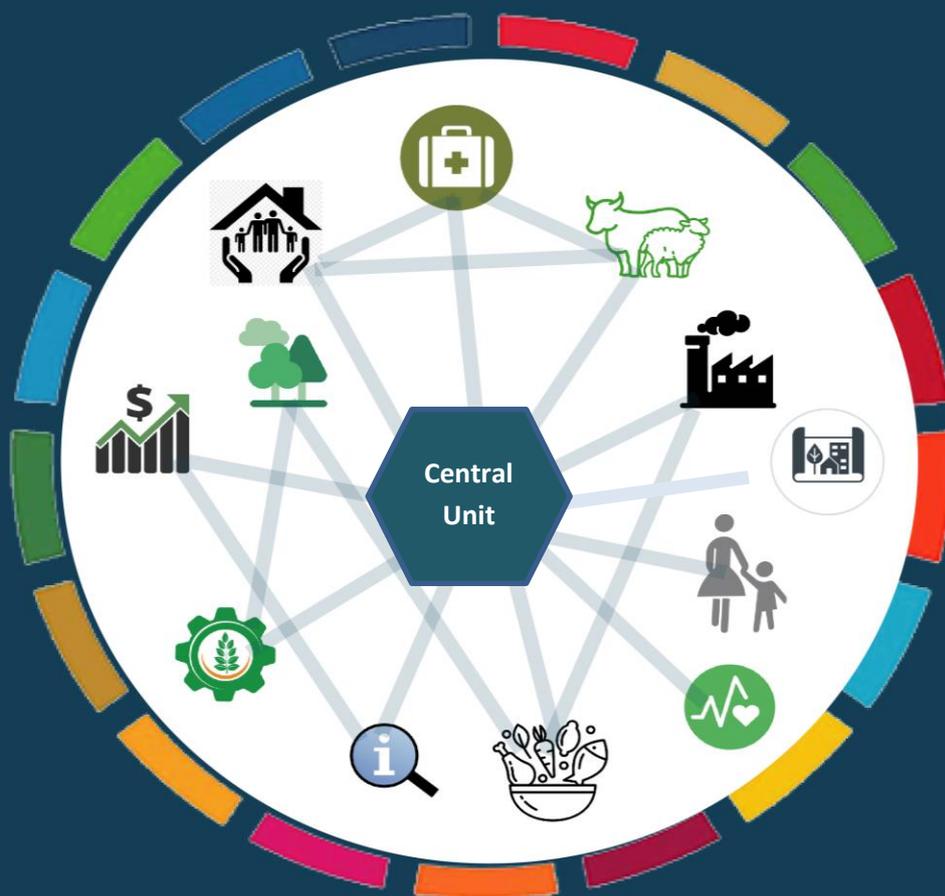




Guidance Document on Integration of Priority Nutrition Indicators into Existing Systems and Consolidation at National Level

Bangladesh National Nutrition Council (BNNC)



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



Foreword

For several decades, the Ministry of Health and Family Welfare (MoHFW) of the Government of Bangladesh has recognized the need for large-scale intervention to prevent malnutrition among large segments of the population. The National Nutrition Services (NNS) has been pursuing a various interventions through the existing health system. On examining the state of implementation and service delivery of NNS interventions, it shows that NNS presents the modalities of implementation arrangements with nutrition service delivery at different geographic levels-district, upazila, union, and community. The study conducted by World Bank (2014) reveals that a system for monitoring and evaluation of services by internal and external experts is a critical need. Of these, to minimize the gap the primary focus of BNNC would be strengthening a strong monitoring and evaluation platform. Therefore, one of the areas of concern identified is capacity of BNNC to develop monitoring and evaluation system for multi-sectoral, multi-stakeholders and multi-level nutrition interventions.

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.

This is a very first draft of guidance documents for integration of priority nutrition indicators into existing systems and consolidation at national level. The BNNC office will ideally integrate all ministerial departments, representatives of various programs, UN system agencies, donors, civil society organizations, and the private sector for best use of data. This will help to resolve conflict, promote harmonization of methods, and assure high quality standards among all stakeholders. It needs to work in a participatory approach with the involvement and input of the existing BNNC M&E platform/forum. On behalf of Bangladesh National Nutrition Council (BNNC), you are requested to work with this forum for finalization of a detail realistic integrated guidance documents for effective nutrition planning and decision making.



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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
BRRRI	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
VDG	Vulnerable Group Development

ACKNOWLEDGEMENT

We extend our sincere thanks to all individuals who were involved for their enthusiasm, advice technical and financial assistance. It is not our intention to leave the name of any person who contributed to make this work happen but it is due to space provided for acknowledgement. We sincerely thank all members of the Multi-sectoral Technical Working Group (M&E platform) established under the NPAN2. A process of development of the final guidance documents were done under leadership of Bangladesh National Nutrition Council (BNNC) through collaboration with Nutrition International, formerly the Micronutrient Initiative (MI), under its DFID-supported Technical Assistance for Nutrition (TAN) project.

We are indebted to Nutrition International, formerly the Micronutrient Initiative (MI) for financial support for this work and SUN movement as the leader of Global Nutrition support. Finally we are indebted to the partners participating in the interviews from different Ministries (MoFood, MOA , MOFL, MOHFW, MOSW, MOWCA, MOLGRD&C, MOPME, MOEF, MODMR, MOCOM and others), bilateral donors (USAID, DFID), UN agencies (UNICEF, WFP, FAO, WHO), NGOs (HKI, GAIN, NI, Save the Children, Concern and the regional and district authorities and communities where Nutrition monitoring process were assessed.

Finally, I owe my deep gratefulness to 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, Public health-2, Health Services Division, Ministry of Health and Family Welfare for their management support to prepare this document successfully.

EXECUTIVE SUMMARY

There are few nutrition information systems in Bangladesh yet, no mechanism exists for harmonizing multi-sectoral data. This is limited ways to ensure quality control of it. Though, there are couple of nutrition data hubs (eg, FPMU, HMIS, FPMIS, BBS, A2i, NIPORT etc.) under the different line ministries which collect and ensure data use. But there is a lack of national level integration and consolidation of nutrition related information.

At present four to five different such agencies working to provide improve nutrition related data and information exclusively from different ministries. Three or more other like, HMIS, FPMU, UNICEF and a2i collecting, processing and disseminating nutrition related information from multiple sources.

They have trained manpower, data archive place, processing hubs those can well serve that purpose of getting nutrition information. They also have intention to integrate data with each other. As BNNC is the apex body of nutrition integration for 22 ministries. These will be an ideal place to start of data integration. As this integration will serve a place where from all can have data from their specific purpose. Although, a common foundation cannot easily be found. However collection of quality data is still a far reaching goal. Since BNNC is the ultimate steward for this hub it will have facilitate to make ensure a common nutrition data hub and ensure quality control of it.

Therefore BNNC need an integrated nutrition information process, where they will not develop any different system. Just create a data warehouse pulling data from different relevant hubs to create an integrated and aggregated nutrition information hub.

This integrated process will help to resolve conflict, promote harmonization of methods, and assure high quality standards among all stakeholders. Initially a guidance document will be developed on integration of priority nutrition indicators into existing systems and consolidation at national level.

CHAPTER 1: Introduction

1.1 Background

Bangladesh has numerous nutrition stakeholders including government ministries, development agencies, implementing partners, private and public teaching and research institutions, nutrition working groups and professional associations, and the private sector. However, even with many players in nutrition, limited impact, including impact from implementation of high impact nutrition interventions, has been realized. There are some parallel nutrition information systems but yet, no mechanism exists for harmonizing data and ensuring its quality control in Bangladesh. The BNNC office ideally includes all ministerial departments, representatives of various programs, UN system agencies, donors, civil society organizations, and the private sector for best use of data.

Nutrition governance emanates from the highest level of government with the Honorable Prime Minister as the Chair of Bangladesh National Nutrition Council (BNNC). BNNC office is placed at the core of the governance system coordinating the overall monitoring and evaluation as well as supporting the Council, its Executive Committee, Standing Technical Committee with informed policy advice. So there is a high-level responsibility of the BNNC office to collate, analyze, and use of data. Though need for a good capacity of data collection at the district level and below. Currently, the possibility 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, analyze data and produce preliminary reports as part of a broader monitoring mechanism.

1.2 Purpose of the guiding note

There are 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.

The BNNC office will ideally integrate all ministerial departments, representatives of various programs, UN system agencies, donors, civil society organizations, and the private sector for best use of data. This will help to resolve conflict, promote harmonization of methods, and assure high quality standards among all stakeholders.

Therefore, this is a guideline of integration of priority nutrition indicators into existing systems and consolidation at the platform of Bangladesh National Nutrition Council using a multi-sectoral integrated approach.

CHAPTER 2: METHODS

2.1 Introduction

This guidance document is to prepare the outline an integrated interoperable nutrition information system for incorporating and monitoring the priority nutrition indicators through the existing systems. It shows a way how to consolidate at national level. BNNC has already done some cascade activities to find out the priority nutrition indicators and M&E practices of different multi-stakeholders. Among those main activities are desk review, stakeholders mapping and identifying priority indicators. Finally, a consultation workshop has been conducted to share key findings of those activities. Now there is a need to come to a common consensus to integrate and use nutrition data. In this regard, we have to develop a guidance document detailing the process of integrating identified priority nutrition indicators into existing systems.

2.2 Structure and scope

The Structure of this document is designed based on the following three questions. The integration process will also be designed in the last question (how we can). Rest of the four questions are explained as the evidence and background information to prepare this guiding document accordingly.

1. *Where we are (Existing systems)*
2. *What we can (Scope of integration)*
3. *What we should be (standard system)*
4. *How we can proceed (process of integration)*

2.3. Target audience

This guidance note is intended for BNNC office including relevant stakeholder are interested or capacitated to build up an integrated interoperable nutrition information system, namely:

- BNNC office (When will update or modify)
- Government agency-Technical programme staff, including Focal Points;
- NGO/UN agency - Technical staff, Developers, programmer, Focal Points
- Academic/Research organizations
- Others (any other interested organization)

2.4 Categories of Indicators

The indicators can be broken down into three general categories based on how they are measured:

1. National target indicators:

The National Nutrition Policy (NNP 2015) and other policy goals and targets (Table 1), NPAN2 sets the following targets and indicators by 2025 for reducing various forms of malnutrition. These indicators are not collected on a regular basis in countries and are closer to program milestones than to traditional indicators. They are intended for use in comparing NPAN2 progress across countries and for assessing how supportive a given country environment is for different programming.

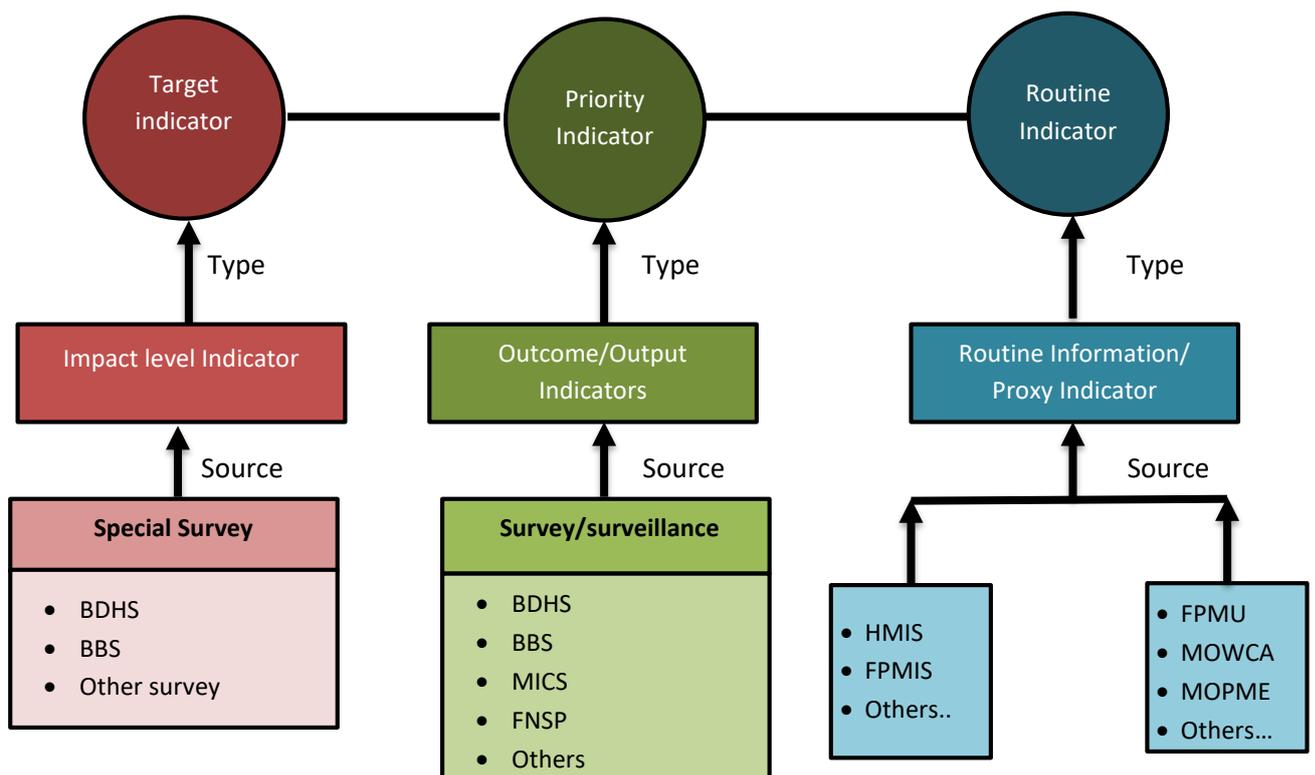
2. NPAN2 Priority indicators:

The following indicators (Table 2) are mentioned in the Matrix table of NPAN2. These indicators are selected as priority indicators based on national nutrition status and short-term & mid-term target of NPAN2. Those indicators are collected on a periodic basis and are not expected to be available on a continuous basis. For example, National Institute of Population Research and Training (NIPORT) is an autonomous national research institute that conduct periodic survey of Bangladesh Demographic and Health Survey (BDHS). These indicators are for use by both program managers and national-level stakeholders.

3. Routine monitoring indicators or proxy indicators:

These indicators (Table 3-8) 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. This 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.

Figure 1: Category and probable sources of selected indicators



2.4.1 Target Indicators

NPAN2 sets the following targets and indicators by 2025 for reducing various forms of malnutrition, as per NNP (2015) and other policy goals and targets:

Table 1: List of National-High level milestone indicators targeted by National Nutrition Policy (NNP) to implement NPAN2 target, 2016- 2025

Higher level indicators	Baseline	Target by 2025	Data source (Baseline)
Increase the initiation of breastfeeding in the first hour of birth	51%	80%	BDHS-2014
Increase the rate of exclusive breastfeeding in infants less than 6 months of age	55%	70%	BDHS-2014
Increase the rate of continued breastfeeding in children aged 20 to 23 months	87%	>95%	BDHS-2014
Increase the proportion of children aged 6-23 months receiving a minimum acceptable diet	23%	>40%	BDHS-2014
Reduce the rate of low birth weight	23%	16%	National LBW Survey
Reduce stunting among under-5 children	36%	25%	BDHS-2014
Reduce wasting among under-5 children	14%	8%	BDHS-2014
Reduce the proportion of underweight among under-5 children	33%	15%	BDHS-2014
Reduce the rate of severe acute malnutrition (SAM)(WHZ < -3)among children under 5	3%	<1%	BDHS-2014
Reduce malnutrition (Total Thinness, BMI<18.5) among adolescent girls (15-19yrs)	19%	<15 %	BDHS-2014
Increase Vitamin A capsule supplementation coverage in children aged 6- 59 month	62%	99%	BDHS-2014
Increase the rate (>15PPM) of iodized salt intake		90%	
Control & reduce maternal overweight (BMI>23)	39%	30%	BDHS-2014
Reduce the rate of anaemia among pregnant women	42%	25%	BDHS-2011
No increase of childhood obesity (WHZ >+2) among children under 5 years	-	-	-

2.4.2 Priority Nutrition Indicators

Total of 25 indicators from NPAN2 action plan have been initially selected as priority indicators through different cascade activities like Key Informant Interviews (KIIs), M&E stakeholders mapping workshop etc. Initially thought that these indicators will support the assessment of the relevance of the identified investment interventions and the extent to which they contribute to the achievement of NPAN2 short-term and mid-term targets.

Table 2: List of Special study indicators measured through household surveys to be monitored and evaluated to assess the high-level indicators of NPAN2

SL.	Indicators	Survey Information	
		Means of Verification	Frequency
Thematic area 1: NPAN2 Outcome indicators relating to Nutrition for All following Life Cycle Approach			
1	% of children (0-5m) exclusively breastfed	BDHS	Every 4 Years
2	% of children (6-23 m) receiving MAD	BDHS	Every 4 Years
3	Percentage of infants born with low birth weight (<2,500 grams)	National LBW Survey	
4	Reduce stunting among under-5 children	BDHS	Every 4 Years
5	Children under 5 years who are wasted	BDHS	Every 4 Years
6	Children aged under 5 years who are overweight	BDHS	Every 4 Years
7	% of Woman 15-49 yrs. With Anaemia	BDHS	Every 4 Years
8	% of children (<5y) with ARI treated with antibiotics	BDHS	Every 4 Years
9	%of women 15-49 yrs who are overweight or obese (BMI ≥23)	BDHS	Every 4 Years
10	% of adolescent girls (15-19 yrs.) with height <145 cm	BDHS	Every 4 Years
11	% of adolescent girls (15-19 yrs.) thin (total thinness)	FSNSP	Yearly
12	% of women (15-19 yrs) who have begun childbearing	BDHS	Every 4 Years
13	% of population that use improved drinking water	FPMU	Yearly
14	% of population that use improved sanitary latrine (not shared)	FPMU	Yearly
15	% of caregivers with appropriate hand washing behavior	FPMU	Yearly
Thematic area 2: NPAN2 Outcome indicators relating to Agriculture & Diet diversification & locally adapted recipes			
16	Per capita consumption of fruits and vegetables	HIES report	Yearly
17	% share of total dietary energy from consumption of cereals	HIES/FPMU report	Yearly
Thematic area 3: NPAN2 Outcome indicators relating to Social Protection			
18	Number of Social Safety Net Programs which incorporated nutrition sensitive & nutrition specific objectives	SSN program report	Yearly
19	Number of upazilas covered under VGD program to providing nutritionally enriched fortified food	Department of Women Affairs	Yearly

SL.	Indicators	Survey Information	
		Means of Verification	Frequency
20	Nutritionally enriched fortified food distributed to vulnerable people during and immediately after emergency	Program report	Yearly
21	% of children (36-59 m) who are attending an early childhood education program	MICS	Yearly
22	% of women who completed secondary/higher education	BDHS	Every 4 Years
23	% of women age 20-24 who were first married by age 18	BDHS	Every 4 Years
Thematic area 4: NPAN2 Outcome indicators relating to Integrated and Comprehensive SBCC			
24	Number of ongoing comprehensive coordinated multisectoral, multichannel advocacy and communications campaign	Program report	Yearly
25	1. Change in per capita consumption of: i. salt ii. sugar consumption	HIES report	Yearly

2.4.3 Routine monitoring or proxy indicators

Table 3: Thematic Area 1- Nutrition for All following Life Cycle Approach

	Proxy/ process indicators	Integration Source	Frequency of data update
Infant and Young Child Feeding			
	Number of infants who are breastfed within one hour of birth	DHIS2, DGHS	Monthly
	% of caregivers of children 0-23 months old receiving age appropriate IYCF counselling	DHIS2, DGHS	Monthly
	Number of Health facilities certified as Baby Friendly hospital initiatives	BBF program data	By six months
	% of children 6-23 months are fed with minimum acceptable diet	FPMU database	Yearly
	Proportion of households that wash hands with soap during handling of food, feeding and after toilet use	FSNSP database	Yearly
Micronutrient Supplements			
	% of children aged under 5 years with diarrhoea who are treated with zinc supplements	NIPORT Database, Program data	Every 4 Years
	Number of children aged 6-59 months receiving Vitamin A supplements	FSNSP database, Campaign data	Every 4 Years
Maternal nutrition & Reducing low birth weight			

	Proxy/ process indicators	Integration Source	Frequency of data update
	% of pregnant women who received 4+ ANC	FPMU database	Yearly
	% of children 0-23 months old whose weight was taken at a facility	DHIS2, DGHS	Monthly
	% of visits with pregnant women who received any IFA	DHIS2, DGHS	Monthly
	% of times women attended a facility during pregnancy that they were weighed	DHIS2, DGHS	Monthly
	% of women receiving maternal nutrition counselling	DHIS2, DGHS	Monthly
	No. of orientation workshops on prevention of early marriage, promoting small family norms, nutrition, ANC, PNC & FP in Islam, spacing and limiting births, ARH, facility delivery, safe motherhood	FPMU database	Yearly
Management of Acute Malnutrition			
	Number of children < 5 years screened at community level and referred for nutrition management.	DHIS2, DGHS	Monthly
	Number of health facilities equipped with anthropometric equipment.	Program data	Quarterly
Adolescent nutrition			
	Number of Orientation program for teachers and students	MoE annual report	Yearly
	Link Established with relevant authorities to include/ strengthen the nutrition component in academic curriculum	MoE annual report	Yearly
	Developed of guideline, IEC materials, training module, academic curriculum related to adolescent nutrition on adolescent nutrition and IFA	MoPME database	Yearly
Water Sanitation & Hygiene			
	Number of population that use improved drinking water	FPMU database	Yearly
	Number of population that use improved sanitary latrine	FPMU database	Yearly
	% of households safely disposing of child's feces	FPMU database	Yearly
	% 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)	FPMU database	Yearly
Obesity & Non-communicable Diseases			
	Number of guidelines distributed to health facilities.	NCDC office	Yearly
	% of population screened for diet related non-communicable diseases.	DHIS2, DGHS	Monthly
Urban Nutrition			
	Number of Urban Health coordination committee meetings held in a year	MOLGRDC program data	By six months
	Urban nutrition reporting included in DHIS2 of HMIS	DHIS2, DGHS	Monthly
	NGO nutrition reporting included DHIS2 of HMIS	DHIS2, DGHS	Monthly

Table 4: Thematic Area 2- Agriculture & Diet diversification & locally adapted recipes

	Proxy/ process indicators	Integration Source	Frequency of data update
Food Fortification			
	Salt Iodization, fortification of oil/other food with Vitamin 'A', iron etc.)	Salt - BSCIC, Ministry of Industries; Edible oil – Ministry of Industries; Rice – MOWCA, MoFood	Yearly
	Develop crude salt specification by BSCIC and monitoring of crude salt quality	BSCIC, Ministry of Industries;	Yearly
Food Security, Safety & quality			
	Poor households engaged in home gardening and backyard poultry	FPMU database	Yearly

Table 5: Thematic Area 3- Social Protection

	Proxy/ process indicators	Source	Frequency of data update
	No. of beneficiaries (pregnant, lactating and children) covered by social protection program	MOWCA program data	Yearly
	Number of social welfare and protection programmes included nutrition education	MOWCA program data	Yearly

Table 6: Thematic Area 4- Integrated and Comprehensive SBCC Strategy

SI	Proxy/ process indicators	Source	Frequency of data update
	Number of ongoing comprehensive coordinated multisectoral, multichannel advocacy and communications campaign	IPHN, BNNC quarterly report	Yearly
	Change in per capita consumption of: i. salt ii. sugar consumption	HIES	Every 5 years

Table 7: Thematic Area 5- Monitoring Evaluation and Research

	Proxy/ process indicators	Source	Frequency of data update
	Number of dissemination of NPAN2 in District and sub-district levels	BNNC Office	By six month
	Number of meeting conducted on M&E platform	BNNC Office	Quarterly
	Number of orientation held on Multisectoral Coordination committee at District level	BNNC Office	Quarterly

	Number of orientation held on Multisectoral Coordination committee at Sub-district level	BNNC Office	Quarterly
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Table 8: Thematic Area 6- Capacity Building

	Proxy/ process indicators	Source	Frequency of data update
	Number of council meetings held	BNNC Office	Yearly
	Number of executive committee meeting held	BNNC Office	Yearly
	Number of standing technical committee meetings held	BNNC Office	Yearly

CHAPTER 3: EXISTING SYSTEMS & INTEGRATION SCOPE

3.1 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.

Currently more than five different agencies working to provide improve nutrition related data and information exclusively from different sectors. Among them three to four other like, HMIS, FPMU, UNICEF and a2i collecting, processing and disseminating nutrition related information from multiple sources.

The following information (Table 9) 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 9: 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
Department of Women Affairs	Social Security	Routinely	Development	Rural	Medium
FPMU, Ministry of Food	- Food - social protection	Routinely	Development	Urban & Rural both	National
UNICEF	Nutrition Survey (MICS)	Periodic Survey	Development	Urban & Rural both	Urban & Rural both
HKI, FAARM	Surveillance	Periodic Survey	Development	Rural	Small
WFP	Food Security	Routinely	Emergency	Urban & Rural both	National

Monitoring Unit/Responsible Department	WHAT (list of activities)	WHEN		WHERE	
		Frequency	Development/ Emergency	Place	Coverage
FAO	Agriculture (Project data collection)	Routinely	Development	Urban & Rural both	Medium
a2i	- SDG tracker - OGD - Others	Routinely	Development	Urban & Rural both	National

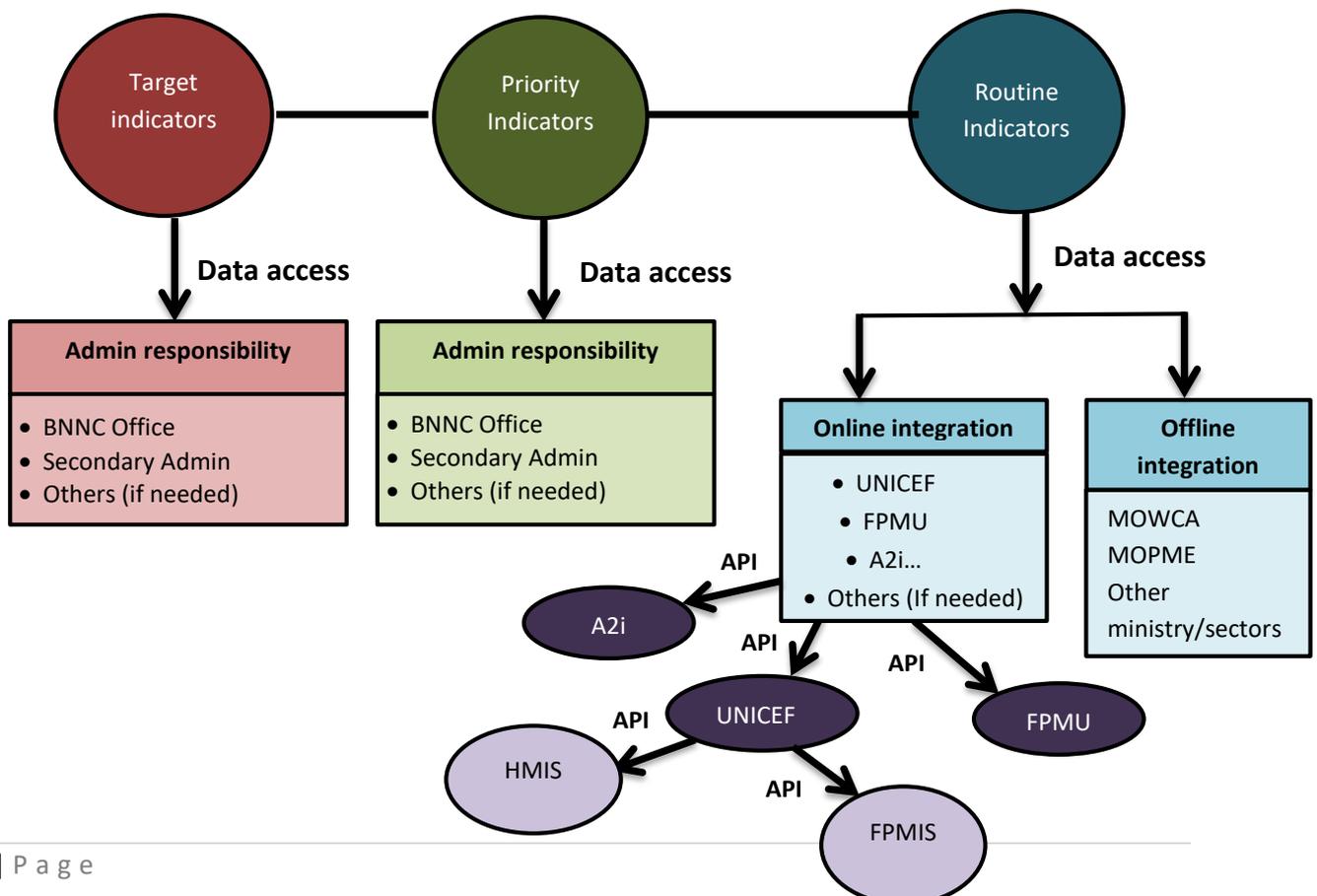
3.2 Scope of Integration

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.

This indicators should be collected after publishing the final report in every 4 years or more. Therefore, the collection of data would be manual process where Central National Office will put the information once when the final report would be published.

For the priority indicators, the process is more or less same. These information is not collected routinely. The information is collected through central office when information are collated through concern agencies. On the other hand, very few priority indicators which are compiled mostly by FPMU and other agencies annually. They stores the information in online database where it is possible to integrate through online applications.

Figure 00: Data integration process from different source of information



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 MoH. Moreover, UNICEF has developed a real time visualization platform integrating some nutrition data from Health and family planning MIS department. On the other hand, FPMU and A2i is collecting, processing and disseminating nutrition related information from different sources. Where central BNNC office can pull those information from UNICEF regarding nutrition specific and others for nutrition sensitive data.

3.3 Existing systems and possible integration

3.3.1 Ministry of Health and Family Welfare (MOHFW)

3.3.1.1 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

In IMCI-N corner report (facilities with IMCI-N corner):

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.

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

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

Flow of routine nutrition data reporting of DGHS

Following diagram depicts way how information are collected and process.

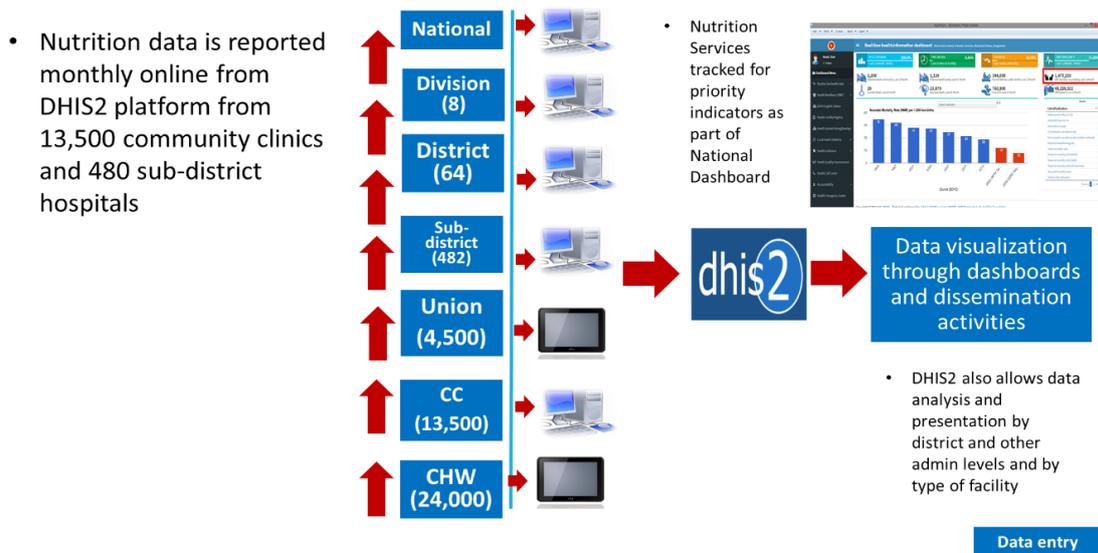


Figure 1.3: Routine Nutrition information and online reporting system through DHIS2 platform

3.3.1.2 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 GDFP

- 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

Flow of routine nutrition data reporting of DGFP

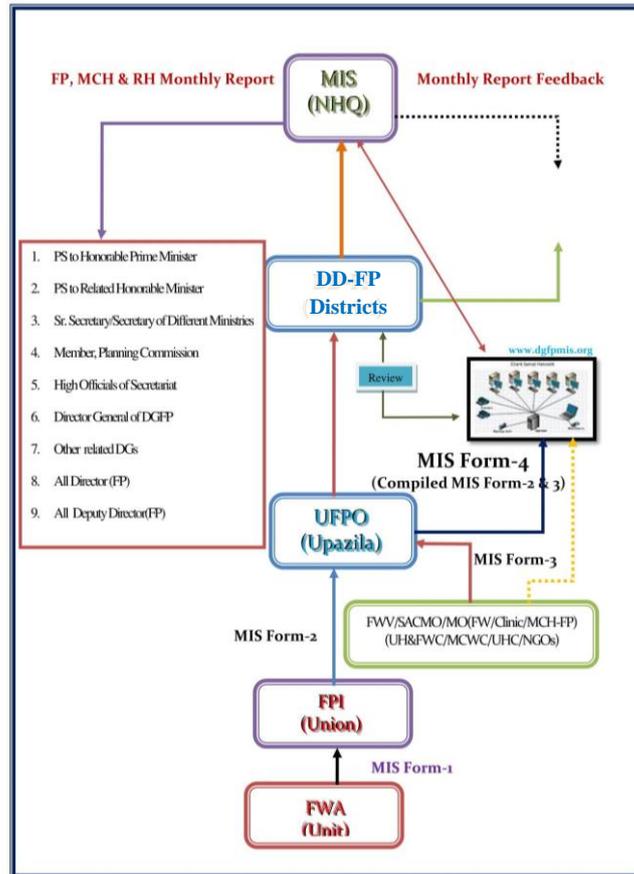


Figure 3: Flow of routine nutrition data reporting of DGFP

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#).

3.3.2 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	Number of infants who are breastfed within one hour of birth	HMIS FPMIS	Monthly
2	% of caregivers of children 0-23 months old receiving age appropriate IYCF counselling	HMIS FPMIS	Monthly
3	% of children 0-23 months old whose weight was taken at a facility	HMIS FPMIS	Monthly
4	% of visits with pregnant women who received any IFA	HMIS FPMIS	Monthly
5	% of times women attended a facility during pregnancy that they were weighed	HMIS FPMIS	Monthly
6	% of women receiving maternal nutrition counselling	HMIS FPMIS	Monthly
7	Number of children < 5 years screened at community level and referred for nutrition management.	HMIS	Monthly
8	% of population screened for diet related non-communicable diseases.	HMIS	Monthly
9	Urban nutrition reporting included in DHIS2 of HMIS	HMIS	Monthly
10	NGO nutrition reporting included DHIS2 of HMIS	HMIS	Monthly

Integration scope with MOHFW:

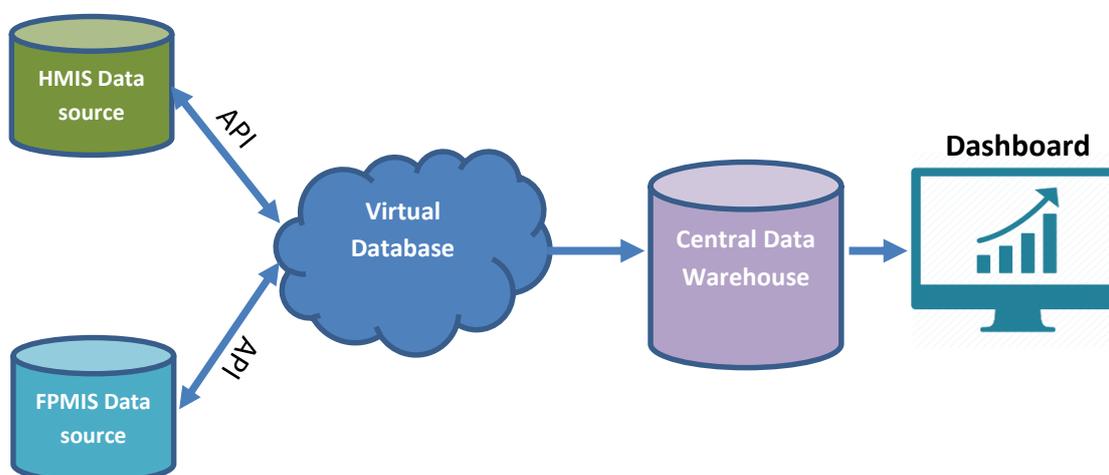


Figure 00: Integration process of MOHFW database

3.4 Ministry of Food

3.4.1 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 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 (%)

Reporting system:

FPMU publish annual monitoring report regularly. The monitoring report is the jointly monitors progress towards the NFP targets. The preparation of the report was led and facilitated by the Food Planning and Monitoring Unit (FPMU) of the Ministry of Food, in collaboration with 17 partner ministries and departments, with technical assistance from FAO and financial support from USAID and EU. The Monitoring Report shows that food and nutrition security for national well-being is a top priority at the highest level of the Government and amongst development partners.

Food Security and Nutrition Data Portal:

The Food Security and Nutrition Data Portal of the FPMU provides 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 data can be downloaded and analysed 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 Foodgrain reports); ii) the document repository consisting of an online Library and physical documentation center; iii) this website.

fpmu.gov.bd/fpmu-database/MAIN.HTM

Ministry of Food www.mofood.gov.bd | www.fpmu.gov.bd Food Planning & Monitoring Unit

Database on Food Situation

January 2019
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Main Page Food Planning and Monitoring Unit (FPMU)
Ministry of Food

3.4.2 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:

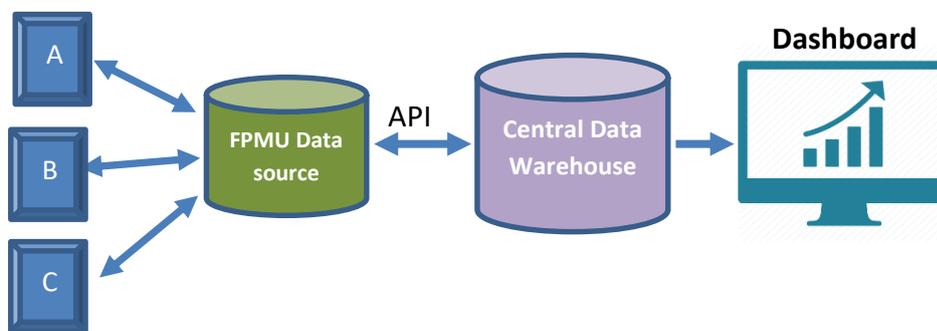


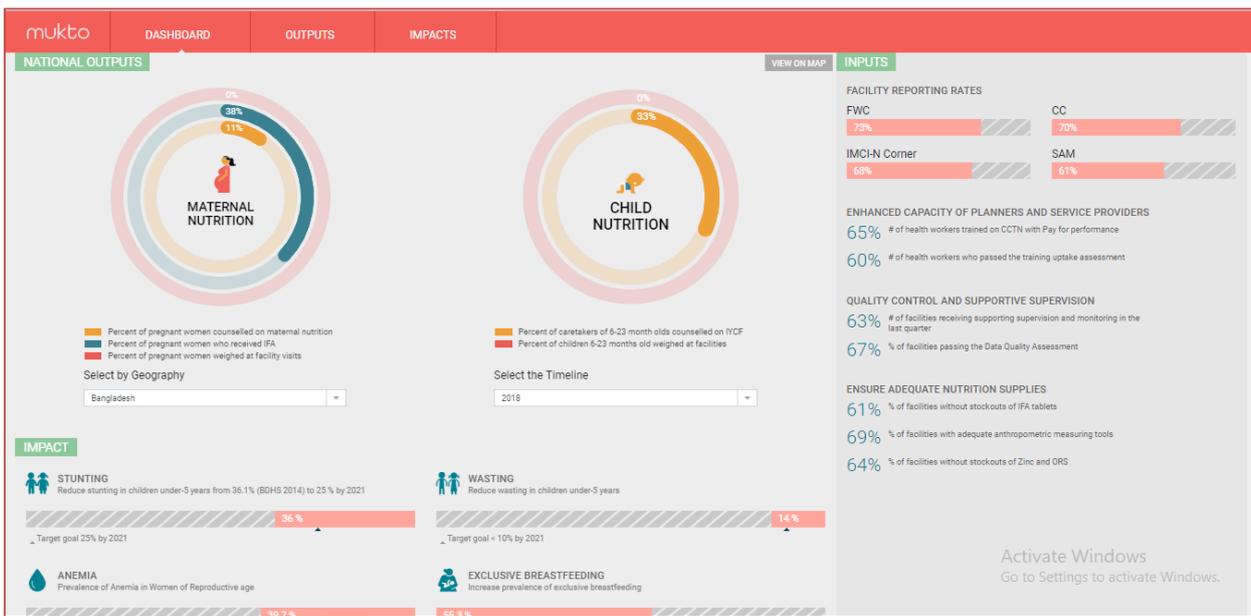
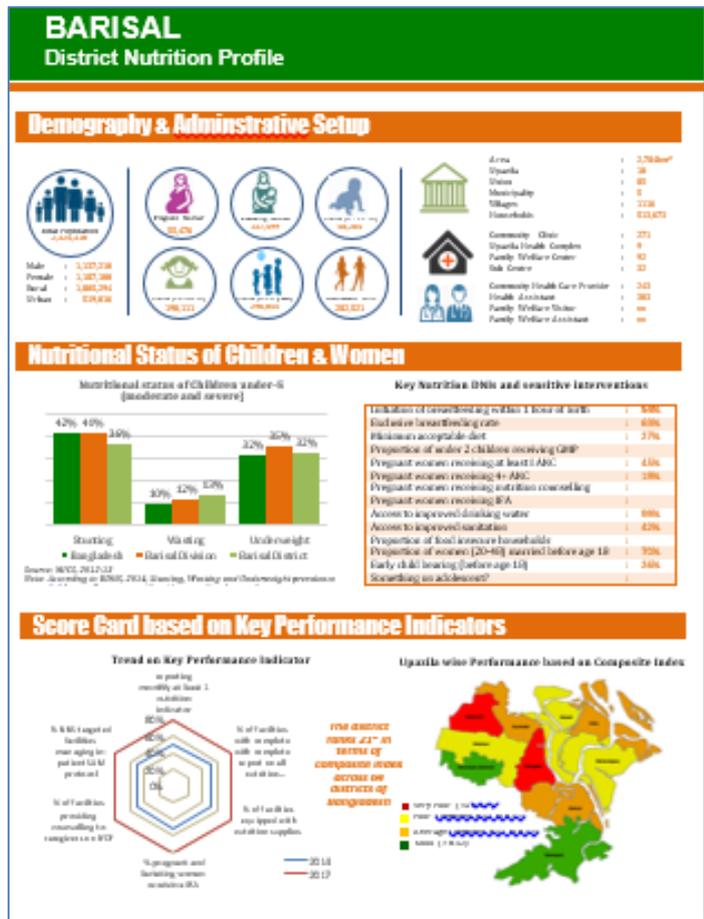
Figure 00: Integration process of FPMU database

3.5 UNICEF

3.5.1 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.



3.5.2 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 00) from different sources. HMIS and FP-MIS collect 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 FPMU 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:

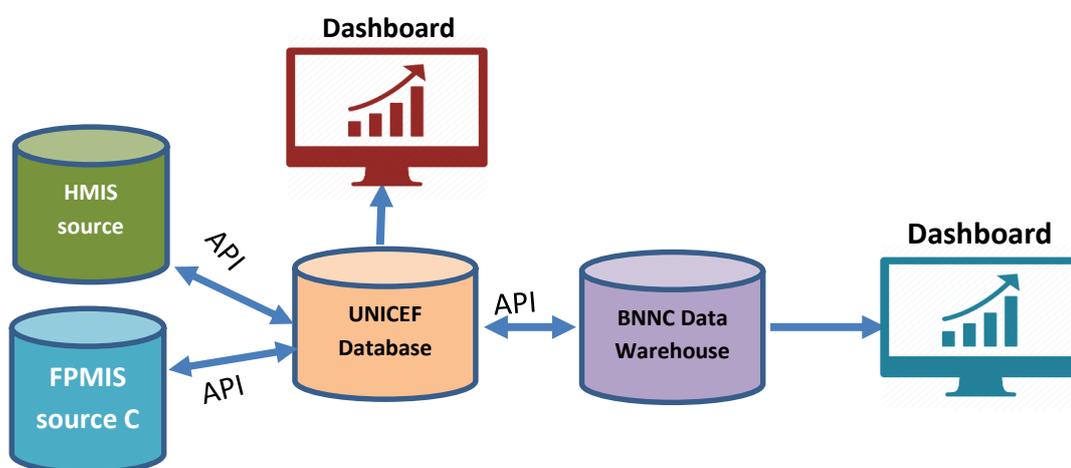


Figure 00: Data integration process of selected nutrition indicators of UNICEF data visualization platform

3.6 Access to Information (A2i)

3.6.1 Existing Systems: SDG Tracker

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

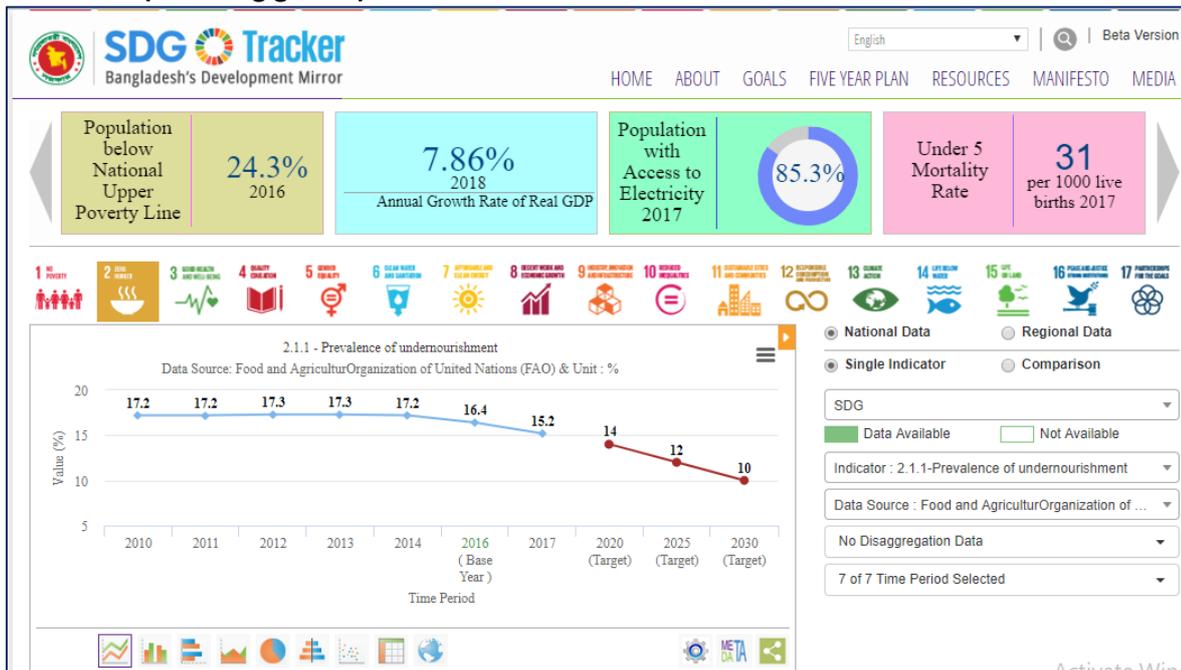
Bangladesh has moved up to lower middle income status but, more importantly, by human development indicators and this achievement came on the back of the country's stride towards higher per capita income in recent years, riding on stable economic growth. This indicates that Bangladesh is well positioned 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)



Potential Thematic Corners on SDGs for Data analytics

Financial Inclusion

Maternal and Child Care

Child Marriage

Human Capital Index

Data Analytics

Way Forward

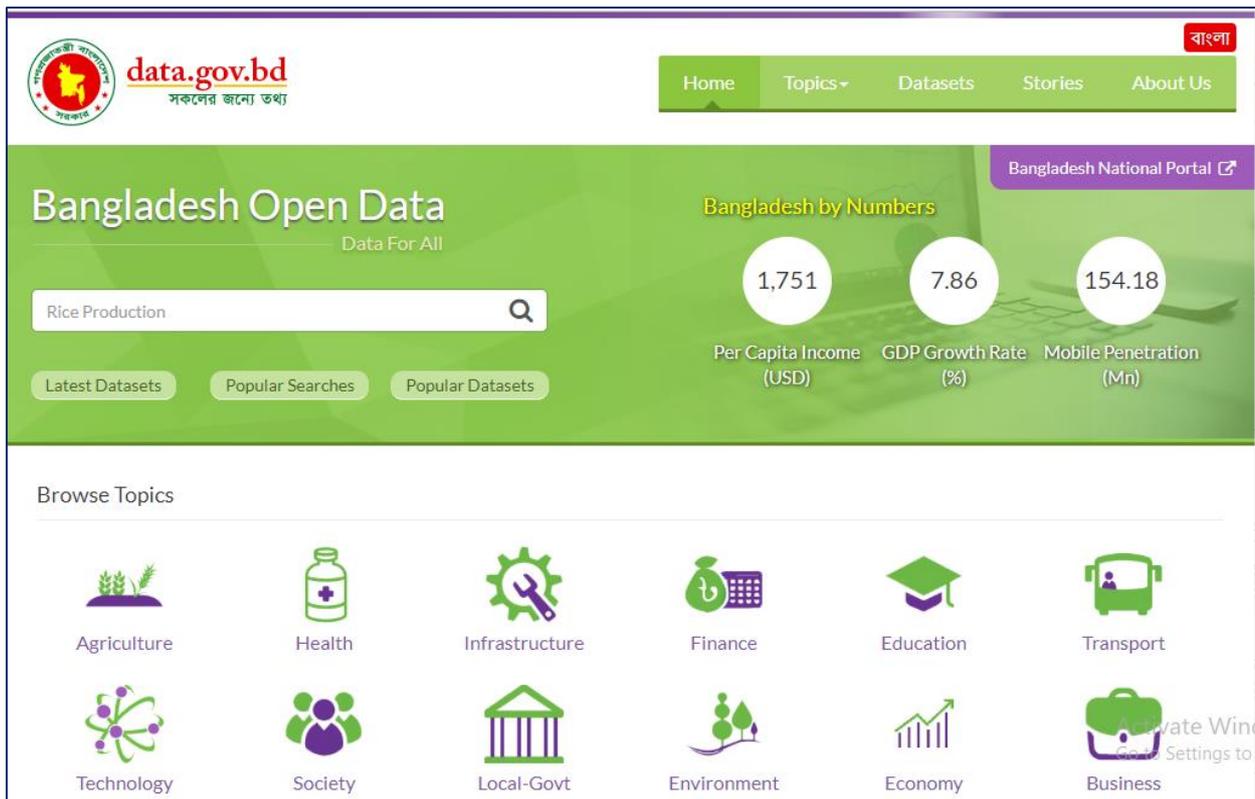
Bangladesh’s commendable achievement in implementing MDGs has poised Bangladesh to do better in achieving the SDGs. The government of Bangladesh is committed to sustain the momentum of MDGs and lead by example again in case of SDGs. National plans and actions are also directed towards this commitment. It is highly expected that the SDG Tracker (www.sdg.gov.bd) will support to drive these actions in the right direction.

3.6.2 OPEN Government DATA

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.

3.6.3 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 shall be shared in machine-readable format, and
- Data shall be as raw as possible.

Data Integration process

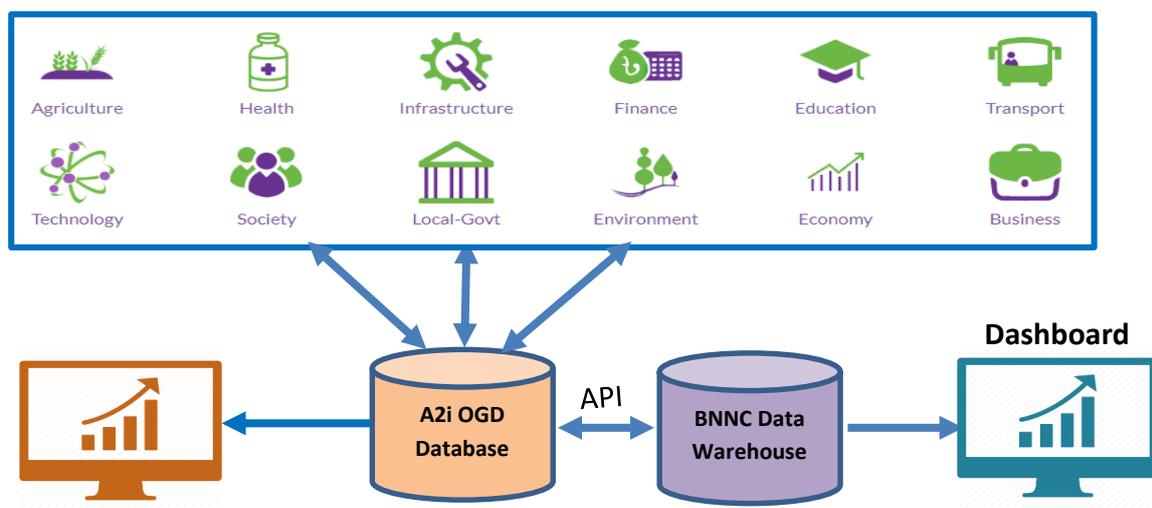
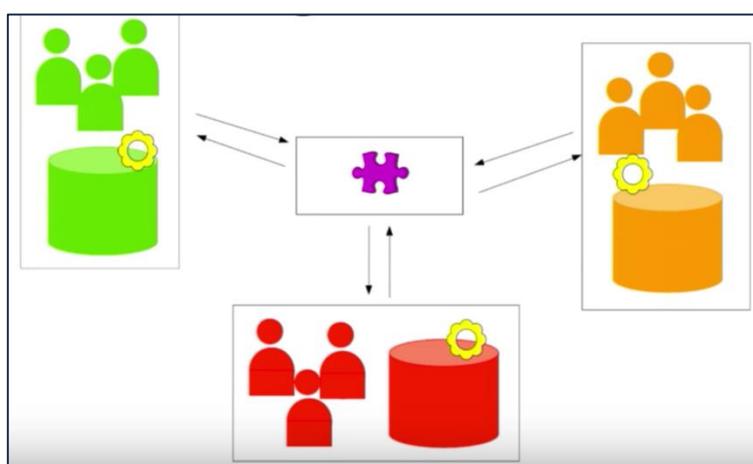


Figure 00: Data integration process of relevant nutrition indicators of a2i open data portal

CHAPTER 4: GUIDING PRINCIPLES

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.



4.2 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.

4.3 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 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 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.

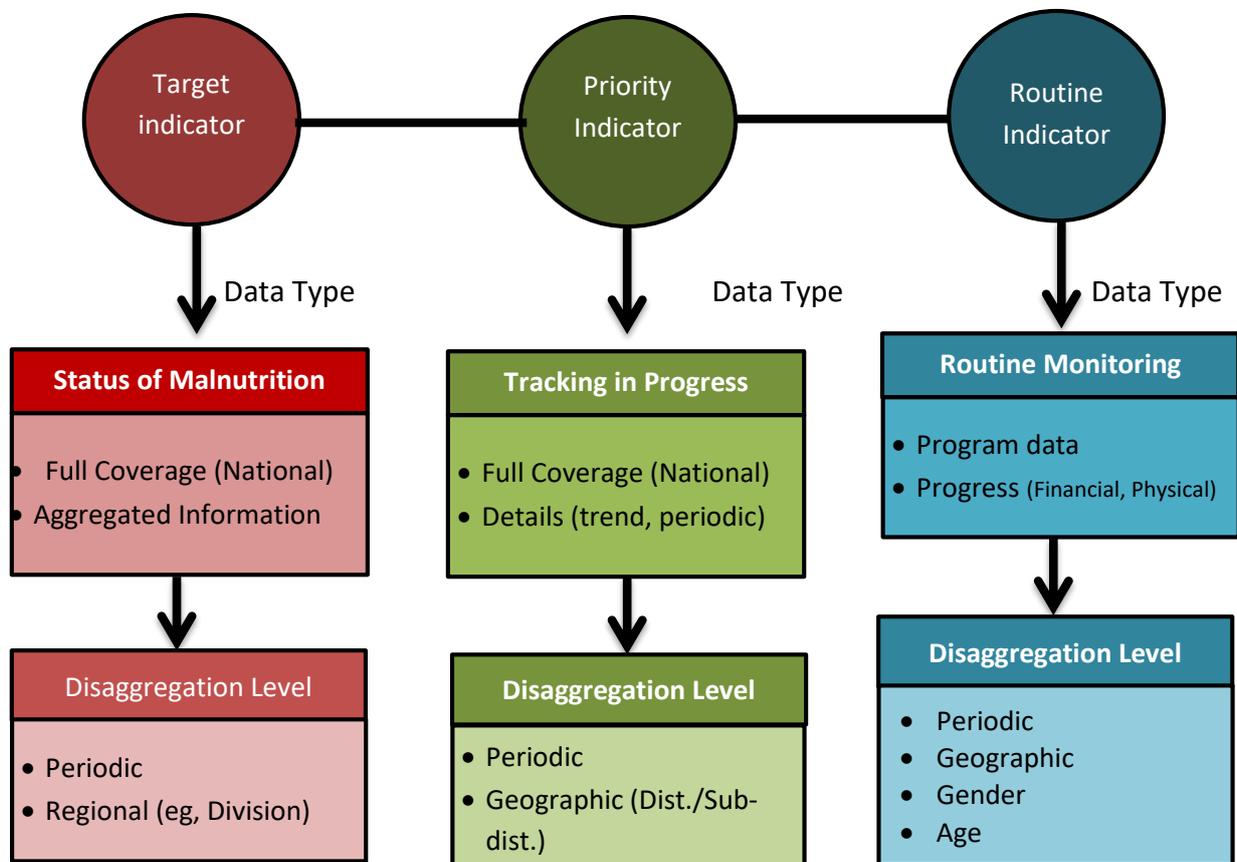
With the selected indicators, a visualization platform has to develop considering geographic map, relational diagram, network diagram, pie chart, line graph, bar diagram, scatterplots and bubble charts. And this is very important to show relevant nutrition information in a same platform to make a good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



4.5.1 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 00** 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.



CHAPTER 5: IMPLEMENTATION PROCESS

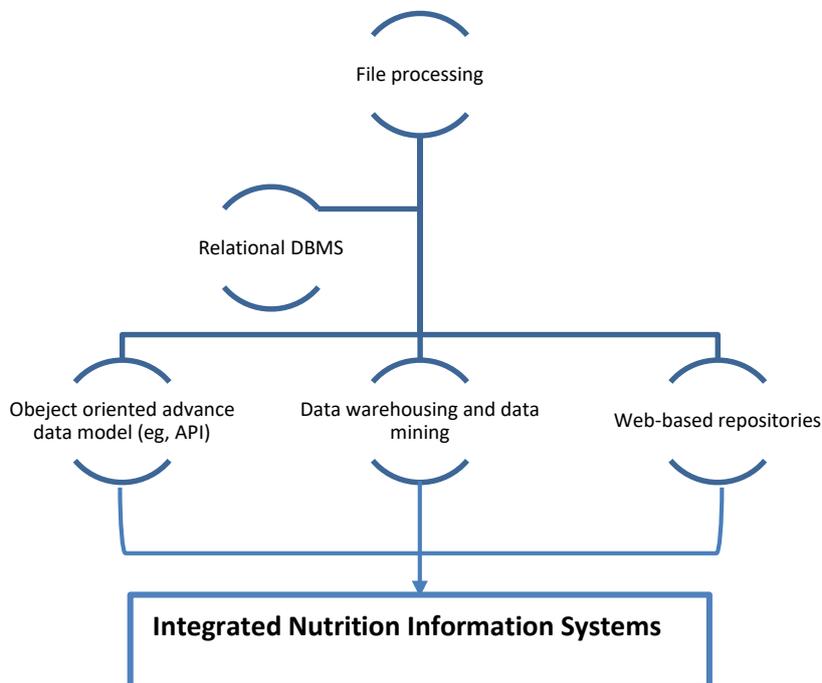
5.1 Development of Data warehouse

5.1.1 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.

5.1.2 Data Processing

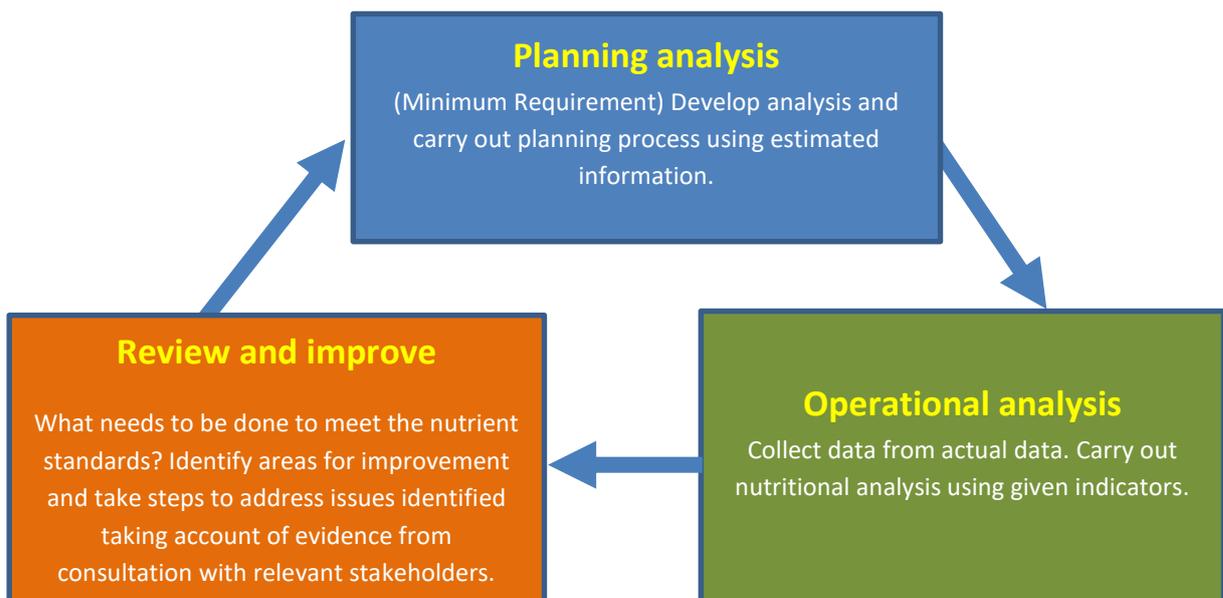
Operational data usually covers a short period of time, because most connections involve the latest data. The data warehouse should enable analyses that instead cover a few years. For this reason, data warehouses are regularly updated from operational data and keep on growing. If data were visually represented, 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.

5.1.3 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.

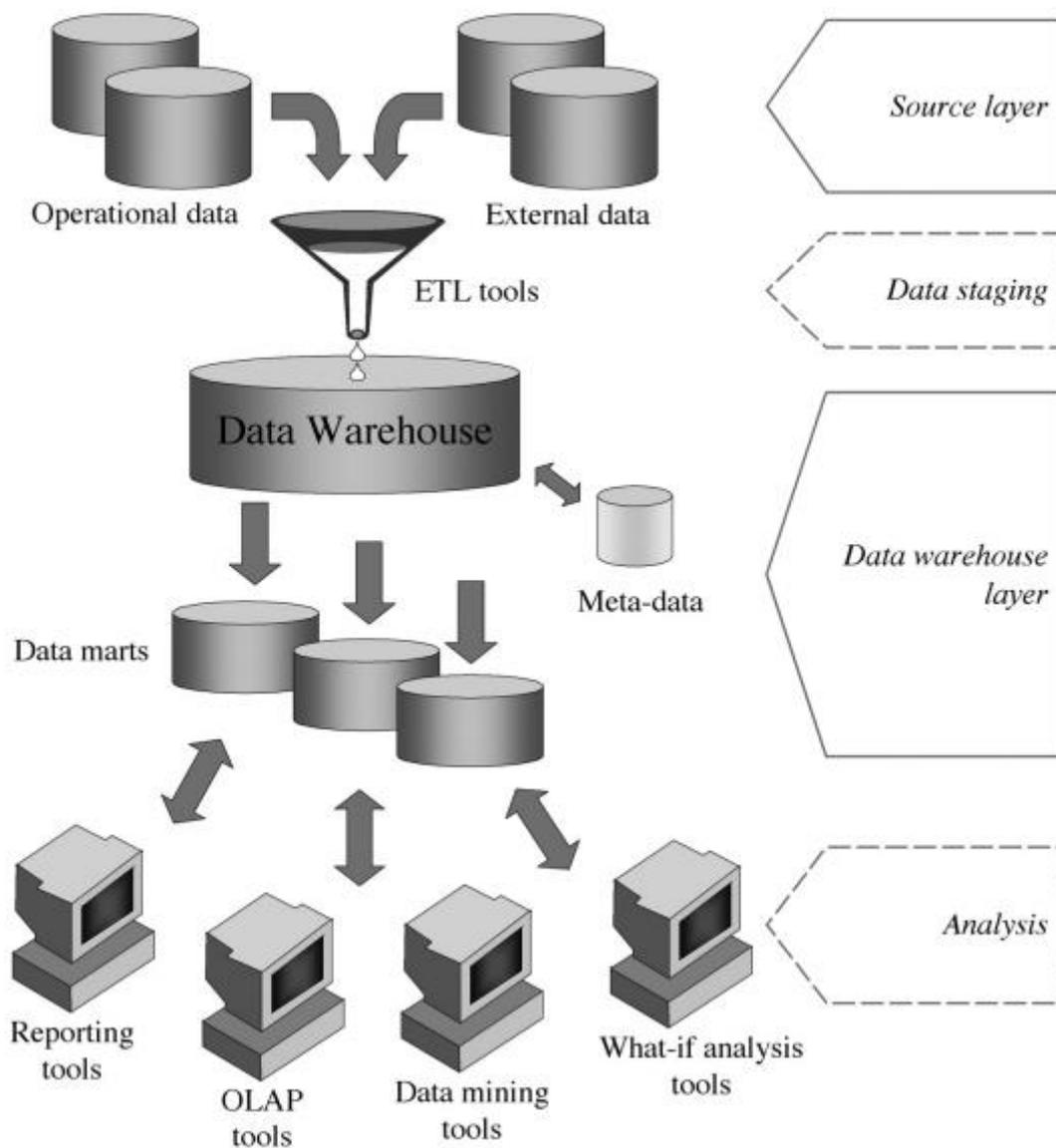
The nutritional analysis process has been broken down into three steps which form the basis of a self-evaluation approach. These steps have been colour coded and are shown below in the overview.



5.1.4 Data warehouse architecture

Relevant nutrition data would be integrated by Developing Information linkage with other ministries and agencies.

Data warehousing is a phenomenon that grew from the huge amount of electronic data stored in recent years and from the urgent need to use that data to accomplish goals that go beyond the routine tasks linked to daily processing. In a typical scenario, a large corporation has many branches, and senior managers need to quantify and evaluate how each branch contributes to the global business performance. The corporate database stores detailed data on the tasks performed by branches.



5.1.5 Data Management and Customization

5.1.5.1 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.

5.1.5.2 Move and resize reports

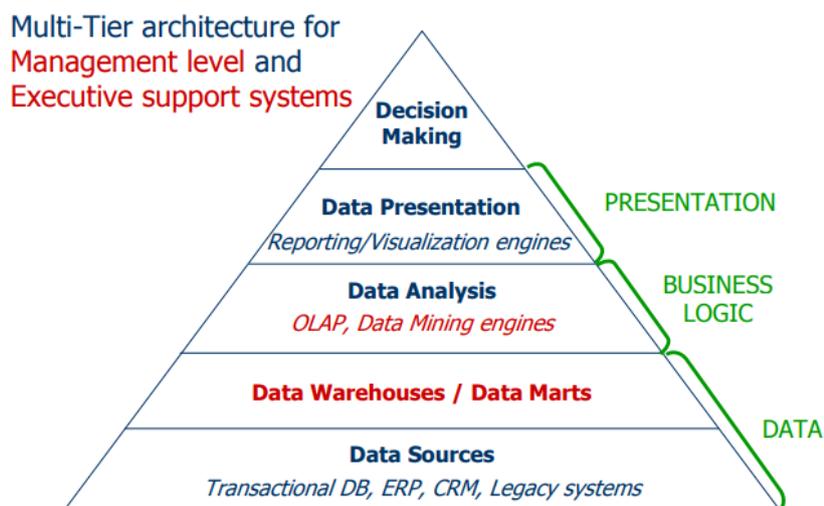
Only report creators and admin can move and resize reports and indicators. Customizers can move and resize the table or illustration as per need.

5.1.5.3 Rename, clone, remove, or delete reports

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

5.1.5.4 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.



5.1.6 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.

5.1.7 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

5.1.8 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.

5.1.9 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.

5.1.10 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.

5.1.11 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.

5.1.12 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.

5.2 GUIDELINE PRINCIPLE OF DASHBOARDS DESIGN

The result areas and indicators in the results matrix are linked to the intervention activities and reflect input, output and outcome indicators. The results matrix is a tool for tracking the progress of implementation and intermediate outcomes. Some of the activities however are steps required in order to build capacity for nutrition interventions to eventually be implemented. For example, there are a number of training activities and it is acknowledged that training does not mean implementation or desired behaviour change; however it is a required step. The results matrix will track progress against 6 thematic areas as target of NPAN2; 1) Nutrition for All following Life Cycle Approach, 2) Agriculture & Diet diversification & locally adapted recipes, 3) Social Protection, 4) Integrated and Comprehensive SBCC, 5) Monitoring Evaluation and Research and 6) Capacity Building.

This section approaches dashboard design in a holistic way, beginning with general goals and evolving to specific data presentation.

Part 1: Foundation helps to identify the target audience, understand what type of dashboard we want to create and why it is valuable to the organization. It concludes guidance regarding how to focus our message on the information and metrics that matter.

Part 2: Structure helps us to start on designing our dashboard, including what form it should take, how to design for audience understanding, and what navigation, interactions, and capabilities will make our dashboard useful and engaging.

Part 3: Information Design dives into the details of interface and information design. We will know how to layout our dashboard and best practices for charting and data presentation.

Part 1: Foundation

You need to find the specific reasons why *your dashboard* will be useful to *your organization*. This section offers exercises to define and refine the purpose for your dashboard. With this purpose in mind, the real work of creating a dashboard will come easily. Better yet, you will have a standard against which you can evaluate success. There are three key questions:

1. Who is my audience?
2. What value will the dashboard add?
3. What type of dashboard am I creating?

Here are a few of the factors to consider about audience, and the implications for a dashboard design:

Table 13: List of factors to consider about audience, and the implications for a dashboard design

	Questions	Implication
Role	Role What decisions do they make? What questions do they need answered?	Structure the information to make it super easy to answer high priority questions.
Work flow	In what context will they be reviewing the dashboard? What information are they using on a daily basis?	The form and information display needs to fit into an existing work flow. For example, an on-the-road sales person may need information

	<i>Questions</i>	<i>Implication</i>
	How much time do they have to review the numbers?	delivered to her BlackBerry, not designed for an online wide-screen monitor.
Data comfort and skills	How sophisticated are they with using data? Are they proficient in Excel? Do they enjoy digging into the numbers?	The dashboard's level of detail and analytical capabilities should match the audiences' comfort zone.
Business and data expertise	How familiar are they with the key performance metrics? Do they understand where the data comes from? Are they familiar with internal company or industry terminology?	This determines the need for embedded explanations and use of natural language.

5.2.1 Type of value dashboard bring:

Dashboards can serve many purposes. Take a moment to consider what you want to get out of your dashboard. Check the top three reasons below.

- Help management define what is important
- Educate people in the organization about the things that matter
- Set goals and expectations for specific individuals or groups
- Help executives sleep at night because they know what's going on
- Encourage specific actions in a timely manner
- Highlight exceptions and provide alerts when problems occur
- Communicate progress and success
- Provide a common interface for interacting with and analyzing important business Data

5.2.2 Type of dashboard to be created:

Dashboards can come in many flavors. What never changes is good dashboards focus on the most important information and communicate this information clearly and concisely.

The delivery channel, level of interactivity, timeliness of data, and analytical capabilities will vary based on the situation.

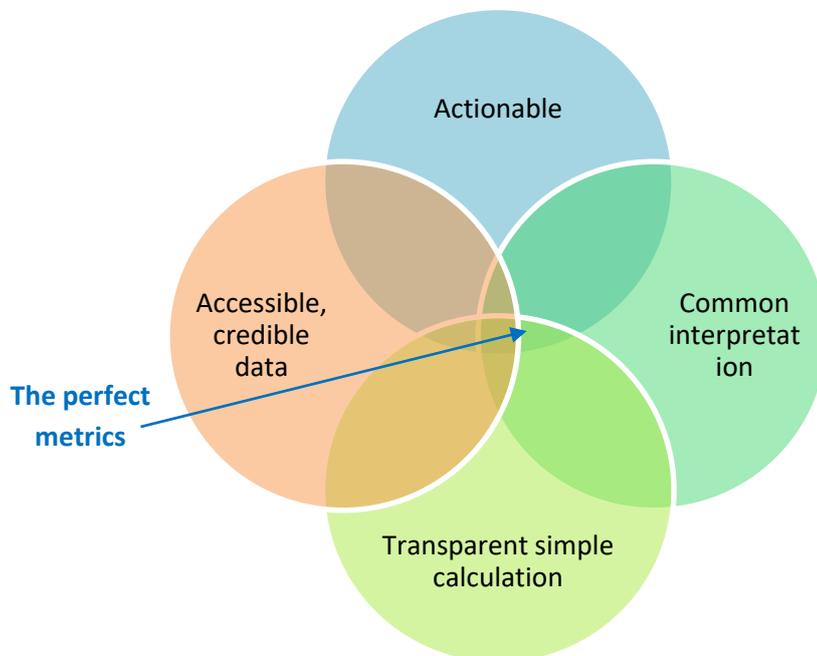
Below is a list of options for your perfect dashboard. Check the boxes that best fit your situation.

SCOPE	<input type="checkbox"/> Broad: Displaying information about the entire organization	<input type="checkbox"/> Specific: Focusing on a specific function, process, product, etc.
BUSINESS ROLE	<input type="checkbox"/> Strategic: Provides a high-level, broad, and long-term view of performance	<input type="checkbox"/> Operational: Provides a focused, near-term, and tactical view of performance
TIME HORIZON	<input type="checkbox"/> Historical: Looking backwards to track trends <input type="checkbox"/> Snapshot: Showing performance at a single point in time	<input type="checkbox"/> Real-time: Monitoring activity as it happens <input type="checkbox"/> Predictive: Using past performance to predict future performance

CUSTOMIZATION	<input type="checkbox"/> One-size-fits-all: Presented as a single view for all users	<input type="checkbox"/> Customizable: Functionality to get users create a view that reflects their needs
LEVEL OF DETAIL	<input type="checkbox"/> High: Presenting only the most critical top-level numbers	<input type="checkbox"/> Drill-able: Providing the ability to drill drill down to detailed numbers to gain more context
POINT OF VIEW	<input type="checkbox"/> Prescriptive: The dashboard explicitly tells the user what the data means and what to do about it	<input type="checkbox"/> Exploratory: User has latitude to interpret the results as they see fit

5.2.3 Choosing the perfect metric

The organization may know the exact metrics that aligned behaviors, drive strategy, and track success. For the rest of us, defining the right metrics for the dashboard is a tricky, ever-evolving task. Below is a simple framework to help hone in on the right performance metrics. Metrics without goals can be a waste. Unfortunately, getting people to agree to specific targets can be painful. After all, goals start us down a slippery slope toward clear accountability. Don't give up. We've found that the first step is to simply get people to buy-in to the success metrics by creating clarity on definitions, showing trends, and incorporate them into the organization's vernacular. Eventually, people start to question why there isn't a goal set. Pretend to act surprised by the cleverness of this suggestion.



Part 2: Structures

Now that we've defined in Part 1 what the dashboard should accomplish for your audience, it is time to start the thinking about how your dashboard actually looks and how it works. This section offers ideas about the big-picture elements of your dashboard—the building blocks that it will use to construct the dashboard. The building blocks can be broken into four categories:

1. **Form:** In what format is the dashboard delivered?
2. **Structure:** How is the dashboard laid out to help users understand the big picture?
3. **Design principles:** What are the fundamental objectives that will guide your design decisions?
4. **Functionality:** What capabilities will the dashboard include to help users understand and interact with the information?

1. Form

The conventional view has been that dashboards need to be constrained to a single page; we believe dashboards can come in many forms. A short e-mail can serve as a dashboard if it works for the recipients. Likewise, a wall-mounted 55" plasma TV showing an animated presentation has the potential to be an effective dashboard.

Before deciding to deliver the dashboard, think about a few factors that may influence the dashboard form:

1. **Timeliness:** How frequently is the data in the dashboard updated?
2. **Aesthetic value:** How important is it that the dashboard look attractive, or can it be purely utilitarian?
3. **Mobility:** Does the audience need to access the information on-the-go?
4. **Connectivity:** Does the dashboard need to connect to live data sources?
5. **Data detail:** Will the dashboard offer an ability to drill down to see more context?
6. **Data density:** How information-rich will views of the data be?
7. **Interactivity:** Will the user benefit from interacting with the dashboard?
8. **Collaboration:** Is it important that your audience be able to easily share and collaborate on the dashboard?

2. Structure

A good dashboard structure requires a deep understanding of how the system you are measuring works. There are many ways to break something down into manageable parts.

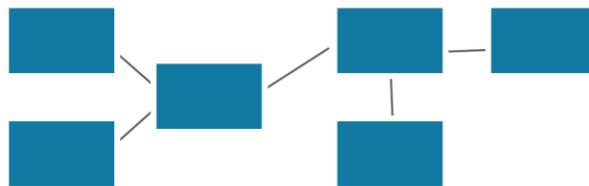
The structure of your dashboard is also an opportunity to define the "right" way to look at a problem or the business. How you choose to lay out the information shapes how your audience understands the big picture and how the smaller pieces fit together. At a more practical level, structure can serve as a navigational mechanism for the user. It shows where to start, and where to go next.

Choosing the right model is a dashboard-specific problem. In our experience, dashboards fall into three categories: flow, relationships, and grouping.

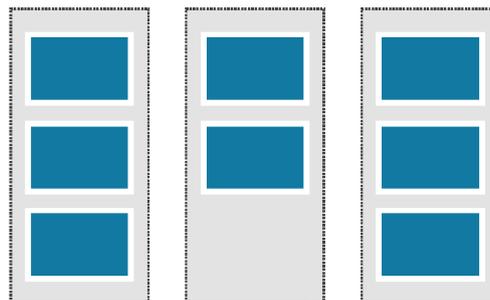
Flow: A flow-based structure emphasizes a sequence of events or actions across time. Systems that fit this model include leads moving through a sales pipeline, stages of customer support, and operational processes.



Relationships: The structure of a dashboard can also emphasize the relationships between entities or measures. These relationships or connections may be mathematical, geographical, organizational, or functional.



Grouping: The structure of last resort is to group related information into categories or a hierarchy. The simple act of putting similar things together can bring some logic and accessibility to an otherwise haphazard dashboard.



3. Design principles

We'd like to lay out a few core design goals to use as reminders of what is important. We call these goals design principles. Below are a few key design principles that we use when we design dashboards. By no means should you feel compelled to follow all of these principles; in fact, it is better to pick a one or two high priority principles to help stay focused.

Lead to action

Empower the user to finish their task quickly and/or understand the action that should be taken based on the results. You can build in explicit guidance about what a change in a metric means, or who to contact to address an issue that is highlighted in the dashboard.

Customizable

Build in flexibility to allow the dashboard to become relevant for different users. The most common way to allow users to customize the dashboard is by defining the scope of the data using filters. There is more that can be done: Does the dashboard let the user save a view of the data that they've configured? Does it offer easy ways to tag or highlight things that are important to them?

Explanation before information

We need context and explanation to understand new and unfamiliar events. Providing data without this higher-level analysis is the difference between a chef presenting a fine dinner and fish monger throwing a fish at your head.

4. Functionality

As we work our way from the big picture to the nuts and bolts of your dashboard design, we want to outline common features that can make your dashboard more useful (Part 3 will offer more detail on the best ways to implement some of these features). Depending on the form that you've chosen, the dashboard can be much more than simply charts on a page. Interactive elements highlight key information; user configuration let users customize their view of the data; advanced visualizations make complex data easy to understand and navigate.

5.2.4 Basics thing:

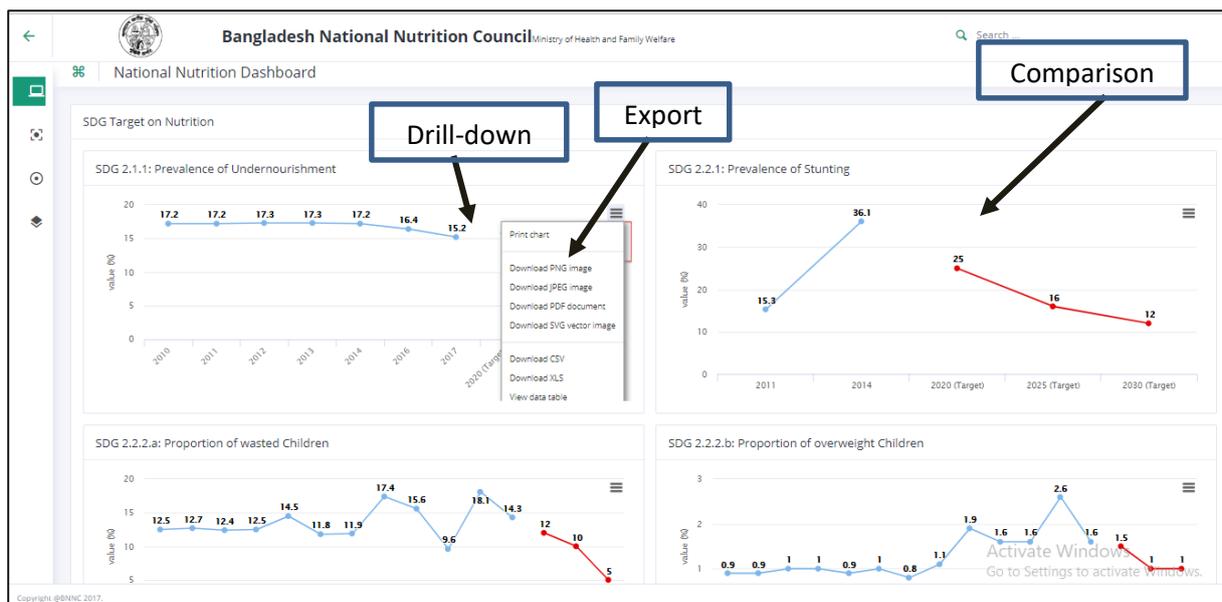
Drill down: Ability to go from a summary metric or view to additional detail that provides more context and/or breakout of the information.

Filters: Allow users to define the scope of the data in the dashboard to reflect their needs. Filters can either be global (refining scope for the entire dashboard) or local (refining scope for a specific chart or metric or view).

Comparison: Ability to see two or more subsets of the data side-by-side. A line chart, for example, may let the user view two geographic regions as separate lines.

Alerts: Highlight information based on pre-defined criteria. The alert may be activated when a metric goes outside of a particular threshold.

Export / print: Give users the ability to pull information out of a dashboard. Export to formats that let users do more with the data like Excel and CSV rather than PDF.



Part 3: Information Design

Clear presentation of information

The third part of our dashboard design guide provides practical tips for putting information on the page in a way that communicates effectively to your audience.

As we've done throughout this series, we will tackle the problem from the outside in. First we share best practices for designing a clear, aesthetically-pleasing page. Next we concentrate on the charts, table and visualizations that communicate the information.

Here's what you can look forward to:

Section 1: Interface design

1. Organize the dashboard page like a web design expert
2. Choose the appropriate use of color to enhance your dashboard
3. Make the right typography decisions to ensure attractive, readable text

Section 2: Information display

1. Pick the chart type that best fits your data
2. Style charts to be attractive and effective
3. Learn about advanced visualization and features for your dashboard

5.2.5 Choosing the right chart

We are often asked "what is the right chart for my data?" Unfortunately there is no secret decoder ring to point at data and see what kind of chart would work best. While we wait on that invention, let's use an understanding of data types and chart types to uncover some of the mystery.

5.2.6 Types of data

There are two major types of data: categorical (i.e. dimensions) and quantitative (i.e. measures or metrics). If you were analyzing a zoo, categorical data would be the different species, gender, and grouping by furry, feathery, or scaly. Quantitative data would include the number of animals, animal weight, number of teeth, etc. The following table describes the different data types:

CHAPTER 6: CONCLUSION & WAY FORWARD

6.1 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. 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.

6.2 Way forward

- It's important that this guiding document which developed implementation plan is functional. Hence, piloting it starting with a prototype dashboard with multi-sectoral nutrition indicators now and later rolling it out to next phases of implementation of real time integration and finalize the National Level Nutrition Dashboard.
- The interoperable and integration plan, indicators matrix and dashboard of indicators must be disseminated in some workshops among government line ministries and stakeholders

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Thank you!