, are employed in the FAO methodology to compute the variability (CV) and skewness (SK) parameters that characterize the distribution of food consumption $f(x)$. It is therefore essential that surveys are improved to obtain more accurate measures of undernourishment. Such improvement will require promoting greater standardization across existing surveys, particularly household budget surveys, and conducting more refined surveys that capture food intake at the individual level.

Coverage

Consistent time series for the indicator exist from 1990-92 for about 140 countries. The indicator is regularly reported in the annual State of Food Insecurity in the World Report published by FAO, IDPAD and WFP since 1999 and in the Millennium Development Goal Report of the UN Statistics Division. Data on the indicators are published on the FAO Statistics website, at <http://www.fao.org/economic/ess/ess-fs/ess-fadata/it/#.VM89cGjF-VM> and update every year. From year 2014 they are also available in FAOSTAT, at http://faostat3.fao.org/download/D/*E.

Comparability across countries

Comparability across time and space is relatively strong. The only potential cause of lack of homogeneity is the quality of the background data. Not all countries monitored undertake regular and reliable surveys of food consumption. In countries where this information source is of poor quality or missing, the distribution of habitual food consumption is estimated indirectly, through an econometric exercise that relates the CV of food consumption to food prices, incomes and their distribution.

Sub-national estimates

In principle the indicator could be defined at sub-national level. However, reliable information has to be available on the amount and distribution of habitual food consumption in the population of the sub-national areas of interest. In fact, this information is frequently available only for wide population sub-groups – such as rural and urban areas and some major geographical areas. The global monitoring exercise has therefore always relied only on the Prevalence of Undernourishment at national level, and never used the indicator at sub-national levels.

5. Can a meaningful numerical target for 2030 be set? Is there already a baseline value for 2015?

Yes. A target for 2030 can be identified in terms of a minimum level, allowing for the possibility that lack of food has become marginal in the reference population. The choice of the threshold should also reflect the ability of the indicator to be accurate at such level, and effectively capture changes in the level.

Indicator 2.1.2

“Percentage of individuals in the population with moderate or severe food insecurity, as classified based on the Food Insecurity Experience Scale (FIES)”

1. Precise definition of the indicator

These are in reality two related indicators, representing the percentage of individuals in the national adult population (15 or more years of age) that have experienced *moderate or severe levels* and *severe levels of food insecurity* respectively, during the previous year.

Severity of food insecurity is defined as the extent to which people have difficulties in accessing food of adequate quality and/or quantity due to lack of money or other resources. Difficulties include also psychological concerns associated with the struggle in accessing food.

2. How is the indicator linked to the specific TARGET as worded in the OWG report and copied above?

This indicator is a direct implementation of the concept of “access to food” that informs the target. Experience-based food insecurity scales are the only available tools that address the effective ability to access food at the individual or household level, directly. Reliable measure at individual level, as afforded by these indicators, is crucial to respond to the need to ensure monitoring access “by all people” and that monitoring can be conducted “in particular for the poor in vulnerable situations”.

3. Does the indicator already exist and is it regularly reported?

Yes, the indicators already exist. The indicators and the global reference standard necessary to ensure proper cross-country comparability of the measures are developed and maintained by the FAO Statistics Division, “Voices of the Hungry” team.

Metadata are available at: <http://www.fao.org/economic/ess/ess-fs/voices/fiessscale/metadata/en/>.

4. Comment on the reliability, potential coverage, comparability across countries, and the possibility to compute the indicator at sub-national level.

Reliability

Reliability of an experience-based measure of food security could be compromised by issues related to (a) the choice and performance of the items used to form the scale and (b) limited sample sizes.

- (a) Choice and performance of the FIES items. Key results from the analysis of the data collected by FAO in 2014 in 145 countries through the GWP confirm the reliability of the FIES based measure of the prevalence of food security at different levels of severity even after relatively minor efforts of adaptation of the questions to local languages. Items’ performance has been tested through the *infit* statistics and only in one case only one of the items showed an *infit* value outside the range 0.7-1.3 that is considered appropriate to ensure sufficient reliability. This confirms the appropriateness of the items chosen (a result of decades of experience with development and application of experience-based food security scales in North and Latin America and throughout the world.)

(b) Sample size: Samples of 1000 individuals, characteristic of the GWP,² have proven sufficient to ensure margins of errors lower than 2% for prevalence of moderate or severe food insecurity, and lower than 1% for prevalence of severe food insecurity at national level. Larger sample sizes might further reduce these margins of error.

Coverage

By leveraging on the GWP as a data collection vehicle, FAO can ensure global coverage (about 150 countries every year covering more than 95% of the world population) annually, for national level assessments.

Comparability across countries

The Voices of the Hungry project has successfully developed and tested the methodology to scale individual measures to a single global reference standard and to make estimates of the prevalence of food insecurity comparable across countries. The method is possible due to the reference to Item Response Theory for measurement and it inspired by existing practice in equating educational and psycho-attitudinal tests.

Possibility to compute the indicator at sub-national level

The indicators can be computed at any level of disaggregation. Reliability of the measure is of course conditioned by the available sample size and representativeness of the specific sample. FAO suggests that, for meaningful disaggregation at subnational level, the data should be collected with surveys that are designed to be representative of the target population.

5. Can a meaningful numerical target for 2030 be set? Is there already a baseline value for 2015?

Meaningful targets that would reflect bringing food insecurity to minimal “physiological” levels and the eradication of hunger could be to bring the prevalence of moderate and severe food insecurity to less than 5% and of severe food insecurity to less than 1%. Such targets might be applicable to developed countries and some transition economies.

Credible, yet ambitious targets for other countries could be defined based on an analysis of the 2014 benchmark that will be available in the first quarter of 2015; they might be framed in terms of reducing prevalence of moderate and severe food security to one third of their current level.

² Larger samples were formed in India (N=3000) and China (N=5000).

Indicator 2.1.3

Percentage of households with inadequate food consumption, as measured by the Food Consumption Score (FCS)

1. What is the precise definition of the indicator?

The frequency weighted diet diversity score or “Food consumption score” is a score calculated using the frequency of consumption of different food groups consumed by a household during the 7 days before the survey.

In its standard form, weights are applied to capture the nutrient density of each food group and the score is the sum of the weighted values over the seven day period. The maximum possible score is 112, which would be achieved by households in which each of the 8 food groups is consumed on a daily basis. Details on the food groups and weights are available here:

http://documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp197216.pdf

2. How is the indicator linked to the specific TARGET as worded in the OWG report and copied above?

The FCS is recommended for Target 2.1: “By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.”

This indicator is a “food access” indicator, and is based on both dietary diversity, and the frequency of food groups consumed.

The FCS in its standard form has been in use by WFP for over 15 years and has enabled the organization to assess and monitor food access and consumption in developing countries. While by definition the FCS is a composite indicator, the food frequency data collected for its computation provides a rich data repository that may be employed in a variety of ways. For example, nutrient adequacy may be analysed from the raw frequency data, and unweighted or differentially weighted scores may be adapted to reflect cultural and geographic dietary variation, to account for seasonality, or to prioritize dietary habits that are consistent with sustainable development goals.

3. Does the indicator already exist and is it regularly reported?

The indicator, and the global reference standard necessary to ensure proper cross-country comparisons are developed and maintained by the WFP Policy and Programme Division, and more specifically; the Food Security Analysis Service.

WFP is a member of the International Household Survey Network (IHSN). As a member of IHSN, WFP maintains a micro-data catalogue and associated website, with meta-data files for its statistically representative household level surveys. These surveys and related studies are known and referred to as Comprehensive Food Security Vulnerability Assessments (CFSVAs). The CFSVA surveys contain Food Consumption Score (FCS) data, along with many other variables. Detailed metadata for the CFSVA surveys, including the metadata for the FCS Indicator data; can be viewed and accessed at WFP’s IHSN Survey Data Portal at the following link: <http://nada.vam.wfp.org/index.php/catalog>

WFP is committed to transparency and data access, and survey data are maintained in publicly available databases.

Detailed Metadata tables for the FCS indicator are available at the link immediately below:

<http://www.wfp.org/content/meta-data-food-consumption-score-fcs-indicator>

4. Comment on the reliability, potential coverage, comparability across countries, and the possibility to compute the indicator at sub-national level.

Since 2003, WFP's VAM/Vulnerability Analysis and Mapping team has completed more than 80 baseline surveys worldwide, most of these have been carried out with national scale coverage. The large majority of these surveys contain Food Consumption Score data. The FCS is measured at household level, and therefore can easily be aggregated at the community, national, or regional level using appropriate population adjustments. The proportion of households failing to achieve a minimally acceptable FCS is easily comparable across countries, while scores for households that are not in states of severe or moderate food insecurity are more easily subjected to cultural and geographic variation. To account for this variation, an analysis of scores associated with high-quality diets in each country can be used to estimate proportions of households meeting acceptable dietary requirements.

A number of experts have highlighted the reliability of the FCS indicator with respect to nutrient adequacy estimates, caloric intake, and have also highlighted unique benefits not associated with other dietary diversity indicators.

Data can be collected by using two kind of survey vehicle: conventional face-to-face interviews, or remotely using mobile phone based surveys.

Conventional "face-to-face" survey approach

FCS data collected around the world by WFP, NGOs, and government partners are often collected within the context of larger/broader food security monitoring systems (FSMS). FSMS surveys and associated household questionnaires typically include a number of core modules; household demographics, income sources, expenditures, food consumption and food sources, coping strategies and shocks. A typical completed FSMS household questionnaire, if collected using a conventional "face-to-face" (i.e. on site enumerator and respondent) approach, costs approximately \$30. For the purpose of providing a rough estimate of the cost and feasibility of collecting only the FCS data together with the standard household demographic data, we estimate the cost at approximately \$15 to \$20 per household using the conventional face-to-face approach for data collection.

Data collected remotely using mobile phones survey; mVAM remote surveys

WFP has been collecting Food Consumption Score (FCS) data with other food security data (reduced Coping Strategy Index / rCSI) remotely in 8 countries around the world since 2013. Collecting FCS data remotely using voice calls placed to mobile phones dramatically reduces the costs of data collection.

The cost estimates provided below, are based on experiences from two countries only (DR Congo and Somalia). It should be noted that these countries represent contexts where data collection is most difficult, and as such the cost estimates below should be interpreted as higher than typical; i.e. conservative estimates.

In DR Congo and Somalia operators are calling respondent households once a month and asking the FCS and the CSI over the phone. The phone calls typically last 6-7 minutes. The cost of completed household questionnaire of these two modules is \$7-9. For the purpose of estimating the cost of the FCS data module; we use a conservative \$7-\$9 estimate per household. This cost estimate includes the salary of the operator, cost of actual call and a \$0.5 airtime credit incentive for the respondent after the call is completed. It is important to note that through potential economies of scale; with a higher call volume; the cost per survey would likely decrease significantly. A review of the mVAM project is currently underway and being undertaken by Tulane University; the review includes a review of costs.

5. Can a meaningful numerical target for 2030 be set? Is there already a baseline value for 2015?

WFP currently has statistically representative FCS data at national scale, for over 35 countries around the world, from which baseline values have been derived.

Establishing global targets with the FCS indicator requires consideration of scoring thresholds. At present, two FCS thresholds are commonly employed: households with scores below 21 are generally considered to have very poor food consumption, while scores between 21 and 35 are associated with borderline consumption. While scores above 35 will not necessarily reflect households consuming sufficient quantities of nutritiously diverse foods, we can be sure that households scoring below these levels are in serious risk. For example, a meaningful universal target associated with hunger eradication could be a reduction in the proportion of households scoring below 21 to under 1% and those scoring under 35 to 5%.

Target 2.2.

By 2030, end all forms of malnutrition, including achieving, by 2025, 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

The Rome Based Agencies endorse the set of indicators that have been endorsed by Member States at the 65th World Health Assembly (WHA 2012), and support in particular the Prevalence of stunting (low height-for-age) in children under 5 years of age (listed here as indicator 2.2.1), and the Prevalence of overweight children under 5 years of age (listed here as indicator 2.2.2) as core indicators for Target 2.2.

Furthermore, it is strongly believed that an important determinant of malnutrition is dietary quality and therefore the Women Dietary Diversity Score (listed here as Indicator 2.2.3) is proposed as an additional one. This indicator would provide information to countries on the dimension of women consuming micronutrient poor diets, an important contribution to micronutrient-related malnutrition.

Indicator 2.2.1

Prevalence of stunting (low height for age) in children under 5 years of age

See metadata at:

http://apps.who.int/gho/indicatorregistry/App_Main/view_indicator.aspx?iid=72

Indicator 2.2.2

Prevalence of overweight children under 5 years of age

The indicator is maintained by the World health Organization. See metadata at:

http://apps.who.int/gho/indicatorregistry/App_Main/view_indicator.aspx?iid=74

Indicator 2.2.3

“Women Dietary Diversity Score”

1. Precise definition of the indicator

The Minimum Dietary Diversity for Women (MDD-W) indicator is defined as: “the proportion of all women 15-49 years of age who consumed at least 5 out of 10 defined food groups the previous day”³

The 10 food groups are:

- All starchy staple foods
- Beans and peas
- Nuts and seeds
- Dairy
- Flesh foods
- Eggs
- Vitamin A-rich dark green leafy vegetables
- Other vitamin A-rich vegetables and fruits
- Other vegetables
- Other fruits

2. How is the indicator linked to the specific TARGET as worded in the OWG report and copied above?

The MDD-W is a proxy indicator of micronutrient adequacy of the diets of women of reproductive age, with the desired direction of change being an increase of the value of the indicator. Women consuming at least five out of ten food groups have a greater likelihood of meeting their micronutrient needs than women consuming foods from fewer food groups⁴. Women's diets in resource-poor countries have been shown to be inadequate (Torheim 2010, Lee 2013)⁵, so this indicator is directly relevant to the target of “addressing the nutritional needs of adolescent girls, pregnant and lactating women”.

3. Does the indicator already exist and is it regularly reported?

This is a new indicator that has been developed and validated against high-quality quantitative dietary data⁶. It is not yet regularly reported although similar data on dietary diversity of women have been reported in the past.

³ <http://www.fantaproject.org/sites/default/files/resources/Introduce-MDD-W-indicator-brief-Sep2014.pdf>

⁴ This is the main conclusion of the Women’s Dietary Diversity Project I and II (WDDP). The technical report of WDDP-II is about to be published by FAO. All available information can be found at:

<http://www.fantaproject.org/research/womens-dietary-diversity-project>

⁵ Lee SE, Talegawkar SA, Merialdi M, Caulfield LE. Dietary intakes of women during pregnancy in low- and middle-income countries. *Public Health Nutr.* 2013 Aug;16(8):1340-53. doi: 10.1017/S1368980012004417. Epub 2012 Oct 9.

Torheim LE(1), Ferguson EL, Penrose K, Arimond M. Women in resource-poor settings are at risk of inadequate intakes of multiple micronutrients. *J Nutr.* 2010 Nov;140(11):2051S-8S. doi: 10.3945/jn.110.123463.

Epub 2010 Sep 29.

⁶ Arimond M, Wiesmann D, Becquey E et al. (2010). Simple food group diversity indicators predict micronutrient adequacy of women’s diets in 5 diverse, resource-poor settings. *Journal of Nutrition.* No. 11 (.Vol. 140): 2059S-69S.

Because the indicator was recently developed, there has been no routine data collection until very recently when several USAID programmes have incorporated it into their monitoring and evaluation framework (for Feed the Future and Title II programmes).

Potential data sources include the DHS surveys and the UNICEF MICS. Representatives from agencies sponsoring these surveys have been engaged in larger stakeholder consultations on the MDD-W. DHS collected women's dietary diversity data using a previous version of the tool. Other potential sources are national nutrition and health surveys. All of these are conducted on an average of every five years, and global coverage is not attained, however the DHS covers over 90 countries, including most developing countries.

If prioritized and funded, inclusion in large scale surveys such as those mentioned above is feasible. It is a short module requiring no more than 15 minutes of interview time and calculation of the indicator is simple and straight forward. Upfront costs include a one-time questionnaire adaptation to include local foods and for translation into languages used for questionnaire administration. Therefore, marginal costs to including the module into an existing survey include the one time questionnaire preparation, and interview and enumerator training time.

4. Comment on the reliability, potential coverage, comparability across countries, and the possibility to compute the indicator at sub-national level.

Reliability

The precision of the calculated estimates depend on the sample size. With large-scale nationally representative studies, the estimates will reach a good level of precision.

Coverage

See the paragraph above on data sources.

Comparability across countries

While there is no global standard of reference, the concept of food group diversity is globally relevant. All national dietary guidelines stress the importance of varied diets for health and nutrition outcomes (Dwyer, 2012)⁷.

Sub-national estimates

Data are collected on individual women. Subnational estimates are possible as long as the survey is representative for specific population groups and/or geographical areas.

5. Can a meaningful numerical target for 2030 be set? Is there already a baseline value for

In the absence of baseline data, it is difficult to set a meaningful target that is feasible to achieve over a 15 year time horizon.

⁷ Dwyer, JT. (2012) Dietary standards and guidelines: Similarities and differences among countries. Chapter 65 in Present Knowledge in Nutrition, 10th ed., pp. 1110-1134, JW Erdman, IA MacDonald, and SH Zeisel, eds. Wiley-Blackwell.

In order to set meaningful targets for tracking progress, it would be desirable to bring together major stakeholders in nutrition and women's health to reach consensus on setting a meaningful and feasible target for the SDGs.

Assembling stakeholders to engage in this process is possible because there is wide support for the inclusion of this indicator in the development goals, as evidenced by the recent policy brief from the Standing Committee on Nutrition available at: http://www.unscn.org/files/Publications/Policy_brief_Priority_Nutrition_Indicators_for_the_Post-2015_SDGs.pdf. In the meantime the organizations, institutions and individuals involved in this area will begin a search for available data that may provide input into this process.

Target 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”

While agricultural productivity broadly defined could be measured, at the aggregate national level, with data available through national account data maintained by OECD and the World Bank, the in the target formulation creates a specific demand for data that can only be obtained through surveys.

The last two decades have witnessed an increased reliance on household surveys, focusing on consumption and living standards indicators, which unfortunately cannot be considered a complete and reliable source of data related to agricultural production and to farmers’ access to productive resources, for which a system of farm surveys would be needed.

While some initiatives have been put in place by various development agencies (most notably, the Integrated Surveys in Agriculture project under the World Bank’s Living Standard Measurement Survey and the World Census of Agriculture initiative by FAO) the availability of reliable agricultural production data at farm level is still largely insufficient to cover the monitoring needs for targets that make explicit reference to small-scale producers and to different population groups.

To respond to this urgent need, concerted actions aimed at promoting the establishment of regular farm surveys through which countries would collect at least a minimum set of core data specifically related to the economic, social and environmental dimensions of the farming sector, using an integrated agricultural and rural development approach.

In this respect, the Global Strategy to improve Agricultural and Rural Statistics (a multi donor/multi partner statistical capacity development initiative) is promoting the establishment of an Agricultural and Rural Integrated Survey (AGRIS) model which would ensure availability of the basic data needs to inform several key indicators, including the ones listed below, at a sufficient level of coverage to serve the needs of the global monitoring framework of all the dimensions listed in the Target definition.

Indicator 2.3.1

“Value of agricultural production per hectare of small-holder producers”

1. Precise definition of the indicator?

The indicator refers to the value of agricultural production per unit of land (hectare) operated by the first two farm size quintiles for all farmers (the bottom 40%) and for female headed farming households. So, there are effectively two indicators to be derived.

2. How is the indicator linked to the specific TARGET as worded in the OWG report and copied above?

The indicator is directly linked with the target, particularly to the agricultural productivity dimension. In particular, the first refers to doubling the land productivity for crops of small farmers (including pastoralists), and the second specifically refers to land productivity of female headed farming households.

3. Does the indicator already exist and is it regularly reported?

FAO has been working in producing the indicator using household survey data, within its program of work in “*small scale agriculture and development transformation*”. To date, the indicator is available for nine developing countries in Asia, Africa and Latin America. The results haven’t been disseminated yet.

Sources of information would be either national agricultural surveys, or agricultural modules from National Household Surveys (eg., LSMS-ISA). Existing data (household surveys for up to 70 countries owned by different agencies or the countries themselves) differ in terms of time span and crop coverage.

Monitoring the indicator would require frequent and consistent collection of data for as many countries as possible.

Data should be collected by the countries with the necessary support from the World Bank, FAO and other agencies to ensure methodological rigor.

It is worth mentioning that the FAO Statistics Division is starting a project called AGRIS (Agricultural and Rural Integrated Surveys) through which methodological guidelines will be provided to countries on how to conduct farm surveys (i.e. key indicators to collect, definitions, methods for data collection, periodicity, etc.), and effort will also be made to support countries in the actual implementation of the farm surveys. This project, as well as partnerships with the World Bank and the countries themselves, could substantially increase the availability of this indicator in the future.

4. Comment on the reliability, potential coverage, comparability across countries, and the possibility to compute the indicator at sub-national level.

Reliability

If data are collected according to standards, reliability is high.

Coverage

Data collection or data sharing might be difficult in some countries (i.e. China, countries at war etc.). In general due to high costs it doesn't make sense to collect data every year.

Sub-national estimates

As long as farm or household level data are available, the indicator can be computed for specific population groups and geographical areas. This is subject to the sampling frame and implied statistical representation in each specific country.

5. Can a meaningful numerical target for 2030 be set? Is there already a baseline value for 2015?

There is no baseline value for 2015.

The target, at least in global terms, may not be feasible to reach given that production for developed countries weighs higher relative to developing ones.

In developing countries the target seems more feasible, but still not achievable considering lagging technology that leaves plenty of room for improvement (which increases the numerator), and structural transformation (which may reduce the denominator). In addition good governance and relevant policies to promote agriculture and rural development in developing countries can assist in achieving the target there. Higher demand for food (either due to increases in the population or because of shifting dietary preferences: meat, fruits and vegetables), may increase prices and hence the numerator of the indicator.

Given diverse levels of importance for agriculture across countries, the target cannot be common but has to be country specific and relative to its baseline.

Target 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”

Indicator 2.4.1

“Emissions of greenhouse gases in agriculture” (per hectare of land and per unit of output, separately for crop and livestock sectors)

1. What is the *precise* definition of the indicator?

This is a family of indicators, with the following general definition:

$$Indicator_{i,j} = GHG_{i,j}/Commodity_{i,j}$$

Where:

- *Indicator_{i,j}* is Greenhouse Gas (GHG) emission intensity per unit of commodity *i* produced by activity *j*;
- *GHG_{i,j}* is the GHG emissions from the FAOSTAT Emission database relative to commodity *i* produced by activity *j*
- *Commodity_{i,j}* is production of the following goods by the following activities:
 - *i* = meat, milk, eggs, grain yield for the following activities
 - *j* = cattle, pork, chicken, etc., cereals, rice, plus two additional non-commodity indexes, currently under discussion across NRC and ESS, land and added value.

2. How is the indicator linked to the specific TARGET as worded in the OWG report and copied above?

The objective of this indicator is to contribute measuring sustainable food production systems. Detectable changes are time changes in the indicators. The indicator has a direct link to the objective measure. Indeed, the GHG intensity of commodities directly relates to their long-term sustainability and usefully links emissions to food production.

The indicator is also capturing other phenomena, such as the link to growing economies of scale. There is univocal direction of change in the value of the indicator that is consistent with the spirit of the developmental goal; as a matter of fact, GHG intensity should decrease over time to indicate increased efficiency of production in relation to environmental impacts.

3. Does the indicator already exist and is it regularly reported?

These indicators have already been produced at FAO and will be available in a FAOSTAT test site by end of February 2015. They are based on the FAOSTAT Emissions database in terms of nominator and on FAOSTAT/Production database in terms of denominator. All necessary data is available in FAOSTAT.

4. Comment on the reliability, potential coverage, comparability across countries, and the possibility to compute the indicator at sub-national level.

Reliability

The indicator is as robust as the underlying FAOSTAT data used for its computation. Emissions can have uncertainty of +- 30%; activity data in the denominator can have +-20%.

Coverage

All FAOSTAT countries, 1961-present

Comparability across countries

As the same FAOSTAT and IPCC methodologies are used throughout for all countries, the indicators would be directly and fully comparable.

Sub-national estimates

It is possible to compute sub-national, district level indicators if countries provide the basic data needed. Such data are not currently available.

5. Can a meaningful numerical target for 2030 be set? Is there already a baseline value for 2015?

While numerical targets for 2030 can hardly be conceived for this indicator at this moment, the UNFCCC COP21 in Paris, December 2015, may reach agreements of possible targets. If these UNFCCC targets are decided and understood, then this indicator can be used to estimate and then monitor them.

Indicator 2.4.2

“Absolute levels of emissions in relevant sectors and sub-sectors”

1. Precise definition of the indicator?

Agriculture GHG contains all the emissions produced in the different agricultural emissions sub-domains, providing a picture of the contribution to the total amount of GHG emissions from agriculture. GHG emissions from agriculture consist of non-CO2 gases, namely methane (CH₄) and nitrous oxide (N₂O), produced by crop and livestock production and management activities.

The indicator is computed following IPCC Guidelines for National GHG Inventories; it is available by country, with global coverage and relative to the period 1990 - present, with annual updates, and projections for 2030 and 2050⁸.

2. How is the indicator linked to the specific TARGET as worded in the OWG report and copied above?

The indicator is linked to the Target because it aims at measuring the overall achievement of sustainable food production systems (through reduced GHG emissions)

Detectable changes: Level of GHG emissions from sector and associated sub-sectors. The link is indirect, in the sense that increased GHG emissions can merely reflect increased food production and thus not necessarily measure sustainability. The latter is to be measured with a second, associated indicator (GHG intensity per commodity)? The direct link is that it helps clarify how agriculture contributes to national (regional, global) GHG emissions – in the context of a scientific agreement that these should overall be reduced in order to prevent further climate change in the future.

3. Does the indicator already exist and is it regularly reported?

Yes, the indicator exists. METADATA, are available at <http://faostat3.fao.org/modules/faostat-download-js/PDF/EN/GT.pdf>

4. Comment on the reliability, potential coverage, comparability across countries, and the possibility to compute the indicator at sub-national level.

Reliability

National level data have an uncertainty of of + / - 30 percent

Coverage

All FAOSTAT countries, 1961-most recent FAOSTAT year (currently 2012)

Comparability across countries

As the indicators are obtained according to 2006 IPCC guidelines in use by UNFCCC, they are fully comparable across countries.

⁸ Source: FAOSTAT Emissions/agriculture metadata.

Sub-national estimates

Yes. Currently sub-national (geo-spatial) data are available for several sub-categories.

5. Can a meaningful numerical target for 2030 be set? Is there already a baseline value for 2015?

Yes. However, it would be most appropriate to wait for UNFCCC COP21 before setting a target, as the two should be consistent and the latter has legal value in international climate agreements.

Target 2.5

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

For this target we identify two possible core indicators: the “ex-situ crop collection indicator (listed here as indicator 2.5.1), which refers to vegetal entities, and the (listed as indicator 2.5.2), while the other refers to domesticated animals and their related wild species.

Indicator 2.5.1

Ex-situ crop collections indicator

1. Precise definition of the indicator

The **Ex-situ crop collections** indicator is a dynamic measure of the bio- and geographical diversity contained within ex-situ collections across time.

Plant genetic resources for food and agriculture (PGRFA) are the biological basis of world food security. They consist of the diversity of genetic material contained in traditional varieties and modern cultivars grown by farmers as well as crop wild relatives and other wild plant species. It is widely believed that PGRFA are being lost. Agricultural systems are dynamic and the amounts and identity of the genetic diversity in them is constantly subject to change. Ex situ conservation of PGRFA represents the most trusted and popular means of conserving plant genetic resources worldwide. The measure of trends in ex situ conserved materials provides an overall assessment of the extent to which we are managing to maintain and/or increase the total genetic diversity required for current and future production and therefore secure under controlled conditions from any permanent loss of this type of genetic diversity occurring in the field.

The indicator proposed for target 15.5 under SDG serves also as indicator for the CBD's Aichi Target 13 on *genetic diversity of cultivated plants [...] and of wild relatives* and is described at the webpage of the Biodiversity Indicators Partnership (BIP), a network of organizations which have come together to provide the most up-to date biodiversity information possible for tracking progress towards the Aichi Targets (<http://www.bipindicators.net/cropcollections>).

2. How is the indicator linked to the specific TARGET as worded in the OWG report and copied above?

The indicator has a direct link to "biodiversity" and, indirectly to "food security", as plant genetic resources are at the base of agricultural ecosystems and biodiversity, and make up to more than 90% of food calories consumed by the world's population. Ex situ collections represent the most accessible gene pool for breeding programmes to improve crop varieties and to find traits of resistance and adaptability to biotic and abiotic stresses, including climate change, salinity, drought, flooding, as well as pests and diseases. Sustainable crop production intensification heavily depends on plant genetic resources and their adequate management.

3. Does the indicator already exist and is it regularly reported?

The indicator has been calculated by FAO/AGPMG in 2008 and 2014. It will be calculated again in 2015 and then periodically every 2-3 years based on data reported by member countries to the Commission of Genetic Resources of Food and Agriculture on the implementation of the Second Global Plan of Action for PGRFA, as agreed at CGRFA-15: <http://www.fao.org/3/a-mm181e.pdf>. The links to the BIP and CBD are provided above.

Country data are stored in WIEWS, the FAO PGRFA information system maintained by AGP (see <http://www.pgrfa.org/WIEWS/>). WIEWS responsible officer is currently Mr Stefano Diulgheroff (wiew@fao.org).

Existing data sources should be identified, possibly with both time and country coverage. If there are not sufficiently dense data sources, a description of the kind of investment that is likely necessary to bring coverage to a sufficient extent to make global monitoring meaningful should be provided.

4. Comment on the reliability, potential coverage, comparability across countries, and the possibility to compute the indicator at sub-national level.

Reliability

Data on genebank holdings which the indicator uses are relatively reliable as they have been periodically reported to FAO since 1996. For the majority of staple crops the largest collections are held by international research centers.

Coverage

Data from more than 2 million accessions conserved ex situ world-wide are already accessible. It is expected that by mid 2015 data from 0.5 to 1 million additional accessions will be gathered from countries around the world. This will allow a relatively accurate elaboration of the indicator, which nevertheless can be subsequently adjusted with the incorporation of missing genebank data. The calculation of the indicator and its evolution overtime will be readjusted with the additional data.

Comparability across countries

The indicator can be calculated globally as well as for each individual country and region. National and regional values can be compared among themselves as calculation is done in the same way for all countries and regions.

Sub-national estimates

Not applicable.

5. Can a meaningful numerical target for 2030 be set? Is there already a baseline value for 2015?

A numerical target for 2030 could be expressed as a minimum percentage *increase* of the indicator value, with respect to the value it had in a specific baseline year such as 1996, which is the year of adoption of the Global Plan of Action for the Conservation and Sustainable Use of PGRFA.

Indicator 2.5.2

“Number/percentage of local breeds classified as being at-risk, not-at-risk and unknown-levels of risk of extinction)”

1. Precise definition of the indicator

The indicator presents the percentage of livestock breeds classified as being at risk, not at risk or of unknown risk of extinctions at a certain moment in time, as well as the trends for those percentages.

The indicator is based on the most up to date data contained in FAO’s Global Databank for Animal Genetic Resources DAD-IS (<http://dad.fao.org/>) at the time of calculation. Risk classes are defined based population sizes of breeds reported to DAD-IS. The risk class is considered to be “unknown” if (i) no population sizes are reported or (ii) the most recent population size reported refers to a year more than 10- years before the year of calculation (10 year cut off point).

Links to official definitions/descriptions of the indicator are reported below:

The indicator is one out of a set of 3 sub-indicators which are defined in the document CGRFA/WG-AnGR-7/12/7 “Targets and indicators for animal genetic resources” (<http://www.fao.org/docrep/meeting/026/me514e.pdf>) and that are endorsed in their current form by Commission on Genetic Resources for Food and Agriculture at its the 14th Session (see par 28 CRRFA-14/13/Report at <http://www.fao.org/docrep/meeting/028/mg538e.pdf>). The indicator serves to monitor the implementation of the [Global Plan of Action for Animal Genetic Resources](#). In this respect the indicator is presented in the “Status and Trends of Animal Genetic Resources-2014” (see <http://www.fao.org/3/a-mm278e.pdf>).

This indicator is also proposed for the Target 15.5 under SDG, and it serves also as an indicator for the Aichi Target 13 “**Genetic Diversity of Terrestrial Domesticated Animals**” under the Convention on Biological Diversity (CBD). It is described on the webpage of the Biodiversity Indicators Partnership (BIP), a network of organizations which have come together to provide the most up-to date biodiversity information possible for tracking progress towards the Aichi Targets (<http://www.bipindicators.net/domesticatedanimals>). Further, it is presented in the Global Biodiversity Outlook 4, page 91 (see <http://www.cbd.int/gbo/gbo4/publication/gbo4-en-lr.pdf>) which is an output of the processes under the CBD.

Risk classes are defined as follows⁹:

- **extinct:** a breed is categorized as extinct when there are no breeding males or breeding females remaining. Nevertheless, genetic material might have been cryoconserved which would allow recreation of the breed. In reality, extinction may be realized well before the loss of the last animal or genetic material.
- **critical:** a breed is categorized as critical if the total number of breeding females is less than or equal to 100 or the total number of breeding males is less than or equal to five; or the overall population size is less than or equal to 120 and decreasing and the percentage of females being bred to males of the same breed is below 80 percent, and it is not classified as extinct.

⁹ FAO. 2007. *The State of the World’s Animal Genetic Resources for Food and Agriculture*, edited by Barbara Rischkowsky & Dafydd Pilling. Rome. Accessible at <http://www.fao.org/docrep/010/a1250e/a1250e00.htm>.

- **critical-maintained:** are those critical populations for which active conservation programmes are in place or populations are maintained by commercial companies or research institutions.
 - **endangered:** a breed is categorized as endangered if the total number of breeding females is greater than 100 and less than or equal to 1 000 or the total number of breeding males is less than or equal to 20 and greater than five; or the overall population size is greater than 80 and less than 100 and increasing and the percentage of females being bred to males of the same breed is above 80 percent; or the overall population size is greater than 1 000 and less than or equal to 1 200 and decreasing and the percentage of females being bred to males of the same breed is below 80 percent, and it is not assigned to any of above categories.
 - **endangered-maintained:** are those endangered populations for which active conservation programmes are in place or populations are maintained by commercial companies or research institutions.
 - **breed at risk:** a breed that has been classified as either critical, critical-maintained, endangered, or endangered-maintained.
- 2. How is the indicator linked to the specific TARGET as worded in the OWG report and copied above?**

The indicator has a direct link to “biodiversity” as animal or livestock genetic resources represent an integral part of agricultural ecosystems and biodiversity as such.

Further there are indirect links to “malnutrition”: Animal genetic resources for food and agriculture are an essential part of the biological basis for world food security, and contribute to the livelihoods of over a thousand million people. A diverse resource base is critical for human survival and well-being, and a contribution to the eradication of hunger: animal genetic resources are crucial in adapting to changing socio-economic and environmental conditions, including climate change. They are the animal breeder’s raw material and amongst the farmer’s most essential inputs. They are essential for sustainable agricultural production.

No increase of the percentage of breeds being at risk or being extinct is directly related to “halt the loss of biodiversity”.

3. Does the indicator already exist and is it regularly reported?

Yes, the indicator exists. It is calculated by FAO/AGAG and reported biannually to the Commission of Genetic Resources of Food and Agriculture. The most recent report is available at: <http://www.fao.org/3/a-mm278e.pdf>. The links to the BIP and CBD are provided above. FAO is a partner in the BIP and provides information on the indicator directly to the partnership.

The underlying data base DAD-IS is maintained by FAO/AGAG (see <http://dad.fao.org/>). The contact person for DAD-IS is Ms Roswitha Baumung. Data are officially provided by countries. Data entry is possible all over the year.

Sustainability of the indicator production and its use within a meaningful global monitoring framework is strongly dependent on the maintenance and development of DAD-IS by FAO.

4. Comment on the reliability, potential coverage, comparability across countries, and the possibility to compute the indicator at sub-national level.

Reliability

The reliability of measures of population size for breeds varies across countries and species (similarly to what is the case for population size of livestock species provided in CountrySTAT). However, rough estimates on country level are considered to be sufficient to reliably detect global and regional trends.

Coverage

The Global Databank for Animal Genetic Resources currently contains data from 182 countries and 38 species. The total number of national breed populations recorded in the Global Databank has increased dramatically since 1993 (from 2 716 national breed populations to 14 869 and from 131 countries to 182). The total number of mammalian national breed populations recorded in June 2014 was 11 062. The total number of avian national breed populations recorded in 2014 was 3 807. However, breed-related information remains far from complete. For almost 60 percent of all reported breeds, risk status is not known because of missing population data or lack of recent updates. Generally data collection should be possible in all countries. Updating of population size data at least each 10 years is needed for the definition of the risk classes.

Comparability across countries

Completely comparable as calculation is done in the same way for all countries and the same definitions on risk classification is applied.

Sub-national estimates

Sub-national estimates can be obtained with regard to the risk status of each national breed population and species. Results can be presented at the national, regional and global levels.

5. Can a meaningful numerical target for 2030 be set? Is there already a baseline value for 2015?

With regard to halt the loss of biodiversity the target can be formulated as “The genetic diversity of farmed and domesticated animals is maintained” which is consistent with the target formulation of Aichi Target 13 under the CBD. However the future projections presented in the Global Biodiversity Outlook 4, Figure 131, page 91 (see <http://www.cbd.int/gbo/gbo4/publication/gbo4-en-lr.pdf>) suggest such halt will be unrealistic.

Target 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 productivity capacity in developing countries, in particular in least developed countries”

Indicator 2.a.1

“Agriculture Orientation Index for Government Expenditures ”

1. Precise definition of the indicator

The Agriculture Orientation Index (AOI) for Government Expenditures is defined as the Agriculture share of Government Expenditures, divided by the Agriculture Share of GDP, where Agriculture refers to the agriculture, forestry, fishing and hunting sector.

$$AOI = \frac{\text{Agriculture Share of Government Expenditures}}{\text{Agriculture Share of GDP}}$$

An AOI greater than 1 reflects a higher orientation towards the agriculture sector, which receives a higher share of government spending relative to its contribution to economic value-added. An AOI less than 1 reflects a lower orientation to agriculture, while an AOI equal to 1 reflects neutrality in a government’s orientation to the agriculture sector.

Agriculture refers to the agriculture, forestry, fishing and hunting sector, based on the Classification of the Functions of Government (COFOG) developed by the OECD and published by the United Nations Statistics Division (UNSD), found at <http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=4&Top=1&Lg=1>.

Government expenditures are all outlays or expenses associated with supporting a particular sector or purpose, including compensation of employees, and subsidies and grants paid as transfers to individuals or corporations in that sector. For a full description, see the Government Finance Statistics Manual (GFSM) 2001, developed by the International Monetary Fund (IMF), found at <http://www.imf.org/external/pubs/ft/gfs/manual/>.

The Agriculture Share of GDP is measured by the ratio of Agriculture Value Added over GDP, based on official data reported by countries to the United Nations Statistics Division or to the OECD.

The annual data and indicator, collected and compiled by the Food and Agriculture Organization of the UN (FAO), can be found on the FAOSTAT domain at: <http://faostat3.fao.org/download/I/IG/E>, covering the periods 2001-2012.

2. How is the indicator linked to the specific TARGET as worded in the OWG report and copied above?

Government spending in Agriculture includes spending on sector policies and programs; soil improvement and soil degradation control; irrigation and reservoirs for agricultural use; animal health management, livestock research and training in animal husbandry; marine/freshwater biological research; afforestation and other forestry projects; etc.

Spending in these agricultural activities helps to increase sector efficiency, productivity and income growth by increasing physical or human capital and /or reducing intertemporal budget constraints. However, the private sector typically under-invests in these activities due to the presence of market failure (e.g. the public good nature of research and development; the positive externalities from improved soil and water conditions; lack of access to competitive credit due to asymmetric information between producers and financial institutions, etc).

Government spending in agriculture is essential to address these market failures. This leads to several potential indicators for the SDGs, which include: a) the level of Government Expenditures in Agriculture (GEA); b) the Agriculture share of Government Expenditures, and c) the AOI for Government Expenditures.

An indicator that measures GEA levels fails to take into account the size of an economy. If two countries, A and B, have the same level of GEA, and the same agriculture contribution to GDP, but country A's economy is 10 times that of country B. Setting the same target levels for GEA fails to take economic size into account.

An indicator that measures the Agriculture share of Government Expenditures fails to take into the relative contributions of the agricultural sector to a country's GDP. Consider two countries with the same economic size, C and D, where agriculture contributes 2% to C's GDP, and 10% to country D's GDP. If total Government Expenditures were equal in both countries, C would experience greater relative investment in Agriculture than D. If total Government Expenditures differed, the result could be magnified or diluted.

The AOI index takes into account a country's economic size, Agriculture's contribution to GDP, and the total amount of Government Expenditures. As such, it allows for the setting of a universal and achievable target.

3. Does the indicator already exist and is it regularly reported?

The indicator is maintained and reported by FAO in FAOSTAT, with metadata soon to be available at http://faostat3.fao.org/mes/methodology_list/E.

The underlying annual data is official country data, from 2001 to 2012, reported by countries through a questionnaire jointly developed by FAO and the IMF using the COFOG and GFSM classifications. The database currently covers 139 countries.

4. Comment on the reliability, potential coverage, comparability across countries, and the possibility to compute the indicator at sub-national level.

The use of the COFOG and GFSM classifications promotes international and inter-temporal comparisons. The expenditure data reported is typically based on administrative data based on a government's public accounts, while GDP and Agriculture Value Added is based on its National Accounts. The nature of the data typically prohibits indicators at sub-national level, as most countries do not compile sub-national GDP estimates, nor sub-national Government Expenditure figures.

Reliability

The numerator (Agriculture Share of Government Expenditures) is based on administrative data, which has no statistical margin of error. The denominator (Agriculture share of GDP) is based on a System of National Accounts, following international guidelines, in which either Agriculture Value-Added or GDP estimates can suffer from statistical errors, though it is difficult to measure. Errors and lack of reliability due to non-statistical errors can arise, for example, as a result of the mapping between national concepts to international classifications (by respondents), the use of different measures of government across countries due to reporting issues (budgetary central, central, and general, as described above).

Coverage

It is relatively high for these particular indicators, with 139 countries included. However, some countries have not provided data for all 13 years from 2001 to 2012, and the level of government to which expenditures pertain can differ.

Comparability across countries

It is facilitated by use of the Agriculture share of Government Expenditures in the numerator, which mitigates difference that arise when some countries report expenditures for all levels of government, and others only for the central government. This does not rule out the fact that state and local governments may spend a different share on Agriculture than the central government. For this reason, analysis of the trends in this indicator may be more reliable, for comparison purposes, than just the indicator alone.

While COFOG and GFSM facilitate international comparisons, not all countries report expenditures covering all three levels of government (Central, State and Municipal). The three levels of reporting include (from smallest to largest): 1) Budgetary Central Government; 2) Central Government, which includes Budgetary Central Government as well as extra-budgetary units; and 3) General Government, which includes Central, State and Local Government. Countries that fully report General Government Expenditures may not report Central Government Expenditures.

Since not all countries collect or share data on all three levels of reporting, the level with the most complete time series is used for each country. To the extent that the Agriculture share of Government Expenditures differs across levels of government (Central, State and Local), differences in this indicator may reflect differences in reporting.

Sub-national estimates

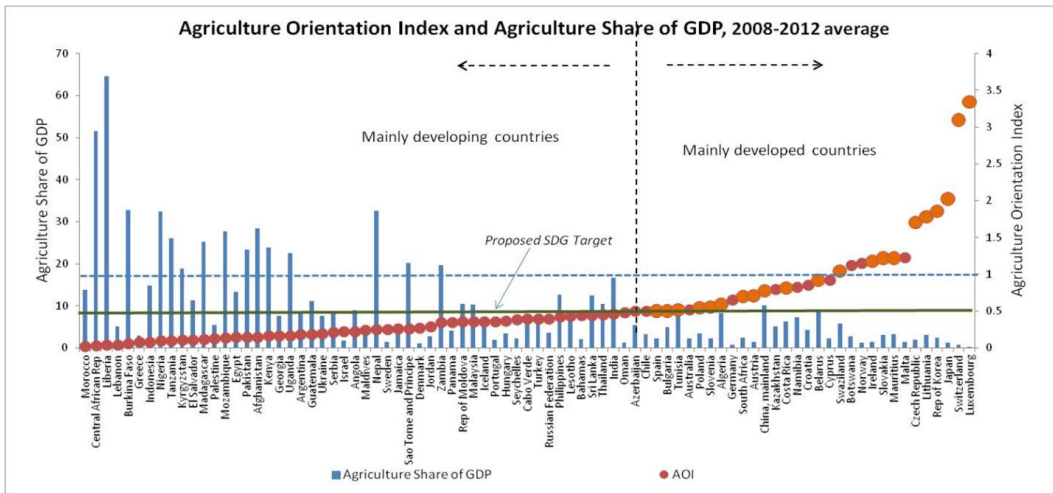
They are not possible to compute sub-national or population group estimates, given the nature of the underlying data.

5. Can a meaningful numerical target for 2030 be set? Is there already a baseline value for 2015?

There is no baseline value for this indicator for 2015.

There is some precedent for using government expenditures as a target indicator for Agriculture. Signatories to the Maputo Declaration set a target of 10% for the Agriculture and Rural Development *Share of Government Expenditures*. However, as Rural Development is not a purpose listed under the COFOG classification, there has been considerable difficulty in consistently measuring this indicator. Furthermore, in setting a universal target, this Share indicator suffers from the problems listed above (comparison of economies of different size, with different levels of government expenditures, and with different agricultural shares of GDP).

A proposed target for 2030 would be an AOI of 0.5. Most but not all developed economies have already achieved this target as have some developing economies, making this an achievable target (see graph below). Among developed countries that have not achieved this target, such as Sweden, Denmark, Iceland, Hungary and Poland, the Agriculture Share of GDP is very small.



Target 2b

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

Indicator 2.b.1

“Evolution of potentially trade restrictive and distortive measures in agriculture”

Evolution of potentially trade restrictive and distortive measures in agriculture, as measured by:

-Domestic and export subsidies (annual notified amounts). The source for these data is the WTO's Agriculture Information Management System (Ag-IMS). Other data sources (e.g. OECD data on support to agriculture in OECD countries) may be used, as appropriate;

-Tariffs and non-tariff measures in the agriculture sector (applied tariff levels, and notified recourse to tariff-rate quotas, special safeguards and quantitative export and import restrictions). The source for these data would be the WTO's Integrated Data Base, Ag-IMS and other WTO notifications. Other data sources (e.g. OECD) may be used, as appropriate.

[indicator description to be further elaborated]

Target 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”

Indicator 2.c.1

“Indicator of Food Price Anomalies” (IPA)

1. Precise definition of the indicator

The indicator of price anomalies (IPA) identifies markets prices that are abnormally high. The IPA relies on a weighted compound growth rate that accounts for both within year and across year price growth.

The indicator directly evaluates growth in prices over a particular month over many years, taking into account seasonality in agricultural markets and inflation, allowing to answer the question of whether or not a change in price is normal for any particular period.

2. How is the indicator linked to the specific TARGET as worded in the OWG report and copied above?

The IPA is uniquely suited to the Target 2.c as it allows early detection of abnormal market conditions, permitting the timely adoption of policies and measures aiming to limit extreme food price volatility. The indicator is able to accomplish this since one can directly measure the number of events and their intensity pre and post the policy adoption.

3. Does the indicator already exist and is it regularly reported?

The indicator is already implemented by FAO’s Global Information and Early Warning System through its Food Price Monitoring and Analysis (FPMA) website at <http://www.fao.org/gIEWS/food-prices/indicators/all/en/>. The IPA is updated monthly for the 90 countries covered in the FPMA Tool. Important country/commodity markets that have been identified as having abnormally high prices are highlighted.

The indicator relies on FAO’s FMPA price tool that has been publically available since 2009. The FPMA price tool has a total of 1200 commodity/markets in 90 countries, of which 90 percent are updated up to the last month.

4. Comment on the reliability, potential coverage, comparability across countries, and the possibility to compute the indicator at sub-national level.

Reliability

To be reliable, the indicator requires monthly prices series that are at least 4 years in length, so as to estimate with confidence certain subcomponents of the indicator (such as the reference weighted averages and standard deviations).

This indicator has been compared to other proposed measures of abnormal price growth and has shown to have a lower probability (or lower Type II error) of revealing abnormal price growth when the price movements are indeed normal.

Coverage

As mentioned above, the indicator currently covers 90 countries and their sub-markets.

Comparability across countries

The IPA allows comparisons not only across country markets but within countries. This is possible because of its clear definition of thresholds of what constitutes abnormal price growth and the fact that the methodology is independent of the country/market being applied to.

Sub-national estimates

Sub-national estimates are automatically generated for the countries in the FPMA price tool that have sub-national data available (i.e., multiple market coverage). Some countries only provide a national average and/or the main markets in the capitol city.

5. Can a meaningful numerical target for 2030 be set? Is there already a baseline value for 2015?

For countries currently covered, baseline levels could be set as the number of observed price anomalies over the 48 months of 2010-2014. Targets for 2030 could be framed in terms of the percentage reduction that will be observed in the number of observed price anomalies in the 2026-30 period with respect to the baseline. As the IPA's main objective is to identify abnormal price events to alert of potential impact on food access by vulnerable populations for the adoption of appropriate interventions by governments and the international community, the reduction in the number of anomalies would be taken as assign that markets have been effectively become more stable.