2019

Capacity Building Module for guidance of Multi-sectoral Nutrition Data Management and Reporting

Bangladesh National Nutrition Council

Supported by: TAN-MER, Nutrition International (NI)

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Prepared by: Bangladesh National Nutrition Council (BNNC)

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ABBREVIATIONS AND ACRONYMS

ANC	Antenatal Care
ARI	Acute Respiratory Infection
BARC	Bangladesh Agricultural Research Council
BARI	Bangladesh Agricultural Research Institute
BAU	Bangladesh Agricultural University
BCSIR	Bangladesh Council of Scientific and Industrial Research
BFRI	Bangladesh Fisheries Research Institute
BFSA	Bangladesh Food Safety Authority
BFSA	Bangladesh Food Safety Authority
BINA	Bangladesh Institute of Nuclear Agriculture
BIRTAN	Bangladesh Institute of Research and Training on Applied Nutrition
BNNC	Bangladesh National Nutrition Council
BLRI	Bangladesh Livestock Research Institute
BRRI	Bangladesh Rice Research Institute
DAE	Department of Agricultural Extension
DGFP	Vulnerable Group Feeding Program
DGHS	Directorate General of Health Services
DLS	Department of Livestock Services
DOF	The Department of Fisheries
FPMU	Food Planning and Monitoring Unit
HIES	Household Income & Expenditure Survey
IFRB	Institute of Food and Radiation Biology
IFST	Institute of Food Science & Technology
INFS	Institute of Nutrition and Food Science
IYCF	Infant and Young Child Feeding
LGD	Local Government Division
M&E	Monitoring & Evaluation
MAD	Minimum Acceptable Diet
MER	Monitoring Evaluation and Reporting
MICS	Multiple Indicator Cluster Survey
MIS	Management Information System
MOA	Ministry of Agriculture
MOFL	Ministry of Fisheries and Livestock
MOFood	Ministry of Food
MOHFW	Ministry of Health & Family Welfare
MOP	Ministry of Planning
MOWCA	Ministry of Women and Children Affairs
NARS	National Agriculture Research System
NGO/UN/CS	Non-Governmental Organisation/ United Nations/Civil society
PNC	Postnatal Care
SWOT	Strengths, Weaknesses, Opportunities, and Threats.
TAN	Technical Assistance for Nutrition
VGD	Vulnerable Group Development

ACKNOWLEDGEMENT

This is clearly declared that this module has borrowed idea from different secondary sources which have been cited in the references and acknowledged them in right way. The basis for "Capacity Building Module for guidance of Multi-sectoral Nutrition Data Management and visualization" is taken from Global Nutrition Monitoring Framework (GNMF) developed and published by WHO and UNICEF. Additional references used in this modules are from few open sources and manual which has been mentioned as references. The Government of Bangladesh is the prime user of this module and will carry all the responsibilities and recognition of this document. Our initial assessment of the technical staff of BNNC's level of learning has guided us enormously to design the contents of the module.

Initial concept and discussion of this module was from WHO colleague who shared idea to design a standard learning module for stakeholders who will be using this one for effective monitoring of NPAN2 for BNNC. We along with our consultants have a long-standing experiences working in monitoring evaluation for Government system which has been blended into this module. In order to engage the participants attentive, familiar examples have been drawn from our day to day work in various monitoring and evaluation systems we worked in Bangladesh. Much emphasis has been put to make the module basic, practical and user friendly rather than aiming to teach advanced technical learning in database management for nutrition.

I wish to express my sincere gratitude to Nutrition International; through its Technical Assistance for Nutrition (TAN) Project for providing the services of Mr. Md. Nezam Uddin Biswas, Lead Consultant, MER and Mr. Zakaria Chowdhury, Consultant, MER of BNNC were instrumental in developing the module.

We extend our sincere thanks to all individuals who were involved for their enthusiasm, advice technical and financial assistance. We are indebted to Nutrition International (NI) for technical and financial support for this work and SUN movement as the leader of Global Nutrition support.

Finally, I owe my deep gratefulness to SUN-FP Mr. Md. Habibur Rahman Khan, Additional Secretary, Public Health & World Health, Health Services Division, Ministry of Health and Family Welfare and Mr. Md. Ruhul Amin Talukder, Joint Secretary, Ministry of Agriculture for their management support to prepare this document successfully.

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EXECUTIVE SUMMARY

This capacity building guide aims to present the data management framework that can support tracking of nutrition progress in line with NPAN2 target indicators. In the context of capacity building of Bangladesh National Nutrition Council (BNNC) and their relevant data managers and intermediate users from different sectors, this module will help to understand and manage the NPAN2 priority indicators. By introducing a framework, which reflects a module-based approach to capacity building and learning, the aim is to inspire the building of the bridge between individual competency development and organizational learning and ultimately change for effective monitoring of NPAN2 progress. The module combines conceptual exploration with practical step-by-step suggestions, process the data extraction, data management, and error checking during the monitoring process. In short the module includes three learning concepts, indicator's framework which helps to understand the process of operationalization of priority indicators.

The guide is divided into three sections: Section 1: introduces the framework of NPAN2 priority indicators as a background to the module-based approach to capacity building. Section 2: explores the concepts of data Integration from different sources, learning and change, Section 3: introduces the data management and data visualization guidelines for nutrition priority indicators based approach and describes the stages included.

This module or guidance will help to resolve conflict, promote harmonization of methods, and assure high quality standards among all stakeholders. Initially a training session on data management and reporting will be conducted among the technical managers of relevant persons on existing systems and future data management process.

CHAPTER 1: INTRODUCTION

1.1 Context:

Monitoring and evaluation (M&E) resides at the core of Bangladesh National Nutrition Council (BNNC) activity and key to unlock many uncertainties and challenges of implementing Second National Plan of Action for Nutrition (NPAN2). BNNC's M&E system is built on a logical framework. The log frame with its matrix specifies the NPAN2 that is intended to achieve (objectives) and how this achievement will be measured (indicators). It is essential to interpret the project inputs, outputs, outcomes, and impact since the indicators to be measured under the M&E system. Monitoring and evaluation are linked to the overall target indicators of NPAN2.

It is necessary to develop and strengthen capacities for planning, data managing as well as monitoring and evaluation through the training of adequate numbers of personnel in relevant disciplines to rack the NPAN2 progress. It will also create an ongoing commitment to innovation, monitoring and evaluation system at BNNC office.

1.2 Objective of the module

The objective of the module is to provide a self-learning material for the M&E unit at BNNC office and other sectoral units who will be involved under multi-sectoral integrated and interoperable nutrition information systems in Bangladesh.

The content of the module will help to understand the different indicators relating to NPAN2 target and process of tracking progress of nutrition status in the country.

It will help to co-ordinate collection of data from different reporting sources; collate and analyze data for generating periodic reports and provide overall support to the system at BNNC's data warehouse.

This is especially important as the BNNC continues to be improved and rolled-out to assess and monitor national nutrition progress tracking and monitor program-level implementation through BNNC's M&E staff members who will be taking routinely on the role of systematically collecting and using information to manage programs and guide strategies and policies.

1.3 Background

Human Capacity on M&E

The BNNC technical staff members who carry out M&E-related functions do not have the sufficient skills to collate, process, and analyze data. They mostly engage in simple compilation of vital statistics. The use of statistical applications to produce simple graphics and table products is lacking and respondents are unaware of such applications. A capacity assessment activity has been conducted among technical staff of BNNC office to understand the level of knowledge and interest on data management and reporting of nutrition information systems.

The baseline assessment of BNNC's capacity as an institution sought information from senior management that included heads of sections (M&E), Information, Communication, and Technology, Human Resource Management, data managers, and personnel who perform M&E functions. Select personnel from BNNC's offices, together with key personnel, were also included. Participants were identified through a purposive sampling method so as to interview only those people who were expected to oversee M&E responsibilities and specific individuals who perform M&E functions directly or indirectly for the BNNC office.

The assessment indicates BNNC has inadequate knowledge on "M&E Structure, M&E functions and Capabilities including capacity building training and knowledge". They must be familiar with the M&E fundamentals that pertain to the methods and procedures of formation of a functional M&E unit at BNNC's premises for data collection, reporting, analysis, and dissemination.

The assessment also shows that BNNC lacks of "Data Management Processes". In the absence of such a knowledge, capacity building that is undertaken is not regular or structured to consider needs and types and levels of training. Consequently, not all gaps in M&E skills and competencies are addressed. Participants mentioned that previously the government relied on external M&E technical support to accomplish routine M&E tasks. Now a new directive for all departments requires the use of internal capacities for M&E tasks, which inevitably will require capacity building in M&E.

The comparative scores for the M&E and non-M&E categories from the individual self-assessment show that the former have more capacity in general management compared to the other functional areas. This result is unexpected, but could be attributed to the nature of self-assessment surveys, where at times respondents tend to rate themselves more highly than their actual level of competency. Other aspects of self-assessment on competency (Links with National Reporting System, Indicator Definitions and Reporting Guidelines, Data-collection and Reporting Forms / Tools etc); however, this overall assessment included all BNNC technical staff who participated in interview, and the results might not reflect a clear picture of M&E capacity because some staff members have no M&E responsibilities in their job descriptions.

Therefore, based on the findings there needs a series of capacity building sessions for BNNC staff on M&E data management and reporting systems to tack the NPAN2 progress.

1.4 Who should use the module?

The BNNC office which is headed by an Executive Director/Director General (as of now called Secretary) as the executive head. S/He will be supported by three directors. Among them the technical

people under “Research, Monitoring & Evaluation” is the target group for whom this module is developed.
The responsible Director of Research, Monitoring & Evaluation will be supported by subject oriented two Deputy Directors. There will be four Assistant Directors under Research, Monitoring & Evaluation supervise by of those Deputy Directors. All the staff need to be well equipped with training and enhancing their capacity for implementing the activities and smooth functioning of BNNC office. An effective training program is one of the best ways to prepare key BNNC personnel for success. By preparing them with the tools and knowledge for performing their jobs can expect a more cohesive unit with better performance.

BNNC and other partner’s organizations need more than just data management; they need a proper guideline that sets the rules for every type of customizations of data. The module will answer data ownership questions, checking inconsistencies in data across different sources, as well as provide solutions to the growing need of big data and the various advantages it offers.

CHAPTER 2: MONITORING INDICATORS

2.1 Concepts of Monitoring Actions

One of the key responsibilities of the BNNC office is to collate, analyse, disseminate and use of data and information. Also, there is need for a good capacity of data collection and analysis at the district level and below. Currently, the capacity for analysis is largely confined to the national level. Therefore, sub-district and district level staff are in need of training and capacity building so that they can capture quality data, analyse data and produce reports as part of a broader monitoring mechanism.

The monitoring and evaluation is a four-tier process with decreasing specificity and number of indicators according to need.

Monitoring at the Upazila and District levels through a strengthened method: Data collected by local sector workers would be collated and sent with some interpretation to local and district level decision - makers for their feedbacks to adjust, strengthen supervision, and improve targeting and so on. Upazila Multi-sectoral Nutrition Coordination Committee and District Multi-sectoral Nutrition Coordination Committee have specific terms of reference and they would meet bi-monthly to monitor progress of nutrition activities and report back to the competent authority at regular interval.

Monitoring at the National level with consolidation and exhaustive interpretation: Each ministry would use their data for their own programs in customary usage and to monitor progress and strengthen their sector activities. They would also have capacity for the selected nutrition indicators, as itemized in the Sector Matrices, to be assembled, and then feed to BNNC.

BNNC Office will work for consolidation to assess more limited number of indicators, examine food security and nutrition trends, progress and formulate Annual Monitoring Report of NPAN2. Apart from annual report, quarterly reports on selected indicators will also be produced. (NPAN2, 2016-2015)

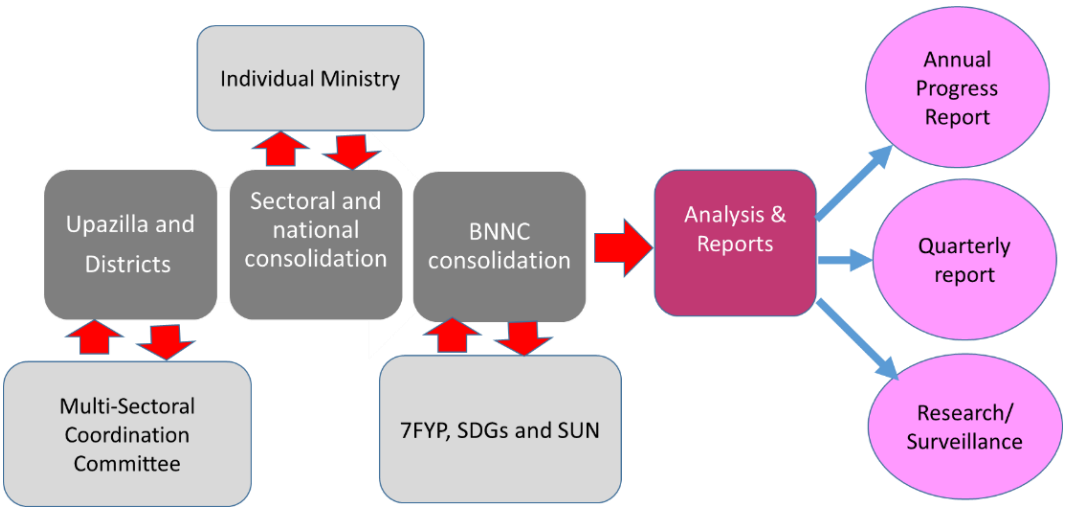


Figure 2.1: Monitoring, Evaluation & Reporting flow

2.2 Categories of Monitoring Indicators

M&E will focus on higher level indicators such as the indicators as itemized in the National Nutrition Policy (NNP) 2015, and to other nutrition framework under Second International Conference on Nutrition (ICN2), Sustainable Development Goals (SDGs), World Health Assembly (WHA) etc. under the UN system.

The indicators have been divided into following three categories based on who, where and what frequency they are measured:

1. National target indicators:

NPAN2 has set tangible and measurable targets to be achieved by 2025 for reducing various forms of malnutrition. These are national level outcome or impact indicators. The indicators are aligned with National and Global indicators and targets. The National Nutrition Policy (NNP 2015) and other policy goals and targets (eg SDGs, WHA, ICN2) are enlisted as national target indicators below in table 2.1.

Table 2.1: List of National Target Indicators for reducing various forms of malnutrition and their progress towards NPAN2 target by 2025

Target Indicators	Baseline	Target by 2025
Increase the initiation of breastfeeding in the first hour of birth	51% (BDHS 2014)	80%
Increase the rate of exclusive breastfeeding in infants less than 6 months of age	55% (BDHS 2014)	70%
Increase the rate of continued breastfeeding in children aged 20 to 23 months	87% (BDHS 2014)	>95%
Increase the proportion of children aged 6-23 months receiving a minimum acceptable diet	23% (BDHS 2014)	>40%
Reduce the rate of low birth weight	23% (National LBW Survey 2016)	16%
Reduce stunting among under-5 children	36% (BDHS 2014)	25%
Reduce wasting among under-5 children	14% (BDHS 2014)	8%
Reduce the proportion of underweight among under-5 children	33% (BDHS 2014)	15%
Reduce the rate of severe acute malnutrition (SAM)(WHZ < -3)among children under 5	8% (BDHS 2014)	<1%
Reduce malnutrition (Total Thinness, BMI<18.5) among adolescent girls (15-19yrs)	19% (BDHS 2014)	<15 %
Increase Vitamin A capsule supplementation coverage in children aged 6- 59 month	62% (BDHS 2014)	99%
Increase the rate (>15PPM) of iodized salt intake	50% (National Salt Iodization Survey 2015)	90%
Control & reduce maternal overweight (BMI>23)	39% (BDHS 2014)	30%
Reduce the rate of anaemia among pregnant women	50% (BDHS 2011)	25%
No increase of childhood overweight (WHZ >+2) among children under 5 years	1.4%	No increase

2. NPAN2 Priority Outputs indicators:

To achieve the agreed upon targets a number of output indicators are considered to assess the progress of NPAN2 Monitoring & Evaluation Matrix.

Several workshops and consultation meetings were conducted for selecting and finalizing the priority output indicators to be monitored at different phases from NPAN2 Monitoring & Evaluation Matrix. In total 25 program indicators and 13 operational indicators have been selected and finalized as a priority monitoring indicators based on national nutrition status and short-term & mid-term target of NPAN2. Data on these indicators will be collected through defined periodic surveys, for example, Bangladesh Demographic and Health Survey (BDHS) by the National Institute of Population Research and Training (NIPORT) every four years. These indicators are for use by both program managers and national-level stakeholders.

Table 2.2: Monitoring and Evaluation Matrix to be monitored and evaluated to assess the high-level indicators in light of NPAN2 target

Program Indicators:

SL.	Indicators	NPAN2 Target 2025	NPAN2 baseline
	Thematic area 1: NPAN2 output indicators relating to Nutrition for All following Life Cycle Approach		
1	Increase the initiation of breastfeeding in the first hour of birth	80%	51% (BDHS 2014
2	% of children (0-5m) exclusively breastfed	70%	55% (BDHS 2014)
3	% of children (6-23 m) receiving MAD*	40%	23% (BDHS 2014)
4	Percentage of infants born with low birth weight (<2,500 grams)	16%	23% (National LBW Survey-2016)
5	Reduce stunting among under-5 children	25%	36% (BDHS 2014)
6	Children under 5 years who are wasted	<8%	14% (BDHS 2014)
7	Children under 5 years who are overweight	No increase	1.4% (BDHS 2014)
8	% of Women 15-49 yrs. With Anaemia	<25%	42% (BDHS 2011)
9	% of children under 5 with diarrhoea treated with ORT and Zinc	Not Available	38% (BDHS 2014)
10	%of women 15-49 yrs who are overweight or obese (BMI ≥23)	30%	24% (BDHS 2014)
11	% of adolescent girls (15-19 yrs.) with height <145 cm	<8%	(BDHS 2014)
12	% of adolescent girls (15-19 yrs.) thin (total thinness)	<15%	29% (FNSP 2015)
13	% of women (15-19 yrs) who have begun childbearing	10%	31% (BDHS 2014)
14	% of population that use improved drinking water	>99%	98% (BDHS 2014)

15	% of population that use improved sanitary latrine (not shared)	75%	48% (BDHS 2014)
16	% of caregivers with appropriate hand washing behaviour	50%	27% (FSNSP 2014)
	Thematic area 2: NPAN2 Output indicators relating to Agriculture & Diet diversification & locally adapted recipes		
17	Per capita consumption of fruits and vegetables	≥400g per day	Fruits: 44.7 gm Vegetables: 166.1 gm (HIES 2010)
18	% share of total dietary energy from consumption of cereals	<60%	70% (HIES 2010)
	Thematic area 3: NPAN2 Output indicators relating to Social Protection/SBCC		
19	% of women age 20-24 who were first married by age 18	30%	59% (BDHS 2014)
20	Number of Social Safety Net Programs which incorporated nutrition sensitive & nutrition specific objectives	50%	10% (assumption)
21	Number of upazilas covered under VGD program to providing nutritionally enriched fortified food	50%	Nill
22	% of children (36-59 m) who are attending an early childhood education program	30%	13% (MICS 2012-13)
23	% of women who completed secondary/higher education	90%	14% (BDHS 2014)
24	Number of ongoing comprehensive coordinated multisectoral, multichannel advocacy and communications campaign	10	0
25	1. Change in per capita consumption of: i. salt ii. sugar consumption	i. <5 gm/ person/day (WHO) ii. <10% of total energy intake	i. Salt: not available ii. Sugar: 7.4 (gm/capita /day) (HIES 2010)

Operational Indicators:

	Thematic area 5: Operational Indicators to be monitored and evaluated to assess the BNNC functionality		
1	Compendium on nutrition research available	1 per 2 years Interval	0
2	Yearly monitoring and evaluation report available	10 (one per yr)	0
3	Strengthening/ Implementing the M&E of NPAN2	In place	Not Applicable
4	Harmonizing the M&E of Nutrition services and Nutrition Information System and reporting	In place	Not Applicable
5	Conducting policy dialogues with 3Ms	In place	Not Applicable
	Thematic area 6: NPAN2 Output indicators relating to Capacity Building, Governance and Institutional Development		
6	BNNC office functional	Yes (2017)	No
7	Number of full-time personnel recruited for BNNC Office	34 (2017)	8
8	Number of council meetings held	2 Per year (On going)	0
9	Number of executive committee meeting held	4 Per year (On going)	0

10	Number of standing technical committee meetings held	6 Per year (On going)	3
11	District and Upazila nutrition coordination committee are in place	Yes (2019)	NA
12	Yearly monitoring report on NPAN is available	Yes (On going)	NA
13	Nutrition focal points in different sectors are in place and TOR available	Yes (2017)	NA

***Minimum acceptable diet*

3. Proxy Indicators: Projects based performance indicators

These indicators (*Annex 2*) are expected to be available over time at the community, facility, district and regional levels in most cases. Primarily for use by program managers and implementers, these should be measured routinely. These indicators would use as a proxy indicators which should be monitored and regulated through monitoring team regular basis. Sometimes these indicators will work as a proxy of priority indicators of NPAN2.

Data Collection and Analysis technique

The data collection and analysis is to be expanded on the information provided in the indicator matrix by describing in detail how data and information are defined, collected, organized, and analysed. Key components of this plan include: the unit of analysis; the link between indicators, variables and questionnaires. Special analyses, such as disaggregating data by gender, age, location, and socio-economic status are also described. The Major sources of data and information for monitoring and evaluation include:

Secondary data: Secondary data sources include partner ministries and agencies including Bangladesh Bureau of Statistics (BBS), Food Planning and Monitoring Unit (FPMU), University or research centres, international agencies and other projects/programs working in the field of nutrition. Useful information is obtained from surveys, other research, and studies previously conducted consistent with the M&E needs, in-depth assessments, and reports.

Sample surveys: BBS, National Institute of Population Research and Training (NIPORT) and periodic surveys such as Households Income and Expenditure Survey (HIES), vital registration, Multiple Indicators Cluster Survey (MICS), Bangladesh Demographic Health Survey (BDHS) would be the best source of data to determine nutritional outcomes and impact. Nevertheless, if any technical support for sample survey is needed that could be provided from BNNC office.

Primary data: Nutrition data from routine system including Health & Family Planning Information System of MOHFW and results through evaluations and assessments will be analysed for use. Analysis would be involved systematic data quality assessment and, adjusted as deemed necessary.

2.3 Target Period

The NPAN2 is based on the agreed prioritization and sequencing principles and is divided into three time periods. The monitoring process would followed short term (2016-2018) and mid-term targets (2016-2020 and) Long term target (2016-2025).

CHAPTER 3: DATA MANAGEMNT FRAMEWORK OF PRIORITY INDICATORS

The second National Plan of Action for Nutrition (NPAN2) targets requires nationally representative indicators of the target population. It is important that NPAN2 has a baseline estimates, collect/produce intermediate nationally representative estimates, and plan for a final assessment in 2025. Standard data collection methods should be used to allow for comparability within countries over time period.

At present, availability of information depends mainly on repeated national surveys, carried out by national agencies, BBS, National Institute of Population Research and Training (NIPORT) and periodic surveys such as Households Income and Expenditure Survey (HIES), vital registration, Multiple Indicators Cluster Survey (MICS), Bangladesh Demographic and Health Survey (BDHS) are the source of data to determine nutritional outcomes and impact. Surveys are usually representative and are carried out at roughly three or four year's intervals.

3.1 Data Management Frameworks

A Data Management Framework (DMF) is a system of thinking, terminology, documentation, resources and insights which allows users to view data related concepts and information in their own context, and in the broader context of the framework, thereby enabling them to integrate their conversations and work.

The management and technical staff of the central units need to make good decisions, i.e., the ones that actually yield results. They thus need to create guidelines and rules, to ensure that these are being followed and then deal with ambiguities, noncompliance and other issues. A nutrition related indicator's framework empowers the organization to do just that, by allowing them to make informed decisions about how to manage data and eventually realize value from it, minimize cost and complexity, manage risk and ensure that the organization can fulfill the ever-growing demand for compliance with nutrition requirements.

The basis for indicators framework has been adopted from Global Nutrition Monitoring Framework (GNMF) developed and published by WHO and UNI CEF. The framework has been customized for NPAN2 priority indicators to be monitored and tracked for assessing NPAN2 progress.

The following priority indicators has been operationalized as per data availability, data quality, data source and use.

NPAN2 TARGET

By 2025,
25% reduction nationally

Stunting is a height-for-age measurement that is a reflection of chronic nutrition. This indicator measures the percent of children 0-59 months (i.e. under five years) who are stunted, as defined by a height for age Z score< -2. Children with a height for age Z score < -2 and >= -3 are classified as moderately stunted. Children with a height for age Z score < -3 are classified as severely stunted. This indicator will be a measurement of any stunting, i.e. both moderate and severe stunting combined. While stunting is difficult to measure in children 0-6 months and most stunting occurs in the -9-23 month range (1,000 days), this indicator data will still be reported for all children under 5 to align with the Bangladesh Demographic and Health Surveys (BDHS) data and to capture the impact of interventions over time (WHO, 2010).

Indicator Name	Reduce Stunting among under-5 children
Definition	Percentage of stunted (moderate and severe) children aged 0–59 months (moderate stunting= length/height-for-age between <-2 and >-3 SD of the WHO Child Growth Standards median; severe stunting = height-for-age below -3 SD of the WHO Child Growth Standards median) x under-five population (GNMF, 2017).
Method of Estimation	
Numerator	Number of children aged 0–59 months who were stunted.
Denominator	Total number of children aged 0–59 months who were measured.
Method	$\text{Percent of stunted children} = \frac{\text{Children aged 0–59 months who are stunted for age}}{\text{Total number of children aged 0–59 months who were measured}} * 100$
Data Availability	Data is available from secondary information. Basically from survey data (eg, BDHS) in every 4 years
Data Sources	Bangladesh Demographic Health Survey (BDHS), Urban Health Survey (UHS)
Data Quality	Population-based surveys that fulfil a set of criteria. Data are checked for validity and consistency and raw data sets are analysed according to a standard procedure to obtain comparable results. The main criteria for including surveys in the database are: (i) a defined population-based sampling frame; (ii) use of standard anthropometric measurement techniques; and (iii) presentation of results in z-scores in relation to the WHO child growth standards. (GNMF, 2017)
Frequency Of Data Collection	Every 3 years.
Guidance On Reporting	Prevalence of stunting in children less than 5 years of age should be presented for the total sample and disaggregated by age, sex, place of residence, region, socioeconomic status and mothers' education. It is useful to present stunting data by severity – moderate (z-score between <-2 and >-3 SD) and severe (z-score below -3 SD). (WHO, 2010)
Scope of reporting	Annual Monitoring report of NPAN2

3.3 WASTING IN CHILDREN UNDER FIVE YEARS OF AGE

NPAN2 TARGET

By 2025,
<8% reduction nationally

Weight-for-height describes current nutritional status and reflects acute or recent nutritional deficit. A child who is more than two standard deviations below (-2 SD) the reference median for weight-for-height is considered too thin for his or her height, or wasted.

Wasting results when a child falls significantly below the expected weight of a child of the same length or height. Wasting indicates current or acute undernutrition resulting from failure to gain expected weight or loss of weight. The main causes of wasting are inadequate food intake, inappropriate feeding practices, and infection or frequently a combination of all three factors.

Because of its response to short-term influences, wasting is often used for screening or targeting purposes in emergency settings and is sometimes used for annual reporting. Users should be aware and consider that wasting can have a strong seasonal dimension and reporting needs to include contextual data. (GNMF, 2017)

As with stunting, wasting is considered severe if the child is more than three standard deviations below the reference median. Severe wasting is closely linked to mortality risk. The 2017 BDHS estimated that 8% of children under 5 were thin for their height, or wasted, while only 2% were severely wasted (BDHS, 2017-18, Preliminary findings). The target of National Plan of Action for Nutrition is <8% reduction nationally by 2025 (NPAN2, 2016-2015).

Indicator Name	Children under 5 years who are wasted
Definition	Percentage of wasted (moderate and severe) children aged 0–59 months (moderate = weight-for-height between <-2 and >-3 SD of the WHO Child Growth Standards median; severe =weight-for-height below -3 SD of the WHO Child Growth Standards median)
Method Of Estimation	
Numerator	Number of children aged 0–59 months who are wasted.
Denominator	Total number of children aged 0–59 months who were measured
Method	$\text{Percent of wasted children} = \frac{\text{Number of children 0–59 months who are wasted}}{\text{Total number of children 0–59 months of age surveyed}} * 100$
Data Availability	Bangladesh Demographic Health Survey (BDHS)
Data Sources	Main sources of data are population-based household surveys with anthropometry and national nutrition surveillance systems.
Frequency Of Data Collection	Every 3 years
Guidance On data Collection	Children's weight and length/height are measured using standard methods. Children less than 24 months of age are measured lying down, while standing height is measured for children aged 24 months and older.
Guidance On Reporting	Prevalence of wasting in children less than 5 years of age should be presented in disaggregated form. Disaggregation should be made by age, sex, place of residence, region, socioeconomic status, and mother's education whenever possible. Prevalence of wasting should also be presented by severity – moderate (weight-for-height z-score between <-2 and >-3 standard deviations) and severe (weight-for-height z-score below -3 standard deviations).

3.4 REDUCE THE RATE OF LOW BIRTH WEIGHT

NPAN2 TARGET

By 2025,
16% reduction nationally

Low birth weight (LBW) has been defined by the World Health Organization (WHO) as weight at birth of less than 2,500 grams[11]. Low birth weight is associated with poor cognitive development, and chronic adulthood diseases- type 2 diabetes, hypertension and cardiovascular disease. It also reduces immunity. Intra-uterine growth retarded (IUGR) and LBW infants are more susceptible to hypoglycemia and birth asphyxia. They suffer from more diarrhea and pneumonia for a few months after birth. The adverse effects of early childhood undernutrition on behavior and cognitive development are not fully redressed, even with better diet and care later. Infants who weigh 2,000-2,499 gm at birth have a four-fold higher risk of neonatal death than those who weigh 2,500-2,999 gm, and a ten-fold higher risk than those weighing 3,000 - 3,499 gm.

Birth weight is affected to a great extent by the mother‟s own fetal growth and her diet from birth to pregnancy, and determining her body composition prior to conception. In deprived socio-economic conditions low birth weight emanates from the mother‟s poor nutrition and health over a long period, including the pregnancy period, the high prevalence of infections, or from pregnancy complications, often related to poverty. Hard physical work during pregnancy may contribute to poor fetal growth.

In 1992, as per WHO and UNICEF, LBW for industrialized countries was found to be around 7 percent, and in less developed countries an average of 17 percent. Half of all low birth weight babies are known to be born in South-central Asia, where about 27 percent of all infants weigh less than 2,500 g at birth. In Bangladesh, on the other hand, the first ever low birth weight survey conducted in 2003-2004, found the rate to be 36 percent. In developing countries, 6.7 percent of LBW infants are born preterm. In Bangladeshi cultural context it is difficult to identify preterm birth, as has been seen in this study, because women do not identify themselves as pregnant, unless they are sure that they will be retain the pregnancy (NLBWS, 2015).

Results from National Low Birth Weight Survey 2016, showed that the adjustments for birth size and for heaping resulted, on average, in an increase of 23% in the incidence of low birth weight compared with the reported data with no adjustments.

[1] The 29th World Health Assembly (1976) agreed that: “Low birth weight is a weight at birth of less than 2,500 g (up to and including 2,499 g) irrespective of gestational age.”

Indicator Name	Percentage of infants born with low birth weight (<2,500 grams)
Definition	The incidence of low birth weight in a population is defined as the percentage of live births under 2500 g out of the total number of live births during the same period.
Method of Estimation	
Numerator	Number of live-born neonates with weight less than 2500 g at birth.
Denominator	Total number of live births.
Method	$\text{Low birth weight incidence rate} = \frac{\text{Number of live born babies with birth weight less than 2,500 g in a year}}{\text{Total number of live births in a year}} * 100$
Data Availability	National low birth weight Survey 2015
Data Sources	Delivery registers (hospital management and information systems – HMIS). This method provides data on the incidence of low birth weight among neonates delivered in health facilities. Population-based household surveys, which collect data on birth weight and the relative size of neonates at birth, allow for an adjusted value even where many infants are not weighed at birth. Other possible data sources include routine facility information systems.
Frequency Of Data Collection	Not followed
Guidance On Reporting	Nationally disaggregated data should be presented by sex, place of residence, region, gestational age (preterm status), socioeconomic status (wealth quintile) and mother's education.

3.5 OVERWEIGHT IN CHILDREN UNDER FIVE YEARS OF AGE

NPAN2 TARGET

By 2025,
No change of 1.4% nationally

Overweight in children is reaching alarming proportions in many countries and poses an urgent and serious challenge. The prevalence of overweight among children is rapidly increasing even in many low- and middle -income countries. In 2016, at least 40.6 million children less than 5 years of age were overweight or obese, and most of them live in low- and middle-income countries. Progress in tackling childhood obesity has been slow and inconsistent. (GNMF, 2017)

The National Plan of Action for Nutrition implies that the estimated prevalence of childhood overweight (1.4%) in BDHS 2014 should not increase by 2025. However, the recent trend shows a slow but steady increase, with more rapid increases in countries with rapidly expanding food systems. National and regional data from high-income countries indicate that higher socioeconomic groups have a lower increase in childhood obesity (BDHS, 2017-18, Preliminary findings).

Indicator Name	Children under 5 years who are overweight
Definition	Prevalence of weight-for-height in children aged 0–59 months defined as above +2 SD of the WHO Child Growth Standards median.
Method Of Estimation	
Numerator	Number of children aged 0–59 months who are overweight.
Denominator	Total number of children aged 0–59 months who were measured.
Method	$\text{Prevalence of overweight} = \frac{\text{Number of children aged 0–59 months who are overweight}}{\text{Total number of children aged 0–59 months who were measured}} * 100$
Data Availability	Bangladesh Demographic Health Survey (BDHS)
Data sources	Data sources include nutrition surveys, any other representative population-based surveys with nutrition modules, and surveillance systems.
Data Quality	Children's length/height and weight are measured using standard procedures.
Frequency Of Data Collection	Every 3 years
Guidance for data collection	Children's length/height and weight are measured using standard procedures.
Guidance On Reporting	Disaggregated data should be presented by age, sex, place of residence, region, socioeconomic status (wealth quintile), and maternal education.

3.6 WOMEN 15-49 YRS. WITH ANAEMIA

NPAN2 TARGET

By 2025,
<25% reduction nationally

Anaemia is defined as low blood haemoglobin concentration (<110 g/L in pregnant women and <120 g/L in non-pregnant women aged 15–49 years) (GNMF, 2017).

The National Plan of Action for Nutrition implies a relative reduction of less than 25% of the number of women of reproductive age (15–49 years) with anaemia by 2025, compared to the 2011 baseline of 42% (BDHS, 2017-18, Preliminary findings).

Indicator Name	% of Women 15-49 with Anemia
Definition	Anaemia is defined as haemoglobin level <110 g/L in pregnant women aged 15–49 years. For non-pregnant and lactating women, the haemoglobin cut-off for anaemia is <120 g/L. The indicator captures both pregnant and non-pregnant women in the reproductive age of 15–49 years. • Prevalence of haemoglobin <110 g/L in pregnant women aged 15–49 years. • Prevalence of haemoglobin <120 g/L in non-pregnant women aged 15–49 years.
Method of Estimation	
Numerator	Number of women aged 15–49 years with haemoglobin levels below the indicated cut-off.
Denominator	***For pregnant women:*** Total number of women aged 15–49 years with haemoglobin levels assessed.
Method	Number of pregnant women 15–49 years with haemoglobin <110 g/L Prevalence of anaemia = ——————————————— *100 Total number of pregnant women 15–49 years with haemoglobin levels assessed ***For non pregnant women:*** Total number of women aged 15–49 years with haemoglobin levels assessed. Number of non pregnant women 15–49 years with haemoglobin <120 g/L Prevalence of anaemia = ——————————————— *100 Total number of non-pregnant women 15–49 years with haemoglobin levels assessed
Data Availability	Population-based household surveys with haemoglobin estimates of women of reproductive age 15–49 years.
Data Sources	National Micronutrients Status Survey

Data Quality	The WHO VMNIS has a set of inclusion criteria for anaemia data. When a potentially relevant survey is identified and the full report obtained, data are checked for consistency as part of routine quality control. If required, data holders are contacted for clarification or to obtain additional results. Available information is extracted and entered into a standard data form. (GNMF, 2017)
Frequency Of Data Collection	Every 3–5 years.
Guidance On Reporting	Anaemia data should be presented disaggregated by age, education level, place of residence,region, reproductive status (pregnant, lactating), and socioeconomic status (wealth quintile). For reporting purposes on anaemia among women of reproductive age, countries should use the WHO recommended haemoglobin cut-offs for anaemia for estimating the national prevalence of anaemia even if a different local reference is used. The haemoglobin cut-off for pregnant and non-pregnant women aged 15–49 years is <110 g/L and <120 g/L, respectively. It is recommended to report on anaemia prevalence by severity. For non-pregnant women, the haemoglobin cut-offs for defining severity of anaemia are mild (110–119 g/L), moderate (80–109 g/L) and severe (<80 g/L). Haemoglobin levels of mild, moderate and severe anaemia for pregnant women. For reporting prevalence of anaemia to WHO, the exact age group assessed should be provided. The prevalence of anaemia in the target group should be from nationally representative household-based cross-sectional surveys. In general, healthy non-pregnant women of reproductive age do not have healthy clinic visits and therefore clinic-based surveys are unlikely to be representative of all women in this target group. Some surveys may only include non-pregnant women who have one or more children less than 5 years of age. (GNMF, 2017)

3.7 EXCLUSIVE BREASTFEEDING IN 0-5 MONTHS CHILDREN

NPAN2 TARGET
By 2025,
70% increase nationally

UNICEF and WHO recommend that children be exclusively breastfed (that is, given no other liquid or solid food or plain water) for the first six months and then should be given solid or semi-solid complementary foods beginning in the seventh month of life. The standard indicator of exclusive breastfeeding is the percentage of children under age 6 months who are exclusively breastfeeding.

Sixty-five percent of infants under age 6 months were exclusively breastfed in 2017, a level markedly higher than in 2014 (55%) (BDHS, 2017-18, Preliminary findings).

Indicator Name	**% of children (0-5m) exclusively breastfed**
Definition	Percentage of infants (0-5m) months of age who are fed exclusively with breast milk (GNMF, 2017)
Method Of Estimation	
Numerator	Number of infants (0-5) months of age who are exclusively breastfed (meaning no other food or drink, including water).
Denominator	Total number of infants (0-5) months of age surveyed.
Method	$\text{Exclusive breastfeeding rate} = \frac{\text{Number of infants (0-5) months who received only breast milk during the previous day}}{\text{Total number of infants <6 months of age surveyed}} * 100$
Data Availability	Survey data can be available in Bangladesh Demographic and Health Survey (BDHS) every four years. However survey data can also found in the Multiple Indicator Cluster Survey (MICS) by UNICEF. Directorate General of Health, (DGHS), MIS also collect routine data using DHIS2 platform from Community Clinic (CC) level.
Data Sources	Bangladesh Demographic and Health Survey (BDHS) DHIS2 (Routine data) Multiple Indicator Cluster Survey (MICS)
Frequency Of Data Collection	BDHS (Every four years) Routine date (Monthly) MICS (Every five years)
Guidance On Reporting	Disaggregated data should be presented by age, sex, place of residence, region, socioeconomic status (wealth quintile), and maternal education.

3.8 INTERMEDIATE OUTCOME INDICATORS

3.8.1 Coverage of diarrhea treatment

Diarrhoea is defined as the passage of three or more loose or liquid stools per day (or more frequent passage than is normal for the individual). Frequent passing of formed stools is not diarrhoea, nor is the passing of loose, "pasty" stools by breastfed babies (GNMF, 2017).

According to BDHS 2017-18, unpublished report, Eighty-five percent of children with diarrhea received oral rehydration therapy (ORT), and 44% received both ORT and zinc. Between 2014 and 2017, use of ORT and care seeking from a health facility/provider remained largely unchanged, but use of oral rehydration salts (ORS) increased from 77% to 83%, and use of ORT with zinc increased from 38% to 44% (BDHS, 2017-18, Preliminary findings).

Indicator Name	**% of children under 5 with diarrhea treated with ORT and Zinc**
Definition	Percentage of children under 5 years of age with diarrhoea in the last two weeks receiving ORS (fluids made from ORS packets or pre-packaged ORS fluids) and Zinc. (GNMF, 2017)
Method Of Estimation	
Numerator	Number of children under 5 years of age with diarrhoea in the two weeks preceding the survey given fluid from ORS packets or pre-packaged ORS fluids and Zinc.
Denominator	Number of children with diarrhoea in the two weeks preceding the survey.
Method	$\text{Percent of children with diarrhoea receiving ORS and Zinc} = \frac{\text{Number of children under 5 years of age with diarrhoea in the two weeks preceding the survey given fluid from ORS packets and Zinc}}{\text{Number of children with diarrhoea in the two weeks preceding the survey}} * 100$
Data Availability	Data are derived from re-analysis of BDHS and MICS micro-data, which are publicly available using the standard indicator definitions as published in DHS or UNICEF documentation
Data Sources	The main source of data should be household surveys (eg, BDHS). The other sources of data could be routine facility information systems. Beside this, IMCI has an online database to collect diarrhoea patient from field site who receive only ORS.
Frequency Of Data Collection	Survey data: Every 3 years Routine program data: Monthly
Guidance On Reporting	Where sample size permits, this indicator should be presented in disaggregated form. Disaggregation should be made by age, sex, place of residence, and socioeconomic status.

3.8.2 Overweight and obesity in women aged 15–49 years

In many countries chronic energy deficiency, characterized by a BMI of less than 18.5 among women, remains the predominant problem, leading to low work productivity and less resistance to illness.

Low pre-pregnancy BMI and short stature of women are known risk factors for poor maternal and birth outcomes. Overweight and obese women are also predisposed to a wide range of health problems. Maternal obesity can lead to several adverse maternal and fetal complications during pregnancy, delivery, and postpartum (Van Lieshout et al. 2011).

Indicator Name	**%of women 15-49 yrs who are overweight or obese (BMI ≥23)**
Definition	Percentage of non-pregnant women aged 15–49 years who are overweight (defined as having a BMI≥23 kg/m2) and obese (defined as having a BMI ≥23 kg/m2). BMI is calculated by dividing the subject's weight in kilograms by their own height in meters squared. (GNMF, 2017)
Method Of Estimation	
Numerator	Number of non-pregnant women aged 15–49 years who are overweight and number of non-pregnant women aged 15-49 years who are obese.
Denominator	All non-pregnant women of the survey aged 15–49 years.
Method	$\text{Overweight} = \frac{\text{Number of non-pregnant women aged 15–49 years in the sample with BMI ≥23 kg/m}^2}{\text{Total number of non-pregnant women aged 15–49 years in the sample}} * 100$ $\text{Obesity} = \frac{\text{Number of non-pregnant women aged 15–49 years in the sample with BMI ≥30 kg/m}^2}{\text{Total number of non-pregnant women aged 15–49 years in the sample}} * 100$
Data Availability	Bangladesh Demographic Health Survey (BDHS)
Data Sources	Nationally representative population-based (preferably) surveys in which height and weight of adult women are measured.
Frequency Of Data Collection	Every 3 years.
Guidance On data collection	Height and weight of adult women are measured using standard procedures.
Guidance On Reporting	Disaggregated data should be presented by age, sex, education level, place of residence and socioeconomic status.

3.8.3 Adolescent girls (15-19 yrs.) thin (total thinness)

Indicator Name	**% of adolescent girls (15-19 yrs.) thin (total thinness)**
Definition	BMI-for-age z-score less than -2SD but greater than or equal to -3SD (GNMF, 2017)
Method Of Estimation	
Numerator	Number of adolescent girls (15-19 yrs.) BMI-for-age z-score less than -2SD but greater than or equal to -3SD
Denominator	Total number of adolescent girls (15-19 yrs.) screened
Data Availability	The Food Security and Nutrition Surveillance - National Nutrition Services (FSNS-NNS)
Data Sources	FSNS-NNS
Data Quality	The Food Security and Nutrition Surveillance - National Nutrition Services (FSNS-NNS) collects nationally representative data on food and nutrition insecurity. The surveillance system provides information about households with and without children, adolescent girls, pregnant and non-pregnant women. Information has been collected on multiple measures of nutritional status for women and children, including dietary diversity, height, weight and mid-upper arm circumference (MUAC).
Frequency Of Data Collection	Every three years
Guidance On Reporting	Disaggregated data should be presented by age, place of residence, region, socioeconomic status (wealth quintile) and educational attendance.

3.8.4 Women (15-19 yrs.) who have begun childbearing

Indicator Name	% of women (15-19 yrs.) who have begun childbearing
Definition	Annual number of births to women aged 15–19 years per 1000 women in that age group. It is also referred to as the age-specific fertility rate for women aged 15–19 years. (GNMF, 2017)
Method Of Estimation	
Numerator	Number of live births that occurred in women aged 15–19 years at the time of the birth in a given year.
Denominator	Total number of women aged 15–19 years in the same year. The adolescent birth rate is generally computed as a ratio. The numerator is the number of live births to women aged 15–19 years, and the denominator is the total number of women aged 15–19 years. The numerator and the denominator are calculated differently for civil registration and survey and census data. $\text{Adolescent fertility rate} = \frac{\text{Number of live births to women aged 15–19 years in a year}}{\text{Total number of women aged 15–19 years in a year}} * 1000$
Data Availability	Bangladesh Demographic Health Survey (BDHS)
Data Sources	The main source of data should be household surveys (eg, BDHS). The other sources of data could be routine facility information systems.
Frequency Of Data Collection	Every 3 years
Guidance On data Collection	This indicator should be collected through nationally representative household surveys.

Guidance On Reporting	Disaggregated data should be presented by marital status, education level, place of residence and socioeconomic status (wealth quintile).

3.9 Process/Proxy indicators

3.9.1 Minimum Dietary Diversity (MDD)

Infant and young child feeding practices directly affect the nutritional status of children under two years of age. Improving infant and young child feeding practices is critical to improved nutrition, health and development of children. Complementary feeding should be timely, adequate and appropriate. This means that all infants should start receiving diverse complementary foods in addition to breastmilk from 6 months onwards. The indicator is a composite of minimum diet diversification and minimum meal frequency and keeping into consideration age of the child in months and status of breastfeeding based on WHO guidelines. (GNMF, 2017)

Indicator Name	**% of children (6-23 m) receiving MDD**
Definition	Proportion of children3 6–23 months of age who receive foods from 5 or more food groups. (GNMF, 2017)
Method Of Estimation	
Numerator	Number of children 6–23 months of age who received foods from 5 or more food groups yesterday during the day or night.
Denominator	Children 6–23 months of age for whom data on breastfeeding and diet were collected.
	$\text{Minimum dietary diversity} = \frac{\text{Number of children 6–23 months of age who received foods from 5 or more food groups yesterday during the day or night}}{\text{Children 6–23 months of age for whom data on breastfeeding and diet were collected}} * 100$
Data Availability	Bangladesh Demographic Health Survey (BDHS)
Data Sources	Nationally representative population-based household surveys that include modules with qualitative or quantitative dietary recalls for children from 6 to 23 months of age.
Data Quality	This indicator, consumption of foods from at least 4 of the above 7 food groups on the previous day, would mean that in most populations the child had a high likelihood of consuming at least one animal-source food and at least one fruit or vegetable that day, in addition to a staple food (grain, root or tuber).
Frequency Of Data Collection	Every 3 years
Guidance On Reporting	It is recommended that the indicator be further disaggregated and reported for the following age groups: 6-11.9 months, 12-17.9 months and 18-23.9 months.

3.9.2 Minimum Acceptable Diet (MAD)

Indicator Name	**% of children (6-23 m) receiving MAD**
Definition	Proportion of children 6-23 months of age who receive a minimum acceptable diet (apart from breastmilk).
Method Of Estimation	
Numerator	Number of youngest children age 6-23 months living with the mother who were fed
Denominator	Number of youngest children under 2 years living with the mother who is age 6-23 months, disaggregated by whether breastfeeding or not. The indicator is calculated from the following two fractions: $\frac{\text{Breastfed children 6–23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day}}{\text{Breastfed children 6–23 months of age}}$ *And* $\frac{\text{Non-breastfed children 6–23 months of age who received at least 2 milk feedings and had at least the minimum dietary diversity not including milk feeds and the minimum meal frequency during the previous day}}{\text{Non-breastfed children 6–23 months of age}}$
Data Availability	Bangladesh Demographic Health Survey (BDHS)
Data Sources	The main source of data should be household surveys (eg, BDHS). The other sources of data could be routine facility information systems.
Data Quality	Population base: Youngest living child age 6-23 month who is living with the mother Time period: 24 hours preceding the interview
Frequency Of Data Collection	Every three years
Guidance On Reporting	It is recommended that the indicator be further disaggregated and reported for the following age groups: 6-11.9 months, 12-17.9 months and 18-23.9 months of age.

3.9.3 Population using safely managed drinking-water

Water and sanitation are fundamental to human development and well-being. In 2010, the United Nations General Assembly recognized access to safe water and sanitation as a human right. These are critical to the achievement of other development objectives related to nutrition, gender equality, education and the eradication of poverty.
Access to water and sanitation are considered as core socioeconomic and health indicators and key determinants of children's health and survival, maternal health, family well-being and economic productivity.

Indicator Name	% of population that use improved drinking water
Definition	Population using an improved drinking water source (piped water into dwelling, yard or plot; public taps or standpipes; boreholes or tube wells; protected dug wells; protected springs, rainwater, packaged or delivered water) which is located on premises, available when needed and free of faecal and priority chemical contamination.
Method Of Estimation	
Numerator	Population using safely managed drinking-water services.
Denominator	Total population. The indicator is computed as the ratio of the number of people who use a safely managed drinking-water service, urban and rural, expressed as a percentage. Population using safely managed drinking-water= Number of households (or population) with safely managed drinking water services) *100 Total number of households (or population)
Data Availability	Data from household surveys or censuses provide information on the types of drinking-water sources used by people. Such data are combined with data on water quality, availability and accessibility from household surveys as well as data from administrative records or regulatory frameworks for various aspects of safe management. Most nationally representative household surveys include information about improved water sources.
Data Sources	Household surveys, population census, data from administrative sources or regulatory framework. Example: Bangladesh Demographic and Health Survey (BDHS) and routine data from Department of Public Health Engineering (DPHE).
Guidance on data collection	The survey questions and response categories for populations using basic drinking-water sources should be fully harmonized with BDHS and MICS and adopted from the standard questionnaire.
Frequency Of Data Collection	Every 3 years
Guidance On Reporting	Disaggregated data should be presented by place of residence (urban/rural), socioeconomic status (wealth, affordability etc.).

3.9.4 Caregivers with appropriate hand washing behavior

It is well known that as appropriate hand washing practices increase, communicable diseases like diarrhoea – and thus stunting- decrease. Based on this premise, the Government of Bangladesh together with development partners has been extensively promoting hand washing.

This indicator indicates that % of caregivers in households who used soap for hand washing at least two critical times in the past 24 hours, these two times include after own defecation and at least one for the following: after cleaning a young child, before preparing food, before eating, and/or before feeding a child. (FSNSP, 2015)

Indicator Name	% of Caregivers with appropriate hand washing behavior
Definition	Proportion of caregivers in households using soap for hand washing for at least two critical times in the past 24 hours. These two critical times include after own defecation, and at least one of the following: after cleaning a young child, before preparing food, before eating, and/or before feeding a child. (FSNSP, 2015)
Method Of Estimation	
Data Availability	The Food Security and Nutrition Surveillance - National Nutrition Services (FSNS-NNS)
Data Sources	FSNS-NNS
Data Quality	The Food Security and Nutrition Surveillance - National Nutrition Services (FSNS-NNS) collects nationally representative data on food and nutrition insecurity. The surveillance system provides information about households with and without children, adolescent girls, pregnant and non-pregnant women. Information has been collected on multiple measures of nutritional status for women and children, including dietary diversity, height, weight and mid-upper arm circumference (MUAC).
Frequency Of Data Collection	Every year
Guidance On Reporting	Disaggregated data should be presented by place of residence, region, educational attainment, water source, household wealth and food security.

3.9.5 Population using safely managed sanitation services

Indicator Name	% of population that use improved sanitary latrine (not shared)
Method Of Estimation	
Definition	Population using an improved sanitation facility that is not shared with other households and where excreta are safely disposed of in situ or treated off site. Improved sanitation facilities include flush or pour flush toilets to sewerage systems, septic tanks or pit latrines, improved pit latrines (pit latrines with a slab or ventilated pit latrines) and composting toilets. (GNMF, 2017)
Numerator	Population using safely managed sanitation services.
Denominator	Total population. The indicator is computed as the ratio of the number of people who use a safely managed sanitation service, urban and rural, expressed as a percentage. Population using safely managed sanitation = Number of households (or population) with safely managed sanitation services *100 Total number of households/ population
Data Availability	Data from household surveys or censuses provide information on types of basic sanitation facilities listed above. Such data will be combined with data from administrative records or regulatory frameworks for various aspects of safe management. The percentage of the total population using an improved sanitation facility is the population weighted average of the previous two numbers. Most nationally representative household surveys include information about improved water and sanitation. The survey questions and response categories pertaining to use of improved sanitation facilities are fully harmonized between BDHS and MICS and are adopted from the standard questionnaire promoted for inclusion in survey instruments. (GNMF, 2017)
Data Sources	Household surveys, population census, data from administrative sources or regulatory framework. Example: Bangladesh Demographic and Health Survey (BDHS)
Data Quality	The survey questions and response categories for populations using basic drinking-water sources should be fully harmonized with BDHS and MICS and adopted from the standard questionnaire.
Frequency Of Data Collection	Every 3 years
Guidance On Reporting	Disaggregated data should be presented by place of residence (urban/rural), socioeconomic status (wealth, affordability etc.).

3.9.6 Pregnant women who received any IFA

Indicator name	Any antenatal iron supplementation.
Definition	The proportion of women who consumed any iron-containing supplements during the current or past pregnancy within the last 2 years. *Note:* The data can be reported on any iron-containing supplement including iron and folic acid tablets (IFA), multiple micronutrient tablets or powders, or iron-only tablets which will vary by country policy. (GNMF, 2017)
Age range and sampling	There is no age range for this indicator, although all women must be or have been pregnant within the last two years, and therefore generally are of reproductive age (15–49 years of age). (GNMF, 2017)
METHOD OF ESTIMATION	
Numerator	Number of women in the sample who consumed any iron-containing supplements during the current or past pregnancy within the last 2 years.
Denominator	Total number of women in the sample who are pregnant or have had a pregnancy in the last 2 years.

$$\text{Antenatal iron supplementation} = \frac{\text{Number of women in the sample who consumed any iron-containing supplements during the current or past pregnancy within the last 2 years}}{\text{Total number of women in the sample who are pregnant or have had a pregnancy in the last 2 years}} * 100$$

Data collection frequency	Survey data: every 3 years. Routine data: Monthly
Data availability	BDHS collects data on antenatal iron consumption. MICS supported by UNICEF may collect some data on iron and folic acid consumption in a pregnancy. Finally, health management information systems (HMIS) under DGHS collect data on provision of antenatal supplementation.
Data sources	BDHS, MICS, and HMIS (as above).
Guidance on data collection	In order to improve the recall reliability of this indicator, samples of the commonly available supplements should be available for viewing during any population based survey conducted. Enumerators must understand the difference between receipt or purchase of the supplement and any consumption. (GNMF, 2017) For HMIS-MOHFW data, they generally do not verify consumption. It is useful to confirm consumption of iron-containing supplements for the monitoring process (depending on the system, some options may include observing the first dose at the site of delivery, or confirming consumption verbally or through returned empty bottles/packages).
Guidance on reporting	When sample sizes allow, disaggregated data may be presented by maternal education, place of residence, and socioeconomic status (e.g., wealth quintile).

3.9.7 Counselling on Breastfeeding

Indicator name	Availability of national-level provision for breastfeeding counselling services in public health and/or nutrition programmes.
Definition	This indicator is defined as availability of a national program like National Nutrition Services (NNS) that includes provision for delivering breastfeeding counselling services to mothers of infants 0–23 months of age through health systems or other community-based facilities. (GNMF, 2017)
Method of estimation	As infants grow during the first six months, the likelihood that they are exclusively breastfed becomes less in many settings. Assessing exclusive breastfeeding in infants aged 4–5 months gives additional information on the duration of exclusive breastfeeding, and is an approximation of the proportion of infants who are exclusively breastfed for the full 6 months.
Data availability and data sources	Ministries of Health to report on the provision of breastfeeding counselling services in public health and/or nutrition programmes through HMIS database named DHIS2 (available at: http://dghs.gov.bd/index.php/en/component/content/article?id=456) Moreover, household surveys, population census, data from administrative sources or regulatory framework. Example: Bangladesh Demographic and Health Survey (BDHS)
Data quality	There is a challenges related to the quality of data on breastfeeding cancelling under the national nutrition programmes in Bangladesh. There is also recall bias and unavailability of data problems in the national data systems.
Data collection frequency	DHIS2: Monthly BDHS: Every 3 years.
Guidance on data collection	For routine data collection online database management systems under DGHS of Ministry of Health of DHIS2 software can be used. For secondary sources, household surveys, population census, data from administrative sources or regulatory framework. Example: Bangladesh Demographic and Health Survey (BDHS) by every 3 years.
Guidance on reporting	Disaggregated data should be presented by place of residence (urban/rural), age, gender etc.

CHAPTER 4: INTEGRATED DATA MANAGEMNT & REPORTING

4.1 INTRODUCTION

Multi-sectoral approaches to tackling malnutrition in Bangladesh implies that various key actors in nutrition specific and nutrition sensitive areas need to willingly come together and contribute to developing strategic actions required for achieving NPAN2 nutrition targets.

4.2 EXISTING SYSTEMS & INTEGRATION

Currently more than 7 different agencies working to provide improve nutrition related data and information exclusively from different sectors. Among them Health MIS, Department of Agricultural Extension (DAE), Department of Public Health Engineering (DPHE), Different units of social safety net programs under Ministry of Women and Child Welfare (MOWCA) collecting, processing and disseminating nutrition related information through their different programs. The priority monitoring indicators has been separated according to sectors (ANNEX 1).

Also Bangladesh Bureau of Statistics (BBS), Food Planning and Monitoring Unit (FPMU), Access to Information (A2i) collect and UNICEF collate, process and use nutrition related information from multiple sources.

The following information (Table 4.1) on mapping of data collection practices are collected through a workshop of stakeholders M&E mapping on nutrition and also a KIIs from selected managers of relevant ministries.

Table 4.1: Current Information management in Bangladesh

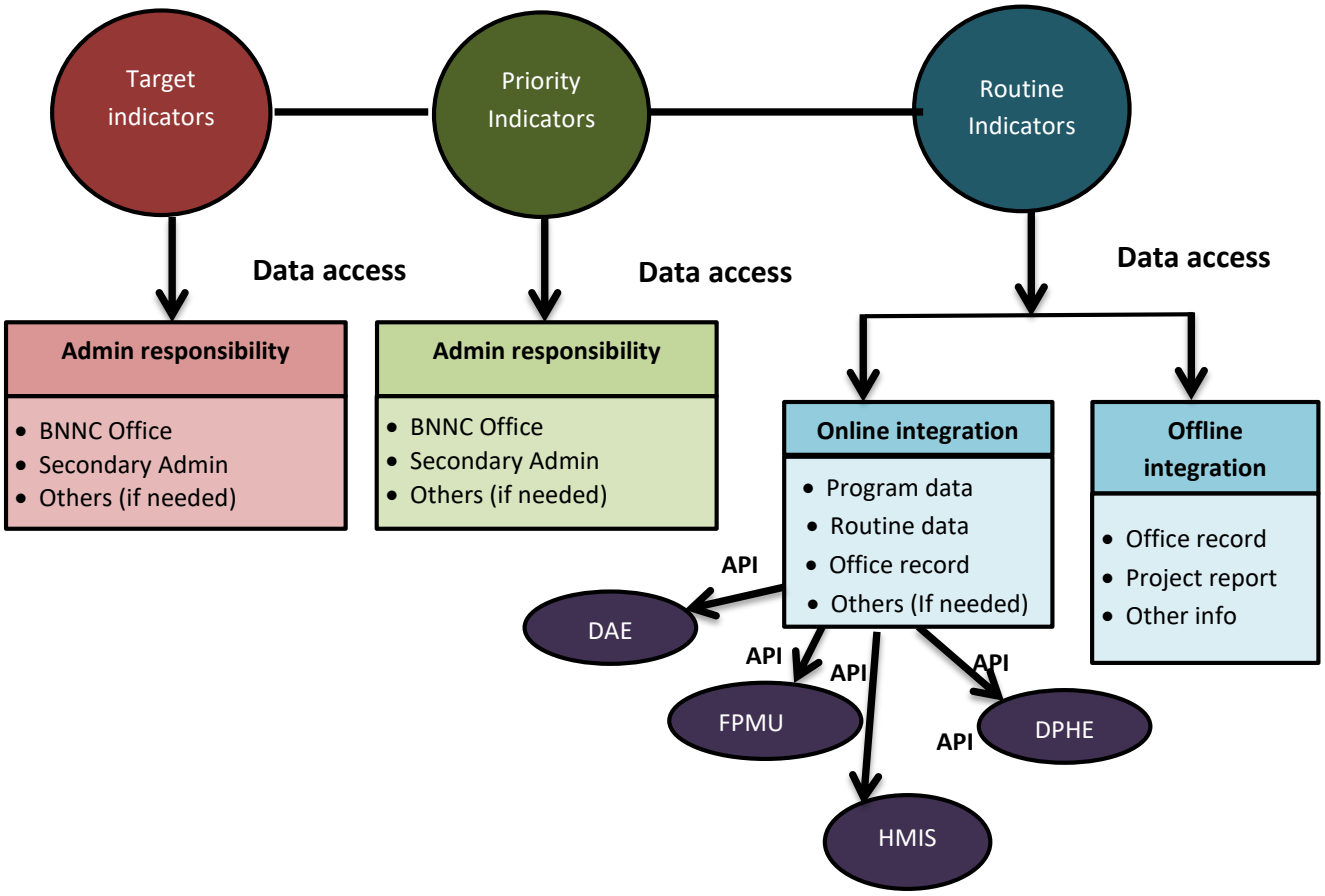
Monitoring Unit/Responsible Department	WHAT (list of activities)	WHEN		WHERE	
		Frequency	Development/ Emergency	Place	Coverage
MIS-DGHS	Health, Population & Nutrition (Service data collection)	Routinely	Development	Urban & Rural both	National
MIS-DGFP	Health, Population & Nutrition (Service data collection)	Routinely	Development	Urban & Rural both	National
DAE	Agriculture	Routinely	Development	Rural	Medium
BBS	Population Survey	Periodic Survey	Development	Urban & Rural both	Urban & Rural both
NIPORT	Health, Population & Nutrition Survey	Periodic Survey	Development	Urban & Rural both	Urban & Rural both
BFRI	- Area-based home gardening - Conduct trainings	Routinely	Development	Only in project	Small

Monitoring Unit/Responsible Department	WHAT (list of activities)	WHEN		WHERE	
		Frequency	Development/ Emergency	Place	Coverage
Department of Women Affairs	Social Security	Routinely	Development	Rural	Medium
FPMU, Ministry of Food	- Food - social protection	Routinely	Development	Urban & Rural both	National
a2i	- SDG tracker - OGD - Others	Routinely	Development	Urban & Rural both	National

4.3 Integration Process

Target indicators are more likely impact or outcome level indicators, which we need to collect through the periodic survey or surveillance. For example, Bangladesh Demographic and Health Survey (BDHS) which collaborative effort of the National Institute of Population Research and Training (NIPORT), conducts a survey on Health, Population and Nutrition Sector Development Program in every 4 years. On the other survey information like Multiple Indicator Cluster Surveys (MICS), Food Security and Nutritional Surveillance Project (FSNSP) provides periodic nutrition data. This type of indicators should be collected after publishing the final report of the survey. Therefore, the collection of data would be the responsibility of central units and update the central database.

Figure 4.1: Data integration process from different source of information



For the priority indicators, the process is more or less same like target indicators. The priority indicators are more likely outcome and output level information which is not collected routinely. The information is collected through central office when information are available. On the other hand, very few priority indicators which are compiled mostly by FPMU and other agencies annually. They stores the information through online systems where it is possible to integrate by using online applications (eg, API).

Routine information or proxy indicators could be collected through both online and offline process. For integration of nutrition specific data, there is a good platform both health and family planning department under Ministry of Health. On the other hand, for collating nutrition sensitive priority indicators DAE, DPHE, MOWCA and other relevant sources will be used.

Moreover, A2i has developed an Open Government Data (OGD) portal for real time visualization platform integrating different sectors, which could be a routine source of information for collecting, processing and disseminating nutrition data through central unit. Therefore, central BNNC office can pull those information from the relevant sources and use the information for policy planning and advocacy.

4.3 Existing systems and possible integration

4.3.1 Ministry of Health and Family Welfare (MOHFW)

4.3.1.1 MIS, DGHS: Existing system

The operational plan for MIS and eHealth was developed with the goal of improving the health information system and eHealth, developing infrastructure and environment necessary for an effective HIS, eHealth, and medical biotechnology. Nutrition information is a huge part of the overall health information system. Therefore National Nutrition Service (NNS) collects and use information by pulling data from HMIS. At this time, nutrition indicators for children younger than five years had been incorporated in the routine RHMIS through the monthly IMCI+Nutrition Corner reporting format and monthly community clinic reporting format for newborn and child health. The Strategic Investment Plan for the latest Sector Wide Approach highlights the importance of moving toward a strong Health Information System, and the NIS will be an important factor in that as a central platform to visualize data from all nutrition service delivery platforms. Furthermore, it addresses the cross-cutting issues of harmonization of data and electronic assessment of performance.

DGHS level Nutrition Monitoring and reporting

Nutrition indicators included at different level of DGHS

At Community Clinic level:

Reporting system: Web-based (DHIS2) monthly report
Record keeping system: Web-based (DHIS2) individual and aggregated record and also hard copy (in register)
Responsible person for reporting: Community Health Care Provider (CHCP) - both male and female service provider:

Indicators they follow:

- No. or % of children 0-5 months exclusively breastfed
- No. or % of children 6– 23 months of age who are fed 4 or 4+ food groups
- No. or % of children 0- 59 months screened for their nutritional status (wasted, stunted, underweight)
- No. of newborn babies with low birth weight
- No. of pregnant women who weighed during pregnancy
- No. of mother counselled on nutrition
- No. of PLW received IFA

<u>In IMCI-N corner report (facilities with IMCI-N corner):</u>

Reporting system: Web-based (DHIS2) monthly report
Record keeping system: Hard copy (in register)
Responsible person for reporting: Statistician
Indicators they follow:

- No. of children 0-5 exclusively breastfed
- No. of children 6– 23 months of age who are fed 4 or 4+ food groups
- No. or % of children 0-2 months who were breastfed within 1 hr. of birth
- % of children 0- 59 months screened for their nutritional status (wasted, stunted, underweight, SAM, MAM) and referred
- % of children 0-5 years are anemic and referred
- No. of newborn babies (0-72 hours) with low birth weight (<2.5 kg)
- % of mothers counselled on IYCF, Vitamin A, IDD, Anemia, MNP etc.

<u>In facility based (UHC, District hospital with SAM corner) Management of Severe Acute Malnutrition report:</u>

Reporting system: Hardcopy based, report monthly send to IPHN
Record keeping system: Hard copy (in register)
Responsible person for reporting: Statistician
Indicators they follow:

- No. or % of 0-59 months aged children admitted by WFH (<-3Z), MUAC (<11.5 cm) and by oedema
- No. or % of 0-59 months aged children readmitted
- No. or % of 0-59 months aged children with SAM who were discharged as cured, died, defaulted, non-responder

4.3.1.2 DGFP: Existing system

During the HNPSP period, FP-MIS system was established for the record keeping and reporting systems at the grass root level to generate RH-FP-MCH performance data. Monitoring and supervision system was implemented for overall FP-MCH services. MIS helps to ensure better monitoring and supervision which helped to achieve Contraceptive Acceptance Rate (CAR) and Contraceptive Prevalence Rate (CPR) increased. MIS introduced innovative approaches to strengthen and institutionalize data collection, collation, storage and transmission to the MIS headquarters for publication of analytical reports for dissemination to different national and international organizations. Notable among the steps taken to strengthen reliable data gathering were the distribution of national FP-MCH projection to different upazilas, introduction of a longitudinal data collection mechanism through FWA registers, different clinic registers and reporting formats, periodic couple registration and survey by FP-MIS personnel and performance monitoring in high and low performing areas.

MIS Program has 3 (three) components

- Service Statistics (SS)
- Logistics Management Information System(LMIS)
- Personnel Management Information System (PMIS)

List of DGFP's nutrition indicators monitored & reported DGFP

- No. of BCC performed by SACMO
- Counseling on IYCF, IFA,Vitamin-A & Hand washing
- Received IFA (Pregnant & Child mother)
- Received MNP Sachet (6-23 months)
- Breast feeding within 1-hour of birth (0-<6 months child)
- Exclusive Breast feeding up to 6 months
- Complimentary feeding after 6 months
- Feeding Tablet Vitamin A (6-59months Child)
- Received Tablet anti-helminthics (24-59months Child)
- Feeding Zink pill with ORS suffering from diarrhoea
- Identifying Suffering from MAM
- Suffering from SAM & Referred
- Identifying Child Stunting
- Identifying Child Wasting
- Identifying Child Under weight

DGFP Database:

Implementation of Direct nutrition intervention is one of the key intervention to overcome the undernutrition status of Bangladesh. DGFP along with National nutrition services is committed to focus on improving nutrition status of women and young children. Government of Bangladesh is very much committed to implement nutrition activities and DGFP/NNS is providing adequate training, ensuring proper supplies and regular supervisory monitoring of activities to improve nutrition status of women and children. Regarding this, DGFP-MIS has been collecting nutrition related information through their service facilities (eg, UH&FWC, MCWC). DGFP has a good database systems to record and visualize nutrition related data through their website (https://www.dgfpmis.org/pusti_new/nutrition.htm#).

4.3.1.3 Scopes of Integration: MOHFW

The following indicators have to collate and integrate with MOHFW routine data management systems. As MOHFW manage online database which collect information up to community levels. Therefore, there is an opportunity to get disaggregated data on the following indicators. As those indicators are collected and managed through online database, so an integrated and interoperable systems can be developed and pull the information by using different online process (eg, API) in the central level.

Table 10: list of indicators are collected and managed online by HMIS & FPMIS unit of MOHFW

SL.	Indicators	Integration Source	Frequency of data update
1	Increase the initiation of breastfeeding in the first hour of birth	HMIS FPMIS	Monthly
2	% of children (0-5m) exclusively breastfed	HMIS FPMIS	Monthly
3	% of children (6-23 m) receiving MAD	HMIS FPMIS	Monthly
4	Percentage of infants born with low birth weight (<2,500 grams)	HMIS FPMIS	Monthly
5	Reduce stunting among under-5 children	HMIS FPMIS	Monthly
6	Children under 5 years who are wasted	HMIS FPMIS	Monthly
7	Children under 5 years who are overweight	HMIS FPMIS	Monthly
8	% of Women 15-49 yrs. With Anaemia	HMIS FPMIS	Monthly
9	% of children under 5 with diarrhoea treated with ORT and Zinc	HMIS FPMIS	Monthly
10	%of women 15-49 yrs who are overweight or obese (BMI ≥23)	HMIS FPMIS	Monthly
11	% of adolescent girls (15-19 yrs.) with height <145 cm	FPMIS	Monthly
12	% of adolescent girls (15-19 yrs.) thin (total thinness)	FPMIS	Monthly
13	% of women (15-19 yrs) who have begun childbearing	FPMIS	Monthly
14	% of population that use improved drinking water	HMIS	Monthly
15	% of population that use improved sanitary latrine (not shared)	HMIS	Monthly
16	% of caregivers with appropriate hand washing behaviour	HMIS	Monthly
17	% of women age 20-24 who were first married by age 18	FPMIS	Monthly
18	1. Change in per capita consumption of: i. salt ii. sugar consumption	HMIS	Monthly

Integration scope with MOHFW:

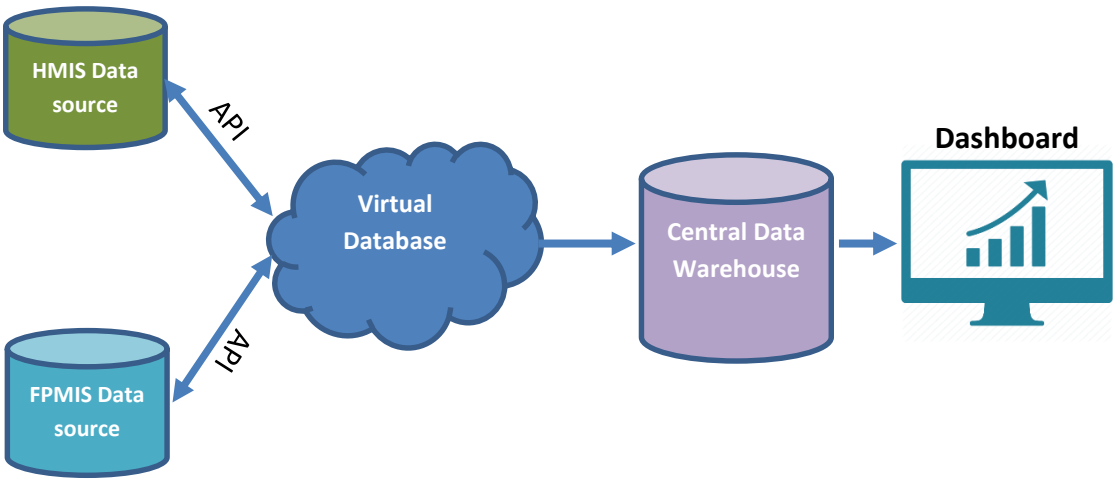


Figure 4.2: Integration process of MOHFW database

4.3.2 Ministry of Food

4.3.2.1 Food Planning Monitoring Unit (FPMU): Existing Systems

The Food Security and Nutrition Data Portal of the FPMU provide the public an easy access to a comprehensive and continuously updated database of information on food security and nutrition data in Bangladesh. Through this portal (Figure 4.3) data can be downloaded and analyze in different formats. The portal is a gateway to a more complex Data Management System of a larger Food Security and Information System (FSNIS) that was developed in collaboration with HISP India, an international NGO with extensive experience in the design of software solutions and counting on technical assistance from FAO and financial support from EU and USAID. The FSNIS comprises:

i) a Data Management System for internal use of FPMU staff helping in the automated production of relevant reports (namely the Daily and Fortnightly Food grain reports)
ii) the document repository consisting of an online Library and physical documentation center
iii) FPMU website.

2.1 Nutrition Indicators Monitored through MoFood and NPAN2:

NFP goal and 6FYP indicators related to nutrition:

Indicators related to NFP goal:

1. Undernourishment (three year average)
2. Underweight (0 to 59 months)
3. Stunting (0 -59 months)

Indicators related to and SFYP:

4. Rate of growth of agricultural GDP in constant prices
5. Government spending on social protection as % of GDP
6. Poverty headcount index (CBN upper poverty line)

7. Change in national wages expressed in kg of coarse rice (3-year moving average)

NFP objective 1 indicators: selected performance indicators:

8. Rate of growth of agricultural GDP in constant prices
9. Rice import dependency
10. Instability of rice production
11. Share of rice value added in total food value added in current price

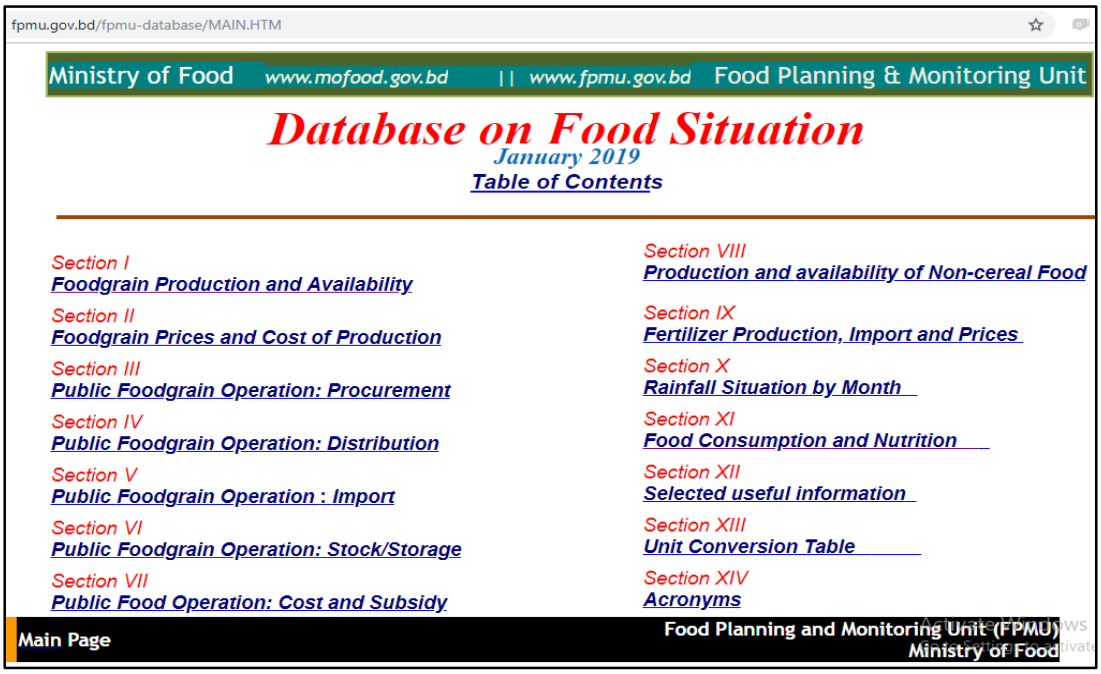
NFP objective 2 indicators: selected performance indicators:

12. Change in national wages expressed in kg of coarse rice (3-year moving average)
13. Poverty headcount index (CBN upper poverty line)
14. Extreme poverty rate (CBN lower poverty line)
15. Poverty gap (CBN upper poverty line)
16. Difference between food and general inflation (3-year moving average)

NFP Objective 3: selected performance indicators:

17. National dietary energy supply from cereals (%)
18. National dietary energy intake from cereals (%)
19. Chronic energy deficiency prevalence among women (BMI <18.5) (%)
20. Proportion of children receiving minimum acceptable diet at 6-23 months of age (%)
21. Proportion of households consuming iodized salt (%)

Figure 4.3: Integration through Food situation and Food Security and Nutrition Database



4.3.2.2 Scopes of Integration: FPMU

The following indicators are relevant to NPAN monitoring indicators which could collate and integrate with the database of FPMU through different data pulling process. FPMU collect raw information from different sources and analyze it locally to use data in reporting and publishing annual monitoring report. Therefore, there is a scope to integrate and make an interoperable system with their online database.

Table 11: List of indicators to be integrated in to FPMU database

Sl.	Indicators	Integration Source	Frequency
1	% of population that use improved drinking water	FPMU-2017	Yearly
2	% of population that use improved sanitary latrine (not shared)	FPMU-2017	Yearly
3	% of caregivers with appropriate hand washing behavior	FPMU-2017	Yearly
4	Poor households engaged in home gardening and backyard poultry	FPMU database	Yearly
5	% of caregivers with appropriate hand washing behavior	FPMU-2017	Yearly

Integration process diagram:

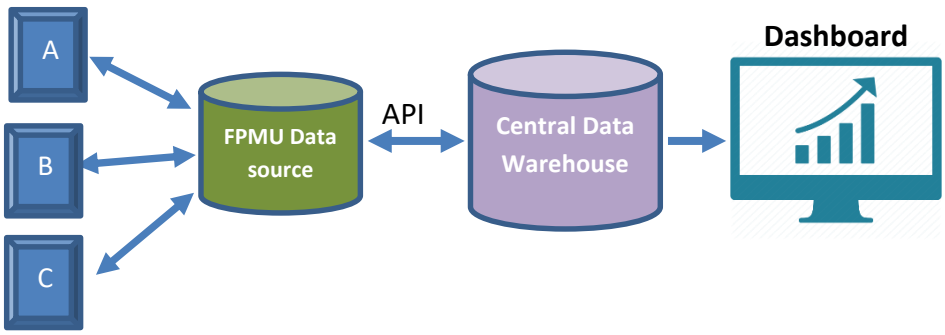
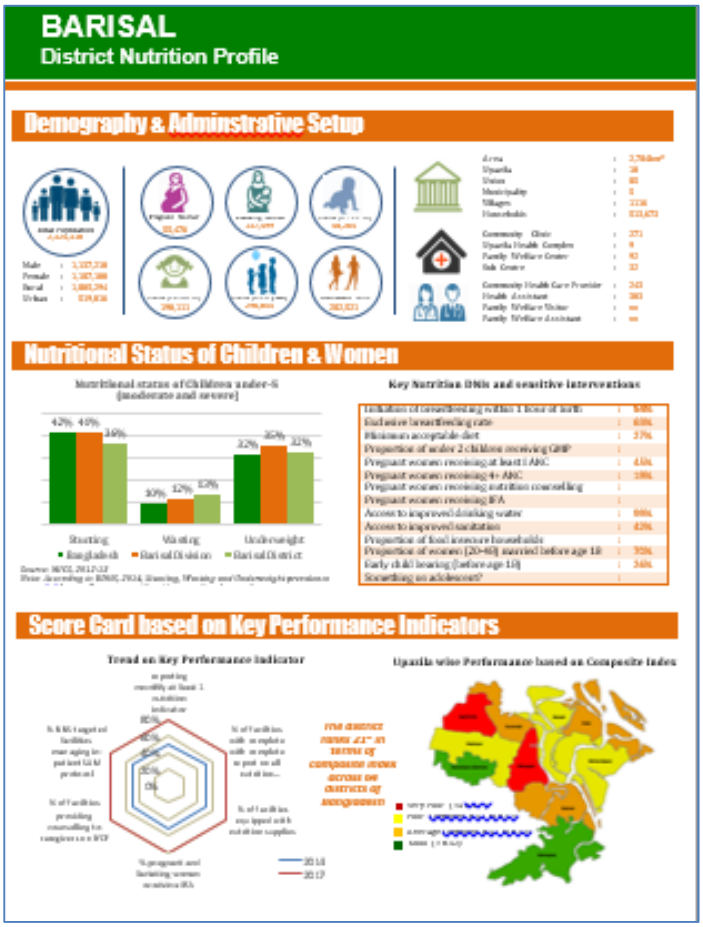


Figure 4.3: Integration process of FPMU database

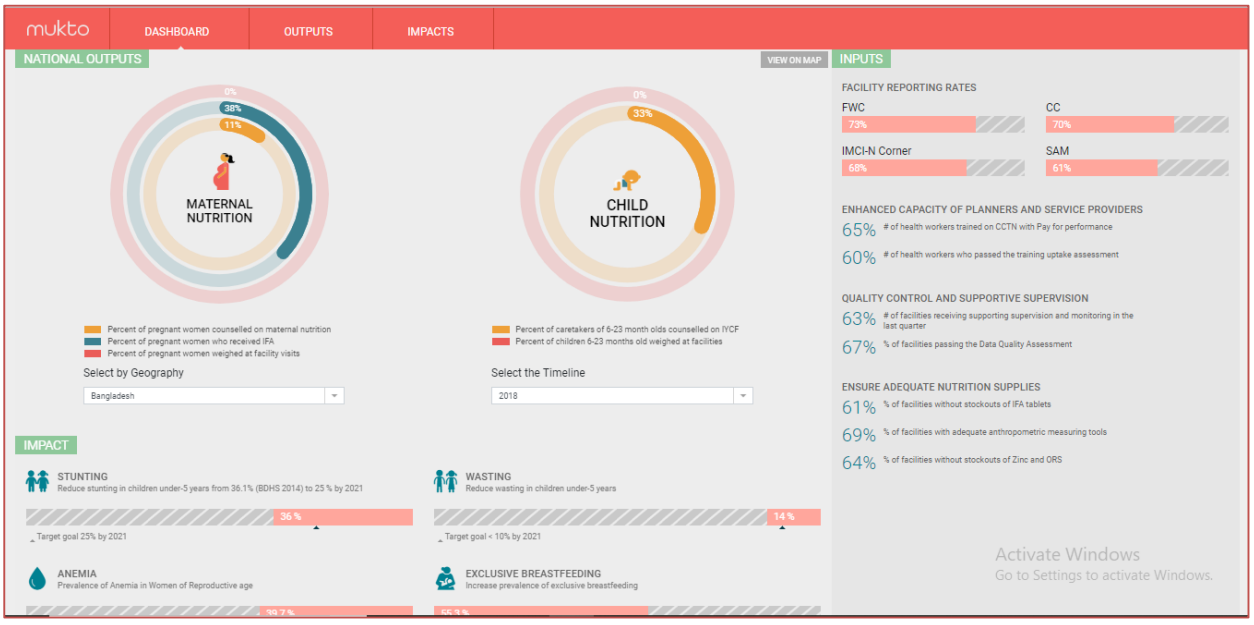
4.3.3 UNICEF

4.3.3.1 Existing Systems



UNICEF Bangladesh has a good visualization platform named "MUKTO" on operational level real time nutrition specific indicators. UNICEF is also providing technical support to National Nutrition Services (NNS) by creating score card based key performance nutrition specific indicators. The information has collected and integrated with DG Health and DG Family planning MIS units. Therefore, this is an opportunity for BNNC that there is a scope of using this platform for specific need.

UNICEF has also the same agenda to enhance and operationalize interoperable integrated nutrition information systems for Bangladesh. So BNNC can work together with UNICEF regarding fulfilling the common objectives to build a common data hubs for nutrition Bangladesh. Furthermore, UNICEF can help BNNC to the data driven advocacy to enhance accountability and programme implementation through operationalization of inter-ministerial information system.



4.3.3.2 Scopes of Integration: UNICEF

The following indicators are relevant to NPAN2 monitoring indicators that could be integrated in the national level integration system. Before said, UNICEF has a visualization platform named "Mukto" which is now collating and visualizing the following indicators (Table 12) from different sources. HMIS and FP-MIS collects raw information from their service areas through online process and use data in their progress report. They have an individual data warehouse where there are different data are processed and analyzed. Generally, UNICEF pulls the following information from those sources and visualize this on MUKTO dashboard. Therefore, there is a scope to integrate and make an interoperable system with UNICEF database where they are already integrated with HMIS and FP-MIS with following nutrition specific indicators. If it is not possible then the national level will have to integrate separately with DGHS and DGFP MIS units. This may take more time to the integration process.

Table 12: List of indicators to be integrated in to UNICEF database

Sl.	Indicators	Integration Source	Frequency
1	% of women receiving maternal nutrition counselling	MUKTO database	Monthly
2	% of caregivers of children 0-23 months old receiving age appropriate IYCF counselling	MUKTO database	Monthly
3	% of visits with pregnant women who received any IFA	MUKTO database	Monthly
4	% of children 0-23 months old whose weight was taken at a facility	MUKTO database	Monthly
5	% of times women attended a facility during pregnancy that they were weighed	MUKTO database	Monthly

Data Integration flow:

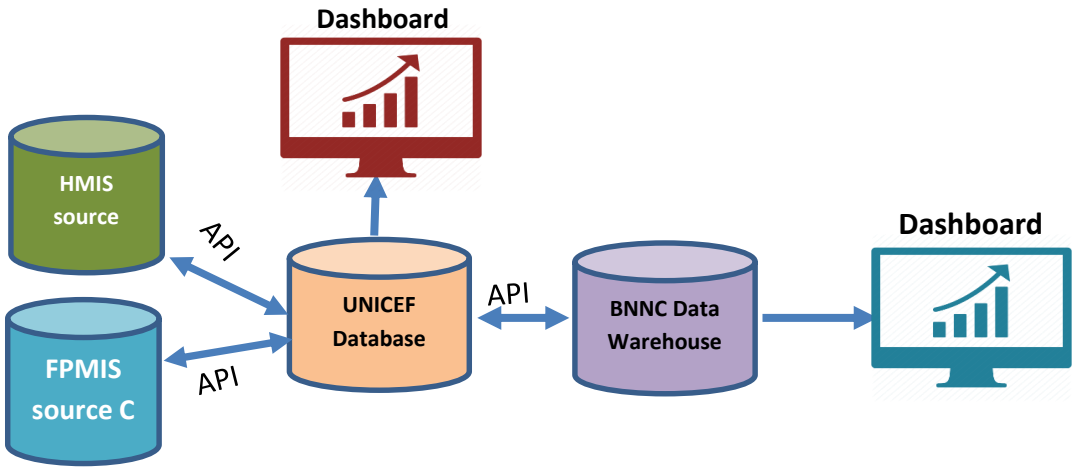


Figure 4.4: Data integration process of selected nutrition indicators of UNICEF data visualization platform

4.3.4 Access to Information (A2i)

4.3.4.1 Existing Systems: SDG Tracker

Access to Information (A2i) is now in good progress of developing a muli-source data visualization through mostly in SDG tracker and Open Government Data (OGD) initiatives.

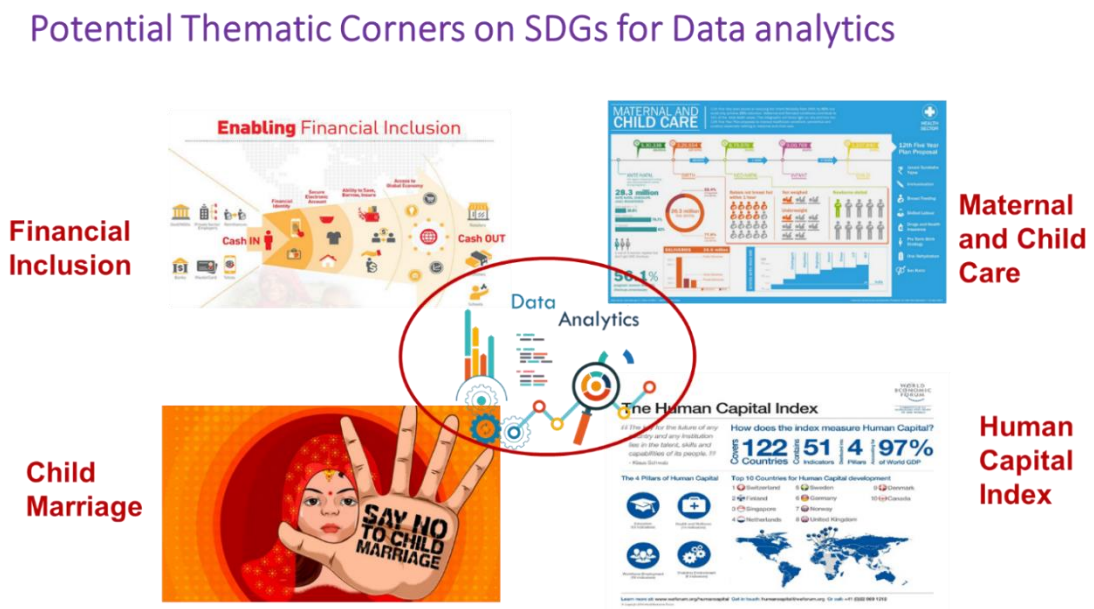
Bangladesh has moved up to lower middle income status but, more importantly, by human development indicators and this achievement came on the back of the country's stride towards higher per capita income in recent years, riding on stable economic growth. This indicates that Bangladesh is well positioned to emerge as a global thought leader with regard to achieving the Sustainable Development Goals (SDGs).

Realizing this ambition rests largely on informed decision making and targeted resource allocation. For a Government to plan and monitor the impact of its policies, it must be able to benchmark data and see year on year progress. An effective monitoring tool provides essential support in order to achieve the SDGs. Regular monitoring and evaluation of development interventions facilitate continuous improvement of their designs and thus enhance their potential to make an impact.

Major Components of SDG Tracker

Two major components of SDG Tracker are SDG Portal and Dashboard. SDG Portal enables policy makers, government agencies, private sector, Civil Society Organizations, International organizations, academia, researchers and the citizens to track year on year progress against each target and to create required visualizations. On the other hand, SDG Dashboards facilitate individual Ministries/Divisions and Agencies to consolidate available data for each SDG and compare it visually against performance thresholds. The resulting dashboards highlight areas where a Ministry needs to make the greatest progress towards achieving the Goals by 2030.

SDG Portal (www.sdg.gov.bd)

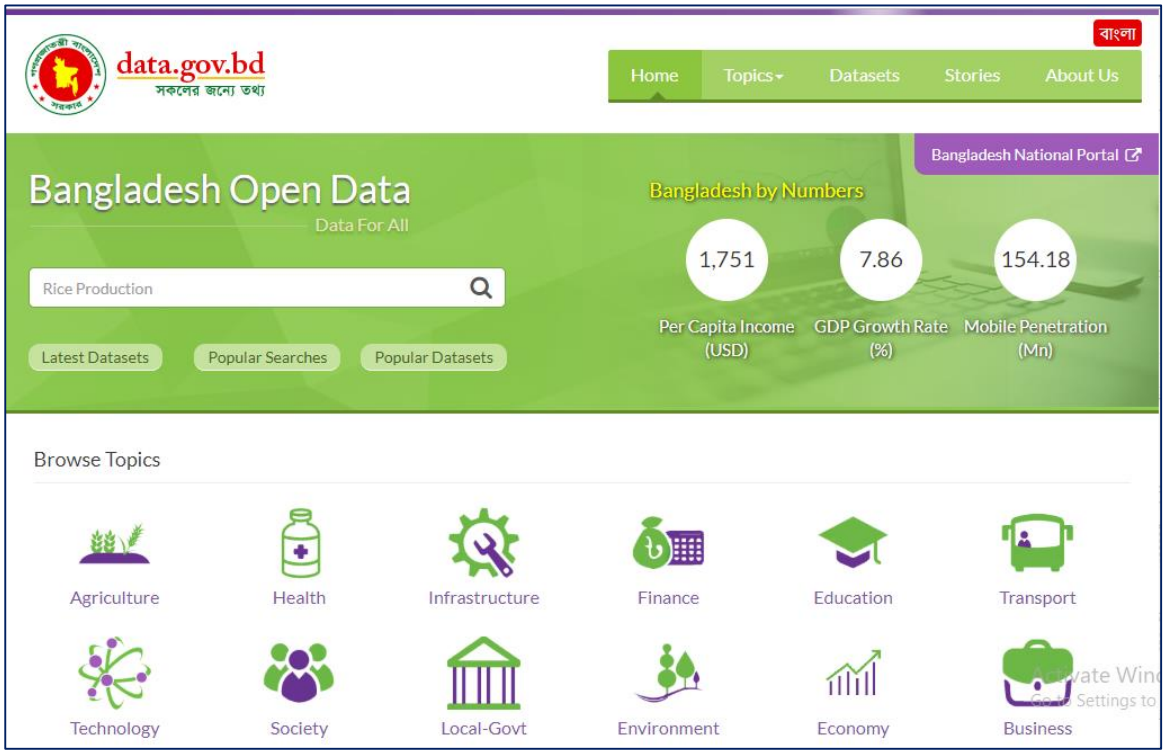


4.3.4.2 Open Government Data (OGD)

With a view that it is a governance issue that reinforces right to information and has massive potential to empower all classes of people. In the context of Bangladesh, open data is critical to ensure effective public services.

The objectives of open data

- to encourage the development of innovative solutions for better public service delivery,
- to enhance the scope of research,
- to create new job opportunities and investment, and
- to make government more transparent and accountable.



a2i along with the United Nations Department of Economic and Social Affairs (UNDESA) and Bangladesh Bureau of Statistics have been implementing Open Government Data (OGD) in Bangladesh to achieve some of the goals of SDG. An OGD Working Group to act as a central point of reference for people and an Executive committee as a controlling authority for the strategic aspects have been formed as part of OGD Management System in Bangladesh. National capacity development workshops and programs are going on for sensitizing national stakeholders, integrating information on the initial gap assessment, identifying demands for data sets and carrying out strategic planning. Development of a portal (data.gov.bd) to provide an easy way to find, access and reuse data is at the final stage of its development. To achieve the “Data for All” objective a strategy paper to guide the stakeholders has received necessary approval.

4.3.4.3 Scopes of Integration: Open Government Data

183 Datasets from 36 Government agencies' are available in the Open Government" Data portal". Most data are relevant with:

- Education
- Agriculture
- Health & Nutrition
- Utility
- University Grant Commission

The release of data in open data formats has been established to be a driver in terms of better public service, economic growth, health & nutrition, job creation, research and innovation, which itself has been identified as one of the primary drivers of development. In this regard, the initiative of integration of relevant data can be taken and the show through open government portal. In this portal, there are publicly available datasets from more than 35 Ministries and related agencies. The following data sharing principles aim to guide the Government's Open Data efforts;

- Data shall be made easily accessible,
- Data shall be made available for co-creation,
- Data shall be released in a timely manner,

Data Integration process

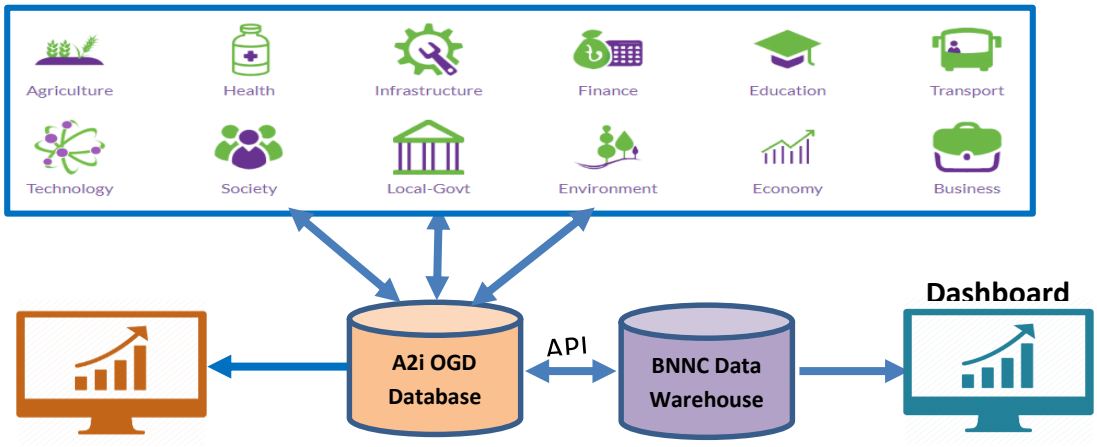
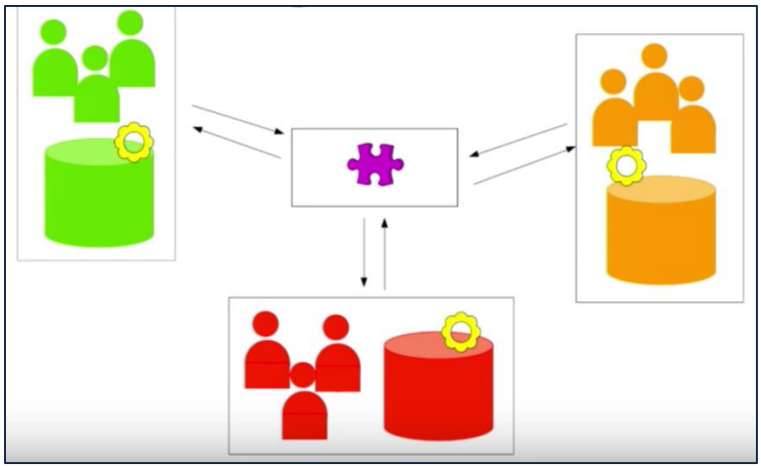


Figure 4.5: Data integration process of relevant nutrition indicators of a2i open data portal

4.4 GUIDING PRINCIPLES OF DATA MANAGEMENT

4.4.1 Data Warehousing

There are several information systems that collect nutrition data in Bangladesh. Different ministries, civil society organizations, the private sector, United Nations (UN) and donor agencies each have their own information systems. Sometimes, these systems create duplication when they collect data from the same sources which are wasteful of resources. In this regard, a data warehouse helps solve the on-going problem of pulling data out of transactional systems quickly and efficiently and converting that data into actionable information. Therefore support for data warehouse will provide an environment with its operational systems in BNNC office and is completely designed for decision-support, analytical-reporting, ad-hoc queries, and data mining.



4.4.2 Support to Data Processing

Data will be collected by and consolidated at the sub district, district and divisional level before being transferred to the central level. Data processing will be done in BNNC office. Therefore, BNNC could become the central data hub and once an electronic data processing system is created and implemented, over time it reduced the costs of managing data by a significant margin. Therefore, the initial support will be required for learning data processing operation.

4.4.3 Support to Data Analysis

Data would be widely analyzed and used by multiple actors working in the field of nutrition. Some information such as routine nutrition data would be collected through the growth monitoring system in community clinics and transferred to Upazila Health Complex (UHC). UHC will send the data to District then Division and finally at BNNC office. The proper and appropriate data analysis in BNNC with the aim of discovering useful information, suggesting conclusions, and supporting decision-making. Therefore, further reinforcement and strengthening of M&E group would be needed to provide sufficient training and capacity development so that they can collect, collate, and analyze data to prepare reports in a timely fashion for the use of all stakeholders at the sub-district, district and central level.

4.4.4 Developing Information linkage with other ministries and agencies

While NPAN2 (2016-2025) has set out the framework, the nutrition information system is not yet fully functional that communicates across ministries, sectors, and partners. There are several challenges to overcome and one such challenge is to ensure efficient use of the information collected from existing systems. However, there is a scope to make an interoperable integrated nutrition information systems and consolidate at national level platform.

4.5. Indicator dashboard

The National nutrition indicator dashboard will at any given point, indicate the status of progress towards achieving the set targets for NPAN2 each result area. The dashboard concept is shown in Figure 4.6 depicting the protocol of three different indicators which will be visualized following aggregation levels. Some of the indicators are high level impact indicators such as stunting prevalence, while others are process or outcome indicators. Target indicators are SUCH higher level information and should not display in details. On the other hand, priority indicators are also policy level indicators and will be collected through secondary sources (eg, survey, surveillance..). These indicators will measure the tracking of progress of different indicators and will help to data driven decisions for policy makers. The third level indicators are Routine or proxy indicators which will be collected through routine service or office records. These indicators will be more disaggregated information. Routine indicators will help to the local level program managers to implement the project and tack their progress.

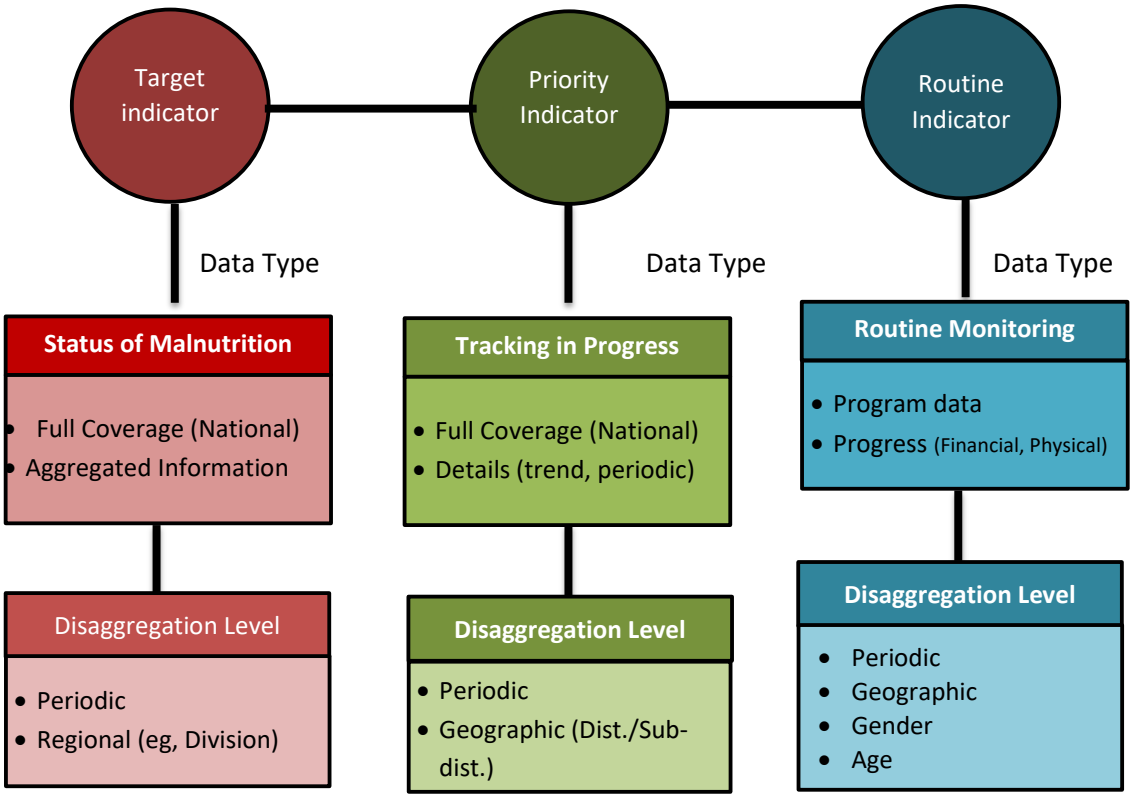


Figure 4.6: Data visualization process of Priority nutrition indicators of NPAN2

4.5.1 Approach to create data visualization platform

It is very useful to show more logical data in the dashboard, a variety of visualizations can help make it digestible. Therefore, a visualization platform at central level is very important for tracking the progress of NPAN2 target as well as nutrition status of Bangladesh.

With the selected indicators, a visualization platform has to develop considering geographic map, relational diagram, network diagram, pie chart, line graph, bar diagram, scatterplots and bubble charts. And this is very important to show relevant nutrition information in a same platform to make a good storyline.

4.6 IMPLEMENTATION PLAN

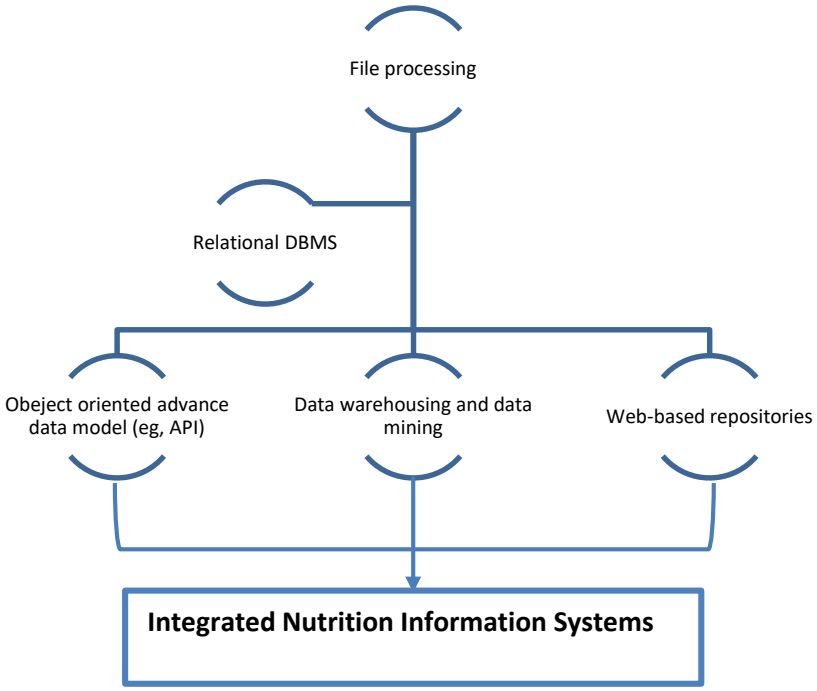
4.6.1 Development of Data warehouse

4.6.1.1 Database Development

The presence of the coordinated multi-sectoral nutrition information system will be an asset for BNNC office. Data reporting will be conducted through three levels of decentralized structures (Sub-district, District and Central). The information system that functions across sectors will collect information in the Nutrition Information Platform (NIP) of the BNNC. Proper database development and management systems will help in gaining better access to data as well as better management of the data. In addition, a well-functioning computerized system would be introduced to facilitate transmission of data at different levels. In turn, better access helps the end users share the data fast and effectively across the organization. A data warehouse is a collection of data that supports decision-making processes. It provides the following features;

- It is subject-oriented
- It is integrated and consistent
- It shows its evolution over time and it is not volatile.

Data warehouses are subject-oriented because they hinge on program-specific concepts, such as Food, agriculture, environment, nutrition etc. On the contrary, operational databases hinge on many different program applications. We put emphasis on integration and interoperability because data warehouses take advantage of multiple data sources, such as data extracted from production and then stored to central databases, or even data from a third party's information systems.



A data warehouse should provide a unified view of all the data. Generally speaking, we can state that creating a data warehouse system does not require that new information be added; rather, existing information needs rearranging. This implicitly means that an information system should be previously available.

4.6.1.2 Data Processing

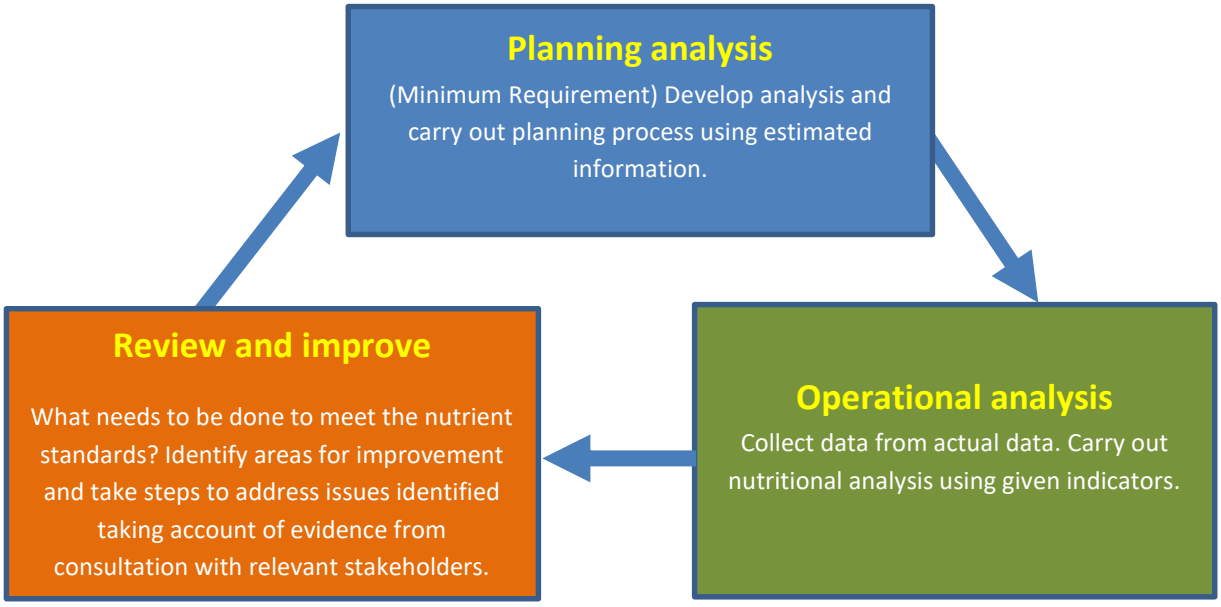
Operational data usually covers a short period of time, because most connections involve the latest data. The data warehouse should enable analyses that instead cover a few years. For this reason, data warehouses are regularly updated from operational data and keep on growing. If data were visually represented, it might progress like so: A routine data would be made at regular intervals.

Fundamentally, data is never deleted from data warehouses and updates are normally carried out when data warehouses are offline. This means that data warehouses can be essentially viewed as read-only databases. This satisfies the users' need for a short analysis query response time and has other important effects. First, it affects data warehouse–specific database management system (DBMS) technologies, because there is no need for advanced transaction management techniques required by operational applications. Second, data warehouses operate in read-only mode, so data warehouse–specific logical design solutions are completely different from those used for operational databases. For instance, the most obvious feature of data warehouse relational implementations is that table normalization can be given up to partially denormalize tables and improve performance. Other differences between operational databases and data warehouses are connected with query types. Operational queries execute transactions that generally read/write a small number of tuples from/to many tables connected by simple relations. For example, this applies if you search for the data of a nutrition program in order to insert a new indicator.

4.6.1.3 Data Analysis

Data warehousing is a collection of methods, techniques, and tools used to support knowledge workers—senior managers, directors, managers, and analysts—to conduct data analyses that help with performing decision-making processes and improving information resources.

The nutritional analysis process has been broken down into three steps which form the basis of a self-evaluation approach. These steps have been colour coded and are shown below in the overview.



4.6.3 Data Management and Customization

4.6.3.1 Add reports or change indicators

Indicators can be customized and changed to suit based on stakeholders needs. It can modify the indicators sets as well as individual indicator within a set in the systematic ways. When developers first add an indicator to a report, it is configured to use default values. Anyone can then change the values so the indicator depicts data the way they want.

4.6.3.2 Move and resize reports

Only report creators and admin can move and resize reports and indicators. Customizers can move and resize the table or illustration as per need.

4.6.3.3 Rename, clone, remove, or delete reports

Developer can rename, clone, remove, or delete reports and indicators by using customization tools and save as accordingly.

4.6.3.4 Feedback mechanism

The nutrition data is visualized for decision makers and policy developers for effective program implementations. The feedback mechanism would be according to the following diagram. Therefore, data would be integrated from different sources and stored in the data warehouse. Then data would be processed and analyzed in data mining engine. After processing the

information, data would be visualized for decision makers and program managers. If you think about feedback process then decision makers could change and update the systems according to their program review.

4.6.4 Data security

Data security is critical for most businesses and even home computer users. Thorough data security begins with an overall strategy and risk assessment. This will enable to identify the risks are faced with and what could happen if valuable data is lost through theft, malware infection or a system crash. Other potential threats that could be identified include the following:

- Physical threats such as a fire, power outage, theft or malicious damage
- Human error such as the mistaken processing of information, unintended disposal of data or input errors
- Exploits from corporate espionage and other malicious activity
- You can then identify areas of vulnerability and develop strategies for securing your data and information systems. Here are several aspects that need to be considered:
- Just who has access to what data
- Who uses the internet, email systems and how they access it
- Who will be allowed access and who will be restricted
- Whether or not to use passwords and how they will be maintained
- What type of firewalls and anti-malware solutions to put in place
- Properly training the staff and enforcing data security.

After the above analysis, you we then prioritize specific data along with more critical systems and determine those that require additional security measures.

4.6.5 Data Backup

Here are things that we may do:

- Protect your office or data center with alarms and monitoring systems
- Keep computers and associated components out of public view
- Enforce restrictions on internet access
- Ensure that your anti-malware solution is up to date
- Ensure that your operating system is up to date
- Fight off hacking attacks with intrusion detection technology
- Utilize a protected power supply and backup energy sources

4.6.6 Data Access Authority

Authentication is the process of confirming that a user logs in only in accordance with the rights to perform the activities he is authorized to perform. User authentication can be performed at operating system level or database level itself. A database administrator must have the DATAACCESS authority to access data in all user tables, views, and materialized query tables. For database security service, it is a mandatory for maintain the authentication. For Authentication, it requires two different credentials, those are user id or username, and password.

4.6.7 Hardware requirement

The BNNC office will require hardware support for computers, telecommunications, and various other devices for enhancing use of information technology. In order to maintain day-to-day operations with other ministries and agencies the computer networking with other ministries and agencies is essential means of communication in recent world. Over the years, the network of networks that forms the internet has evolved into a very complex structure. Computers, smart phones, Web servers, mail servers, etc. are connected to the Internet via an ISP (Internet Service Provider). The ISP can provide either wired or wireless connectivity using an array of access technologies including Wi-Fi, and cellular. Therefore, Internet services must be able to move as much data as we want between any two end systems instantaneously, without any data loss. The BNNC officials need to be trained for developing the computer networking management program network skills.

4.6.8 Software installation

Different software needs to be installed to run essential programs. The software must be network compatible to load without errors. By taking advantage of the widespread proliferation of interactive media, the central unit has targeted the use of internet-based forms of communication. BNNC office has planned to create a server based database management systems in the office premises. There need to make a complete digital ecosystem using relevant software for integration of information from different sources. By using the latest solutions, BNNC office should have the opportunity to streamline and refine operational processes, and ensure their people work as effectively as possible.

4.6.9 Manpower requirements

The BNNC office demands qualified information technology staff to provide the highest standard of performance for their stakeholders and partners. It is assumed that the BNNC staff would be trained by information technology vendors to cover knowledge and content specific solutions and best practices. This would be fulfilling specific knowledge and learning requirements with acceptable levels of competency and experience.

4.6.10 Capacity building

Human capacity development for effectively performing the BNNC activities in ICT is significant and requires substantial effort. This could be achieved by providing training in long term, midterm and short term at central level to design, customization and implement the activities with increasing nutrition information systems under monitoring and evaluation platform.

CHAPTER 5: CONCLUSION

Currently, the BNNC has been reorganized and envisaged to be the highest-level coordinating office for nutrition under the leadership of the Honorable Prime Minister (PM). The Ministry of Health and Family Welfare (MoHFW) has been supporting the revitalization process, including the restructuring of the BNNC. The initiative of the BNNC office is intended to build national and sub-national platforms for scaling up nutrition activities through multi-sectoral, multi-stakeholder and multilevel approaches and opportunities for improving nutritional scenario in the country. Now, the focus has been shifted towards strengthening the sectoral coordination and engagement of relevant stakeholders. It has been observed that a strong BNNC office is essential to reinforce the overall coordination, accountability, and monitoring of activities at the national and sub-national level. The revitalized BNNC office with its platforms will work for consolidation to assess limited number of indicators, examine food security and nutrition trends, progress and formulate annual monitoring report of Second National Plan of action for Nutrition (NPAN2).

As BNNC is the apex body of nutrition integration for 22 ministries. These will be an ideal place to start of data integration and management. Therefore, existing coordination mechanisms or platforms such as NPAN2 need to be strengthened to ensure participation by all ministries whose core activities are reflected in this plan.

Progress of NPAN2 implementation will be measured by monitoring and tracking process indicators throughout the life of the plan, while outcomes and results will be measured only at the end of the life of the plan; 2016-2025. Therefore, this is a first and foremost responsibility of BNNC to develop an interoperable and integrated nutrition information systems and consolidate it at national level for implementation of NPAN2.

Therefore, it is necessary to develop and strengthen capacities for planning, data managing as well as monitoring and evaluation through the training of adequate numbers of personnel in relevant units of different sectors including BNNC office.

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Annexure

Annex 1: List of NPAN2 priority indicators according to different sectors

MOHFW, UPHCSDP II

SL.	Indicators	NPAN2 Target 2025	NPAN2 Baseline
1	Increase the initiation of breastfeeding in the first hour of birth	80%	51% (BDHS 2014
2	% of children (0-5m) exclusively breastfed	70%	55% (BDHS 2014)
3	% of children (6-23 m) receiving MAD	40%	23% (BDHS 2014)
4	Percentage of infants born with low birth weight (<2,500 grams)	16%	23% (National LBW Survey-2016)
5	Reduce stunting among under-5 children	25%	36% (BDHS 2014)
6	Children under 5 years who are wasted	<8%	14% (BDHS 2014)
7	Children under 5 years who are overweight	No increase	1.4% (BDHS 2014)
8	% of Women 15-49 yrs. With Anaemia	<25%	42% (BDHS 2011)
9	% of children under 5 with diarrhoea treated with ORT and Zinc	Not Available	38% (BDHS 2014)
10	%of women 15-49 yrs who are overweight or obese (BMI ≥23)	30%	24% (BDHS 2014)
11	% of adolescent girls (15-19 yrs.) with height <145 cm	<8%	(BDHS 2014)
12	% of adolescent girls (15-19 yrs.) thin (total thinness)	<15%	29% (FNSP 2015)
13	% of women (15-19 yrs) who have begun childbearing	10%	31% (BDHS 2014)
14	% of population that use improved drinking water	>99%	98% (BDHS 2014)
15	% of population that use improved sanitary latrine (not shared)	75%	48% (BDHS 2014)
16	% of caregivers with appropriate hand washing behaviour	50%	27% (FSNSP 2014)
17	% of women age 20-24 who were first married by age 18	30%	59% (BDHS 2014)
18	1. Change in per capita consumption of: i. salt ii. sugar consumption	i. <5 gm/ person/day (WHO)	i. Salt: not available

DPHE

SL.	Indicators	NPAN2 Target 2025	NPAN2 Baseline
1	% of population that use improved drinking water	>99%	98% (BDHS 2014)
2	% of population that use improved sanitary latrine (not shared)	75%	48% (BDHS 2014)
3	% of caregivers with appropriate hand washing behaviour	50%	27% (FSNSP 2014)

MOWCA

SL.	Indicators	NPAN2 Target 2025	NPAN2 Baseline
1	% of women (15-19 yrs) who have begun childbearing	10%	31% (BDHS 2014)
2	% of women age 20-24 who were first married by age 18	30%	59% (BDHS 2014)
3	Number of Social Safety Net Programs which incorporated nutrition sensitive & nutrition specific objectives	50%	10% (assumption)
4	Number of upazilas covered under VGD program to providing nutritionally enriched fortified food	50%	Nill

MoFood, MoA

SL.	Indicators	NPAN2 Target 2025	NPAN2 Baseline
1	Per capita consumption of fruits and vegetables	≥400g per day	Fruits: 44.7 gm Vegetables: 166.1 gm (HIES 2010)
2	% share of total dietary energy from consumption of cereals	<60%	70% (HIES 2010)
3	Number of upazilas covered under VGD program to providing nutritionally enriched fortified food	50%	Nill

MoSW

SL.	Indicators	NPAN2 Target 2025	NPAN2 Baseline
1	Number of Social Safety Net Programs which incorporated nutrition sensitive & nutrition specific objectives	50%	10% (assumption)

MoPME

SL.	Indicators	NPAN2 Target 2025	NPAN2 Baseline
1	% of children (36-59 m) who are attending an early childhood education program	30%	13% (MICS 2012-13)

MoDMR

SL.	Indicators	NPAN2 Target 2025	NPAN2 Baseline
1	Number of upazilas covered under VGD program to providing nutritionally enriched fortified food	50%	Nill

LGD

SL.	Indicators	NPAN2 Target 2025	NPAN2 Baseline
1	Number of Social Safety Net Programs which incorporated nutrition sensitive & nutrition specific objectives	50%	10% (assumption)

MOE

SL.	Indicators	NPAN2 Target 2025	NPAN2 Baseline
1	% of women who completed secondary/higher education	90%	14% (BDHS 2014)

Annex 2: List of Process or proxy indicators

Table 2.1: Status of proxy indicators to assess IYCF status from 2015 to 2018

Proxy indicators	*2015*	*2016*	*2017*	*2018*	*Source*
Number of infants who are breastfed within one hour of birth	324947 (Rural facility)	421517 (Rural facility)	520759 (Rural facility)	592872 (Rural facility)	DHIS2, DGHS
% of caregivers of children 0-23 months old receiving age appropriate IYCF counselling	na	19% (Rural)	31% (Rural)	33% (Rural)	DHIS2, DGHS
Number of Health facilities certified as Baby Friendly hospital initiatives	188	231	Not available	723	BBF
% of children 6-23 months are fed with minimum acceptable diet	39% (FNSP 2014-2015)	33% (FNSP 2015-2016)	Not available	Not available	FNSP

Table 2.2: Status of Micronutrient malnutrition as envisaged under NPAN2.

Output indicators	*2015*	*2016*	*2017*	*2018*	*Source*
% of children aged 6-59 months receiving Vitamin A supplements	99% (The World Bank)	98.6% (DHIS2, DGHS)	99.9% (DHIS2, DGHS)	98.8% (DHIS2, DGHS)	World Bank, DHIS2-DGHS
Number of children under 5 with diarrhoea treated with ORT and Zinc	737824 (Only ORT)	794022 (Only ORT)	846331 (Only ORT)	851518 (Only ORT)	DHIS2, DGHS

Table 2.3: Status of Management of Maternal nutrition and reducing low birth weight

Output indicators	***2016***	***2017***	***2018***	***Source***
% of pregnant women who received 4+ ANC	31% (Rural)	35% (Rural)	37% (Rural)	APIR report
% of children 0-23 months old whose weight was taken at a facility	9% (Rural)	7% (Rural)	10% (Rural)	DHIS2, DGHS
% of visits with pregnant women who received any IFA	33% (Rural)	44% (Rural)	38% (Rural)	DHIS2, DGHS
% of times women attended a facility during pregnancy that they were weighed	17% (Rural)	16% (Rural)	17% (Rural)	DHIS2, DGHS
% of women receiving maternal nutrition counselling	15% (Rural)	15% (Rural)	11% (Rural)	DHIS2, DGHS

Table 2.4: Status of Management of Acute Malnutrition as progress of relevant programs from 2015-2018

Output indicators	*2015*	*2016*	*2017*	*2018*	*Source*
Number of children < 5 years screened at community level and referred for nutrition management.	13,468 (Rural)	59,891 (Rural)	81,274 (Rural)	78,145 (Rural)	DHIS2, DGHS
Number of health facilities equipped with anthropometric equipment.	Not available	Not available	Not available	427 (Rural)	NNS, DGHS

Table 2.5: Status of nutrition in Adolescent Girls and Women

Indicators	*NPAN2 Target 2025*	*2011*	*2014*	*Source*
%of women 15-49 yrs who are overweight or obese (BMI ≥23)	30%	17%	39%	BDHS
% of adolescent girls (15-19 yrs.) with height <145 cm	<8%	13%	13%	BDHS
% of adolescent girls (15-19 yrs.) thin (total thinness)	<15%	25%	31%	BDHS

Table 2.6: Status of process indicators and targets of Water, sanitation and hygiene as envisaged under NPAN2.

Output indicators	*2015*	*Source*
% of population that use improved drinking water	99%	FSNSP
% of population that use improved sanitary latrine	61%	FSNSP
% of caregivers with appropriate hand washing behavior (% of caregivers in households who used soap for hand washing at least two critical times in the past 24 hours, these two times include after own defecation and at least one for the following: after cleaning a young child, before preparing food, before eating, and/or before feeding a child)	35%	FSNSP

Table 2.7: Status of existing urban nutrition and reporting mechanism as envisaged under NPAN2.

Output indicators	*2015*	*2016*	*2017*	*2018*	*Target by 2018*	*Source*
Number of Urban Health coordination committee meetings held in a year	1	2	2	0	3	MOLGRDC
Urban nutrition reporting included in DHIS2 of HMIS	Yes	Yes	Yes	Yes	Yes	DHIS2, DGHS
NGO nutrition reporting included DHIS2 of HMIS	Yes	Yes	Yes	Yes	Yes	DHIS2, DGHS

Table 2.8: Status of process indicators and targets of Food security, safety and quality as envisaged under NPAN2.

Output indicators	*2015*	*2016*	*2017*	*2018*	*Target by 2018*	*Source*
Rate of growth of agricultural GDP at constant prices (2005-06)	3.12% (BBS)	2.50% (BBS)	2.65% (BBS)	Not Available	Not Available	BBS Yearbook of Agricultural Statistics
Poor households engaged in home gardening and backyard poultry	46.10%	49%	Not Available	Not Available	Not Available	BBS, HIES report

Table 2.9: Status of process indicators and targets of Social Protection Programs as envisaged under NPAN2.

Output indicators	*2015*	*2016*	*2017*	*2018*	*Target by 2018*	*Source*
Government spending on social protection as % of GDP	2.02% (2014-15)	2.19% (2015-16)	Not Available	Not Available	Not Available	Finance Division, MoF
No. of beneficiaries (pregnant, lactating and children) covered by social protection program	2.5 Lac (Maternal allowance)	5 Lac (Maternal allowance)	5 Lac (Maternal allowance)	7 Lac (Maternal allowance)	Not Available	DWA
	1.25 Lac (Working Lactating allowance)	1.75 Lac (Working Lactating allowance)	1.75 Lac (Working Lactating allowance)	2.5 Lac (Working Lactating allowance)	Not Available	DWA
	7,50,000 lac (VGD)	10,00000 lac (VGD)	10,00000 lac (VGD)	10,40,000 lac (VGD)		

Table 2.10: Status of process indicators and targets of Nutrition SBCC as envisaged under NPAN2.

Output indicators	***NPAN2 baseline***	***2014***	***2016-18***	***Target by 2018***	***Source***
Number of ongoing comprehensive coordinated multisectoral, multichannel advocacy and communications campaign	0	Not Available	Not Available	Not Available	Program report
Change in per capita consumption of: *i. salt* *ii. sugar consumption*	i. Salt: not available ii. Sugar: 7.4 (Gram per capita per day)	Not Available	i. Salt: not available ii. Sugar: 6.90 (Gram per capita per day)	Not Available	HIES report 2016

This work is supported by Nutrition International, formerly the Micronutrient Initiative, as part of the Technical Assistance for Nutrition (TAN) program funded with UK aid from the UK government.