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# Mapping and Harmonization of Nutrition-Sensitive Indicators Across Sectors to Facilitate Food and Nutrition Security Monitoring and Evaluation Processes

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***By***

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## Abstract

Harmonised nutrition indicators are crucial for effective assessment, surveillance and monitoring of nutrition in a coordinated manner across existing systems in Kenya. The study utilised a multi-sectoral expert approach to map and harmonise nutrition indicators per sector and institution by reviewing nutrition-sensitive indicators, strategies and programmes. The study involved collection of views on indicator mapping, ranking; evaluation and prioritisation based on expert advice; while obtaining consensus on the final key indicators. The experts drawn from relevant sectors provided a preliminary list of 181 indicators. A criterion evaluating relevance, actionability, meaningfulness and usability, accuracy, feasibility, timeliness and international comparability of the indicators was applied resulting to 130 prioritised indicators.

Majority of the prioritised indicators were related to the health sector (57) followed by agriculture (27), National Drought Management Authority (NDMA) (17), water (16), education (7) and social protection (6). Predominance of the indicators related to the health sector is satisfactory given nutrition falls under the health domain. The role of agriculture in provision of adequate food of good quality and that of water and sanitation services make the related sectors important in the nutrition monitoring space. However, some nutrition indicators were observed to have been poorly defined and therefore not specific, measurable, attainable, relevant and timely (SMART). Further, the country has limited data on some indicators which constrains their usability and monitoring.

The study recommends regular review and monitoring of the harmonised indicators to cater for any emerging contexts; broadening the sectors to include all other emerging relevant sectors that might have implications on nutrition and include experts, such as medical professionals. It will be important to regularly improve the existing list to enhance quality of the harmonised indicators, validation of novel indicators, as well as serve as a sharing platform for experiences gained in the use of nutrition surveillance and monitoring systems. The study also recommends development of a glossary listing all the harmonised indicators and indicating how they are computed. Collaboration among sectors and institutions in the nutrition space as well as promotion of data pooling and access in encouraged to enhance strong nutrition surveillance and monitoring systems.

# Introduction

Improved nutrition is a core concept in development dialogues at the global, regional, and country levels such as illustrated in the 2030 Agenda for Sustainable Development, African Union's Agenda 2063 and country specific nutrition institutional frameworks (AUC, 2015; Webb, 2014; Kihiu & Franklin, 2021). Improved nutrition is not only a core development goal but a smart development policy; the United Nations System Standing Committee on Nutrition, 2004, highlights that realising adequate nutrition can reinforce additional key development priority outcomes such as poverty reduction, improved governance and human rights, health sector reforms and trade liberalisation (Haddad et al., 2004).

Nutritional plans and strategies require knowledge of the actual nutrition condition of an individual, community, or country (de Guzman & Molano,1994). This assessment aims to define the nutritional problem in terms of magnitude and distribution (FAO, 2007). Upon assessment, an analysis of the causes, choice and prioritisation of actions to combat identified nutritional problems is needed (FAO, 2007; Maire & Delpeuch, 2005). Further, countries need to track nutrition status changes over time and monitor, report on and account for progress of national plans and programs towards improved nutrition (Wüstefeld et al., 2015; de Guzman & Molano,1994; Maire & Delpeuch, 2005). The status, assessment and monitoring of nutrition is done on the basis of information derived from nutrition indicators. An indicator, as the word suggests, "tries to reflect a given situation or an underlying reality which is difficult to qualify directly, and usually to give an order of magnitude" (Maire & Delpeuch, 2005). It is a "measure of performance, usually a rate or percentage or proportion" (UNICEF, 2020). Nutrition indicators should be available to planners and decision makers for appropriate recommendations on nutrition-related interventions on problems affecting a population.

Many factors can contribute towards improving nutrition and therefore multidimensional solutions are required. The challenge is identifying and choosing relevant indicators for appropriate action. In an assessment of use of nutrition data in decision making, WHO and UNICEF (2020), note that while developing countries have abundant data on nutrition indicators, evidence-based decision-making is hindered by lack of meaningful utilisation of the data. Given that nutrition-related decisions are taken and implemented within a multisectoral system, the sources of available nutrition data and indicators are also multi-dimensional in nature (WHO & UNICEF, 2020). This has led to many indicators being used across major sectors and even within the sectors, the indicators are scattered among many documents (Maire & Delpeuch, 2005). If one was to consider all sectors with a direct or indirect link with the nutrition, there will be several hundreds of them. This presents decision makers and planners with challenges in making a judicious choice among the indicators to take appropriate action as well as presence of inconsistencies in data collection, data quality and indicator measurement (WHO &UNICEF, 2020).

Similar observations were made in a landscape analysis of nutrition information in Eastern and Southern Africa region, including Kenya, where many countries collect large amounts of data which impacts on data quality (UNICEF, 2020). Further, not all the data collected is

converted into indicators. In some instances, where nutrition indicators were provided, there was seldom clarity around the source of the data, means of verification, and what would be obtained from surveys, routine systems or other M&E data sources (UNICEF, 2020).

It was also observed that there was lack of consistency on how often the countries updated their national indicators and associated data elements and reporting tools. Additional challenges observed included lack of a standard list of nutrition indicators with variation on how data was collected and reported (UNICEF, 2020). Despite the presence of abundant nutrition-specific and nutrition-sensitive indicators, there are still some data and nutrition indicators gaps in some nutrition-related areas, which limit the scope of evidence-based decision making by the nutrition actors (WHO & UNICEF, 2020).

As highlighted by UNICEF (2020), there is need for countries to develop a list of standardised indicators with definitions, numerators and denominators clearly stated. The concise selection of nutrition indicators and development of harmonised standards, tools and methods in relevant sectors such as health, water, agriculture and social protection provides actors with an easy-to understand snapshot of key nutrition outcomes and track progress (WHO 2019; WHO & UNICEF, 2020).

There is also need for improved presentation of indicators and datasets, for instance in the form of dashboards, for easy access and analysis at all levels of government (WHO and UNICEF, 2020; UNICEF, 2020). It is also important for countries to encourage cross-sectoral linkages to maximise on use of nutritional data and indicators. Where there are nutrition gaps, there is need to synthesise the existing pool of information such that indicators are configured with this data or need for the data to be reviewed (WHO and UNICEF, 2020; UNICEF, 2020). Further, WHO & UNICEF (2020), highlight the importance of a country's multisectoral nutrition system to increase synergy among actors through increased awareness on how outcomes of one sector contributes to multidimensional solutions to tackle the nutrition problems. This can be achieved through joint planning at the national and county levels, and collective monitoring of nutrition indicators. To contribute towards addressing the identified gaps, the Kenya National Information Platform for Food and Nutrition (NIPFN) project aims at assessing the current and potential nutrition-sensitive indicators, data related processes and information systems within different sectors.

The policy question then is: What are the current and potential nutrition-sensitive indicators, data related processes and information systems within different sectors?

To address this question, the specific research objectives are:

i) Mapping exercise of indicators per sector and institution;

ii) Literature review of nutrition sensitive indicators for global guidance (e.g., WHO global indicators; FAO Compendium of nutrition sensitive indicators);

iii) Review of nutrition sensitive strategies and programmes for M&E indicators;

iv) Harmonisation and prioritisation of key nutrition sensitive indicators from each sector. The findings of the research will inform evidence-based policies or programmes in all sectors that contribute to improvement in human nutrition.

# Burden of Malnutrition: Policies, Strategies and Programmes

In 2014, Kenya lost an estimated 6.9 per cent of GDP (Ksh373.9 billion or US$4.2 billion) as a result of child undernutrition. Productivity-related losses contributed the largest costs at 6.5 per cent of GDP followed by health and education at 0.34 per cent and 0.06 per cent, respectively. Child undernutrition increases the risk of morbidity and mortality; affects school attendance, performance, grade repetition; and overall economic productivity in the long-term according to the *Cost of Hunger in Africa* report (2019).

The country has made remarkable progress towards achieving some of the targets set at the global level: the Scaling Up Nutrition (Sue N) Movement, the World Health Assembly (WHA) 2025 nutrition targets, the Sustainable Development Goals (SDGs) and the United Nations (UN) Decade of Action on Nutrition (2016–2025).

And at the national level: the Constitution (2010) and the Medium Plan term III. The Kenya National Nutrition Action Plan (KNAP) 2018–2022 provides a multisectoral approach and promotes cross-sectoral collaboration to sustainably address the social determinants of malnutrition. The functions are ascribed to the two government levels and provide an umbrella framework and guidance to counties, which will develop their own County Nutrition Action Plans (CNAPs) to align with the KNAP's strategic framework.

Other policy documents supporting the implementation of the nutrition action plans include: Implementation framework for securing a breastfeeding-friendly workplace environment (2020-2024). It provides a national roadmap for coordinated implementation and monitoring of interventions to support breastfeeding in the workplaces in the public and private sectors. The Kenya Agri-Nutrition Implementation Strategy (2020-2025) highlights access to safe, diverse and nutritious food by strengthening the food system. The Scaling Up Nutrition (SUN) Business Network Kenya Strategy (2019 -2023) recognises the role of the private sector in making safe and nutritious food available and affordable. The Kenya Nutrition Monitoring and Evaluation Framework (2018–2022) ensures that the Government and partners can monitor the progress and success of the KNAP.

Further, legislative frameworks have been established to support nutrition interventions: mandatory salt iodisation to prevent and control iodine deficiency disorders; mandatory food fortification of cooking fats and oils and cereal flours, to control micronutrient deficiencies (Food Drugs and Chemical Substances Act 2012; food labelling, additives, and standard (amendment) regulation 2015 on trans fats). The benefits of breastfeeding are protected through the Breast Milk Substitutes Regulation and Control Act 2012.

The specific targets set to track progress include:

(i) a 40-per cent reduction in the number of children under five years who are stunted;

(ii) a 50-per cent reduction of anaemia in women of reproductive age;

(iii) 30-per cent reduction in low birth weight;

(iv) no increase in childhood overweight;

(v) increase the rate of exclusive breastfeeding in the first six months to at least 50 per cent;

(vi) reduce and maintain childhood wasting to less than five per cent;

(vii) 30-per cent relative reduction in the mean population intake of salt/sodium by 2025;

(viii) 25-per cent relative reduction in the prevalence of raised blood pressure or contain the prevalence of raised blood pressure, according to national circumstances; and

(ix) halt the rise in obesity and diabetes.

The country is making progress towards meeting these targets, with; 26.2 per cent of children under five years affected by stunting, 4.2 per cent of children under five years are wasting, and the prevalence of overweight children under five years being 4.1 per cent. Regarding Maternal, Infant and Young Child Nutrition (MIYCN), the country is on course; 61.4 per cent of infants aged zero to five months are exclusively breastfed. However, 11.5 per cent of infants have a low weight at birth. No progress has been made towards reducing anaemia; 28.7 per cent of women of reproductive age (15 to 49) are affected. An estimated 13.4 per cent of adult women and 3.6 per cent of adult men live with obesity. At the same time, diabetes is estimated to affect 7.3 per cent of adult women and 7.0 per cent of adult men (Global Nutrition Report, 2021).

# Literature Review

## 3.1 Measures of Malnutrition

Understanding and measuring nutritional status has increasingly gained importance with research on the weak link between food availability and nutritional outcomes. Lack of proper nutrition is multifaceted and can result from either insufficient supply of essential nutrients (undernutrition) or excess calorie consumption (overnutrition) (Bhattacharya et al., 2019; Black et al., 2016). Overnutrition is associated with overweight and obesity while undernutrition is associated with multiple conditions, including micronutrient deficiencies, acute malnutrition and chronic malnutrition (Black et al., 2016). As such, improper nutrition can result in: increased body weight causing several non-communicable diseases; different nutrition deficiency diseases; nutrition related complications; and even increases risk to morbidity and mortality from decreased body immunity (Blössner et al., 2005; Bhattacharya et al., 2019). Malnutrition is thus a health outcome and a risk factor for both disease and exacerbated malnutrition (Blössner et al., 2005). Nutritional status can be measured by assessing clinical signs and symptoms; biochemical indicators; dietary surveys; and anthropometric measurements (Bhattacharya et al., 2019; Knox, et al., 2003; WHO, 1999; Black et al., 2016).

### i) Anthropometric Measurements

The anthropometric measurements, which refer to body measurements of body composition of fat and lean mass, have a long tradition of assessing nutritional status of individuals (WHO, 1999; Knox, et al., 2003; Bhattacharya et al., 2019; Prudhon, 2011; Blössner et al., 2005; Shrivastava, et al., 2014). The measurements are inexpensive, non-invasive, highly sensitive to the broad spectrum of nutrition and provide detailed information on the body structure. However, disadvantage of anthropometry as stipulated by Blössner et al., (2005) is that the measure lacks specificity as body measurements are also sensitive to many other factors such as stress, altitude, and genes. Among the common anthropometric measures include body mass index (BMI), mid-upper-arm-circumference (MUAC), weight-for-height (or length), height (or length)-for-age, and weight-for-age (WHO, 1999; Bhattacharya et al., 2019; Blössner et al., 2005). A common feature of the anthropometric indicators is the combination of body measurements with age (Blössner et al., 2005).

### ii) Biochemical Measurements

Biochemical assessment involves use of laboratory measures of: serum protein, serum micronutrients, serum lipids, immunological and metabolic parameters (Knox, et al., 2003; Bhattacharya et al., 2019; Blössner et al., 2005; Shrivastava, et al., 2014). Biochemical indicators are not easily diagnosable and require testing of body samples. As highlighted by Knox, et al. (2003), among the specific tests used include: albumin, prealbumin, haemoglobin, serum iron, triglycerides, total iron-binding capacity, magnesium, vitamin levels, trace elements, cholesterol, fasting glucose, renal function, liver enzyme levels, CD4, CD8 and virus

load of HIV.

### iii) Dietary intake

Measurement of dietary intake can give some indication of daily diet intake of individuals and households which in turn helps to determine the variety of non-staple food consumed (Knox, et al., 2003; Bhattacharya et al., 2019; Shrivastava, et al., 2014). It involves the assessment of adequacy of micro-nutrients and macro-nutrients in the current diet. The assessment also identifies factors affecting adequate nutrient intake, food intolerances that are likely to affect intake and appropriate medication regimes. Dietary intake assessments aid in educating, counselling and determining appropriate measures to improve the nutritional outcomes of individuals. Approaches used include 24-hour recall and seven-day diet history which have both been shown to provide good estimates of dietary intake. However, there can be misreporting in dietary surveys brought about by poor information recall of the usual diet over long periods of time (Bhattacharya et al., 2019).

### iv) Clinical Assessment

Clinical assessment involves the assessment of conditions that may affect nutritional status and dietary intake as well as assessment of clinical manifestations of micronutrient deficiencies (Knox, et al., 2003; Bhattacharya et al., 2019; WHO, 1999; Prudhon, 2011; Blössner et al., 2005; Shrivastava, et al., 2014). The assessment includes medical history and physical examination to identify malnutrition or its contributors such as social or psychological issues and altered nutritional requirements. Knox, et al., (2003) and Blössner et al., (2005) identify the key areas in clinical assessment to include: physical appearance e.g. oedema, hair and skin changes; evaluation of opportunistic infections; comorbid conditions; occurrence of diarrhoea; symptoms of gastrointestinal distress or malabsorption; medications; use of nutritional or herbal supplements; functional status; and assessment of social, psychological, and financial resources affecting one's ability to obtain, prepare, and eat food. Clinical assessments require close and detailed inspection of the clinical history and status of an individual and also the consideration of confounders and to present a good representation of the deficiency.

### v) Environment Assessment

Inadequate diet and disease, which are immediate causes of malnutrition (UNICEF, 1990), are closely linked to environmental conditions (Blössner et al., 2005; Shrivastava, et al., 2014). Factors such as diseases with an environmental component (such as environments with insect or protozoan vectors), environmental contamination, and ecological factors (e.g., the breakdown of ecological balance between population and capacity of environment) clearly compromise the nutritional status of individuals (Blössner et al., 2005). Thus, an environmental diagnosis can help identify the nutritional status of a community (Shrivastava, et al., 2014). It is also noted that malnutrition can impact the environment, leading to a vicious cycle of additional nutritional problems. To illustrate this, Blössner et al., (2005) highlights that malnutrition can lead to poverty, and in turn unsustainable use of the environment and environmental degradation leading to additional nutritional problems. Thus, breaking the vicious cycle between malnutrition and environmental degradation is important to enhance the nutritional wellbeing of a community.

## 3.2 Selection of Indicators

In their review of food and nutrition security indicators, Pangaribowo, et al., (2013), indicate that there is no best indicator, best measure of an indicator, or best analysis of an indicator in a generic sense, where a complex phenomenon is to be reflected. There is need for a range of indicators to be assessed. This notion applies to nutrition matters as there is no single indicator that can summarise the complexity of nutrition issues, therefore requiring a set of

indicators.

When selecting nutritional indicators, FAO (2007) highlights different indicators that are used for assessment and analysis purposes. Assessment indicators address the following questions: who suffers from malnutrition? what is the type of malnutrition? when? and where? The indicators are also used to analyse the causes of the problem and address the following question: why are people malnourished or at risk of malnutrition?

In monitoring and evaluating nutrition programmes, Maire & Delpeuch, (2005) identify three different types of evaluations and related indicators namely: monitoring implementation of programmes; evaluation of programme impact; and keeping track of general trends in the nutritional situation. Monitoring implementation of programmes deals with the assessment of programme activities to ensure a programme was implemented according to plans. Indicators of programme implementation developed from conception and monitored for each stage of the programme.

In evaluation of programme impact, indicators of outcomes and impact are used to measure the effectiveness of the programme. Lastly, monitoring general trends in the nutrition situation encompasses the indirect effects of the programme. Indicators used here help in the regular measurement of progress to assess whether the situation is evolving in the desired direction and provide feedback on the choice of strategies whether they are still relevant or whether activities need refocusing (Maire & Delpeuch, 2005).

As such, the selection of nutrition indicators should be rooted in a solid theory of change framework that is rapidly available and communicable to actors in nutrition and always aiming at answering a given set of policy questions (Pangaribowo, et al., 2013). The theory of change should also indicate the essential indicator dataset that helps interpret pathways of: where are we now? where do we want to go? how will we get there? and how will we know we have arrived? (UNICEF, 2020; WHO and UNICEF, 2020). Additional quality of nutrition indicators is; the availability or obtainability of acceptable data; validity; comparability; degree of association or correlation of a particular indicator with other development indicators; comprehensiveness; appropriateness; sensitivity; relevance; balance among sectors and generally between socioeconomic and nutrition indicators; and impact orientation (Shamah-Levy et al., 2019; Pangaribowo, et al., 2013; de Guzman & Molano,1994; Gurinovi´c et al., 2017; Hebestreit, et al., 2019; Garnica Rosas et al., 2021).

# Methodology

The mapping, harmonisation and prioritisation of key nutrition sensitive indicators among nutrition relevant sectors was achieved through a multistage expert consultation process. Similar methodologies are applied by Garnica Rosas et al., (2021), Verotti et al., (2012) and Bertoldi et al., (2018). The process involves various rounds of rating aimed at: collecting experts' views on indicator ranking; evaluation of indicators with the aim of selecting and prioritising indicators based in expert advice; and lastly obtaining consensus on the final key indicators (Garnica Rosas et al., 2021). Harmonisation was achieved through "minimising differences in comparability of measures, variables and methods", so that nutrition outcomes among various sectors and institutions are comparable (Hebestreit, et al., 2019; Garnica Rosas et al.,2021).

A total of 25 professionals from 12 relevant institutions, making up a multidisciplinary team, were invited to participate in the process. The institutions included: Kenya National Bureau of Statistics (KNBS); Kenya Institute for Public Policy Research and Analysis (KIPPRA); Ministry of Health, Division of Nutrition and Dietetics; State Department of Livestock, Ministry of Agriculture, and Livestock, Development; State Department for Fisheries, Aquaculture and The Blue Economy, MoALFC ; Agri-Nutrition Unit, Department for Crops Development and Agricultural Research, MoALFC; National Information Platform for Food Security and Nutrition (NIPFN); Ministry of Water and Sanitation and Irrigation (MoWSI); State Department for Social Protection, Ministry of Labour and Social Protection; USAID Advancing Nutrition Kenya; Food and Agriculture Organization (FAO); State Department for Economic Planning, the National Treasury; and The National Treasury.

The following process was followed:

## a) Preliminary list of nutrition sensitive indicators

As a starting point, a mapping exercise of nutrition sensitive indicators was carried out to collate a preliminary list of nutrition sensitive indicators in the country. Consultations with nutrition related sectors of the Kenyan economy was complemented by a review of literature to:

i) Capture all important existing nutrition sensitive indicators in nutrition-related sectors and identify gaps.

ii) Ensure inclusion of the global core indicators to support the achievement of the global nutrition targets to be achieved by 2025.

iii) Identify relevant frameworks and proposed set of indicators which Kenya could report on where relevant.

iv) Benefit from global guidance on desirable properties of nutrition indicators and data elements in analysis of missing indicators and configuration of indicators with data.

v) Having essential indicator dataset to measure nutritional goals and targets from the national plans.

As highlighted by Garnica Rosas et al., (2021), the aim of the mapping exercise was to provide experts with an extensive list of all potentially principal nutrition sensitive indicators to be used in the multistage consultation process. As such, all nutrition sensitive indicators, including those with minor evidence of direct association with nutrition, were considered with input from the following frameworks:

i) WHO global indicators;

ii) FAO Compendium of nutrition sensitive indicators;

iii) SUN Compendium of nutrition sensitive indicators;

iv) SDGs; and

v) MDGs.

A summary report from the mapping exercise was developed. The summary report developed served as the basis for discussions with various nutrition actors to select standard harmonised nutrition indicators.

### b) Criteria Agreement

In carrying out the literature review, existing organised and precise criteria for selecting nutrition indicators were identified (Hebestreit, et al., 2019; de Guzman & Molano,1994; Garnica Rosas et al., 2021) and presented to the experts. The criteria presented by Garnica Rosas et al., (2021) was adapted for this purpose and experts given an opportunity for general improvements and modifications to customise it to the Kenyan nutrition space.

### c) Ranking of Indicators

Experts had an opportunity to add missing indicators as well as make general improvements in the framing of indicators in the preliminary list. Indicators were grouped in six dimensions representing the sectors/institutions with a direct or indirect link with the nutrition namely; health, water, agriculture, social protection, education and NDMA. Thereafter, experts rated the indicators in the preliminary list using the scale below:

| -1 | 0 | 1 |
|---|---|---|
| Disagree | Neutral | Agree |

where disagree is where the indicator does not meet the criteria; neutral where one is impartial as to whether the indicator meets the criteria or not; and agree where the indicator meets the criteria.

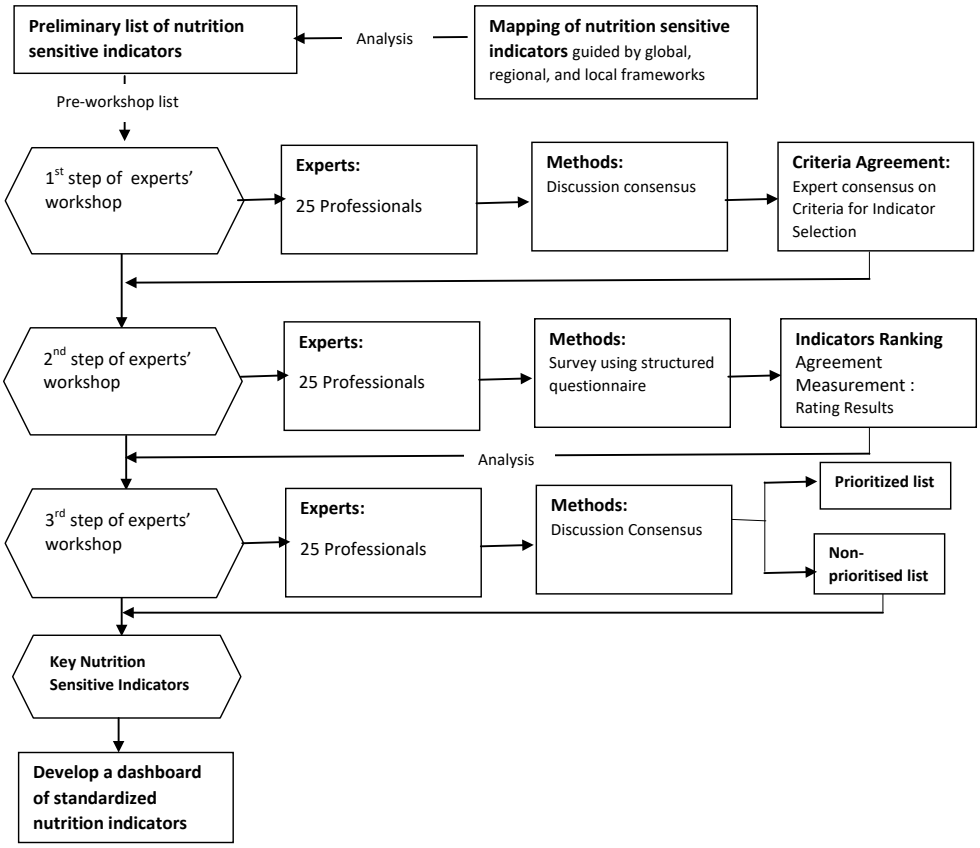
In proportion to the number of respondents, indicators that scored at least 70 per cent of the total maximum score were retained for the next stage. The list of retained indicators served as the basis for the subsequent experts' consultation step on prioritised indicators lists, measures and variables for comparability of outcomes.

### d) Prioritisation of indicator lists

The final step aimed at presenting the experts with an opportunity to discuss and reach a consensus on the selected indicators and prioritisation of the indicator list (Garnica Rosas et al., 2021). Similar to the previous step, experts were given an opportunity to make additions to the list of indicators previously selected. In addition, discussions involved making modifications to the selected indicators to include: rephrasing of indicators; merging comparable indicators; excluding indicators that were not considered to be a priority; and stratification of policy

related indicators either at individual or group level (e.g. age, sex) to facilitate the evaluation of nutrition outcomes among vulnerable groups. Figure 1 summarises the approach used in the mapping and harmonisation of nutrition sensitive indicators across sectors.

**Figure 1: Mapping and harmonization of nutrition-sensitive indicators across sectors**




*Source: Adapted from Garnica Rosas et al., (2021) with authors' modifications*

# 5 Results

## 5.1 Preliminary List of Indicators

The mapping exercise saw the development of a preliminary list of 179 indicators: 83 related to the health sector; 37 to agriculture; 16 to education; 13 to water; seven to social protection; and 20 to NDMA. Table 1 presents the comprehensive preliminary list as developed[1].

**Table 1: Preliminary list of nutrition sensitive indicators**

| Dimension | Indicator | Dimension | Indicator |
|---|---|---|---|
| Health | Percentage of stunted (moderate and severe) children aged 0–59 months | Social Protection | No. of households (HH) receiving nutrition-sensitive cash transfer top ups |
| Health | Percentage of children under five years, who are severely malnourished wasted (severe acute malnutrition). Weight for height Z-score (-3sd) | Social Protection | No. of beneficiaries receiving nutrition-sensitive cash transfer (disaggregated by gender) |
| Health | Percentage of children under five years, who are wasted (moderate acute malnutrition). Weight for height Z-score (-2sd) | Social Protection | No. of counties strengthened to support nutrition sensitive safety nets (NICHE) |
| Health | Children under five years who are overweight | Social Protection | No. of NICHE beneficiaries receiving nutrition counselling |
| Health | Children under five years who are overweight obese | Social Protection | No. of beneficiaries covered under nutrition-sensitive safety net (NICHE) |
| Health | Percentage of children under five years who are attending CWC for growth monitoring for the first time | Social Protection | No. of households receiving GoK cash transfer programmes after every two months (CT-OVC, OPCT, PWSD-CT, HSNP) |
| Health | Percentage of underweight 0-59 months (<-2 z-score) | Social Protection | No. of beneficiaries receiving GoK cash transfer programmes after every two months (disaggregated by gender) |

1 Table A1 in the annexes contains a list of frameworks and related indicators that informed the development of the prelminary list.

| Dimension | Indicator | Dimension | Indicator |
|---|---|---|---|
| Health | Prevalence of VAD in children 0-59 months ( per cent) | NDMA | Vegetation Condition Index (VCI) |
| Health | Prevalence of iodine deficiency in school going children | NDMA | Rainfall |
| Health | Prevalence of iodine deficiency in women of reproductive age (per cent) | NDMA | Milk production |
| Health | Prevalence of zinc deficiency in the population n | NDMA | Crop production(yield) |
| Health | Prevalence of anaemia among women of reproductive age | NDMA | Livestock Body Condition- PET methodology |
| Health | Prevalence of anaemia in pregnant women (Hb<11g/dl) | NDMA | Livestock deaths (for drought) |
| Health | Prevalence of iron deficiency in the population | NDMA | Livestock Migration Pattern |
| Health | Prevalence of folate among women of reproductive age | NDMA | ToT- Terms of Trade |
| Health | Prevalence of Vitamin B12 among women of reproductive age | NDMA | Goat prices |
| Health | Percentage of pregnant women attending ANC issued with iron/folic acid (IFA) supplement | NDMA | Maize prices (ASAL) |
| Health | Percentage of under-five children consuming MNPs | NDMA | Cattle prices |
| Health | Percentage of pregnant women consuming Iron/folic acid (IFA) supplement | NDMA | Distances to grazing for livestock (km) |
| Health | Children aged 6–59 months who received vitamin A supplementation (per cent) | NDMA | Water for households - trekking distance (km) |
| Health | Incidence of low birth weight among newborns | NDMA | Milk consumption (Ltr) |
| Health | Prevalence of diarrhoea among children | NDMA | At Risk (MUAC) |
| Health | Children under five years with diarrhoea receiving oral rehydration solution (ORS). | NDMA | Reduced Coping Strategy Index (rCSI) |

| Dimension | Indicator | Dimension | Indicator |
|---|---|---|---|
| Health | Children given ORS and zinc for an episode of diarrhoea in the past two weeks: Among children under five who had diarrhoea in the two weeks preceding the survey, the percentage given fluid from an ORS packet or pre-packaged ORS fluid and zinc | NDMA | Food Consumption Score (FCS) |
| Health | Proportion of population with access to safe water | NDMA | Pasture and browse conditions |
| Health | Proportion of households with latrines or Population using improved sanitation facilities (per cent) | NDMA | Population in need of food assistance |
| Health | Percentage of children with (moderate/severe) acute malnutrition receiving therapeutic treatment | NDMA | Number of cash transfer beneficiaries under regular and emergency (HSNP) |
| Health | Percentage of new cases with moderate malnutrition receiving treatment | Water | Percentage of population using an improved drinking water source (disaggregated by National, urban, rural) |
| Health | Cure/recovery rate per cent of children discharged from the treatment program as successfully recovered | Water | Percentage of population using basic drinking water service (disaggregated by national, urban, rural) |
| Health | Death rate per cent of children who died from any cause while registered in the treatment program | Water | Percentage of population using limited drinking water service (disaggregated by national, urban, rural) |
| Health | Non-recovery rate per cent of children discharged as medical referrals and as non-response | Water | Percentage of population using safely managed drinking water services (disaggregated by national, urban, rural) |
| Health | Defaulter rate per cent of children who were absent for two consecutive weightings | Water | Percentage of population using basic sanitation services |
| Health | Percentage of children aged 12-59 months correctly de-wormed twice in the year | Water | Percentage of population using safely managed sanitation services |
| Health | Percentage of school children correctly de-wormed at least once in the year | Water | Proportion of wastewater safely treated |
| Health | Prevalence of insufficient physical activity in adults 18–64 years (per cent) | Water | Percentage of utilities meeting drinking water quality standards |

| Dimension | Indicator | Dimension | Indicator |
|---|---|---|---|
| Health | Proportion of population with raised blood pressure or currently on medication | Water | Hours of water supply (hrs/day) |
| Health | Proportion of adults 18-69 years with raised fasting blood sugar (per cent) | Water | HH connections to water supply |
| Health | Proportion of men with normal waist: hip ratio (per cent) | Water | HH connections to sewerage |
| Health | Proportion of women with normal waist: hip ratio (per cent) | Water | Area under irrigation |
| Health | Mean intake of sodium salt (g/day) | Water | Population practicing irrigation agriculture |
| Health | Percentage of children with severe acute malnutrition receiving treatment | Agriculture | MDD-W (Minimum Dietary Diversity – women of reproductive age) |
| Health | Prevalence of Acute Malnutrition (MUAC)>210MM | Agriculture | Minimum Dietary Diversity – Young children |
| Health | Percentage of adults with BMI <18.5, >25 & >30 | Agriculture | Individual Dietary Diversity Score (IDDS) |
| Health | Percentage of adolescents with BMI <18.5, >25 & >30 | Agriculture | Consumption of 400g fruits and vegetables per day |
| Health | Introduction of solid, semi-solid or soft foods | Agriculture | Vitamin A-rich food consumption |
| Health | Minimum acceptable diet | Agriculture | Iron-rich food consumption |
| Health | Infant and young child feeding index | Agriculture | Consumption of specific target foods |
| Health | Minimum Dietary Diversity - Children | Agriculture | Food Insecurity Experience Scale (FIES) |
| Health | Minimum meal frequency | Agriculture | Household Dietary Diversity Score (HDDS) |
| Health | Acquired knowledge/skills | Agriculture | Food Consumption Score (FCS) |
| Health | Awareness of appropriate diet | Agriculture | Household Food Insecurity Access Scale (HFIAS) |
| Health | Following promoted child care practices | Agriculture | Household Hunger Scale (HHS) |
| Health | Feeding of fresh or reheated foods | Agriculture | Coping Strategies Index (CSI) |
| Health | Vitamin A deficiency among children | Agriculture | Availability of specific foods on-farm |
| Health | Consumption of vitamin A rich foods among children | Agriculture | Diversity of foods produced on-farm |
| Health | Consumption of iron-rich foods among children | Agriculture | Proportion of staple crop production that is bio-fortified |

| Dimension | Indicator | Dimension | Indicator |
|---|---|---|---|
| Health | Minimum milk feeding frequency for non-breastfed children | Agriculture | Implementation of good agricultural practices |
| Health | Egg and/or flesh food consumption by children | Agriculture | Availability of specific foods in markets |
| Health | Sweet beverage consumption by children | Agriculture | Prices of specific foods in markets |
| Health | Unhealthy food consumption by children | Agriculture | Cost of a healthy diet |
| Health | Zero vegetable/fruit consumption by children | Agriculture | Food loss in the supply chain |
| Health | Ever breastfed | Agriculture | Women's Empowerment in Agriculture Index (WEAI) |
| Health | Early initiation of breastfeeding | Agriculture | Women's control of income |
| Health | Exclusively breastfed for the first two days after birth | Agriculture | Women's time use and labour |
| Health | Exclusive breastfeeding under six months | Agriculture | Asset ownership by gender |
| Health | Mixed milk feeding under six months | Agriculture | Indicator of nutrition and food safety-related knowledge |
| Health | Continued breastfeeding 12-23 months | Agriculture | Production volume, by value chain i.e., for crops, livestock, fish |
| Health | Continued breastfeeding at two years | Agriculture | Post-harvest losses (crops, livestock products and fish) |
| Health | Access to skilled breastfeeding support | Agriculture | Number of SMEs engaged in agricultural food processing and distribution |
| Health | Addressing breastfeeding difficulties | Agriculture | Value of agriculture produce marketed |
| Health | Awareness on the prevention of breastmilk insufficiency | Agriculture | Food and feed balance sheet |
| Health | Individual dietary diversity score | Agriculture | Proportion of Agric area under productive and sustainable agriculture |
| Health | Minimum dietary diversity - Women | Agriculture | No. of plant and animal resource for food and agriculture secured in facilities |
| Health | Women dietary diversity score | Agriculture | Food price volatility |
| Health | Consumption of iron-rich foods among pregnant and lactating women | Agriculture | Implementation of GAP for food safety |

| Dimension | Indicator | Dimension | Indicator |
|---|---|---|---|
| Health | Percentage of households using adequately iodised salt | Agriculture | Import dependency ratio |
| Health | Compliance of fortified maize flour to fortification standards | Agriculture | Self-sufficiency ratio |
| Health | Compliance of fortified wheat flour to fortification standards | Education | Educational attainment of household population: females/ males |
| Health | Compliance of fortified fats/ oils to fortification standards | Education | Literacy: Women/Men |
| Health | Prevalence of undernourishment. Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES) | Education | Gross attendance ratio |
| Health | Household hunger scale | Education | National budget line and funding allocation |
| Health | Food consumption score | Education | Multisectoral steering committee |
| Health | Coping Strategy Index | Education | School level management and accountability structures |
| Education | Number and percentage of learners in school meals programme | Education | A functional M&E system and used for implementation and feedback |
| Education | Transition rates (gender disaggregated) | Education | Food modalities and the food basket (corresponding to the objectives, local habits and taste) |
| Education | Enrolment rates (gender disaggregated) | Education | Procurement and Logistics arrangements |
| Education | Completion rates (gender disaggregated) | Education | Community participation in school meals |
| Education | Attendance rates (gender disaggregated) | Education | Quantity of food commodities released from stores per school |

*Source: Compiled by authors*

## 5.2 Criteria for Indicator Selection

Experts discussed the indicator selection criteria as demonstrated by Garnica Rosas et al., (2021) and adapted them with modifications. The criteria were applied by experts to ensure the selected nutrition sensitive indicators for M&E purposes meet important criteria. Table 2 presents the criteria agreed on, through expert consultations, to be met by the shortlist indicators. Having a structured and strong criterion enables quality assurance over time (Hebestreit, et al., 2019).

**Table 2: Criteria for indicator selection**

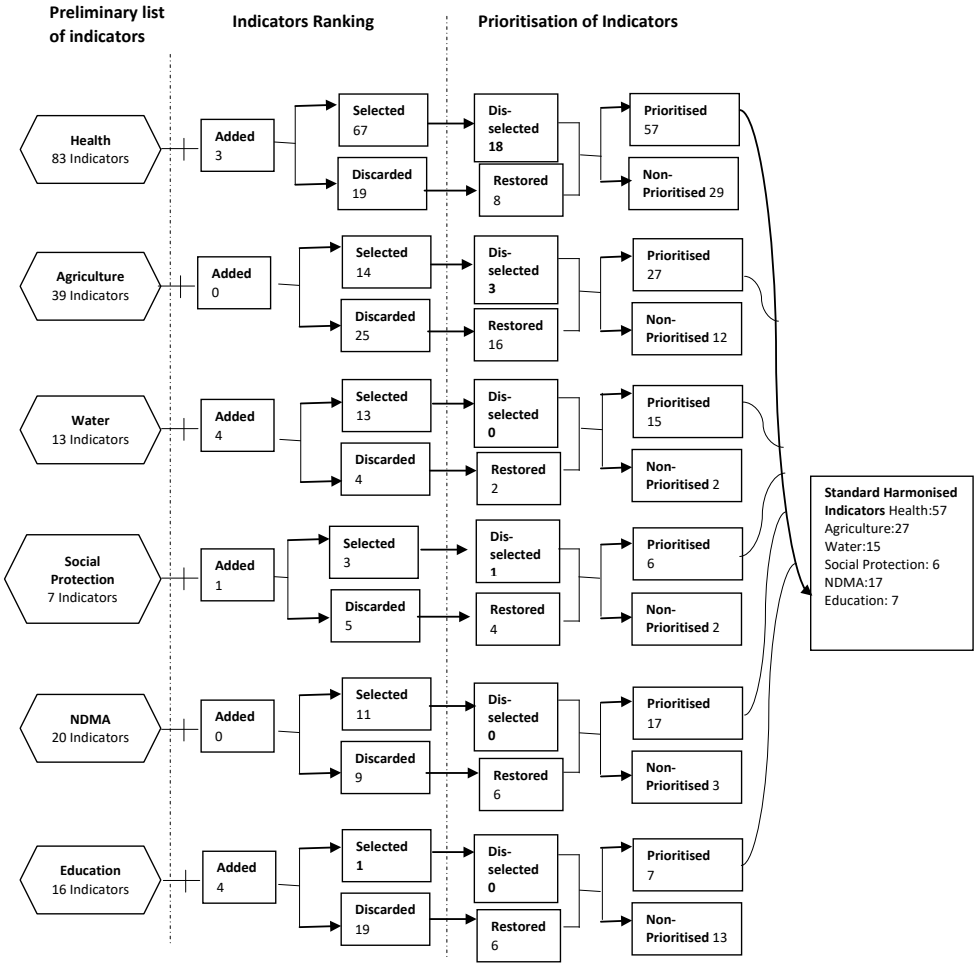
| | Indicator criteria | Description |
|---|---|---|
| 1 | The indicator is relevant | The indicator is clearly relevant to policy evaluation of malnutrition prevention and/or is a plausible proxy for the underlying measure. |
| 2 | The indicator is actionable | The indicator provides information that can lead to action for change: inform and influence policies. It is actionable regarding the nutrition case studies. |
| 3 | The indicator is meaningful and usable | The information must be easy to understand, relevant for governments plans and priorities and useful for public health action (e.g., targets population groups that are likely more affected) |
| 4 | The indicator is accurate | Scientific soundness: The scientific evidence supporting a link between the performance of an indicator and malnutrition prevention is strong. |
| | | Validity: The indicator appears reasonable as a measure of what it is intended to measure (face validity), and the components of the indicator make sense (construct validity). |
| | | Reliability: The same results can be obtained if measurements are repeated under identical conditions. |
| 5 | The indicator is feasible/ efficient | Sufficient good quality data are already available and accessible, or data collection can be put in place at relatively low costs. |
| 6 | The indicator is ongoing | Data can be regularly collected and compared over time. |
| 7 | The indicator is internationally comparable | The indicator is clearly relevant to different cultural settings and regions and not entirely national |
| | | context bound. The information can be harmonized across all EAC member states. |

*Source: Adapted from Garnica Rosas et al., 2021 with modifications from experts*

## 6.3 Selected and Prioritized Nutrition-Sensitive Indicators

Figure 2 presents the selection and prioritization process accomplished by application of the criteria on the preliminary list and discussions by experts.

**Figure 2: Selection and prioritization process towards harmonized nutrition-sensitive indicators across sectors**




*Source: Compiled by authors*

The selected and prioritised nutrition sensitive indicators shortlist includes 57 indicators related to the health sector, 27 to agriculture, 16 to water, six to social protection, 17 to NDMA and seven to the education sector. While selection of indicators was achieved by rating scores, the subsequent process of identifying indicators with highest priority was achieved through experts' consensus in a face-to-face discussion.

The process also included discussions to harmonise indicators, and this was achieved through: merging comparable indicators; standardisation through rephrasing indicators to minimise differences in common indicators across sectors; aligning them to existing relevant frameworks; and stratification of policy related indicators by age and sex to assess nutrition outcome differences across different demographic groups and gender. Table 3 presents the final list of nutrition sensitive indicators that is suitable for easy and standardised assessment of nutrition status, and monitoring of progress overtime against targets in a harmonised manner.

**Table 3: Selected and prioritized nutrition sensitive indicators per related sector**

| Sector | Indicator | Sector | Indicator |
|---|---|---|---|
| Health | The percentage of children under the age of five who are wasted (moderate acute malnutrition). Weight for height Z-score (-2sd) | Agriculture | Food Insecurity Experience Scale (FIES) |
| Health | Percentage of stunted (moderate and severe) children aged 0–59 months | Agriculture | MDD-W (Minimum Dietary Diversity (women of reproductive age and young children aged 6-59 months |
| Health | Percentage of children aged under five years who are overweight obese | Agriculture | Household Dietary Diversity Score (HDDS) |
| Health | Percentage of underweight 0-59 months (<-2 z-score) | Agriculture | Diversity of foods produced on-farm |
| Health | Percent of children with: (moderate/severe] acute malnutrition receiving therapeutic treatment | Agriculture | Vitamin A-rich food consumption |
| Health | Prevalence of Acute Malnutrition (MUAC)<210MM PLW | Agriculture | Iron-rich food consumption |
| Health | Prevalence of diarrhoea among children under five years | Agriculture | Food Consumption Score (FCS) |
| Health | Per cent Consumption of iron-rich foods among children | Agriculture | Food prices |
| Health | Proportion of households with latrines or population using improved sanitation facilities (per cent) | Agriculture | Cost of a healthy diet |
| Health | Percentage of population with BMI <18.5, >25 & >30 – Cohorts | Agriculture | Consumption of specific target foods |
| Health | Food consumption score | Agriculture | Production volume, by value chain i.e., for crops, livestock, fish |
| Health | Minimum acceptable diet | Agriculture | Proportion of Agricultural area under productive and sustainable agric - Data GAP |
| Health | Minimum meal frequency | Agriculture | Individual consumption of 400g fruits and vegetables per day |

| Sector | Indicator | Sector | Indicator |
|---|---|---|---|
| Health | Minimum Dietary Diversity – Children | Agriculture | Coping Strategies Index (CSI) |
| Health | Proportion of population with access to safe water | Agriculture | Post-harvest losses (crops, livestock products and fish) |
| Health | Prevalence of iodine deficiency in the population (Cohort) (per cent) | Agriculture | Number of SMEs engaged in agricultural food processing and distribution |
| Health | Early initiation of breastfeeding | Agriculture | Women's time use and labour - Gap Area |
| Health | Exclusive breastfeeding under six months | Agriculture | Women's Empowerment in Agriculture Index (WEAI) |
| Health | Children under five years with diarrhoea receiving oral rehydration solution (ORS) and zinc. | Agriculture | Asset ownership by gender |
| Health | Percentage of pregnant women consuming iron/ folic acid (IFA) supplement | Agriculture | Value of agriculture produce marketed () |
| Health | Infant and young child feeding index | Agriculture | Self-sufficiency ratio |
| Health | Incidence of low birth weight among newborns | Agriculture | Food Price volatility/Food CPI (Proxy) |
| Health | Consumption of vitamin A rich foods among children | Agriculture | Import dependency ratio |
| Health | Prevalence of iron deficiency in the population (Cohorts) | Agriculture | Per caput daily supply |
| Health | Children aged 6–59 months who received vitamin A supplementation (per cent) | Agriculture | Per caput calorific daily supply |
| Health | Women dietary diversity score | Agriculture | Quantity of agricultural produce marketed (food crops + milk + eggs+ fish) |
| Health | Minimum Dietary Diversity – Women | Agriculture | Indicator of nutrition and food safety-related knowledge - GAP (implementation of GAP for food safety) - Indicator is very key but at the moment the indicator has not been identified. What we have is an area of interest. |
| Health | Vitamin A deficiency in the population (Cohorts) | Education | Number and percentage of learners in school meals programme (by type of programme) |

| Sector | Indicator | Sector | Indicator |
|---|---|---|---|
| Health | Compliance of fortified maize flour to fortification standards | Education | Educational attainment of household population: Females/Males |
| Health | Prevalence of undernourishment. | Education | Quantity of food commodities released from stores per school |
| Health | Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES) | Education | Attendance rates (gender disaggregated) |
| Health | Prevalence of zinc deficiency in the population (Cohorts) | Education | Enrolment rates (gender disaggregated) |
| Health | Percentage of households using adequately iodised salt | Education | Proportion of primary schools providing deworming services to children aged 6-14 years |
| Health | Consumption of iron-rich foods among pregnant and lactating women | Education | Proportion of primary and secondary schools with functional school gardens - GAP |
| Health | Household hunger scale | Social Protection | No. of beneficiaries receiving nutrition-sensitive cash transfer (disaggregated by gender) |
| Health | Prevalence of anaemia in pregnant women (Hb<11g/dl) | Social Protection | No. of HH receiving nutrition- sensitive cash transfer top ups |
| Health | Prevalence of anaemia among the population (Cohorts) | Social Protection | No. of NICHE beneficiaries receiving nutrition-counselling |
| Health | Compliance of fortified wheat flour to fortification standards | Social Protection | No. of households receiving GoK cash transfer programmes after every two months (CT-OVC, OPCT, PWSD-CT, HSNP) |
| Health | Compliance of fortified fats/oils to fortification standards | Social Protection | No. of beneficiaries receiving GoK cash transfer programmes after every two months (disaggregated by gender) (CT-OVC, OPCT, PWSD-CT, HSNP) |
| Health | Unhealthy food consumption by children | Social Protection | Proportion of population covered by social protection programmes |

| Sector | Indicator | Sector | Indicator |
|---|---|---|---|
| Health | Coping Strategy Index | NDMA | Food Consumption Score (FCS) |
| Health | Prevalence of folate deficiency among women of reproductive age | NDMA | Population in need of food assistance |
| Health | Proportion of population with raised blood pressure or currently on medication | NDMA | Rainfall performance |
| Health | Continued breastfeeding 12-23 months | NDMA | Number of cash transfer beneficiaries under regular and emergency (HSNP) |
| Health | Percentage of children aged 12-59 months correctly de-wormed twice in the year | NDMA | Household milk production |
| Health | Percentage of school children correctly de-wormed at least once in the year | NDMA | Household milk consumption (Ltr) |
| Health | Cure/recovery rate per cent of children discharged from the treatment program as successfully recovered | NDMA | Distance to household drinking water source (km) |
| Health | Death rate per cent of children who died from any cause while registered in the treatment program | NDMA | Proportion of children under five years at risk of malnutrition at risk (MUAC) |
| Health | Proportion of adults - women and men with normal waist: hip ratio (per cent) | NDMA | Maize prices (ASAL) |
| Health | Percentage of under-five children consuming multiple micronutrient powder | NDMA | Pasture and browse conditions |
| Health | Proportion of men with normal waist: hip ratio (per cent) | NDMA | Goat prices |
| Health | Introduction of solid, semi-solid or soft foods | NDMA | Reduced Coping Strategy Index (rCSI) |
| Health | Mean intake of sodium salt (g/day) | NDMA | Livestock body condition-PET methodology |
| Health | Prevalence of insufficient physical activity in adults 18–64 years (per cent) | NDMA | Vegetation condition index |
| Health | Defaulter rate per cent of children who were absent for two consecutive weightings | NDMA | Livestock deaths (for drought) |

| Sector | Indicator | Sector | Indicator |
|---|---|---|---|
| Health | Per cent of caregivers receiving nutrition counselling | NDMA | ToT- Terms of Trade |
| Health | Individual dietary diversity score | NDMA | Livestock migration pattern |
| Water | Percentage of population using an improved drinking water source (disaggregated by national, urban, rural) | Water | Customers connections to water supply |
| Water | Percentage of population using basic drinking water service (disaggregated by national, urban, rural) | Water | Population practising irrigation agriculture |
| Water | Percentage of population using safely managed sanitation services | Water | Area under irrigation |
| Water | Percentage of population using safely managed drinking water services (disaggregated by national, urban, rural) | Water | Hours of water supply (hrs/day) - WASREB |
| Water | Percentage of population using basic sanitation services | Water | Proportion of wastewater safely treated - GAP |
| Water | Customers connections to sewerage | Water | Percentage of population using limited drinking water service (disaggregated by national, urban, rural) |
| Water | Percentage of utilities meeting drinking water quality standards | Water | Yield in irrigated area (rice, potatoes, maize, fish, horticulture, cotton, fodder) |
| Water | Time and distance to water source | Water | Distance to water source |

*Source: Compiled by authors*

# Discussions on Mapping and Harmonization of Nutrition Indicators

The list of prioritised nutrition sensitive indicators was based on joint action of an experts' consultation process where several criteria had to be met. The ranking outcomes and discussions held indicated agreement among the experts across the various sectors and institutions. Majority of the prioritised indicators were related to the health sector followed by the agriculture sector, NDMA and the water sector.

Predominance of the indicators related to the health sector is satisfactory given nutrition in the country falls under the health domain (GoK, 2018). The role of agriculture in provision of adequate food of good quality and that of water and sanitation services make the related sectors important in the nutrition space. Further, assessment of nutrition in ASAL counties by NDMA is paramount for policy analysis as acute malnutrition in the country is concentrated in ASAL areas (GoK, 2018).

During the selection and prioritisation process, it was observed that there were common indicators of interest across various sectors/organisations. In addition, despite various sectors having common areas of interest, important discussions on tracking of indicators elicited questions on mandate of various organisations. The observations highlight that the success of the harmonisation process counts on different sectors and institutions working together for effective assessment, surveillance and monitoring of nutrition as noted by Hebestreit, et al., (2019).

Some indicators were poorly defined and therefore not specific, measurable, attainable, relevant and timely (SMART) (WHO & UNICEF, 2020). In some of the instances, what had been identified as indicators by sectors represented broad areas of interest to have indicators on rather than specified indicators. This in particular affected the indicators related to the education sector. In other instances, different indicators had been combined into one. Use of existing global, regional and local frameworks and literature reviews helped identify such anomalies and align them in a standardised manner. Existing frameworks and literature reviews were also used to ensure the operational definitions of indicators were clear and consistent with existing methodologies and theoretical definitions (de Guzman & Molano, 1994). Further, some indicators covered specific demographics but were broadened to allow comparisons for purposes of evaluating policy impact among various groups (Garnica Rosas et al., 2021). Experts also noted likelihood of data problems for some of the indicators in the shortlist. Though important, the indicators were noted to lack the data required to measure them, thus limiting the usability.

# Conclusion and Recommendations

Harmonised nutrition indicators are viewed as crucial for effective assessment, surveillance and monitoring of nutrition in a harmonised manner across existing systems in Kenya. Towards this, the paper provides a prioritised list of selected standard harmonised nutrition indicators for current nutrition surveillance and monitoring systems in the country. The selection and prioritisation followed a systematic process involving experts in the nutrition network. A total of 130 indicators were prioritised: 57 related to the health sector, 27 to agriculture, 16 to water, six to social protection, 17 to NDMA and seven to the education sector.

The study recommends regular review of the indicators to cater for any emerging contexts and include experts, such as medical professionals, who were missing in the current study. During the reviews, the experts will have an opportunity to propose additional indicators, improve the existing list towards higher quality and harmonised indicators, validation of novel indicators, as well as serve as a sharing platform for experiences gained in the use of nutrition surveillance and monitoring systems.

The study also recommends that a glossary of indicators be developed listing all the harmonised indicators and indicating how they are computed. Collaboration among sectors and institutions in the nutrition space as well as the promotion of data pooling and access in encouraged to enhance nutrition surveillance and monitoring systems.

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# Annex

**Table A1: Frameworks consulted in the development of the preliminary list of nutrition-sensitive indicators**

| Framework | Indicators | Framework | Indicator |
|---|---|---|---|
| EAC | Household Dietary Diversity Score (HDDS) | Agenda 2063 | Prevalence of underweight among children under five |
| EAC | Food Insecurity Experience Scale (FIES) | Agenda | Percentage of stunted (moderate and severe) children aged 0–59 months |
| EAC | Coping Strategies Index (CSI) | 2063 | Prevalence of under-nourishment |
| EAC | Food Consumption Score (FCS) | Agenda | Per cent of population with access to safe drinking water |
| EAC | Household Hunger Scale (HHS) | 2063 | Per cent of population with access to safely managed sanitation services |
| EAC | Availability of specific foods in markets | Agenda | Growth rate of yields for the first National Priority Commodity |
| EAC | Prices of specific foods in markets | 2063 | Growth rate of yields for the second National Priority Commodity |
| EAC | Food prices | Agenda | Growth rate of yields for the third National Priority Commodity |
| EAC | Anaemia among children 6-59 months | 2063 | Growth rate of yields for the fourth National Priority Commodity |
| EAC | Anaemia among pregnant women | Agenda | Growth rate of yields for the fifth National Priority Commodity |
| EAC | Anaemia among non-pregnant women | FAO | MDD-W (Minimum Dietary Diversity – women of reproductive age) |
| EAC | Vitamin A deficiency among pre-school children (6 – 71 months) | FAO | Minimum Dietary Diversity – Young children |
| EAC | Vitamin A deficiency among non-pregnant women (15 – 49 years) | FAO | Food Insecurity Experience Scale (FIES) |
| EAC | Prevalence of stunting (per cent of children under five years) | FAO | Household Dietary Diversity Score (HDDS) |
| EAC | Prevalence of underweight (per cent of children under five years) | FAO | Food Consumption Score (FCS) |

| Framework | Indicators | Framework | Indicator |
|---|---|---|---|
| EAC | Prevalence of wasting (per cent of children under five years) | FAO | Coping Strategies Index (CSI) |
| EAC | Low birth weight | FAO | Availability of specific foods on-farm |
| EAC | Adolescent overweight | FAO | Diversity of foods produced on-farm |
| EAC | Adolescent obesity | FAO | Prices of specific foods in markets |
| EAC | Adult underweight | FAO | Food prices |
| EAC | Adult overweight | FAO | Cost of a healthy diet |
| EAC | Minimum Dietary Diversity Score for Women; | FAO | Asset ownership by gender |
| EAC | Minimum Dietary Diversity score for children; | FAO | Indicator of nutrition and food safety-related knowledge |
| EAC | Minimum acceptable diet for children | FAO | Minimum Acceptable Diet (MAD), |
| EAC | Children minimum meal frequency | FAO | Minimum Meal Frequency (MMF) |
| EAC | Iodised salt | FAO | Individual Dietary Diversity Score (IDDS) |
| EAC | Average dietary energy intake; | FAO | Unique food items/dietary variety |
| EAC | Number of regular household drinking water sources | FAO | Quantitative nutrient intakes |
| EAC | Main and regular use of unimproved drinking water source | FAO | Consumption of 400g fruits and vegetables per day |
| EAC | Water source reliability (improved source) | FAO | Proportion of the diet consisting of processed/ultra-processed foods |
| EAC | Dedicated hand-washing station | FAO | Vitamin A-rich food consumption |
| EAC | Child faeces disposal | FAO | Iron-rich food consumption |
| EAC | Main sanitation facility | FAO | Consumption of specific target foods |
| EAC | Main and regular practice of open defecation | FAO | Household Food Insecurity Access Scale (HFIAS) |
| EAC | Food price volatility | FAO | Household Hunger Scale (HHS) |
| EAC | Import dependency ratio | FAO | Months of Adequate Household Food Provisioning (MAHFP) |
| EAC | Self-sufficiency ratio | FAO | Availability of specific foods in markets |

| Framework | Indicators | Framework | Indicator |
|---|---|---|---|
| EAC | Household incomes | FAO | Wealth indices/ Poverty levels |
| EAC | Unemployment rate | FAO | Household asset index |
| EAC | Number of regular household drinking water sources | FAO | Women's |
| | | | Empowerment in Agriculture Index (WEAI) |
| EAC | Main and regular use of unimproved drinking water source | FAO | Women's control of income |
| EAC | Water source reliability (improved source) | FAO | Women's time use and labour |
| EAC | Dedicated hand-washing station | FAO | Functional diversity index |
| EAC | Child faeces disposal | FAO | Proportion of staple crop production that is biofortified |
| EAC | Main sanitation facility | FAO | Implementation of good agricultural practices |
| EAC | Main and regular practice of open defecation | FAO | Grain loss |
| EAC | Food price volatility | SUN | 2.1 National investments for nutrition disaggregated by specific or sensitive, types of programmes, MDAs, sources of funding, allocations expenditures, years |
| EAC | Import dependency ratio | SUN | 2.2 Total resource flows for development, by recipient and donor countries and type of flow |
| EAC | Self-sufficiency Ratio | SUN | 2.3 The agriculture orientation index for government expenditures |
| EAC | Household incomes | SUN | 2.4 Financing gap for costed nutrition high-impact interventions |
| EAC | Unemployment rate | SUN | 2.5 Proportion of total government spending on essential services - education, health and social protection |
| WHA | Prevalence of low height-for-age in children under five years | SUN | |
| WHA | Prevalence of haemoglobin <11 g/dL in pregnant women | SUN | 3.1 Proportion of health facilities that are Baby Friendly Hospital Initiative (BFHI) certified |

| Framework | Indicators | Framework | Indicator |
|---|---|---|---|
| WHA | Prevalence of haemoglobin <12 g/dL in non-pregnant women | SUN | 3.2 Proportion of mothers of children 0-23 months who have received counselling, support or messages on optimal breastfeeding at least once in the last year |
| WHA | Prevalence of infants born <2500g | SUN | 3.3 Proportion of children 6-59 months with severe acute malnutrition admitted for treatment |
| WHA | Prevalence of weight-for-height >2 SD in children under five years | SUN | 3.4 Proportion of children 6-59 months receiving Vitamin A supplementation |
| WHA | Prevalence of exclusive breastfeeding in infants aged six months or less | SUN | 3.5 Proportion of pregnant women receiving iron and folic acid supplementation |
| WHA | Prevalence of low weight-for-height in children under five years of age | SUN | 3.6 Proportion of children aged 6-23 months receiving micronutrient powders |
| WHA | | SUN | 3.7 Number of trained nutrition professionals /100,000 population |
| WHA | Prevalence of diarrhoea in children under five years | SUN | 3.8 Percentage of households that have iodized salt (>0 ppm) |
| WHA | Proportion of women aged 15-49 years with low body mass index (<18.5kg/m2)3 | SUN | 3.9 Proportion of children under five years with diarrhoea (in past two weeks) receiving oral rehydration salts (ORS packets or pre-packaged ORS fluids) and zinc supplements |
| WHA | Number of births during a given reference period to women aged 15-19 years/1000 females aged 15-19 years | SUN | 3.10 Proportion of children aged 12- 59 months receiving at least one dose of de-worming medication |
| WHA | Proportion of overweight and obese women 18+-49 years of age (body mass index ≥25 kg/m2) | SUN | 3.11 Use of insecticide treated nets in children aged 0-5 years |
| WHA | Proportion of overweight in school-age children and adolescents 5-18 years (BMI-for-age >+1 SD) | SUN | 3.12 Percentage of 1-year-olds who have received the appropriate doses of the recommended vaccines in the national schedule by recommended age |

| Framework | Indicators | Framework | Indicator |
|---|---|---|---|
| WHA | | SUN | 3.13 Proportion of women of reproductive age (15-49 years) who have their need for family planning satisfied with modern methods |
| WHA | Proportion of children aged 6-23 months who receive a minimum acceptable diet | SUN | 3.14 Percentage of calories from non-staples[11] in food supply |
| WHA | Proportion of population using a safely managed drinking service | SUN | 3.15 Availability of fruits and vegetables (grams) |
| WHA | Proportion of population using a safely managed sanitation service | SUN | 3.16 Fortified Food Supply |
| WHA | Proportion of pregnant women receiving iron and folic acid supplements | SUN | 3.17 Proportion of the population covered by social protection floors/systems disaggregated by sex, and distinguishing children, the unemployed, the elderly, persons with disabilities, pregnant women, new born, work injury victims, the poor and vulnerable |
| WHA | Percentage of births in baby friendly facilities | SUN | 3.18 Geographic distribution of stakeholders and core nutrition actions at sub-national level |
| WHA | Proportion of mothers of children 0-23 months who have received counselling, support or messages on optimal breastfeeding at least once in the last year | SUN | 3.19 Distribution of stakeholders and core nutrition actions at sub-national level |
| WHA | Number of trained nutrition professionals /100,000 population | SUN | 4.1 Country has legislation / regulations fully implementing the International Code of Marketing of Breast-milk Substitutes (resolution WHA34.22) and subsequent relevant resolutions adopted by the World Health Assembly |

| Framework | Indicators | Framework | Indicator |
|---|---|---|---|
| WHA | Number of countries with legislation /regulations fully implementing the International Code of Marketing of Breast-milk Substitutes (resolution WHA34.22) and subsequent relevant resolutions adopted by the Health Assembly | SUN | 4.2 Country has maternity protection laws or regulations in place in line with the ILO Maternity Protection Convention, 2000 (No. 183) and Recommendation No. 191 |
| WHA | Number of countries with maternity protection laws or regulations in place | SUN | 4.3 Country has legislation on the Constitutional right to food |
| WHA | | SUN | 4.4 Country has policies to reduce the impact on children of marketing of foods and non-alcoholic beverages high in saturated fats, *trans*-fatty acids, free sugars, or salt |
| WHA | Incidence of malaria | SUN | 4.5 Country has legal documentation that has the effect of allowing or mandating food fortification (Y/N) |
| WHA | Median urinary iodine concentration in children aged 6-12 years | SUN | 4.6 Country has legal documentation specifying nutrient levels for fortification (Y/N) |
| WHA | Proportion of stunted women of reproductive age (15-49 years) | SUN | |
| WHA | Percentage of pregnant women, aged 15-49 years who used any tobacco product (smoked or smokeless) | SUN | 5.1 Prevalence of diarrhoea in children under five years |
| WHA | Proportion of children born in the last 24 months who were put to the breast within one hour of birth | SUN | 5.2 Proportion of population using safely managed drinking water services |
| WHA | New cases of measles | SUN | 5.3 Proportion of population using a safely managed sanitation service [including a hand-washing facility with soap and water] |
| WHA | Use of insecticide treated nets in children aged 0-5 years | SUN | 5.4 Malaria incident cases per 1,000 population |

| Framework | Indicators | Framework | Indicator |
|---|---|---|---|
| WHA | Proportion of children under five years with diarrhoea (in past two weeks) receiving oral rehydration salts (ORS packets or pre-packaged ORS fluids) | SUN | 5.5 New cases of measles |
| WHA | Percentage of households that have iodized salt (>15 ppm) | SUN | 5.6 Number of births during a given reference period to women aged 15-19 years /1,000 females (and aged 10-14) |
| WHA | Percentage of one-year-olds who have received the appropriate doses of the recommended vaccines in the national schedule by recommended age | SUN | 5.7 Number of new HIV infections per 1,000 uninfected population by age group, sex, and key populations |
| WHA | Percentage of households consuming iron-fortified wheat flour products | SUN | 5.8 Tuberculosis incidence per 1,000 population |
| WHA | Appropriate use of micronutrient powders for children aged 6-23 months | SUN | 5.9 Prevalence of undernourishment |
| WHA | Proportion of children with severe acute malnutrition having access to appropriate treatment including therapeutic foods and nutrition counselling | SUN | 5.10 Prevalence of moderate or severe food insecurity in the population |
| WHA | Proportion of children aged 12-59 months receiving at least one dose of de-worming medication | SUN | 5.11 Proportion of women aged 20–24 years who were married or in a union before age 15 and before age 18 |
| WHA | Strength of nutrition governance | SUN | 5.12 Female secondary school enrolment |
| WHA | Number of countries with legislation /regulations to protect children from the marketing of unhealthy foods and beverages | SUN | 5.13 Proportion of children 2-14 years old who experienced any violent discipline (psychological aggression and/or physical punishment) |
| SDGs | 1.1.1 Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural) | SUN | 5.14 Growth rates of household expenditure and income per capita among the bottom 40 per cent of the population and the total population |

| Framework | Indicators | Framework | Indicator |
|---|---|---|---|
| SDGs | 1.2.1 Proportion of population living below the national poverty line, by sex and age | SUN | 5.15 Proportion of urban population living in slums, informal settlement or inadequate housing |
| SDGs | 1.2.2 Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions | SUN | |
| SDGs | 1.3.1 Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable | SUN | 6.1 Exclusive breastfeeding for the first six months |
| SDGs | 2.1.1 Prevalence of undernourishment | SUN | 6.2 Proportion of children born in the last 24 months who were put to the breast within one hour of birth |
| SDGs | 2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES) | SUN | 6.3 Proportion of children aged six to 23 months who receive a Minimum Acceptable Diet (MAD) |
| SDGs | 2.2.1 Prevalence of stunting among children under five years of age | SUN | 6.4 Proportion of children aged 6 to 23 months who receive a Minimum Diet Diversity (MDD) |
| SDGs | 2.2.2 Prevalence of malnutrition among older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable | SUN | 6.x Proportion of women 15-49 years of age with Minimum Diet Diversity (MDD-W) |
| SDGs | 2.2.3 Prevalence of anaemia in women aged 15 to 49 years, by pregnancy status (percentage) | SUN | 6.5 Age-standardised prevalence of persons (aged 18+ years) consuming less than five total servings (400 grams) of fruit and vegetables per day |

| Framework | Indicators | Framework | Indicator |
|---|---|---|---|
| SDGs | 2.3.1 Volume of production per labour unit by classes of farming/pastoral/ forestry enterprise size | SUN | 6.6 Age-standardised mean population intake of salt (sodium chloride) per day in grams in persons aged 18+ years. |
| SDGs | 2.3.2 Average income of small-scale food producers, by sex and indigenous status | SUN | 6.7 Median urinary iodine concentration in children aged 6-12 years |
| SDGs | 2.4.1 Proportion of agricultural area under productive and sustainable agriculture | SUN | 6.x Average amount of food vehicle that is eaten per capita (suggested by GAIN, FFI, IGN and MNF) |
| SDGs | 2.5.1 Number of (a) plant and (b) animal genetic resources for food and agriculture secured in either medium- or long-term conservation facilities | SUN | 6.8 Percentage of the population consuming food that is fortified according to standards (suggested by GAIN, FFI, IGN and MNF) |
| SDGs | 2.5.2 Proportion of local breeds classified as being at risk of extinction | SUN | |
| SDGs | 2.a.1 The agriculture orientation index for government expenditures | SUN | 7.1 Prevalence of low height-for-age <-2 SD in children under five years of age |
| SDGs | 2.a.2 Total official flows (official development assistance plus other official flows) to the agriculture sector | SUN | 7.2 Prevalence of infants born < 2500 g |
| SDGs | 2.c.1 Indicator of food price anomalies | SUN | 7.3 Prevalence of weight-for-height >2 SD in children under five years |
| SDGs | 3.8.1 Coverage of essential health services | SUN | 7.4 Prevalence of weight-for-height < -2SD in children under five years |
| SDGs | 3.8.2 Proportion of population with large household expenditures on health as a share of total household expenditure or income | SUN | 7.5 Prevalence of haemoglobin <11 g/dL in pregnant women |

| Framework | Indicators | Framework | Indicator |
|---|---|---|---|
| SDGs | 3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services) | SUN | 7.6 Prevalence of haemoglobin <12 g/dL in non-pregnant women |
| SDGs | 3.b.1 Proportion of the target population covered by all vaccines included in their national programme | SUN | 7.7 Proportion of women aged 18+ years with low body mass index (BMI) |
| SDGs | 3.c.1 Health worker density and distribution | SUN | 7.8 Proportion of overweight and obese women aged 18+ years (defined as BMI ≥25 kg/m² for overweight and BMI |
| | | | ≥ 30 kg/m² for obesity) |
| SDGs | 4.1.2 Completion rate (primary education, lower secondary education, upper secondary education) | SUN | 7.9 Prevalence of overweight and obesity in adolescent girls aged 10-19 years (defined according to the WHO growth reference for school-aged children and adolescents, overweight - one SD BMI for age and sex, obese - two SD BMI for age and sex). |
| SDGs | 4.2.1 Proportion of children aged 24–59 months who are developmentally on track in health, learning and psychosocial wellbeing, by sex | SUN | 7.10 Age-standardised prevalence of raised blood glucose/diabetes among persons aged 18+ years (defined as fasting plasma glucose value ≥7.0 mmol/L (126 mg/dl) or on medication for raised blood glucose). |
| SDGs | 4.2.2 Participation attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services) | SUN | 7.11 Age-standardised prevalence of raised blood pressure among persons aged 18+ years (defined as systolic BP ≥140 mmHg and/or diastolic BP ≥90 mmHg); and mean systolic BP. |
| SDGs | 6.1.1 Proportion of population using safely managed drinking water services | SUN | |
| SDGs | 6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a handwashing facility with soap and water | SUN | 8.1 Proportion of population below international poverty line disaggregated by sex, age group, employment status, and geographical location (urban/ rural) |

| Framework | Indicators | Framework | Indicator |
|---|---|---|---|
| SDGs | 6.3.1 Proportion of domestic and industrial wastewater flows safely treated | SUN | 8.2 Under five mortality rate (deaths per 1,000 live births) |
| SDGs | 6.3.2 Proportion of bodies of water with good ambient water quality | SUN | 8.3 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory infections |
| SDGs | 6.4.1 Change in water use efficiency over time | SUN | 8.4 Proportion of children aged 36-59 months who are developmentally on track in at least three of the following domains: literacy-numeracy, physical development, social-emotional development and learning |
| SDGs | 6.4.2 Level of water stress: freshwater 2. withdrawal as a proportion of available freshwater resources | SUN | 8.5 Annual growth rate of real GDP per capita |
| SDGs | 6.a.1 Amount of water- and sanitation related official development assistance that is part of a government coordinated spending plan | Post-2015 Sustainable Development Goals | The percentage of women, 15-49 years of age, who consume at least five out of 10 defined food groups |
| SDGs | 12.3.1 (a) Food loss index and (b) food waste index | Post-2015 Sustainable Development Goals | Percentage of national budget allocated to nutrition |
| SDGs | 14.4.1 Proportion of fish stocks within biologically sustainable levels | Post-2015 Sustainable Development Goals | Prevalence of overweight and obesity in persons aged 18+ years (defined as body mass index ≥ 25 kg/m² for overweight and body mass index ≥ 30 kg/m² for obesity) |
| Post-2015 Sustainable Development Goals | Proportion of women (and adolescent girls, where appropriate) reached through social protection measures which include a nutrition component (i.e. explicit nutrition objectives and actions to be monitored | Post-2015 Sustainable Development Goals | Prevalence of undernutrition in women, adolescent girls, children under five years of age (according to the appropriate indicators) |

| Framework | Indicators | Framework | Indicator |
|---|---|---|---|
| Post-2015 Sustainable Development Goals | Proportion of adolescent girls completing secondary level education. | Post-2015 Sustainable Development Goals | Proportion of children 6-23 months of age who receive foods from four or more food groups |
| Post-2015 Sustainable Development Goals | Nutrition status of adolescent girls | Post-2015 Sustainable Development Goals | Household Food Consumption Score (FCS), a composite index based on household level dietary diversity (number of food groups consumed by a household over a 7-day reference period), food frequency (number of times, usually in days, a particular food group is consumed), and the relative nutritional value of different food groups |
| Post-2015 Sustainable Development Goals | Nutritional status of women of reproductive age | Post-2015 Sustainable Development Goals | Number of health professionals who are trained innutrition per 100,000 population |
| Post-2015 Sustainable Development Goals | Proportion of population using a safely managed sanitation service | Post-2015 Sustainable Development Goals | Proportion of population using a safely managed drinking water service |

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