CHILD PROFILE ESTIMATES AND COSTING MODEL DEVELOPMENT TO REDUCE CHILD UNDERNUTRITION IN SELECTED COASTAL AREAS OF BANGLADESH

November, 2024

Bangladesh National Nutrition Council

Health Services Division

Ministry of Health and Family Welfare

Government of the People's Republic of Bangladesh

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November, 2024

Director General (In-Charge)
Bangladesh National Nutrition Council (BNNC)

Foreword

It is a great pleasure to inform you that Bangladesh National Nutrition Council (BNNC) is going to publish the study conducted on Child Profile Estimate and Costing Model Development for the Selected Coastal area of Bangladesh through a multisectoral approach. The study focuses on the nutrition, food security and WASH status of children under five years of age in the respective areas and recommends costing model on basic nutrition interventions that will be helpful to plan accordingly and allocate the budget for reducing malnutrition of children in Bangladesh. The study was focused on coastal areas which are different from other parts of the country but can serve as a guiding document for other areas for doing the same.

The first section of the publication provides evidence-based child profile estimates, offering in-depth insights into the nutritional status of children under five in selected coastal areas. Through community-led data collection and analysis, this section highlights the challenges of these regions, which underscore the urgent need of targeted and context specific interventions.
The second section emphasize on the development of a costing model that will enable local government officials, CSOs, and health service providers to allocate resources more efficiently and advocate for necessary funding to implement sustainable nutrition interventions. This reference tool will be instrumental in bridging the gaps between nutritional needs and the financial requirements necessary to address child malnutrition in these vulnerable communities.

I strongly believe this report would be a vital resource for policymakers, members of District Nutrition Coordination Committee (DNCC), Upazila Nutrition Coordination Committee (UNCC), public health practitioners. By utilizing its findings and recommendations, stakeholders can work collaboratively to implement multi-sectoral solutions that will have a lasting impact on child nutrition and health outcomes in Bangladesh. I extend my gratitude to all those who contributed in producing the report and hope that its findings will help further action to combat child malnutrition and secure a brighter future for every child in Bangladesh.

Dr. Mohammad Mahbubur Rahman

Acknowledgement

The study named “Conduct Child Profile Estimates and Costing Model Development to Reduce Child Undernutrition in Selected Coastal Areas in Bangladesh” is led by Bangladesh National Nutrition Council (BNNC) with the support of Save the Children on behalf of the Right2Grow (R2G) Consortium Program Bangladesh.We would like to express our heartfelt gratitude to the member of Technical Working Group and Advisory Committee who are guided intensively for theresearch. We wish to convey our sincere gratitude to the Institutional Review Board (IRB) of the Institute of Health Economics under the University of Dhaka for providing the ethical approval to conduct the research. We appreciate Ministry of Foreign Affairs- Embassy of the Kingdom of the Netherlandsfor funding the initiative and the Right2Grow Consortium Program Bangladeshpartners- Save the Children. We acknowledge the contribution of Institute of Public Health and Nutrition (IPHN), Institute of Public Health (IPH), National Nutrition Services (NNS), Bangladesh College of Physicians and Surgeons (BCPS), Health Service Division-MoHFW, Secondary and Higher Education Division-MoE, Social Service Division-MoSW, Ministry of Disaster Managementand Relief, MoWCA, Fisheries Department-MoFL, Department of Agricultural Extension-Ministry of Agriculture, Care Bangladesh, GAIN and ICDDR, B. We also acknowledge the contribution of SUN CSA Bangladesh, SUN Academia and Thinkthrough Consulting (TTC) Ltd for finalizing this important research and relevant tools.

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ACRONYMS

ADB	Asian Development Bank
ANC	Antenatal Care
B (Beta)	Coefficient Value
BBS	Bangladesh Bureau of Statistics
BDHS	Bangladesh Health Services
BDT	Bangladeshi Taka
BNNC	Bangladesh National Nutrition Council
CC	Community Clinic
CHCP	Community Healthcare Provider
CI	Confidence Interval
CIP1	First Country Investment Plan
CIP2	Second Country Investment Plan
CMSD	Central Medical Stores Depot
CSO	Civil Society Organization
DALYs	Disability Adjusted Life Years
DGFP	Directorate General of Family Planning
DGHS	Directorate General of Health Services
DIP	Detailed Implementation Plan
DNCC	District Nutrition Coordination Committee
DPs	Development Partners
DPA	Direct Project Aid
DWA	Department of Women's Affairs
EBF	Exclusive Breastfeeding
EIBF	Early Initiation of Breastfeeding
EPI	Expanded Program on Immunization
EvBF	Ever Breastfed
ESP	Essential Health Service Package
EU	European Union
FAO	Food and Agriculture Organization
FCS	Food Consumption Score
FIES	Food Insecurity Experience Scale
FIES-SM	Food Insecurity Experience Scale Survey Module
FSNS	Food Safety Net Services
GR	Gratuitous Relief
HA	Health Assistant
HI	Health Invigilator
HH	Household
GAM	Global Acute Malnutrition
HDDS	Household Dietary Diversity Score
GoB	Government of Bangladesh
HIES	Household Income Expenditure Survey

HLP	Horizontal Learning Platform
HSD	Health Services Division
ICN2	Second International Conference on Nutrition
IHE	Institute of Health Economics
IPHN	Institute of Public Health & Nutrition
IRB	Institutional Review Board
IU	International Units
IYCF	Infant and Young Children Feeding
JICA	Japan International Cooperation Agency
KII	Key Informant Interviews
LBW	Low Birth Weight
LGI	Local Government Institutions
LL	Lower Limit
M&E	Monitoring and Evaluation
MAD	Minimum Acceptable Diet
MAM	Moderate Actual Malnutrition
MCBP	Mother and Child Benefit Program
MDD	Minimum Dietary Diversity
MMF	Minimum Meal Frequency
MMFF	Minimum Milk Feeding Frequency
MOE	Margin of Error
MOHFW	Ministry of Health and Family Welfare
MOU	Memorandum of Understanding
MOWCA	Ministry of Women and Children Affairs
MTEPI	Medical Technologist-EPI
MUAC	Mid-Upper Arm Circumference
N4G	Nutrition for Growth
NGOs	Non-Government Organizations
NI	Nutrition International
NIPU	Nutrition Information and Planning Unit
NNP	National Nutrition Policy
NNS	National Nutrition Service
NPAN	Nutrition Policy and Action Plan
NPAN2	Nutrition Policy and Action Plan 2
NVAC	National Vitamin A Campaign
ODK	Open Data Kit
OPM	Oxford Policy Management
ORS	Oral Rehydration Solution
p (P Value)	Probability Value
PER-N	Public Expenditure Review of Nutrition
PNC	Postnatal Care
R2G	Right2Grow
rCSI	reduced Coping Strategy Index

RPA	Reimbursable Project Aid
SAM	Severe Actual Malnutrition
SBCC	Social and Behavioral Change Communication
SD	Standard Deviation
SDA	Society Development Agency
SDG	Sustainable Development Goals
SE	Standard Error
SI	Sanitary Inspector
SIDA	Swedish International Development Cooperation Agency
SSP	Social Security Program
SUN	Scaling Up Nutrition
TTC	Thinkthrough Consulting Pvt. Ltd.
UH&FPO	Upazila Health & Family Planning Officer
UHC	Upazila Health Complex
UHFWC	Union Health & Family Welfare Center
TEAM	Technical Expert Advisory Group on Nutrition Monitoring
TWG	Technical Working Group
U5	Under Five
UHC	Upazila Health Complex
UKAid	United Kingdom Agency for International Development
UL	Upper Limit
UNDP	United Nations Development Fund
UNICEF	United Nations International Children's Emergency Fund
UNNC	Upazila Nutrition Coordination Committee
UP	Union Parishad
US	United States
USAID	United States Agency for International Development
USD	United States Dollar
VGD	Vulnerable Group Development
VGF	Vulnerable Group Feeding
VGFP	Vulnerable Group Feeding Program
WFP	World Food Program
WASH	Water, Sanitation, and Hygiene
WHA	World Health Assembly
WHO	World Health Organization

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EXECUTIVE SUMMARY

The report is divided into two parts, each with two chapters. Part One covers Child Profile Estimation and the Community-led Child Profiling Tool, while Part Two focuses on the Costing of Priority Nutrition Interventions and the Development of a Costing Tool for local stakeholders.

Part One: Child Profile Estimation and Community-led Child Profiling Tool

The child profile development supports BNNC in advocacy and resource allocation to combat undernutrition, especially stunting among children under five at the local level. This initiative emphasizes comprehensive assessments to guide tailored interventions.Profiles were estimated in selected coastal upazilas based on UNICEF's Conceptual Framework on Maternal and Child Nutrition. A survey of 922 households from five upazilas utilized a semi-structured questionnaire, including anthropometric data on under-five children. Ethical approval was obtained from the IRB of the Institute of Health Economics, University of Dhaka.

Findings indicate the average family size (4.9) exceeds the national rural average (4.1), while income (BDT 19,159) and expenditure (BDT 18,090/month) fall below national rural averages (BDT 26,163). Stunting affected 28.4% of under-five children, peaking at 36.8% in Galachipa. Wasting prevalence was 13.3%, with Patuakhali Sadar (16.3%) and Galachipa (14.2%). Underweight prevalence was 19.3%. Stunting and wasting rates were higher than national and divisional averages. Exclusive breastfeeding for 0-5 months was observed in 61% of cases, but 24% of children received pre-lacteal feeds. Suboptimal dietary diversity among older infants highlighted the need for improved IYCF practices. Food insecurity affected 37% of households, with 46% adopting coping strategies like consuming less preferred food (41%), reducing meal sizes (29%), or borrowing food (28%).High dietary diversity was found in 63% of households, but nutritional deficiencies persist. Health service access, including ANC visits and vaccinations, was generally high.

The study team developed a child nutrition profiling tool for individual and community use. The tool aids health providers in assessing nutritional status, offering counseling, and referrals. Local stakeholders (DNCC, UNCC, Union Parishad, and CSOs) can use the tool for local-level evidence-based planning, advocacy, and resource mobilization, supporting annual nutrition planning.

Part Two: Costing Model Development and Costing Tool

The costing model estimates financial resources required to address child undernutrition in project areas. It bridges the gap between needs assessments and resource allocation, ensuring scalable and sustainable interventions.The model applies two approaches used in the World Bank's NPAN 2 costing: (i) program experience costing and (ii) ingredients-based costing. Estimated unit costs per beneficiary at the national level include iron and folic acid supplementation during pregnancy (BDT 190.33), calcium supplementation (BDT 173.09), IYCF promotion (BDT 414.68), vitamin A supplementation (BDT 41.00), zinc and ORS for diarrhea (BDT 93.42), micronutrient powders for infants (BDT 824.46), SAM treatment (BDT 15,200), WASH (BDT 3,491), maternal and child benefit program (BDT 9,944), vulnerable group development (BDT 18,202), and feeding programs (BDT 599.75).

A simple Excel-based costing tool was developed for local GoB stakeholders and CSOs to estimate intervention costs and resource gaps by inputting beneficiary numbers. The tool calculates total costs and resource gaps by deducting central allocations. This localized costing is crucial for understanding financial needs and advocating for additional budget allocations from central or local sources. It empowers planners, donors, and development partners to estimate costs and mobilize funds. The tool aids local government and CSOs in bottom-up planning, monitoring, and ensuring adequate funding for priority nutrition interventions.

The report is divided into two Parts each having 2 chapters: Part one- Child profile estimation along with Community-led child profiling tool; and Part two- Costing of priority nutrition interventions, and Development of costing tool for local-level stakeholders.

PART ONE:

CHILD PROFILE ESTIMATION AND COMMUNITY-LED CHILD PROFILING TOOL

Chapter One: Child Profile Estimation

1.1 Context

1.1.1 Nutrition Situation in Bangladesh

Bangladesh has made good progress in improving child and maternal nutrition outcomes over time. The level of stunting among children under five years declined from 51 percent in 2004 to 31 percent in 2017 to 24 percent in 2022, underweight declined from 31 percent in 2004 to 22 percent and remained unchanged in 2022 (BDHS, 2022) Wasting declined from around 15 percent to 8 percent in 2017-18, however increased to 11 percent in 2022 (BDHS 2022). During the same period, undernutrition among women decreased from 33 percent to 12 percent (FSNS, 2018-19). The prevalence of Low Birth Weight (LBW) reduced to 14.8 percent in 2019 from 36 percent in 2003-04 (FSNS, 2018-19). Much of this improvement in nutrition can be explained by the combination of nutrition-specific and sensitive drivers within a wider enabling environment of pro- poor economic growth, of which key factors are improving incomes, smaller family sizes, and greater gaps between births, parental and particularly women's education and wider access to health and WASH services (Nisbett et al, 2017).

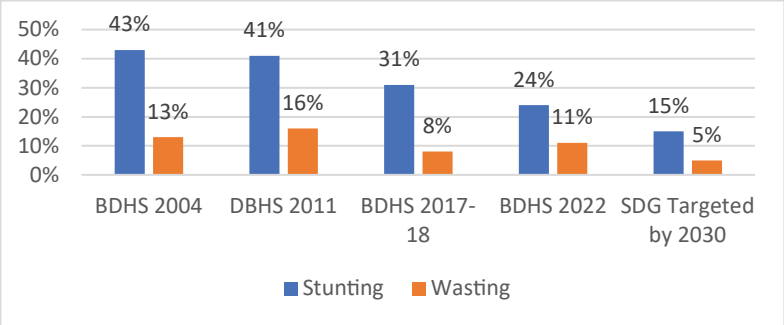


Figure 1: Nutritional Outcome Status in BDHS 2024, 2011, 2017-18 & 2022

In adherence to the Constitution of the People's Republic of Bangladesh, the right to adequate nutrition is recognized as a fundamental human right, and the Government of Bangladesh (GoB) is steadfast in its commitment to investing in nutrition.

The National Nutrition Policy (NNP) was formally endorsed in October 2015, providing essential guidance for implementing strategies to improve the nutritional well-being of the population. The Nutrition Policy and Action Plan 2 (NPAN2) for 2016-2025 reflects GoB's dedication to combating malnutrition and has received approval from the Honorable Prime Minister in 2017. The development of NPAN2 involved a diverse multi-stakeholder platform, emphasizing the need for strengthened collaboration and coordination under the revitalized Bangladesh National Nutrition Council (BNNC). The BNNC, chaired by the Prime Minister, oversees nutrition governance and policy coordination. Efforts are underway to revitalize and restructure the BNNC, with a focus on multi-sectoral coordination at national and sub-national levels (at district and upazilas). The NPAN2 implementation requires an enabling environment with strengthened coordination for nutrition planning, delivery, and tracking at both national and sub-national levels.

1.1.2 Right2Grow (R2G) Initiative

The Right2Grow (R2G) initiative is a five-year advocacy program spanning multiple countries, including Bangladesh, with a dedicated focus on ensuring optimal nourishment and development for every child. In Bangladesh, the project aims to enable all children under five to be well-nourished (under project implementation areas) through strategic engagement with both the public and private sector, prioritizing child growth and maternal health. The initiative involves a consortium of six key members, including Action Against Hunger, The Hunger

Project, World Vision International, Max Foundation, Centre for Economic Governance & Accountability in Africa (represented by HLP Foundation), and Save the Children in Bangladesh, along with local partners JAGO NARI and SDA. Save the Children leads evidence-based advocacy efforts within the consortium, and a central aspect of the project is the development of a child profiling estimation. The project is being implemented in selected areas of the coastal region in southern Bangladesh, this child profiling estimation will provide crucial insights into child undernutrition in the region, which will support advocacy initiatives to prompt government authorities and donors to take essential measures for effective combat against child undernutrition.

1.1.3 Purpose of the Development of the Child Profiles

Profile estimation for children's nutrition involves a comprehensive assessment of health and dietary patterns, considering factors such as age, weight, height, eating/feeding behaviours, cultural norms, and medical conditions. This process helps identify nutritional needs and deficiencies, guiding interventions for improved health, with recommendations ranging from dietary adjustments to specialized care.

The advocacy initiative under the Memorandum of Understanding (MOU) with R2G the Bangladesh National Nutrition Council (BNNC), requires child nutrition profile estimation for its advocacy efforts at various levels. It would also require capacitating its development partners for lobbying and advocacy at central and local level to attract resources and design interventions, that would eventually contribute towards reducing stunting among under-five children in Bangladesh. With the backdrop of this context this research was designed jointly with Save the Children.

1.2 Objectives of Child Profiles Estimation:

a. To know the nutrition status of children under-five in specific locations and periods that would be helpful to make plans and management for the betterment of existing nutrition situation.

b. To analyse the socio-demographic and food security situation of children under five in project implementation areas in selected coastal locations (project area of Right2Grow).

c. To explore the child undernutrition reduction process and planning effectively and efficiently for the selected coastal areas.

d. To undertake the causal analysis for child malnutrition based on UNICEF's conceptual framework.

e. To develop a community-led child profiling /advocacy tool about child nutrition for the government (Upazila Nutrition Coordination Committee-UNCC and District Nutrition Coordination Committee-DNCC) and Civil Society Organisations (CSOs) to apply at the sub-national level and in the community.

f. To identify the key processes to be applied for the community child profiling by the UNCC, DNCC and CSOs.

1.3 Approach and Methodology

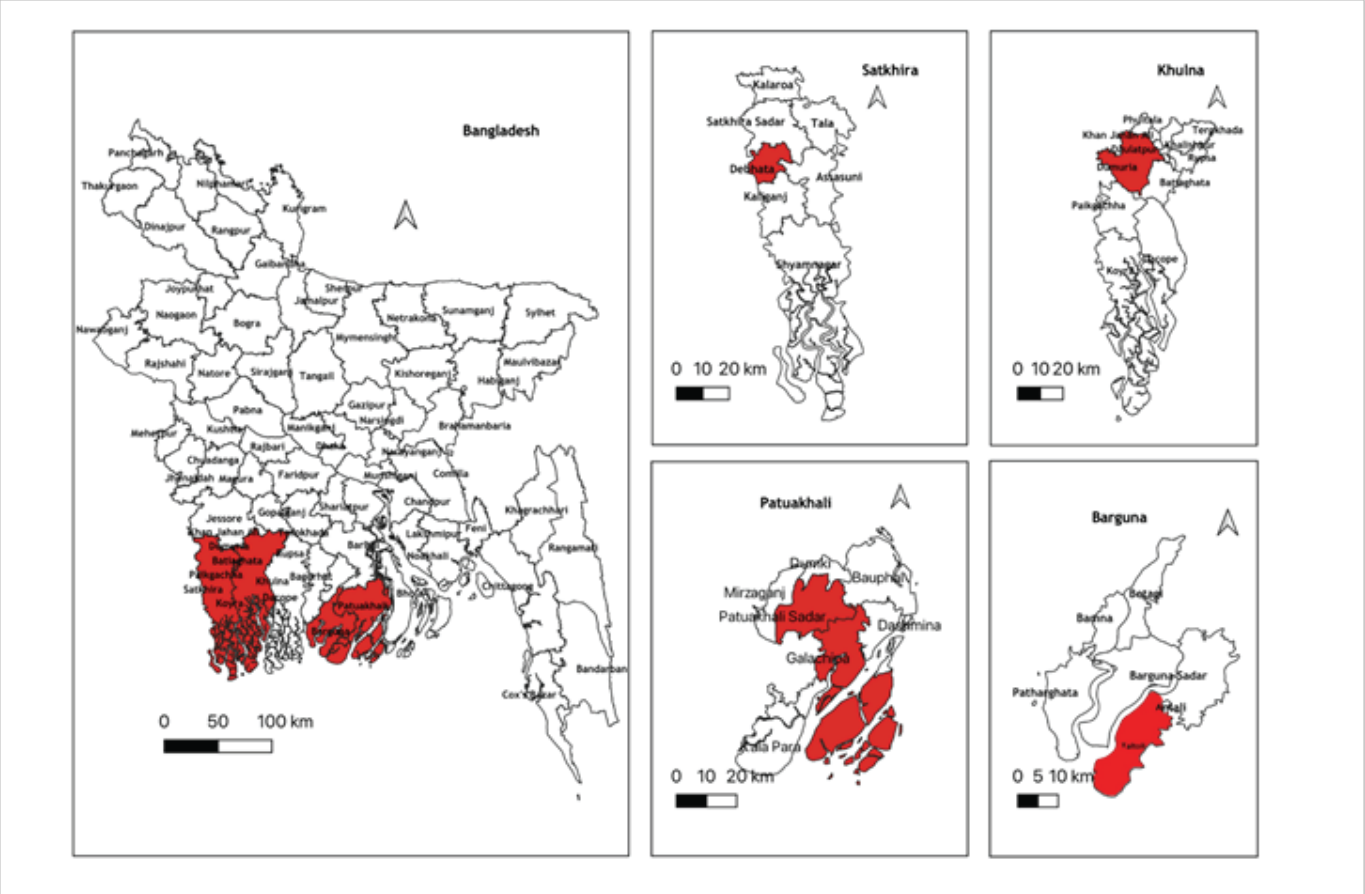
The profile development in the selected coastal upazilas was based on the UNICEF Conceptual Framework on the Determinants of Maternal and Child Nutrition[1], which identify and measures the outcomes of nutrition for under-five children in the surveyed areas and the different enabling, underlying and immediate determinants for the nutrition status. A survey of 922 households was undertaken for the profile estimation, from the selected five upazilas using a semi-structured questionnaire. The household survey also included an anthropometric survey of all under-five children of the surveyed households. For the estimation of household food insecurity, FAO's Food

Insecurity Experience Scale (FIES) methodology and related questionnaires were used. A detailed protocol was developed for conducting this research, which was then submitted to the Institutional Review Board (IRB) of the Institute of Health Economics (IHE), University of Dhaka. The study team received ethical approval on the protocol on 19 November 2023 (Ref. No. IHE/IRB/DU/62/2023/Final). The approach and methodology as per the approved protocol, is attached in Annex 1.

The study was approved by the members of the Nutrition-Sensitive Platform[2] of BNNC in a stakeholder consultation workshop organized by BNNC. As per the decision of the consultation workshop, a Technical Working Group (TWG) and an Advisory Committee were established to offer technical and advisory assistance throughout the study. Four meetings were convened during which the TWG and Advisory Committees offered feedback and guidance to uphold the quality of the study. The training module of National Nutrition Services (NNS), IPHN is used for capacity building of data enumerators for this study.

1.4 Geographical Location of the Study

As previously stated, the study was carried out in specific coastal regions within the operational areas of R2G. The data collection took place in Dumuria and Debhata Upazilas within the Khulna Division, as well as Patuakhali Sadar, Galachipa, and Taltoli Upazilas within the Barishal Division.



[1]https://www.unicef.org/media/113291/file/UNICEF%20Conceptual%20Framework.pdf

[2]To support the BNNC office in carrying out its intended functions, NPAN2 included a number of coordination platforms within BNNC. These platforms were established under an order from HSD, MOHFW in July 2018. Five platforms were formed under the same order, one of which was the Nutrition-Sensitive Platform. This particular research was under the purview of this Platform.

1.5 Ethical Considerations

Ethical approval for the study was taken from IRB of IHE, University of Dhaka. As per the approved protocol, the following ethical considerations were adopted:

- Child safeguarding – the study team members demonstrated the highest standards of behavior towards children and adolescents. An orientation on safeguarding was conducted by Save the Children on 26 November 2023 and all the study team members participated in that orientation.
- The approach to which the study was conducted was sensitive to child rights, gender, inclusion and cultural contexts.
- Confidentiality and data protection - measures were put in place to protect the identity of all participants and any other information that may put them or others at risk.
- Data collection was done in a space where respondents felt comfortable and safe to provide their responses.
- The team explored any personal and professional influence or potential bias in data collection or analysis of data and addressed them ethically.
- No personal contact information was collected or reported in the assessment that might link the respondents' identity with their responses.
- Before each interview (regardless of method or respondent), the objective of the study, the purpose, potential benefits of the study and potential risks of the respondents were explained clearly by the study team members. Then the team member asked for consent of the respondent in the study. The administration of tools was only continued after the respondent (s) provided consent.
- The data collection was conducted in a way that either didn't disturb the service provision at the facility or disrupt the service providers or disturb the household members of the respondent.

1.6 Funding of the Study

The study was funded by the Right2Grow initiative. On behalf of R2G, Save the Children conducted the contracting process. Thinkthrough Consulting was the recipient of the study funding. The study team members worked on behalf of Thinkthrough Consulting.

1.7 Limitations of the Study

- The study was conducted in the project area of R2G in Bangladesh. This project area is in selected upazilas of some of the coastal districts in Bangladesh. Thus, the results cannot be generalized over the entire coastal area of the country.
- The R2G project works only in a few selected coastal Upazilas in the rural Bangladesh, thus, the child profiles for nutrition developed here does not represent urban children.
- This study does not cover all age groups. For child nutrition profiling only the under-five-year age group was considered.

2.1 Demographic and Socio-economic Profile of the Surveyed Households

The average household size of the surveyed households in the selected coastal upazilas under R2G was 4.97. This was higher than the national average household size for rural areas (4.1) in Bangladesh[3]. The male-to-female household member ratio in the R2G working area was 98:100, which is similar to the national figure as stipulated in Census, 2022. The average number of earning members in the households in the selected coastal upazila under R2G working area was 1.43. Around 0.41 persons per household were found to be a person with disabilities/special need.

Table 1: Demographic Data of the Surveyed Households in the Selected Coastal Upazilas

Upazila	Avg. HH Size	Avg. No of Male HH Members	Avg. No of Female HH Members	Avg. No of Earning Member	Avg. No of Persons with Disability
Debhata	4.69	2.27	2.43	1.44	0.30
Dumuria	5.16	2.62	2.54	1.59	0.36
Galachipa	4.94	2.60	2.40	1.22	0.36
Patuakhali_Sadar	4.96	2.38	2.57	1.43	0.36
Taltoli	5.12	2.49	2.60	1.47	0.60
All Upazila	**4.97**	**2.47**	**2.50**	**1.43**	**0.41**

The average monthly income in the surveyed households was BDT 19,159. This is quite low in comparison to the average monthly household income of BDT 26,163 in rural areas as identified in the Household Income Expenditure Survey (HIES), 2022. Average expenditure was BDT 18,090/month/HH in these selected Upazilas which is also low in comparison of BDT 26,842 for rural areas (HIES, 2022).

Table 2: Monthly Income and Expenditure Scenario of the Surveyed Households in the Selected Coastal Upazilas

Upazila	Avg. Monthly Income (BDT)	Avg. Monthly Expenditure (BDT)	Avg. Monthly Expenditure on Food (BDT)	Avg. Monthly Expenditure Non-Food (BDT)
Debhata	16,672	15,471	10,111 (65.35%)	5,332 (34.46%)
Dumuria	20,676	20,885	11,181 (53.4%)	7,965 (38.13%)
Galachipa	18,196	17,767	12,132 (68.28%)	4,995 (28.11%)
Patuakhali_Sadar	20,733	18,819	12,072 (64.15%)	6,921 (36.71%)
Taltoli	19,507	17,550	13,172 (75.05%)	5,729 (32.46%)
All Upazila	**19,159**	**18,090**	**11,740 (65%)**	**6,186 (34.19%)**

The study identified food-consumption expenditure to be BDT 11,740/month which was close to the expenditure of the same category in the HIES, 2022 (BDT 13,125) for rural areas. The non-food consumption was BDT 6,186/month, which was significantly lower than the expenditure of the same category (BDT 13,082) for rural areas.

[3]Population and Housing Census of Bangladesh, 2022

2.2 Anthropometric Profiles of Under-five Children in Selected Coastal Areas of Bangladesh (Study areas).

2.2.1 Stunting of Under-five Children in Selected Coastal Upazilas

Height-for-age was considered to denote stunting. Children whose height-for-age Z-score is below minus two standard deviations (–2 SD) from the median of the WHO reference population were considered short for their age (stunted). Children whose Z-score is below minus three standard deviations (–3 SD) from the median were considered severely stunted.

The study identified 28.4 percent of the under-five children to be stunted (–2 SD) in the upazilas under R2G working areas. Male children were more stunted than the female children. Among the Upazilas, Galachipa showed more prevalence of stunting (36.8 percent), followed by Patuakhali Sadar (29.9 percent).

Table 3: Prevalence of Stunting among U5 Children in the Selected Coastal Upazilas under R2G Working Areas in Bangladesh

	Number of Children	% < -3SD	% < -2SD	Mean Z-score (SD)
Total	1013	7.9	28.4	-1.25
Sex				
Male	517	9.9	32.9	-1.41
Female	496	5.8	23.8	-1.08
Upazila				
Dumuria, Khulna	205	3.9	25.4	-1.19
Debhata, Satkhira	201	5.5	29.4	-1.35
Taltoli, Barguna	213	8.5	21.6	-1.08
Patuakhali Sadar	204	8.8	29.9	-1.13
Galachipa, Patuakhali	190	13.2	36.8	-1.51

The prevalence of Stunting was higher in the 12 to 23 months age group, followed by the 24 to 35 months age group. Comparatively low prevalence was seen among the 0-5 months age group.

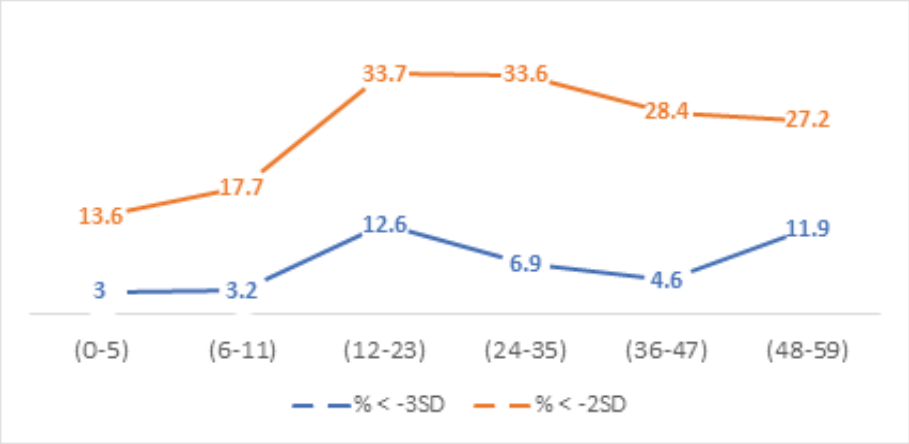


Figure 3: Age group wise prevalence of stunting among the under 5 children in the selected Upazilas

2.2.2 Stunting of Under-five Children in Selected Coastal Upazilas

The weight-for-height index measures body mass in relation to body height or length and was used to measure the wasting of under-five children. Children whose weight-for-height Z-score is below minus two standard deviations (−2 SD) from the median of the WHO reference population are considered thin (wasted). Children whose Z-score is below minus three standard deviations (−3 SD) from the median are considered severely wasted.

Overall, 13.3 percent of the under-five children were wasted. Wasting was higher prevalent in male children than the female children. Considering upazilas, Patuakhali Sadar had the highest prevalence of wasting (16.3 percent) followed by Galachipa Upazila (14.2 percent).

Table 4: Prevalence of Wasting among U5 Children in the Selected Coastal Upazilas under R2G Working Areas in Bangladesh

	Number of Children	% < -3SD	% < -2SD	Mean Z-score (SD)
Total	1009	3.6	13.3	-0.62
Sex				
Male	514	4.3	16	-0.69
Female	495	2.8	10.5	-0.54
Upazila				
Dumuria, Khulna	204	2.9	12.3	-0.93
Debhata, Satkhira	200	4	11.5	-0.19
Taltoli, Barguna	212	0.9	12.3	-0.6
Patuakhali Sadar	203	3.9	16.3	-0.72
Galachipa, Patuakhali	190	6.3	14.2	-0.63

Considering the age groups the prevalence was higher in the 6 to 11 months age group (22.3 percent) , followed by the 48 to 60 months age group (17.9 percent).

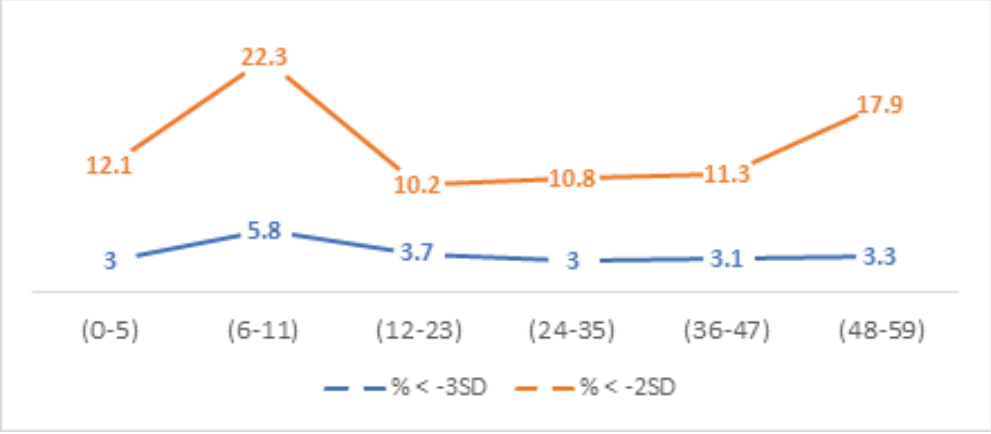


Figure 4: Age group wise prevalence of wasting among the under 5 children in the selected Upazilas

2.2.3 Underweight of Under-five Children

Children whose weight-for-age Z-score is below minus two standard deviations (–2 SD) from the median of the reference population are classified as underweight. Children whose Z-score is below minus three standard deviations (–3 SD) from the median are considered severely underweight.

Overall, 19.3 percent of the children under five years old were found to be underweight. The prevalence of underweight was more prominent among male children than the female children. Upazila-wise, Patukhali Sadar was found to have higher prevalence of underweight (24.4 percent), whereas the prevalence was similar in Taltoli (21.1 percent) Galachipa (20.6 percent), and Dumuria (17.6 percent).

Table 5: Prevalence of Underweight among U5 Children in the Selected Coastal Upazilas under R2G Working Areas in Bangladesh

	Number of Children	% < -3SD	% < -2SD	Mean Z-score (SD)
Total	1018	4.3	19.3	-1.15
Sex				
Male	522	5.4	23.6	-1.29
Female	496	3.2	14.7	-1.01
Upazila				
Dumuria, Khulna	205	2.9	17.6	-1.32
Debhata, Satkhira	201	2.5	12.4	-0.91
Taltoli, Barguna	213	3.3	21.1	-1.09
Patuakhali Sadar	205	3.9	24.4	-1.17
Galachipa, Patuakhali	194	9.3	20.6	-1.28

Considering age groups, the prevalence was higher in the 36 to 47 months age group (22.4 percent), followed by the 48 to 60 months age group (21.9 percent). The prevalence was lower in the 12-23 months of age group (16.1 percent).

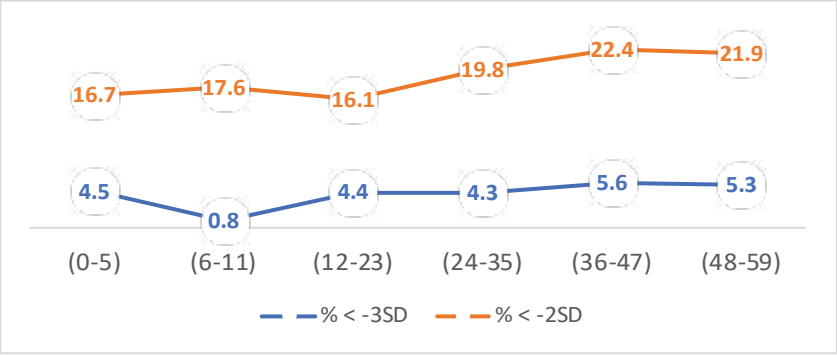


Figure 5: Age group wise prevalence of underweight among the under 5 children in the selected Upazilas

2.2.4 Comparison of Nutrition Status of Under-five Children between the Study area, National and Respective Divisions.

From Table 6 below, it is revealed that in R2G operation areas the stunting and wasting level among under-five children are higher compared to that of the level in national and the respective division. Similar situation was also observed for severe stunting and wasting level. The level of Global Acute Malnutrition (GAM) in study areas was found to be serious according to the WHO threshold level for GAM (10 to <15 percent). On the other hand, though the overall level of underweight was lower than the national and respective division, the level of severe underweight (below -3SD) was higher than the national and respective division.

The difference in findings partly could be due to the relatively small sample size, different in methodologies, and specific geographic areas (which is highly vulnerable to climate change and natural disasters) compared to the overall national and divisional areas.

Table 6: Comparison of nutrition status of under-five children in R2G operation areas with the national and respective divisions (Barishal and Khulna).

Status Indicator		Project Area (R2G) (%)	National (BDHS, 2022) (%)	Barishal Div. (BDHS, 2022) (%)				Khulna Div. (BDHS,2022) (%)		
					Taltoli (%)	Patuakhali Sadar (%)	Galachipa (%)		Dumuria (%)	Debhata (%)
Stunting	< -3SD	7.9	5.7	5.7	8.5	8.8	13.2	3.6	3.9	5.5
	< -2SD	28.4	23.6	24.9	21.6	29.9	36.8	19.0	25.4	29.4
Wasting	< -3SD	3.6	1.8	2.0	0.9	3.9	6.3	1.6	2.9	4.0
	< -2SD	13.3	11.0	14.4	12.3	16.3	14.2	10.3	12.3	11.5
Under-weight	< -3SD	4.3	4.4	4.6	3.3	3.9	9.3	3.5	2.9	2.5
	< -2SD	19.3	22.3	25.7	21.1	24.4	20.6	18.7	17.2	12.4

2.3 Food Security in the Households of Under-five Children in Selected Study Areas

The Food Insecurity Experience Scale (FIES) of the Food and Agriculture Organization (FAO) was used to measure food insecurity. The FIES is a metric of the severity of food insecurity at the household or individual level that relies on respondent's direct yes/no responses to eight brief questions regarding their access to adequate food. Two specific durations/periods of recall were used for this scale – the 12-month recall and the 30-day recall period. Both scales were used for this study, i.e. asked the respondents about the different status of their food insecurity in the past 12 months, as well as the past 30 days. The results are shown in the table below.

Table 7: Situation of Food Insecurity among the Respondents from Different Coastal Upazilas

Standard Label	Duration	Debhata	Dumuria	Galachipa	Patuakhali	Taltoli	All Upazila
WORRIED	12 Months	59%	49%	46%	53%	56%	53%
	30 Days	52%	42%	26%	38%	43%	39%
HEALTHY	12 Months	55%	46%	36%	48%	51%	47%
	30 Days	48%	38%	28%	39%	44%	38%
FEW FOODS	12 Months	53%	44%	32%	46%	34%	42%
	30 Days	47%	36%	21%	37%	28%	33%
SKIPPED	12 Months	16%	15%	5%	22%	18%	16%
	30 Days	10%	9%	1%	15%	14%	9%
ATE LESS	12 Months	26%	28%	11%	37%	21%	25%
	30 Days	20%	21%	6%	28%	17%	18%
RAN OUT	12 Months	11%	12%	2%	23%	14%	12%
	30 Days	7%	6%	0%	15%	11%	7%
HUNGRY	12 Months	9%	8%	5%	18%	8%	10%
	30 Days	5%	4%	1%	13%	5%	6%
WHOLE DAY	12 Months	3%	5%	1%	13%	6%	6%
	30 Days	3%	4%	0%	9%	3%	4%

Considering the 12-month recall data and putting the FIES scores in a continuous scale, the study found that around 50 percent of the households in the study areas were worrying about running out of food, while 29 percent compromised on the quality and variety of food, 18 percent either reduced the quantity of food or skip meal and 8 percent of the households experience hunger (figure 6). However, the 30 days recall identified a better scenario for food security, in which, the proportion of households compromising on quality and variety of food, reducing quantity of food or skipping meals and experiencing hunger were less than that of 12-month recall (figure 7). A comparison was made on the moderate and severe food insecurity experience of the Upazilas under study areas. Considering both the 12-month and 30-day recall methods, it seemed that Patuakhali Sadar Upazila had the worst experience of food insecurity among all five Upazilas under the study areas (figure 8).

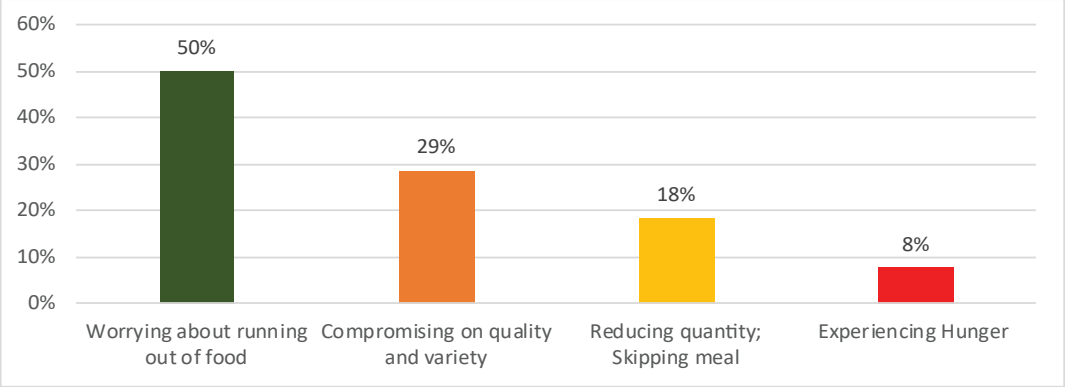


Figure 6: Severity of Food Insecurity (12 Month Recall)

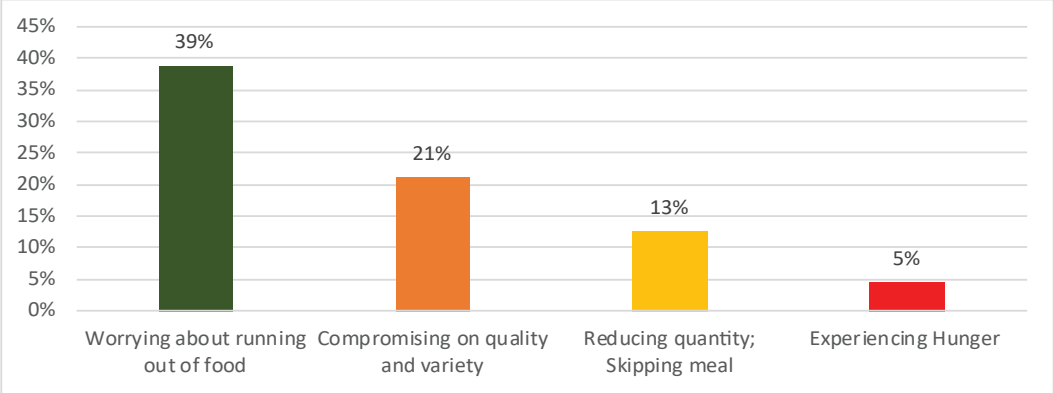


Figure 7: Severity of Food Insecurity (30 Days Recall)

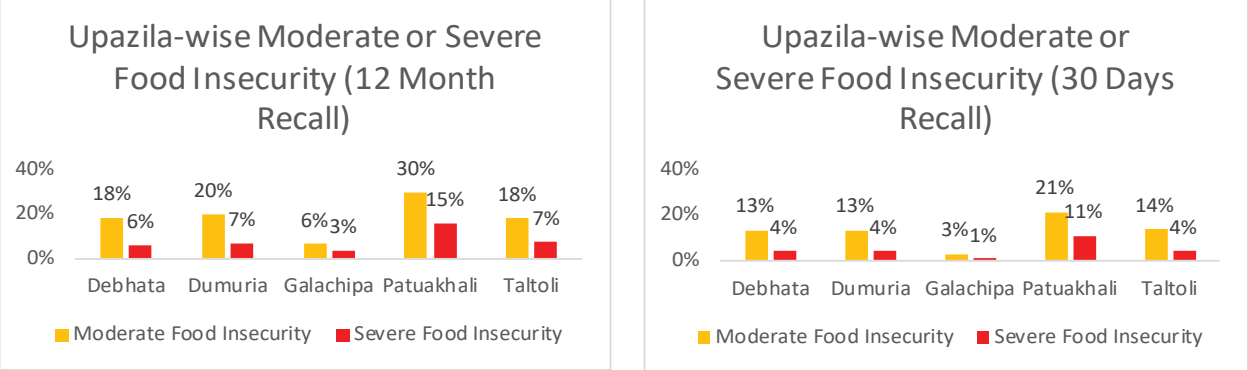


Figure 8: Comparative Scenario of Moderate and Severe Food Insecurity in the Surveyed Upazilas under R2G Working Area

2.4 Food Insecurity Coping Mechanism/Strategy

Demographic and socio-economic characteristics of food insecure households define their propensity towards adaptation of coping strategies. Severely food insecure households are significantly more inclined to adopt both financial and food coping strategies. Whereas moderately food insecure households are also found to be significantly more opted to implement mixed coping strategies rather than only financial coping strategies.

For analyzing the coping mechanism adopted by the households against food insecurity, the study used the reduced Coping Strategy Index (rCSI) method. This is an indicator used to compare the hardship faced by households due to a shortage of food. The index (rCSI) measures the frequency and severity of the food consumption behaviors the households had to engage in due to food shortage in the seven (7) days prior to the survey. A higher rCSI score indicates that more frequent and/or extreme coping mechanisms are adopted.

Overall, the survey identified 54 percent of the households not requiring any coping strategy to address food insecurity, whereas 46 percent took at least one coping strategy to address food insecurity. These findings are similar to the recently completed study undertaken by BNNC which revealed that 45 percent households practiced at least one coping strategy while facing household food insecurity. Overall, the three most common coping strategies adopted were: 'eat less items of foods' (36 percent), 'loan money' (30 percent), and 'eat low quality foods' (23 percent)[4] . The prevalence was highest in Debhata and Patuakhali Sadar (53 percent). In Galachipa the prevalence of adopting a negative coping strategy was least at (31 percent).

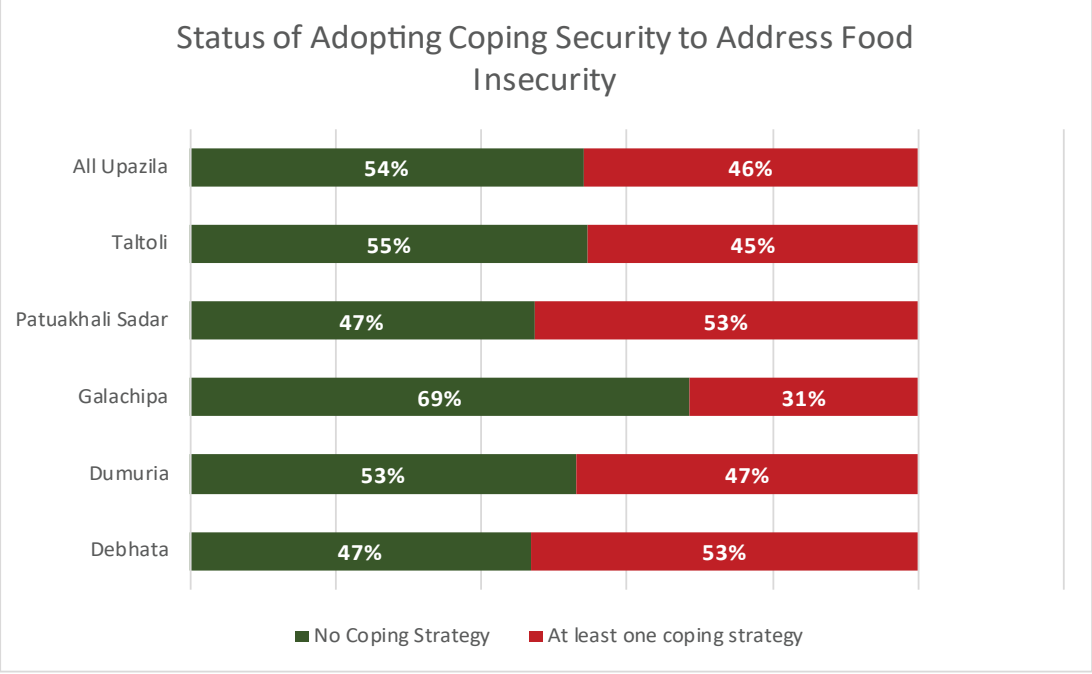


Figure 9: Percentage of households adopting a coping strategy to address food insecurity (negative coping strategy)

[4]Assessment of the nutritional status of children under age five, their mothers, and adolescent girls of Bangladesh: A comparison of pre and two years after onset COVID 19. BRAC James P Grant School of Public Health, BRAC University, BNNC and UNICEF, 2023.

Among those adopting different coping mechanisms, around 41 percent relied on less preferred and less expensive foods. Around 29 percent reduced the number of meals eaten in a day and/or limited portion size at meals, whereas 28 percent borrowed food or relied on help from others. Around 21 percent adopted a more stressful coping mechanism of restricting consumption for adults to allow small children to eat.

Table 8: Different Coping Mechanism Used by the Households in Coastal Areas (Multiple Coping Mechanisms Adopted by the Households)

Coping Mechanism	All Upazila	Taltoli	Dumuria	Patuakhali	Galachipa	Debhata
Rely on less preferred and less expensive food	41%	28%	46%	49%	30%	51%
Reduce number of meals eaten in a day	29%	22%	21%	35%	40%	44%
Limit portion size at meals	29%	33%	23%	41%	12%	34%
Borrow food or rely on help from relative(s) or friend(s)	28%	35%	25%	40%	8%	31%
Restrict consumption by adults to allow small children to eat	21%	37%	16%	30%	3%	16%

The rCSI scores were derived by multiplying incidences of the five standard coping mechanisms with their respective severity weight. Based on the rCSI score, overall, around 54 percent of the households were in food secured situations, with 37 percent being in low food security, five percent being in moderate food insecurity and around three percent in crisis situations in terms of food insecurity. Upazila-wise, more households in Galachipa were in food secured situation, whereas more from Debhata were in a crisis situation.

2.5 Household Dietary Diversity Score (HDDS)

The household dietary diversity score (HDDS) is meant to reflect, in a snapshot form, the economic ability of a household to access a variety of foods. Studies have shown that an increase in dietary diversity is associated with socioeconomic status and household food security [5,6].

HDDS of the surveyed households were calculated based on the food consumed by the household members within previous seven days of the survey. The score indicates that, overall, around 63 percent of the households in the study areas had high dietary diversity, with households consuming six or more types of food. Dumuria and Debhata were found to have the highest HDDS score of 75 percent and 74 percent respectively, indicating high dietary diversity in these two areas. The highest prevalence of medium dietary diversity (47 percent) was found in Taltoli Upazila, indicating the consumption of four to five types of food by the households living in this area. Patuakhali Sadar had the highest prevalence of low HDDS score (10 percent), indicating lowest dietary diversity, followed up very closely by Taltoli upazila (8 percent). The Study undertaken by BNNC revealed that the mothers of children under-five age dietary diversity were 79 percent and 57 percent in Barisal and Chattogram divisions respectively[7].

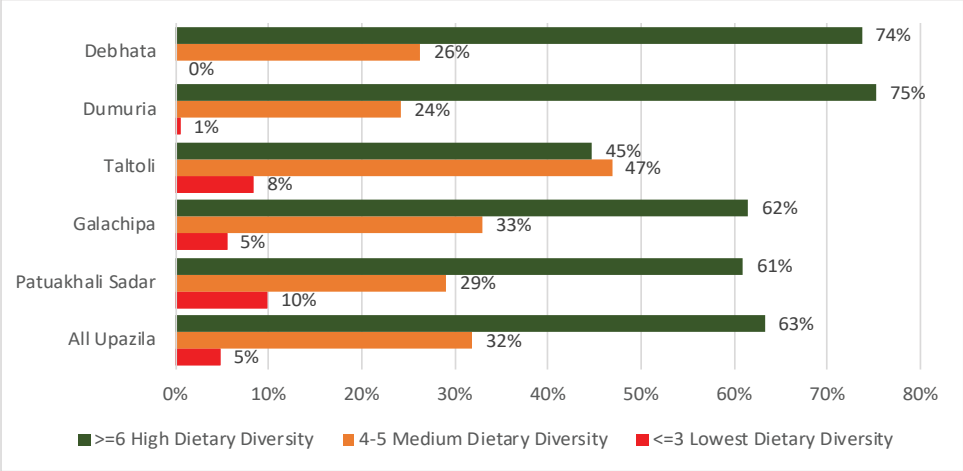


Figure 11: HDDS for the Selected Coastal Upazilas under R2G Working Area

2.6 Infant and Young Children Feeding (IYCF) Practices

The prevalence of ever breastfed (EBF) among the study children aged 0-23 months was 99 percent which is comparable with the finding for the national average[8]. 69 percent of the children were fed breastmilk within one hour after birth (Early Initiation of Breastfeeding or EIBF), higher than the national average of 60 percent (BDHS 2017/18). Galachipa had the highest prevalence of EBIF, while the other four Upazilas had almost similar prevalence, with Dumuria having the least (61 percent). Around 24 percent of the households reported giving child anything other than breastmilk (pre-lacteal feed) in first two days after delivery compared to the national average of 29 percent (BDHS 2017/18). This prevalence was found to be the highest in Dumuria (28 percent) and lowest in Galachipa (12 percent). 61 percent of the study children aged 0-5 months were exclusive breastfed, which was relatively better compared to 55 percent of the national average (BDHS 2022). Considering specific Upazilas, Debhata had the highest prevalence of EBF rate at 66 percent, closely followed by Dumuria at 65 percent. On the other hand, Patuakhali Sadar had the lowest prevalence of EBF at 57 percent.

[5]Hoddinott, John and Yisehac Yohannes. Dietary Diversity as a Household Food Security Indicator. Washington, D.C.: Food and Nutrition Technical Assistance Project, FHI 360, 2002

[6]Hatløy A, Hallund J, Diarra MM, Oshaug A. Food variety, socioeconomic status and nutritional status in urban and rural areas in Koutiala (Mali). Public Health Nutr. 2000 Mar;3(1):57-65. doi: 10.1017/s1368980000000628. PMID: 10786724.

[7]Assessment of the nutritional status of children under age five, their mothers, and adolescent girls of Bangladesh: A comparison of pre and two years after onset COVID 19. BRAC James P Grant School of Public Health, BRAC University, BNNC and UNICEF, 2023.

[8]Bangladesh Demographic and Health Survey, 2017/18.

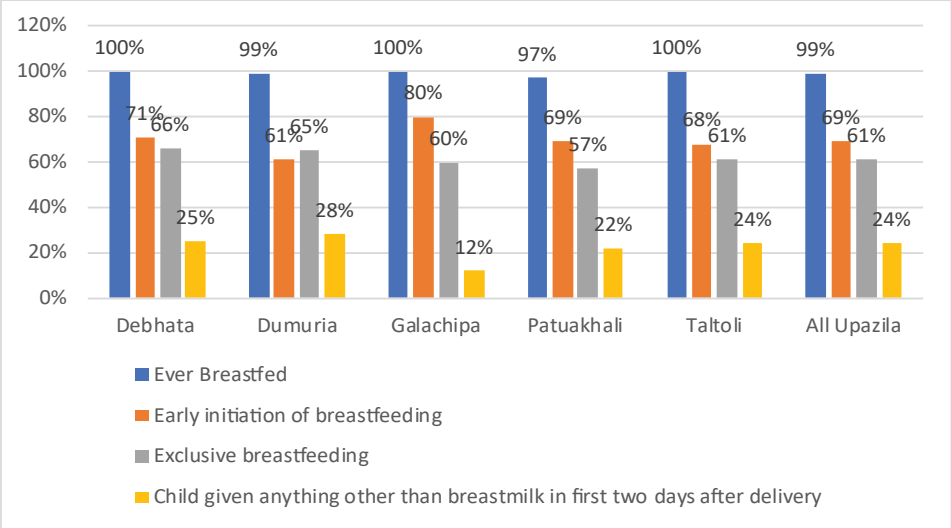


Figure 12: Breastfeeding Practices in the Selected Coastal Upazilas

In general, 16 and 12 percent of study infants aged 0-5 and children 6-23 months respectively were consuming formula and animal milk. Patukhali Sadar and Debhati Upazilas exhibited a similar prevalence (20 percent) of use of formula and animal milks use in the 0-5 months age group. On the other hand, Dumuria and Taltoli Upazilas had a higher prevalence (17.54 percent) of use of formula and animal milks in the 6-23 months age group.

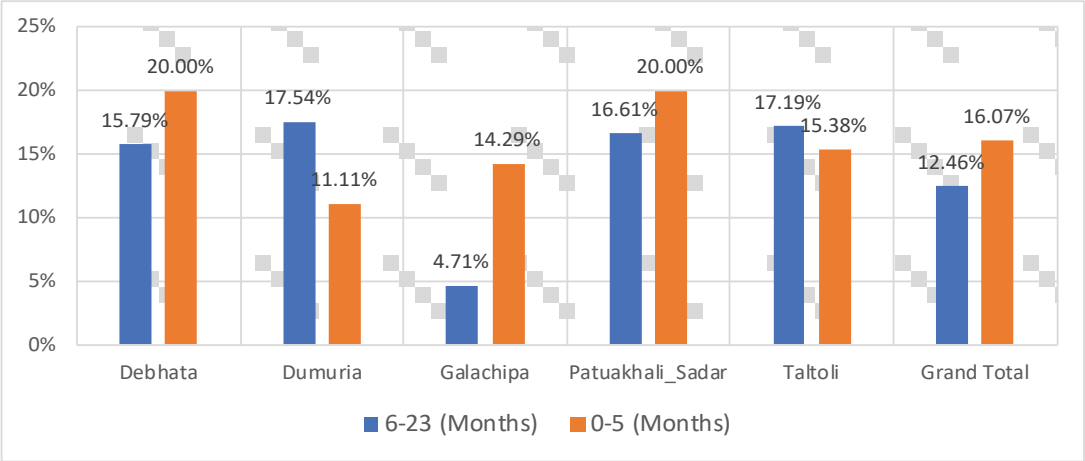


Figure 13: Formula and Animal Milk Feeding Practices in the Selected Coastal Upazilas

The survey asked the households regarding the sources of information on breastfeeding and other IYCF practices. Most of the households (74 percent) got the information from the local Community Clinic (CC). Around 34 percent got the information from Upazila Health Complex (UHC), 32 percent from their neighbours, 18 percent from Union Health and Family Welfare Centre (UHFWC) and 15 percent from private hospital/clinic. On the other hand, only five and three percent got the information from the Community Paramedics and Private Practitioners respectively.

Table 9: Sources of Information on IYCF

	Debhata	Dumuria	Galachipa	Patuakhali	Taltoli	All Upazila
Community Clinic	84%	62%	90%	53%	65%	71%
UHC	10%	21%	45%	37%	42%	31%
Private hospital/ clinic	22%	33%	6%	22%	11%	15%
Private practitioner	0%	3%	1%	5%	7%	3%
Community Paramedic	0%	10%	0%	14%	4%	5%
UHFWC	29%	5%	34%	12%	8%	18%
Neighbors	45%	29%	9%	32%	49%	32%

The survey asked about the feeding of liquid drinks to under 24 month sold children on yesterday during the day or night. Table 10 below shows the detailed liquid feeding practices to under 24 months old children in the study areas.

Table 10: Practice of feeding type of liquid of under 24 months children in the selected coastal upazilas

Type of liquid fed to the child the previous day of the survey	Age categorization	Debhata	Dumuria	Galachipa	Patuakhali	Taltoli	All Upazila
Drank chocolate-flavored drink	All Age Group	1%	7%	10%	5%	7%	6%
	0-5 months	0%	0%	0%	0%	0%	0%
	6-23 months	2%	7%	12%	6%	8%	7%
Drank Fruit-juice or fruit-flavoured Drink	All Age Group	7%	8%	8%	3%	7%	6%
	0-5 months	0%	3%	4%	0%	8%	3%
	6-23 months	8%	7%	9%	4%	6%	7%
Drank Soda, Sports Drink or Energy Drink	All Age Group	1%	0%	0%	2%	0%	1%
	0-5 months	0%	0%	0%	0%	0%	0%
	6-23 months	2%	0%	0%	2%	0%	1%
Drank tea, coffee or herbal drink	All Age Group	0%	5%	0%	6%	2%	3%
	0-5 months	0%	2%	0%	0%	0%	0%
	6-23 months	0%	4%	0%	7%	3%	3%
Drank any broth or clear soup	All Age Group	12%	1%	0%	1%	2%	3%
	0-5 months	0%	0%	0%	7%	0%	2%
	6-23 months	13%	1%	0%	0%	3%	3%
Drank any other liquid	All Age Group	0%	1%	0%	5%	3%	2%
	0-5 months	0%	0%	0%	13%	8%	5%
	6-23 months	0%	1%	0%	4%	3%	2%

Table 11 below includes the feeding of different foods to children aged 6-23 months in the study Upazilas. It was found that 62 percent of the children were fed with cereals, 45 and 14 percent green leafy vegetables and other vegetables, 38 percent eggs and 36 percent fish and 24 percent organ and other meat. 39 percent ate various types of fruits, and 28 percent ate beans, peas, lentils, nuts, seeds, etc.

Thirty nine percent of the children were fed with sweet snacks and confectionary items, and 18 percent were fed with chips, French fries, noodles, etc. which were comparable to the national findings. For instance, according to the BDHS 2022 findings, 22 percent and 49 percent children consumed sweet beverage and unhealthy foods respectively during the previous day of the survey. Unhealthy infant and young child feeding practices should be avoided because they can promote unhealthy weight gain and replace nutritious foods that provide important nutrients for children. For infants and young children, the consumption of sweet foods and beverages increases the risk of dental caries and childhood overweight and obesity.

Table 11: Practice of feeding type of food to children of 6-23 months in the selected coastal upazilas

Type of solid food fed to the child the previous day of the survey	Debhata	Dumuria	Galachipa	Patuakhali	Taltoli	All Upazila
Bread, rice, noodles, bread, crackers	79%	71%	55%	59%	52%	62%
Pumpkin, carrots, sweet red peppers, squash, or sweet potatoes that are yellow or orange inside	7%	22%	13%	10%	18%	14%
bananas, white potatoes, sweet potatoes, radishes	24%	16%	34%	24%	21%	24%
Green leafy vegetables such as spinach, Pui, red leave, broccoli, carrots, peppers, green beans, eggplant, cauliflower, raw banana, cabbage	56%	50%	54%	36%	32%	45%
Cucumbers, tomatoes	13%	20%	4%	5%	14%	10%
Ripe mangoes or ripe papayas or Bangi, Hog plum, date palm	12%	12%	1%	5%	3%	6%
Fruits, such as bananas, apples, lemon, orange, guava, jujube (boroi), jackfruit, black berry, lychee, watermelon, sugar cane	25%	22%	13%	14%	8%	15%
Organ meat (e.g. liver, kidney, heart)	21%	16%	1%	8%	10%	10%
Any other meat, such as beef, lamb, goat, chicken, duck	21%	18%	9%	9%	18%	14%
Eggs	40%	53%	46%	25%	31%	38%
Fresh or Dried Fish	68%	54%	35%	21%	15%	36%
Beans, peas, lentils, nuts, seeds	31%	39%	34%	25%	13%	28%
Sweet foods such as chocolate, candy, cakes, biscuits or frozen foods such as ice cream sugar, honey	53%	45%	53%	31%	14%	39%
Chips, French fries, instant noodles	18%	18%	27%	16%	8%	18%

2.7 Access to the Services

2.7.1 Access to Health Services

The study looked into the prevalence of ANC visits of pregnant women to a health facility or by a trained healthcare provider. 13 percent of the households reported that the pregnant women in the household had ANC visit to a health facility or by a trained healthcare provider for more than four times and 30 percent reported having the same for four times. Dumuria had the highest prevalence of ANC visits for more than four times (24 percent) and had the highest prevalence of ANC visits for four times (42 percent) during the pregnancy as well.

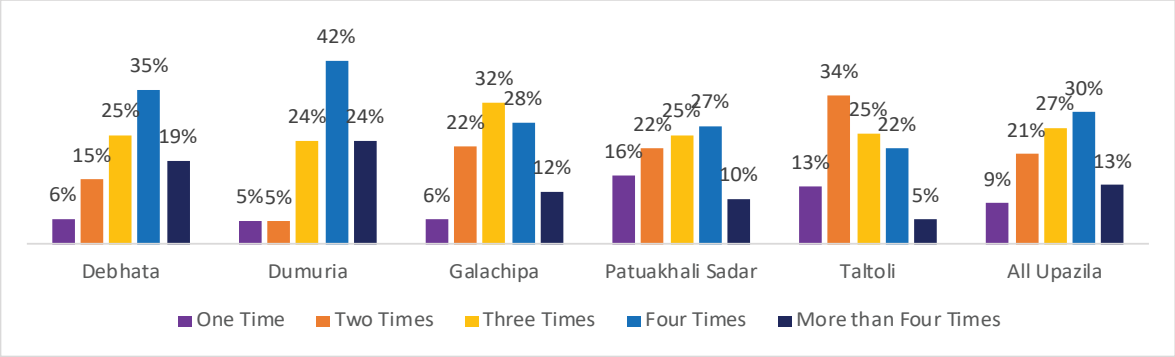


Figure 14: ANC Visits in the Selected Coastal Upazilas in R2G Area

For under-five children of the household, the survey looked into the completion of measles and rubella vaccination. The data revealed that around 87 percent of the children completed their measles and rubella vaccination. Debhata had the highest proportion (93 percent) of children completing measles and rubella vaccination. Other four Upazilas the coverages of measles and rubella vaccination were very similar ranging between 85-86 percent. In case of vitamin supplementation, 82 percent of the children received vitamin A supplementation in the previous vitamin A supplementation campaign round. This was highest in Debhata (91 percent) and lowest in Taltoli (76 percent).

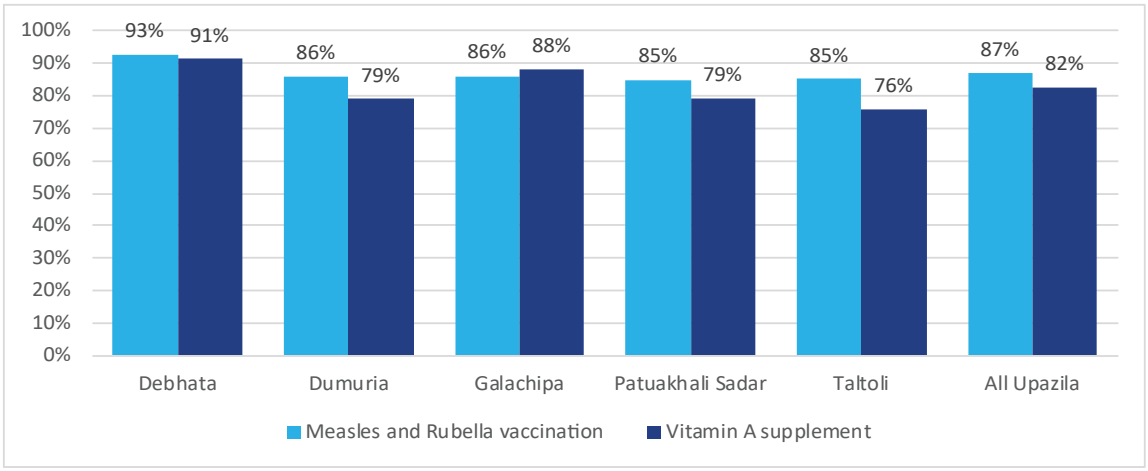


Figure 15: Completion of Measles and Rubella Vaccination and Vitamin A Supplementation

The study inquired about the occurrence of diarrhea symptoms in children under the age of five during the two weeks leading up to the survey. Overall, 7.27 percent of children under the age of five experienced diarrhea during this period. Among the five selected Upazilas, Patuakhali Sadar had the highest incidence (14.95 percent) of diarrhoea cases. Conversely, Taltoli had the lowest percentage (1.52) for the same period.

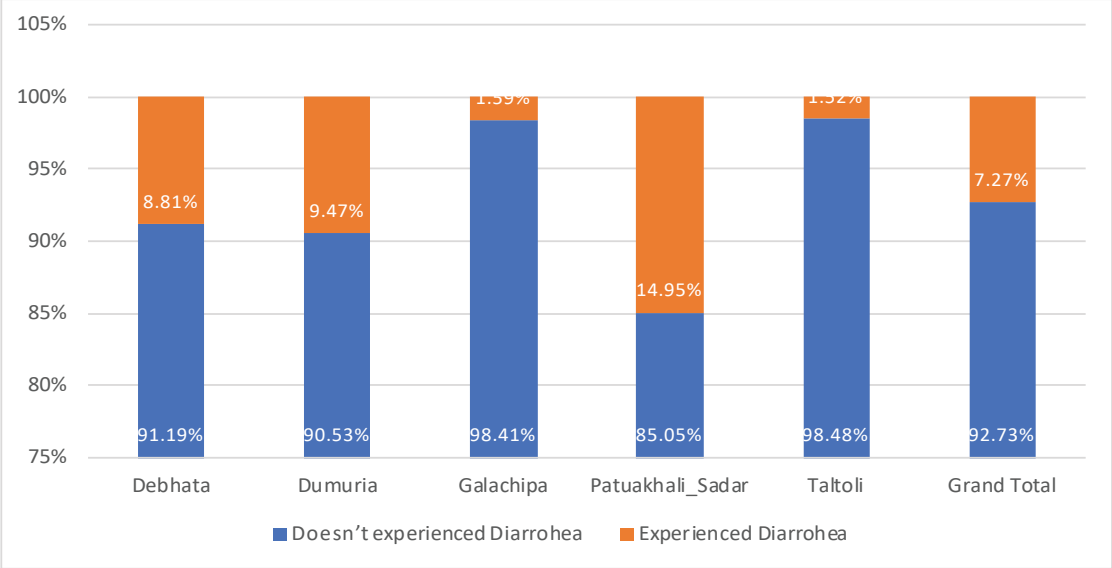


Figure 16: Percentage of children under age 5 with diarrhea in the 2 weeks preceding the survey

2.7.2 Access to WASH Services

The majority of the households in the surveyed coastal upazilas had tubewell as the main source of drinking water (95 percent). Use of tubewell as drinking water source (98 percent) was highest in Dumuria and Taltoli Upazilas followed by Debhata (96 percent). Around 11 percent used ponds, river and similar unimproved water sources for their drinking water. The use of ponds, river and similar unimproved water sources was maximum in Taltoli (20 percent), followed by Galachipa (16 percent) and Patuakhali Sadar (14 percent). Twenty percent of the households in Taltoli also used improved rainwater as a source of drinking water.

Table 12: Sources of Drinking Water for the Surveyed Households

Source of Drinking Water	Debhata	Dumuria	Galachipa	Patuakhali	Taltoli	All Upazila
Household Connection	4%	5%	13%	6%	2%	6%
Tubewell	96%	98%	87%	95%	98%	95%
Protected Dugwell	0%	0%	0%	0%	5%	1%
Improved Rainwater Collection	0%	0%	1%	2%	20%	5%
Pond, River, Stream	1%	0%	9%	10%	8%	6%
Unimproved rainwater	0%	0%	1%	2%	7%	2%
Bottle-Water	2%	0%	0%	0%	0%	0%

Tubewell was found to be the source of handwash water for 61 percent of the households in the study Upazilas, followed by pond, river and stream (32 percent). The practice of using tubewell water for handwashing was the highest in Dumuria (89 percent), and lowest in Taltoli (49 percent). The practice of using pond, river and stream water for handwashing was the highest in Taltoli (44 percent), followed by Galachipa and Taltoli (38 percent each).

Table 13: Source of Handwash Water

Source of Handwash Water	Debhata	Dumuria	Galachipa	Patuakhali	Taltoli	All Upazila
Household Source	6%	5%	8%	6%	1%	5%
Tubewell	80%	89%	54%	52%	49%	61%
Improved Rainwater Collection	0%	0%	0%	2%	3%	1%
Unprotected Dugwell	0%	1%	0%	0%	0%	0%
Pond, River, Stream	13%	6%	38%	38%	44%	32%
Unimproved rainwater	0%	0%	0%	1%	3%	1%

99 percent of the surveyed households had latrines. Among those, around 94 percent of the households had improved latrines, whereas the remaining six percent had unimproved latrines. Taltoli had the highest proportion of improved latrines (98 percent), and Patuakhali Sadar had the highest proportion of unimproved latrines (10 percent).

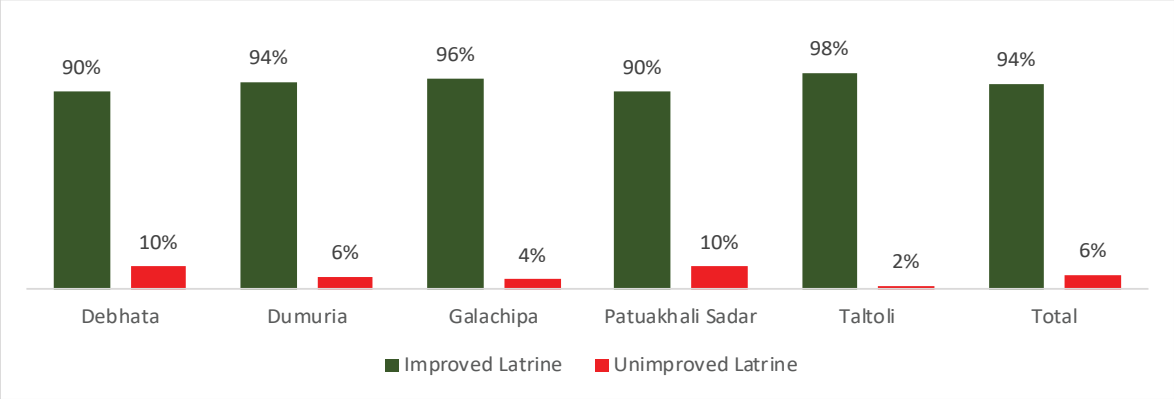


Figure 17: Type of latrines at the households in the coastal upazilas under R2G areas

2.7.3 Access to Social Security Programmes (SSP)

Around 73 percent of the households surveyed did not have access to any type of SSPs, whereas 27 percent had access to at least one or more SSP, which is as per the national average coverage (27.8 percent) of SSPs as well. Households from Taltoli (14 percent) had the least access to SSPs, and Dumuria and Debhata (30 percent each) had the highest percentage of households having access to SSPs. Access to SSPs in Patuakhali Sadar and Galachipa was 27 percent and 23 percent respectively.

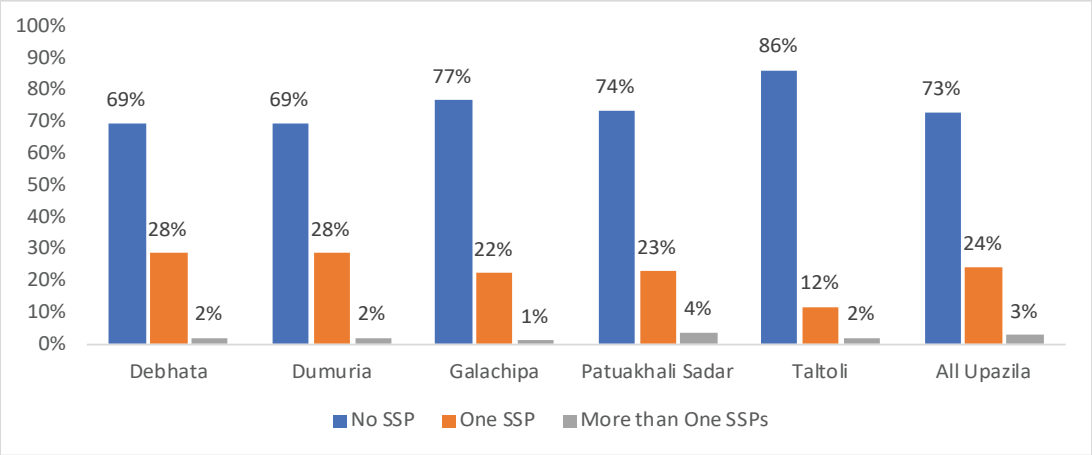


Figure 18: Percentage of Households having Access to SSPs

2.8 Selected Factors Associated with Under-five Children's Anthropometric Outcomes among the Selected Upazilas

The study assessed the associations of a few influential factors (ever breastfeeding, food expense, coping mechanisms & household dietary diversity-HDD, etc.) with stunting, wasting and underweight of under-five children among the selected study areas. The study analysed datausing SPSS version 25.0. Firstly, to visualize the outcome indicators, a statistical plot like a bar diagram was used. Several descriptive statistics such as mean, standard deviation, frequency, and proportion were used to summarize the data. Due to binary outcomes, simple linear regression was used to assess the association between outcome variables and the independent variables. The Coefficient Value with 95 percent Confidence Intervals were calculated and $P < 0.05$ were considered as a significance level.

Selected Factors Associated with Under-five Children's Stunting in the Selected Upazilas

Table 14: Distribution of Child Stunting by Selected Factors Associated Among Under-5 Children in the Selected 5 Upazilas

Variable	*95% CI*				
	B	SE	LL	UL	*p*
Children aged 0-23 months ever breastfed	1.70	0.76	0.21	3.20	*0.03*
Household's Food Consumption Expenses	-0.008	0.001	-0.002	0.002	*0.94*
Food Insecurity Coping Mechanism	0.02	0.10	-0.18	0.22	0.84
Household Dietary Diversity	0.19	0.09	0.03	0.36	*0.02*

Note: p < 0.05; B (Beta Coefficient) SE (Standard Error); LL (Lower Limit); UP (Upper Limit)

Table 14 shows that ever breastfed and household dietary diversity have a positive impact on stunting. Whereas the coping mechanism has no significant ($p > 0.05$) effect on stunting. Among the three significant variables "ever breastfed" has an impactful association with stunting in a large magnitude of 1.70. The positive coefficient value indicates that children who were never breastfed are 1.70 times more likely to experience stunting compared to those who were breastfed initially.

Additionally, household dietary diversity also showed a positive association with stunting, households with low dietary diversity tend to experience stunting with an increasing unit of 0.19.

Selected Factors Associated with Under-five Children's Wasting in the Selected Study Upazilas

Table 15: Distribution of Child Wasting by Selected Factors Associated Among Under-5 Children in the Selected 5 Upazilas

Variable	*95% CI*				
	B	SE	LL	UL	*p*
Children aged 0-23 months ever breastfed	-0.29	0.70	-1.66	1.09	0.68
Household's Food Consumption Expenses	0.003	0.001	-0.001	0.006	*0.004*
Food Insecurity Coping Mechanism	-0.22	0.09	-0.41	-0.02	*0.03*
Household Dietary Diversity	-0.12	0.08	-0.29	0.04	0.14

Note: $p < 0.05$; B (Beta Coefficient) SE (Standard Error); LL (Lower Limit); UP (Upper Limit)

The above regression table 15 shows that the coping mechanism and food expenses have statistically significant ($p = 0.03$: $p = 0.004$) association with wasting among the all-other variables (ever breastfed, HDD).

The coping mechanism has a negative coefficient value (-0.22) stating a negative association with wasting. This implies that a better coping mechanism corresponds to a 0.22-unit decrease in the likelihood of experiencing wasting. The coefficient value for food expenses is relatively very small (0.0003).

Selected Factors Associated with Under-five Children's Underweightin the Selected Study Upazilas

Table 16: Distribution of Child Underweight by Selected Factors Associated Among Under-5 Children in the Selected 5 Upazilas

Variable	*95% CI*				
	B	SE	LL	UL	*p*
Children aged 0-23 months ever breastfed	0.97	0.54	-0.09	2.04	*0.07*
Household's Food Consumption Expenses	0.002	0.009	-0.008	0.003	*0.06*
Food Insecurity Coping Mechanism	-0.14	0.08	-0.29	0.01	0.06
Household Dietary Diversity	0.13	0.06	0.01	0.25	*0.04*

Note: p< 0.05; B (Beta Coefficient) SE (Standard Error); LL (Lower Limit); UP (Upper Limit)

Regression table 16 suggests that only the Household Dietary Diversity significantly influences the underweight. Besides, there is no association of underweight with ever breastfed, food expenses, and coping mechanisms. The coefficient of 0.13 for household dietary diversity indicates that low dietary diversity is linked to a 0.13-unit increase in the likelihood of being underweight. In simpler terms, having better dietary diversity seems to be associated with a lower risk of being underweight.

Chapter Two: Community-led Child Profiling Tool

Simple Child Profiling Application/Practice and Development of a Tool

The study team developed the child nutrition profiling practice/application for an individual child and a simple community-led tool as well aiming following two purposes:

1. **Individual Child Nutrition Profiling:** The first purpose is to assist the health service provider in both health facilities and in the community to assess/screen the nutritional status of an individual child and associated underlying factors affecting a child's nutrition status. This will be done for children attending the health facility or visited by the health service provider at home during routine field/home visits. Accordingly, the health service provider will be able to provide necessary nutrition education/counselling, and nutrition services, including referral (if required) to improve their nutritional status and prevent deaths. This will also improve the SAM management and follow-up. Furthermore, it will generate routine nutrition data and their systematic reporting and monitoring.
2. **Community-led Child Profiling Tool:** The second purpose is to generate local-level (e.g. Union and Upazila) valid data to assess the nutritional status and associated underlying key factors affecting the nutritional status of under-five children. It will assist the local stakeholders like the DNCC, UNCC, Union Parishad and CSOs to estimate/prepare the child nutrition profiles for sub-national/local level evidence-based costing, advocacy for resources, and bottom-up planning. This can be done once or twice a year depending on the available resources before preparing the annual nutrition plan by the local authority.

A similar set of priority nutrition indicators and related data will be collected (as included in table 1. Below) in both settings with the exception of the food consumption Score that will be collected only for the second purpose (i.e. Community-led Child Profiling Tool),to meet two different purposes as explained above. These priority indicators and selected data to be collected were grounded on a set of principles, whichare: (i) based on evidence, (ii) statistically valid sample data, (iii) the capacity of the local stakeholdersto collect them with minimum technical knowledge, cost and logistics, (iv) can be acted upon locally by the local authority, and (v) aligned with the existing district and national level profile indicators.

A. Individual Child Nutrition Profiling:

The service provider will screen the nutrition status of the under-five children routinely using the Mid Upper Arm Circumference (MUAC) measuring tape. S/he will also gather the responses on the related questions for priority underlying factors included in the table 17.

Table17: List of priority indicators for individual child nutrition profiling.

Indicators	Name of the Individual child				
	1:	2:	3:	4:	5:
Under-fivewasting (Global/Severe Acute Malnutrition- GAM/SAM) through MUACmeasurement (Green/Yellow/Red)					

Exclusive breastfeeding rate					
Child food poverty					
Food consumption score					
Access to safe drinking water					
Use of improved latrine					
Hand washing with soap in critical times					
Diarrhea episode					

B. Community-led Child Profiling Tool:

3.1 Methodology for conducting the survey at the local level to generate valid data:

The study team adaptedthe methodologies for estimating child profiles at the union and upazila levels. Accordingly, the team employed globally accepted formulas to calculate statistically valid sample size that can be applied/used at the local level with minimum technical knowledge. The relevant questionnaire has been designed aligning with the set of agreed priority indicators shown in the table 18.

Table 18:List of Priority Indicators for Community-led Child Profiling Tool.

Indicators	Name of Upazila/ Union				
	1	2	3	4	5
Under-fivewasting (Global/Severe Acute Malnutrition- GAM/SAM) through MUAC measurement (green/ yellow/red)					
Exclusive breastfeeding rate					
Child food poverty					
Food consumption score					
Household dietary diversity					
Access to safe drinking water					
Use of improved latrine					
Hand washing with soap in critical times					
Diarrhea episode among under-five children					

3.2 Union level data generation:

3.2.1 Determine the sample size for data collection at Union level.

Assumptions:

- Average number of populations of a union in Bangladesh is 37,073;
- Average household size: 4.00; and
- Under five children (0-4 years): 9.44%[9] .

Sample size: for one union a total sample will be 178[10].

3.2.2Administration of the Survey at the Union Level

Step 1: List of under-five children and select sample.

Collect the list of all households having under-five children from the local Union Parishad (UP) secretary or other available sources. From this list, select randomly or by lottery the required sample (178), and prepare the final list of respondents.

Alternatively, select the sample children through a systematic samplingmethod using/applying the following steps:

1. Divide the total number of households having under five children by 178.
2. Take a random number from the result obtained in step 1 (e.g., if the result is 5, randomly select a number between 1 and 5, perhaps through a lottery).
3. The chosen random number will serve as the starting point for the sampling process.
4. Select samples from the exhaustive list of households at intervals of the result obtained in step 1.

Note: You may choose one of these two methods depending on available technical knowledge/expertise and local decision.

Step 2: Consent for the survey:

Visit households to conduct survey using the standard questionnaire (sample questionnaire attached). Please explain the purpose and objective of the survey, emphasizing that participation is entirely voluntary. Also ensure the comfort and safety of the respondent. Inform respondents about their right to withdraw from the survey at any point, even during questioning. Once everything is clear, you will seek verbal consent from the respondent. If consent is given, then start the survey to collect data.

[9]Population and Housing Census, 2022, Preliminary Report, Bangladesh Bureau of Statistics, Ministry of Planning.

[10]To calculate the sample size for simple random sampling, we have used the following formula:

$$n=\frac{Z^2 \times p \times (1-p)}{MOE^2}$$

Where: n = sample size, Z = Z-score (corresponding to the desired confidence level) p = estimated proportion of the population with a characteristic of interest, MOE= margin of error (expressed as a proportion). We considered MOE 6% with 90% confidence interval.

Step 3: Collect data/ Administer survey questionnaire: Use the standard questionnaire to collect and analyse the household-level data. Survey questionnaire and data analysis are same for both union and upazila levels. The survey questionnaire is attached in Annexure 04

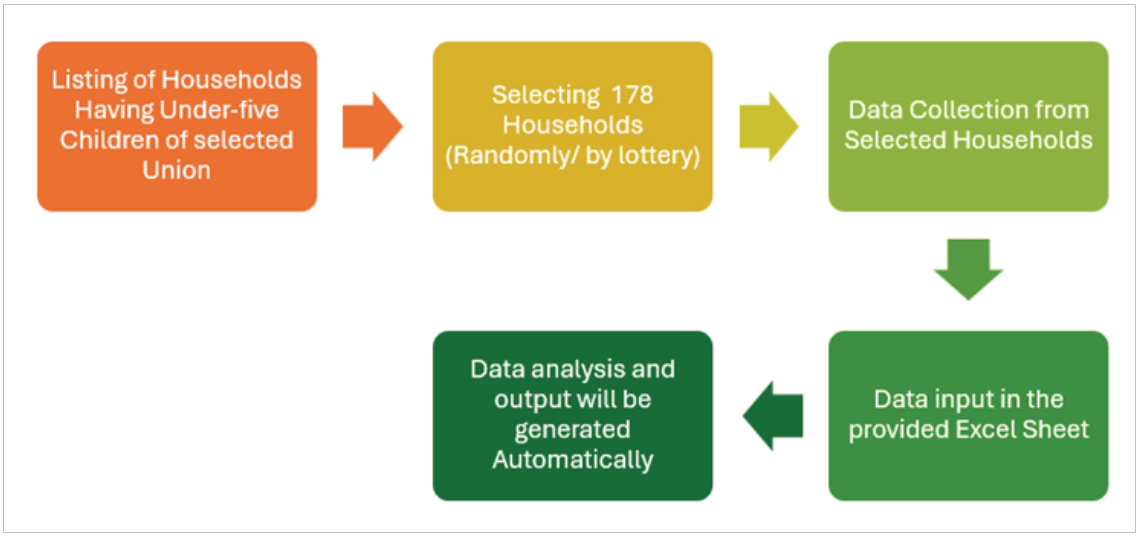


Figure 19: Administration of the Survey at Union Level

3.3 Upazila Level data generation

3.3.1 Determine the sample size for data collection at Upazila level.

Assumptions:

- Average number of populations of anUpazila in Bangladesh is 342,490;
- Average household size: 4.00; and
- Under five children (0-4 years): 9.44% .

Sample size: for one Upazila the total sample will be 314.

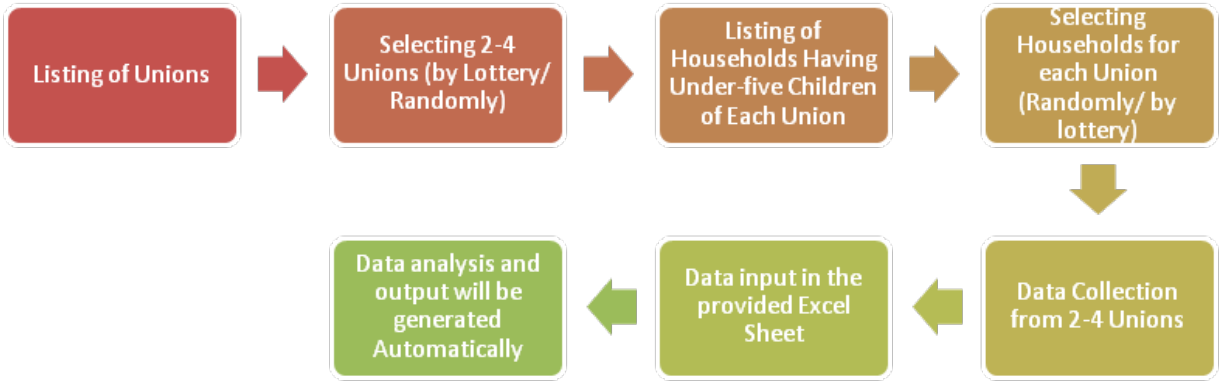
3.3. 2 Administration of the Survey at the Upazila Level

Step 1:List of under-five children and select sample:

Collect a list of Unions from the Upazila. Select randomly or by lottery 2-4 Unions (as per availability of the budget and other resources).Divide the total number of households having under-five children in selected unions by the selected number of Unions. This result will give you the sample size for each union. Follow the same process as mentioned in the union level data generation for sample selection from each Union.

Step 2: Consent for the survey:

Visit households to conduct survey using the standard prepared questionnaire (sample questionnaire attached). Please explain the purposes and objectives of the survey, emphasizing that participation is entirely voluntary. Also ensure that the comfort and safety of the respondent. Inform respondents about their right to withdraw from the survey at any point, even during questioning. Once everything is clear, you will seek verbal consent from the respondent. If consent is given, start the data collection for the survey. Survey questionnaire and data analysis methods will be the same for both union and upazila levels.



Step 3: Collect data/ Administer survey questionnaire:

Use the standard questionnaire to collect and analyse the household-level data.Survey questionnaire and data analysis are same for both union and upazila levels.The survey questionnaire is attached in Annexure 04.

3.4 Analysis of Selected Priority Indicators

3.4.1 Wasting: Global/Severe Acute Malnutrition(GAM/SAM) Measurement using MUAC Tape:

To check/assess if anunder-five child is malnourished, measuring the circumference of their upper arm using a color-coded band. A measurement between 11.5 cm and 12.5 cm indicates moderate acute malnutrition is represented by the color 'yellow'. A measurement below 11.5 cm indicates severe acute malnutrition is represented by the color 'red' and above 12.5 cm indicates a normal nutritional status is represented by the color 'green'. This willhelp mothers, caregivers, and Community Health Workers (CHWs) to identify early signs of malnutrition in children as well as the child's current nutrition status (i.e. either they are normal, or moderate or severe acute malnourished).

Step 1: Put a tick mark in the yellow box if measured yellow; if measured red, mark a tick in the red box; and similarly, if measured green, mark a tick in the green box.

Step 2: Put the total number of green, yellow and red separately into the Excel template provided in table 19. The rate will be generated automatically.

Color Code	Color Code Meaning	Yes (total)	Rate (%) (Total number of Yes/ N) *100 *N= Total U5 Sample	GAM and SAM Calculation
	Severe Acute Malnutrition			GAM Rate (%) = (Total # of Red and Yellow /Total U-5 Sample) *100
	Moderate Acute Malnutrition			GAM Rate (%) = (Total # of Red and Yellow /Total U-5 Sample) *100
	Normal			

[12] Note: Ensure the band is securely wrapped around the upper arm without being too tight or too loose for accurate measurement.

3.4.2. Exclusive breastfeeding (EBF)

To find out the rate of exclusive breastfeeding among 0-5 months old children in your respective Union or Upazila provide the data input into the Excel template for analysis givenin Table 20. The EBF rate will be calculated automatically.

Table20: Excel Template for analyzing Exclusive Breastfeeding in 0-5 months old children

SL No.	Indicator	Yes (total)	Rate (%)
1	Exclusive breastfeeding		(Total number of Yes/ N) *100

**N= Total 0-5 months old children (sample)*

3.4.3. Household Food Consumption Score

Step 1: Frequency of food consumption in last seven days:

Household Food Consumption Score will be based on the data gathered (seven-day recall period) by the household survey using the WFP's Food Consumption Score (FCS). This indicator is a composite score based on households' dietary diversity, food consumption frequency, and relative nutritional value of different food groups. The FCS is calculated by asking how often households consume food items from the 9 different food groupsduring a seven-day reference period.

Step 2: Put the number of days food consumed in the last seven days in the Excel Template.

This data is combined and weighted based on the nutritional value of the consumed food groups to determine the overall diversity and quality of household diets.Use the analysis template/table 20provided below. A separate weighted frequency will be generated automatically.

Food Groups	Frequency of consumption (total days)	Weight	Frequency*Weight
1. Cereals, grains, roots and tubers		2	
2. Pulses/legumes, nuts and seeds		3	
3.Milk and other dairy products		4	
4.Meat, fish and eggs		4	
5.Vegetables and leaves		1	
6.Fruits		1	
7.Oil/fat/butter		0.5	
8.Sugar, or sweet		0.5	
9.Condiments / Spices		0	
		Sum of Score	

Step 3: After Analysis of each household data an aggregated table to be generated (Table 22). From the aggregation table, and according to the sum of household food consumption score indicate the percentage of households with "poor" FCS (0-21 scores), "borderline" FCS (21,5 - 35 scores), and "acceptable" FCS (more than 35 scores). In contexts where the consumption of oil and sugar is high, the thresholds are higher.

Put the total number in the respective categories as per the sum of consumption scores for the total sample. A rate to be generated as per the food consumption categories.

Table 22: Analysis of Food Consumption Score for Union/ Upazila level

Name of Union/ Upazila			
	Threshold	**Yes (Total)**	**Rate (%)**
Poor Food Consumption	0-28		(Total #Poor Food Consumptions/N)*100
Borderline Food Consumption	29-42		(Total # Borderline Food Consumption /N)*100
Acceptable Food Consumption	>42		(Total # Acceptable Food Consumptions /N)*100

**N= total number of 6-23 months old children from the total sample households*

3.4.4 Child Food Poverty

UNICEF and WHO define minimum dietary diversity as the percentage of children 6–23 months of age consuming foods and beverages from at least five out of eight defined food groups during the previous day. To meet the minimum dietary diversity for healthy growth and development, children need to consume foods from at least five out of the eight recommended food groups.

Step 1: Asked the question if their 6-23 months aged children consume the food items during the previous day.

Step 2: Aggregate the data and sum of food items that consumed the previous day for each household.

If children are only fed 0-two food groups per day, they are living in severe food poverty. If children are fed three-four (3-4) food groups per day, they are experiencing moderate food poverty. If children are fed five or more food groups per day, they meet the minimum dietary diversity required for optimal health.

The aggregation of food groups from the questionnaire to create the Child Food Poverty Score is mentioned in the table below.

Table 23: Excel Template to analyse the Child Food Poverty

Upazila or Union Name		
Category 1	**Category 2**	**Category 3**
Severe Child Food Poverty (0-2 Food Groups)	**Moderate Child Food Poverty (3-4 Food Groups per day)**	**Meet the Minimum Dietary Diversity (>= 5 Food Groups per day)**
Percentage = (Total Number of responses mentioned 0-2 Food Groups per day / N)*100	Percentage = (Total Number of responses mentioned 3-4 food groups per day/ N)*100	Percentage = (Total Number of responses mentioned >=5 Food Groups / N) *100

**N= Total number of 6-23 months old children of the sample*

3.4.5 Household Dietary Diversity:

Step 1. Include the globally recommended food groups in the survey questionnaire.

Based on the global recommendation, a total of 12 food groups have been adopted and used in the questionnaire (see Annexure 04) for the survey.

Step 2. Categorize the level of Household Dietary Diversity (HDD)

According to household food consumption, you may present the Household Dietary Diversity of your area by Category 1: Low Dietary Diversity (consumed <= 3 food groups), Category 2:, (consumed 4-5 food groups), and Category 3: High Dietary Diversity, (consumed >= 6food groups), the way mentioned in table 24below.

Table24: Excel Template for Analysisof Household Dietary Diversity Score.

Upazila or Union Name		
Category 1	**Category 2**	**Category 3**
Low Dietary Diversity (<=3 Food Groups)	**Medium Dietary Diversity (4-5 Food Groups)**	**High Dietary Diversity (>= 6 Food Groups)**
Percentage = (Total Number of responses mentioned <=3 Food Groups / N)*100	Percentage = (Total Number of responses mentioned 4-5 food groups/ N)*100	Percentage = (Total Number of responses mentioned >=6 Food Groups / N) *100

Note: N (number) is the total number of respondents.

3.4.6 Accessto Safe Drinking Water

After completion of the data collection, put the data into the Excel Template. The rate will be calculated automatically as shown in table 25 below.

Table25: Excel Template to analysefor access to safe drinking water

Indicator	Name of the Union/Upazila	Rate (%)
	Yes (total)	**(The Total Number of Yes/ N) *100**
Access to safe drinking water[1]		

**N= Total sample Households*

[13] Safe drinking water sources are considered improved drinking water sources when they are located on the premises, easily accessible, and are not contaminated by feces or harmful chemicals. These sources may include piped water, boreholes, tube wells, protected dug wells, rainwater, or packaged water.

3.4.7 Use of Improved Latrine

Put the data into the Excel Template below under each indicator. The rate of use of improved latrine in your area will be calculated automatically.

Table26: Excel Template to analysefor access to an improved latrine

Indicator	Name of the Upazila	
	Yes (total)	Rate (%)
		(The Total Number of Yes/ N) *100
Access to use Improved Latrine[1]		

**N= Total sample Households*

3.4.8 Handwashing Practice

Put the data into the Excel Template (Table 27) below under the indicator for respondents. The rate of hand washing practices by respondents in your area will be calculated automatically.

Table27: Excel Template to Analysefor Handwash practice

Indicator	Name of the Union/Upazila	Rate (%)
	Yes (total)	(The Total Number of Yes/ N) *100
Handwashing with water and soap at critical times (respondent)[1]		(The Total Number of Yes/ N) *100 N= Total Number of Yes in indicator No 1 (Handwash)

**N= Total sample Households*

3.4.9 Incidence of diarrhoeal diseases among under-five children.

You will collect the data on the number of children reported to have had diarrhea in the two weeks preceding the survey.Put the data into the Excel Template, Table 28 below. The rate of diarrhoeal incidence will be calculated automatically.

Table28: Excel Template to analysis for diarrheal incidence in children

Indicator	Name of the Upazila/ Union	
	Yes (total)	Rate (%)
Experienced diarrhea in the last two weeks among children under-five		(Total Number of Yes/N) * 100

**N= total number of under-five years old children.*

[14]Improved latrines are defined as those that hygienically separate human waste from human contact. This category includes flush or pour-flush to piped sewer system, septic tank pit latrines, ventilated-improved pit latrines, or pit latrines with slab or composting toilets.

[14]There are five critical times to wash hands: after defecation, after handling feces from a child or adult or changing a child's diaper, after cleaning the environment, before preparing food, and before eating.

4. Conclusion

In the selected Upazilas in coastal areas, the study findings indicated that, except for the underweight, the prevalence of stunting and wasting among children under five years old were notably higher compared to national and corresponding divisional level status (BDHS 2022). As this study was limited to only 5 upazilas of 4 districts, the results of this study may not represent the entire coastal areas of Bangladesh, which creates the necessity of further research by taking the representative number of upazilas from the coastal areas. However, the findings of the study indicate providing nutritional support for under-five children through various means is crucial, especially for those households that are socioeconomically vulnerable and underprivileged. Additionally, implementing nutrition-sensitive and nutrition-specific interventions, regular nutritional monitoring, adequate and timely management, as well as behavioural changes, should be improved.

Higher household dietary diversity as a common predictor have had a positive impact on both childhood underweight and stunting in the study areas. However, wasting did not have any such common predictor with stunting or underweight. Significant differences were identified among the study Upazilas in terms of anthropometric outcome, household dietary diversity, food security, coping strategies, WASH practices, and access to healthcare services.

5. Recommendations

Profile Estimation as Part of Nutrition Programming:

Child profile estimation exercise would offer better insights into the prevalence of childhood malnutrition including their underlying determinants, strengthen evidence-based advocacy for resource allocation and targeted priority interventions to address them comprehensively. It is recommended to advocate to incorporate the child profiles exercise as part of bottom-up nutrition programme planning, particularly at the sub-national level, by the government and non-government stakeholders.

Development of Local Level Capacity:

The child profile estimation tool offers opportunities for assessment of individual child nutritional status as well as community-led profile estimation with limited capacity and resources in preparing tailored nutrition services, systematic reporting, and evidence-driven advocacy for resource mobilization at the grassroots level. It is recommended to promote widespread adoption of the community-led child profiling tool by the local health service providers, governmental bodies (such as the District and Upazila Nutrition Coordination Committee – DNCC/UNCC), Union Parishads, Civil Society Organizations (CSOs), and community-based organizations. This may entail local-level capacity building of the relevant staff of various entities in identification and analysis of the nutrition status of under-five children, and the secondary causes of malnutrition in their households, including poverty, food security and access to education, WASH services, social security programmes.

Advocacy for Resource Amplification:

The child profile estimation exercise would empower local-level entities to advocate for resource mobilization based on local data to increase funding for nutrition interventions and support evidence-based program implementation. It is recommended to engage in advocacy to amplify resource mobilization efforts, both from the central and local level leveraging insights gathered from child profiles and community-led child profiling undertakings. Recommendations provided in part two of this report have specific recommendations on how to use the child profile in resource mobilisation.

Recommendations on Further Research:

From this particular study it was evident that the nutrition status of the under-five children and their associated underlying factors in the study upazila are relatively poorer compared to the national and the respective divisional average of the same group. Since the study did not cover the entire coastal region of Bangladesh, it is not known if this scenario is common to only these specific five upazila or can be generalised over the entire coastal region of Bangladesh. Right2Grow, being particularly confined within these five upazila, may not be able to commission a wider research or study to see the nutrition status of under-five children of the entire coastal areas. BNNC may approach respective research organisations (e.g., icddr,b, INFS of the University of Dhaka, BRAC JPGSPH, etc.) to conduct a similar study with a wider geographical spread. BNNC may approach its partners to arrange the required funding for such a study. The overall nutrition status of under-five children in these five upazila suggests that the nutrition (both nutrition specific and sensitive) interventions being implemented in these areas may not be performing to the extent that these were supposed to. This issue was not covered in this study as it was not within the scope of work which would require a focused study, involving the respective district and upazila officials from respective line departments implementing nutrition (specific and sensitive) interventions. In this regard, it is recommended that Right2Grow may conduct formative research to look into the effectiveness of the nutrition interventions by the respective line departments and identify any gaps in implementation that might have attributed towards such a high level of childhood malnutrition. The research findings would recommend the necessary steps to improve the effectiveness of these nutrition interventions and the role of different stakeholders (BNNC, DNCC, UNCC, line departments, UN agencies, CSOs and private sector) in the improvements of these interventions.

Scale up of Upazila-Nutrition Profiles of Under-five Children Across the Country and Linking with National and District Nutrition Profiles:

BNNC undertook a commendable step in developing the national and district nutrition profiles of the country. However, even districts are quite larger geographical areas to underpin the specific nutrition situation of under-five children and their households across all the upazilas. Hence, BNNC may take the initiative in scaling up the approach of developing the upazila nutrition profile of under-five children, done here in this assignment, across the country. A few years back, BNNC developed a mapping of NGOs/CSOs working with nutrition in different locations of the country. BNNC may work with these NGOs/CSOs and SUN CSO network in preparing similar upazila-nutrition profiles in their respective working areas. Once developed, BNNC have to synchronized those upazila profiles with the national and district profiles already developed. Right2Grow may have policy dialogues with BNNC and its partners in this regard.

Adopting the "Community-based Model" to Identify and Address Nutrition-sensitive Interventions at the Implementation Level:

BNNC conducted a bottleneck analysis for addressing bottlenecks/constraints in nutrition-sensitive interventions in 2019. The assessment identified the immense potential of community in the identification of specific bottlenecks/constraints hindering the progress of nutrition-sensitive interventions. Based on the analysis, a community-based model was proposed, which would enable local level stakeholders (DNCC and UNCC, supported by CSOs/NGOs) identifying specific bottlenecks/constraints hindering particular nutrition-sensitive interventions and taking actions in addressing those bottlenecks/constraints . The key feature of this model was to identify, influence and engage local level actors at the implementation level (i.e. upazila level and below) and develop a set of community-targeted actions that would result in positive nutrition outcomes. These community-targeted actions would be within the present jurisdiction and terms of reference of the local-level actors . While this model was developed, it could not be implemented due to lack of funding.

Right2Grow may consider implementing this community-based model in at least one upazila under its jurisdiction. During the implementation of this model, the right influencers and implementers at the local level are needed to be identified. An appropriate community-targeted action plan needed to be developed

considering the context of the specific upazila (a generic one is presented in the subsequent section). The specific context of the geographical location, target groups and particular programmatic bottlenecks hindering the coverage of nutrition-sensitive interventions for that area should be considered for development of the community-targeted action plan. Then the influencers should be sensitized and motivated so that they can engage the implementers as per the community action plan. A Social Mobilization Plan (SMP) may need to be developed for the influencers in this regard, which will be part of the community action plan, and specifically will guide the influencers on how to engage and initiate the activities at the community level through the efforts of the implementers. The capacity of the influencers needs also be developed, and may have the provisionof some resources to implement the action plans. The actions in the model will be implemented by the implementers, who would be sensitized and influenced by the influencers. The engagements will be done as per the community-targeted action plan, which will improve the knowledge, attitude and behavior of the targeted group/population. The cumulative actions will improve the accessibility, affordability and utilisation of nutrition interventions. These will in turn improve the nutrition outcomes for the target groups. Right2Grow may review this community-based model and conduct a dialogue with BNNC on how to pilot it in at least one upazila.

[14]The assessment and the community-based model can be found in this document https://bnnc.portal.gov.bd/sites/default/files/files/bnnc.portal.gov.bd/page/1f1d0f32_ab6f_49f3_8b9c_b52ccefd63c4/2021-09-22-06-21-bf72c4d6bb2f206a56e550e1196b5d87.pdf

[17]Note: The local level actors here can be categorized into two groups - the influencers and the implementers, from both formal (e.g. government departments, local government institutes, NGOs) and informal (e.g. civil society, youth groups, volunteers, committees, etc.). The influencers are local level decision makers, with the capacity to induce actions and processes at the upazila level and below. Influencers. can be upazila level government officials from different departments (e.g. Upazila Nurbahi Officer or UNO, UHFPO,UFPO, UWAO, etc.), local government representatives (e.g. Upazila chairman, UP chairman, etc.), civil society representatives (e.g. NGO and religious leaders) or leaders of business member organizations (e.g. president of upazila chapters of the district chamber of commerce and industries). The implementers are the upazila, union or ward-level actors under the direct supervision of the influencers, or report to the influencers, or related to the influencers in a way that their actions can be influenced or guided. Implementers can be frontline workers of respective government departments (e.g. health assistants, family welfare assistants, Sub Assistant Agricultural Officers, etc.), field workers of NGOs, local government institutes (e.g. different UP standing committees, ward committees), professional associations, school/college teachers NGO field workers, or local volunteers.

PART TWO:

COSTING MODEL DEVELOMENT

Chapter One: Costing of Selected Nutrition Interventions

1.1 Context/Background

The Government of Bangladesh (GoB) has prioritized nutrition as a means to achieve greater progress towards its national developmentgoals. In 2012, Bangladesh committed to the six global nutrition targets set by the World Health Assembly (WHA) to be achieved by 2025. Additionally, it endorsed both the Rome Declaration and the Plan of Action at the Second International Conference on Nutrition (ICN2) in 2014, Nutrition for Growth (N4G) Summits (in 2013,2017 and 2021) reaffirming its dedication to addressing undernutrition. Nutrition has been integrated into key national development plans including the 8th Five Year Plan. To provide a robust policy framework, the GoB has developed the National Nutrition Policy (2015) and the Second National Plan of Action for Nutrition 2016-2025 (NPAN2).

1.2 Expenditure for Nutrition and Overall Financial Requirement for Implementation of Priority Nutrition Activities

Adopting a life-cycle perspective and emphasizing multisectoral interventions, NPAN2 outlined the projected financial needs over a 10-year period. In 2018, The World Bank Group conducted an analysis to support the operationalizationof NPAN2 by estimating the costs associated with scaling up the coverage of a specific set of high-impact nutrition interventions, known as direct nutrition interventions. For costing this analysis primarily focused on 13 direct nutrition interventions identified in the 2013 Lancet series on Maternal and Child Malnutrition. These direct nutrition interventions are also included in NPAN2.

Additionally, Bangladesh has conducted the Bangladesh Public Expenditure Review on Nutrition (PERN), as part of the global Scaling Up Nutrition (SUN) Movement initiative. The PERN exercise aimed at monitoring budget allocation and expenditure data related to nutrition and covered the fiscal years 201/15,2016/17 and 2017/18.

The Bangladesh Second Country Investment Plan (CIP2) covering the period 2016-2020, played a crucial role in the comprehensive, multi-sectoral strategy required to address hunger and malnutrition and achieve the Sustainable Development Goals (SDGs). It served as a mechanism to generate funding and coordinate sectoral and cross-sectoral initiatives related to food and nutrition security. However, it's important to note that CIP2 specifically incorporates nutrition-sensitive activities.

The ‘National WASH Accounts 2020' report aimed towards understanding water, sanitation, and hygiene (WASH) expenditure and investments trends in Bangladesh, and to develop better policies and practices to achieve sustainable development goal (SDG) 6. This would also contribute significantly to evidence-based decision-making for future investments in WASH. The formulation and adoption of National Wash Accounts will ensure the sustainable and equitable management of water resources with appropriate financing to implement an integrated development plan.

1.2.1 Financing Nutrition Programming in Bangladesh

The government funding sources for nutrition encompass both the GoB Operating and Development budget. The Development budget is primarily supported by the Development Partners (DPs) through Reimbursable Project Aid (RPA) and Direct Project Aid (DPA). DPs include bilateral government aid agencies (such as UKAid, USAID, EU, JICA, Sida), multilateral aid agencies (like the World Bank, and Asian Development Bank), UN Agencies (UNICEF, WFP, WHO, FAO, UNDP) global alliances, and international NGOs (for example, Save the Children, NI, CARE, etc.).

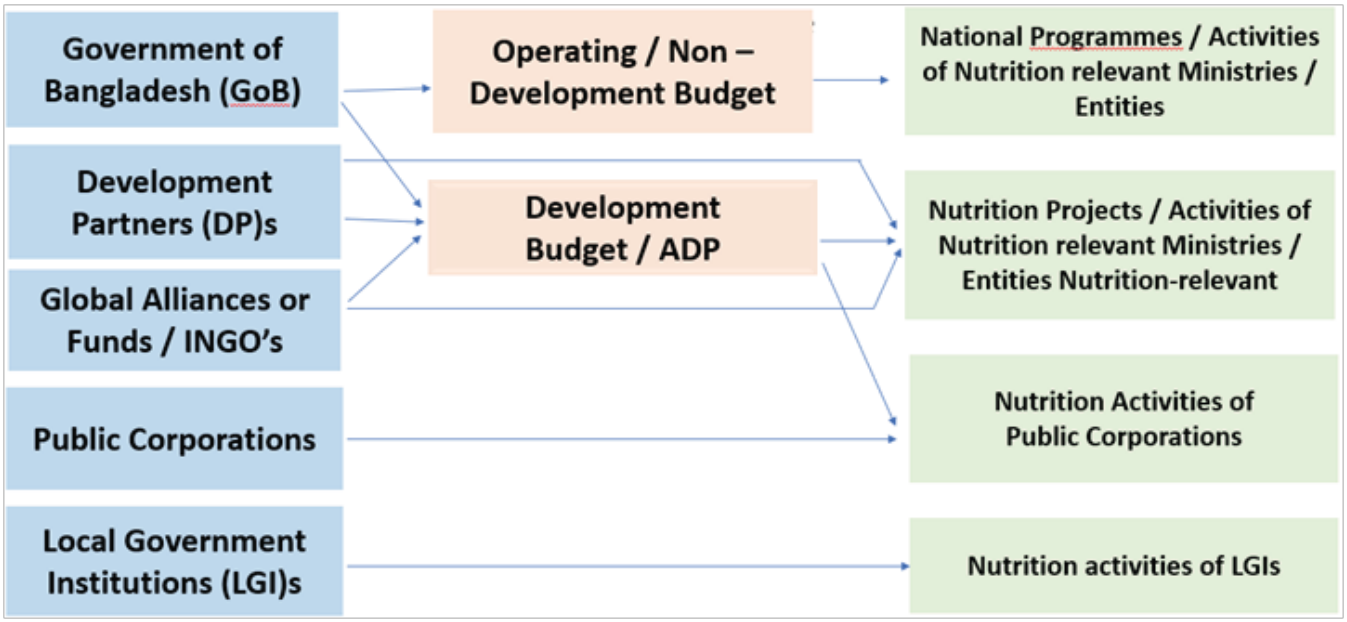


Figure 1: Public Financing Flow for Nutrition

Source: MTR-NPAN2

1.2.2 Overall Financing Requirement for NPAN2 Implementation

The total financial requirement for NPAN2 from 2016 to 2025 was estimated additional amount a totalof BDT 12,463 crore (equivalent to US$ 1.6 billion), averaging BDT 1,246.3 crore (US$ 0.16 billion) per year. NPAN2 delineated financing needs across thematic areas, sectors, and for institutional capacity development, monitoring, and evaluation. Specifically, BDT 5,420.6 crore (43.5 percent) was allocated for nutrition-specific activities, and 56 percent for nutrition-sensitive initiatives over the decade, translating to an annual requirement of BDT 542 crore (US$69.5 million) and BDT 699.7 crore (US$89.7 million), respectively. Notably, sectors such as women's empowerment, education, social safety nets, and information necessitated more than half of the total funding (52 percent). The health sector, including urban health, followed closely, requiring the second-largest share at 42.3 percent.

Table 1: Indicative Requirement of NPAN2 2016-2025

Sector		Level of Priority	Crore BDT	US$ million (1 $= 78 BDT)
Nutrition Specific				
	Health, Urban Health	High	5,270.6	675.7
	SBCC and WASH	High	150.0	19.2
Nutrition Sensitive				
	Food, Agriculture, Fisheries and Livestock	High	442.4	56.7
		Medium	80.6	10.3

	Women Empowerment, Education, Social Safety Net, and Information	**High**	**6,400.5**	**820.6**
		Medium	73.7	9.4
Institution and Capacity Building			39.3	5.0
Monitoring and Evaluation			6.4	0.8
Total for 10 years program period			**12,463.4**	**1,597.9**

Source: MTR-NPAN2

A comparison of the estimates of NPAN2 (2016-2025) and CIP2 (2016-2020) is presented in Table 2 that shows:

Table 1: Indicative Requirement of NPAN2 2016-2025

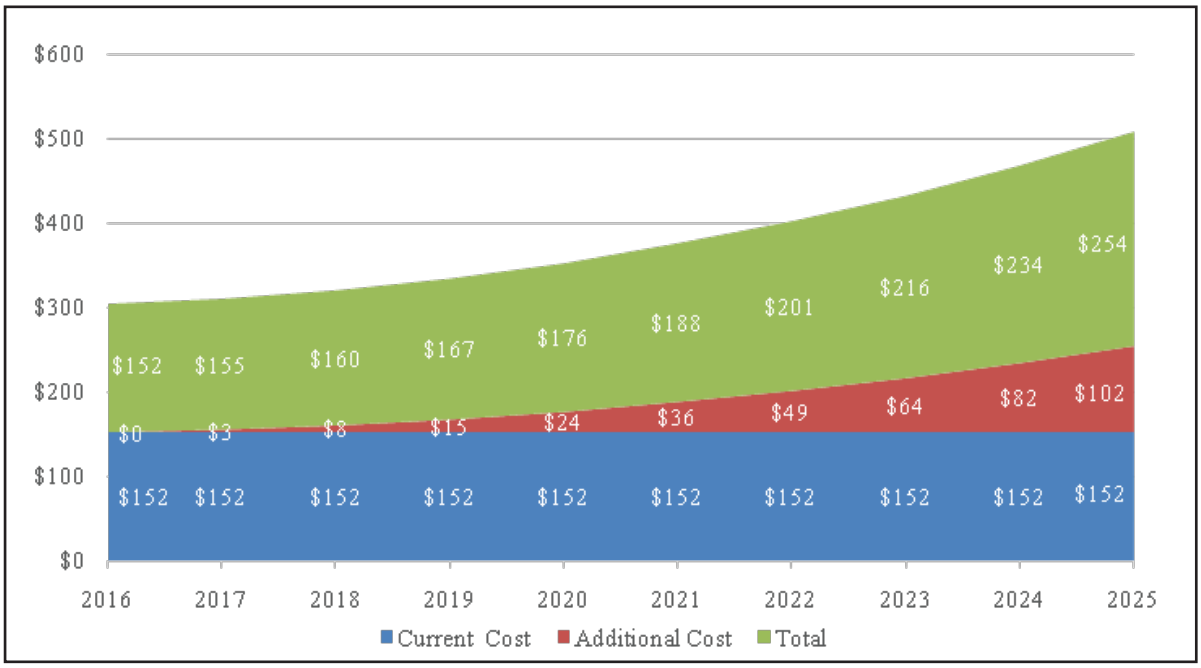
	NPAN2 (2016-2025)	**CIP2 (2016-2020)**
Time period	**10 years**	**5 years**
Includes	Nutrition specific and sensitive	Only nutrition sensitive
Total fund requirement	US$1.6 billion	US$ 9.25 billion
Total funding gap		US$3.6 billion
Total fund requirement after adjusting for nutrition sensitivity weight		US$ 5.6 billion
Total funding gap after adjusting for nutrition sensitivity weight		US$ 2.4 billion

Sources: MTR- NAPN2 and CIP2

1.2.3 Investment Required for Implementing Direct Nutrition Interventions

According to the World Bank report, the total public investment required for implementing direct nutrition interventions in Bangladesh was estimated at USD 536.9 million over a decade, averaging USD 53.7 million annually. This includes USD 152.8 million to maintain the current coverage of interventions and an additional USD 384.8 million to gradually expand coverage to reach 90 percent by the tenth year. Human resources constitute about 41 percent of the total costs, consumables (mainly nutrition supplements and therapeutic and supplemental food) account for 24 percent, program management (including supervision and monitoring) accounts for 25 percent, equipment and other inputs make up around 7 percent, and transport comprises approximately 3 percent of the total cost. Figure 2 illustrates the Annual Public Sector Cost of Implementing Direct Nutrition Interventions.

Figure 2: Annual Public Sector Cost of Implementing the Direct Intervention Cost



Source: World Bank, 2018

Additionally, beyond public investment, expanding the coverage of fortification of rice with iron and folic acid, edible oil with vitamin A, and iodization of salt would incur costs passed on to consumers by producers. These costs include fortification expenses and initial capital investment. Expanding coverage of fortification for rice and edible oil, as well as salt iodization, would necessitate an additional USD 2.5 billion over 10 years, resulting from price increases for these products.

It is crucial to estimate the financial expenses associated with reducing child undernutritionin order to achieve NPAN2, WHA and SDG targets. This would help determinethe necessary funding for national nutrition programs and enable tracking of finances allocated to nutrition interventions, including identifying any gaps in current investments at the country level. Moreover, understanding the breakdown of this funding, especially government budgets dedicated to both nutrition-specific and nutrition-sensitive interventions is essential. Cost assessments of nutrition investments would serve not only policymakers but also citizens, the private sector, and donors alike.

1.2.4. Purpose of the Development of the Costing Model

Calculating the financial cost to reduce child undernutrition (particularly stunting) is vital for effective national nutrition programing, involving the assessment of current investments, identification of gaps, and understanding of resource allocation from government budgets and donor contributions. The costing model provides tools for estimating resources needed for interventions at local level, supporting local level policymakers, citizens, and the private sector. The Right2Grow initiative strategically strengthens partnerships with the local government, Civil Society Organizations (CSOs) and the private sector to collaboratively combat malnutrition in children under five. Emphasizing the crucial link between Water, Sanitation, and Hygiene (WASH) access and nutrition, the project aims to enable every child under-five to reach their full potential by ensuring their well-nourished status in the project operation areas.

2.1 Objectives of Costing Model Development

a. To know the effective strategy/intervention to reduce child undernutrition (stunting) for children under-five.

b. To know the cost of selective/priority nutrition-specific and nutrition-sensitive interventions at national and sub-national level.

c. To know the gap between current nutrition investment and standard need.

d. To get an advocacy agenda of BNNC and Right2Grow to advocate towards various relevant government sectors and donors.

e. To calculate the cost to reduce child undernutrition (stunting) in the selected coastal areas (R2G working areas).

2.2 Methodology

For estimating the cost and development of the costing model, two broad approaches,the similar methodology that was used by the World Bank Study on the costing of nutrition specific intervention of NPAN 2 was adopted which is further explained below. Thesewere: i) the program experience costing approach, and ii) the ingredients-based costing approach. The justification for using both these approaches in the costing model was that the interventions included in this assessment were both nutrition-specific and nutrition-sensitive in nature and had varying types of data availability with varying quality.

2.2.1Approaches used in the World Bank costing for Bangladesh NPAN2

As indicated above , two primary approaches were used to estimate the unit cost (cost per beneficiary) of the interventions: (1) the program experience costing approach and, (2) ingredients-based costing approach. The program experience approach, employed in the Scaling Up Nutrition report (Horton et al. 2010), uses budgets or expenditure from real-life programs. Unit costs are approximated by dividing the total annual expenditure by the number of beneficiaries served in a given year. This approach generates unit cost data that capture all aspects of service delivery—including the costs of commodities, transportation and storage, personnel, training, supervision, monitoring and evaluation (M&E), relevant overhead, wastage, and so on for each intervention.

In the ingredients-based approach, unit costs are estimated based on assumptions regarding the elements that should make up a specific intervention. This approach identifies the key components of an intervention (for example, the time of nursing staff/physicians, drugs, medical equipment, overhead costs, etc.), their unit prices, and quantities needed. Per beneficiary, the cost is calculated by multiplying the price and quantity needed of each component and then summing those across all components.

The program experience approach was used for programs where the budgets or expenditure reports for specific interventions were available and the costs for a given intervention could be isolated from the overall budget or report.

[18]Supporting the National Plan of Action for Nutrition (NPAN2): Estimating the Costs, Impact, and Cost-Effectiveness, and Economic Benefits of Expanding the Coverage of Direct Nutrition Interventions in Bangladesh .

Source: The World Bank, Discussion Paper, 2018.

The estimated costs were estimated from the public health sector perspective and included the costs that would be borne by the public sector—the government—as well as other organizations (NGOs, UN organizations) involved in the provision of nutrition services. Furthermore, the calculated costs are reported in financial terms. They do not capture the full social resource requirements, such as the opportunity costs of the time committed by beneficiaries accessing the services. Finally, all costs were estimated as incremental cost of providing nutrition services using the existing public health delivery system and do not include the cost of the existing or new health infrastructure (e.g. health facilities) or systems needed to deliver the interventions.

2.2.2 Stakeholder Consultations and Key Informant Interviews (KII)

Costing modalities (i.e., programme-experience based vis-à-vis ingredient-based) were discussed and agreed upon in the stakeholder consultation workshop organized by BNNC. In addition, aTechnical Working Group (TWG) and an Advisory Committee were formed to ensure quality providing technical, feedback on findings and advisory supportthroughout the study period. Four meetings (of the TWG and Advisory Committee (two each) and a validation workshop were held during the study period. Technical & advisory support was obtained from these processes and groups as required.

Furthermore, the study team conducted Key Informant Interviews (KII) at the Upazila level with the respective departmental officials responsible for the implementation of the relevant interventions. For example, Upazila Health and Family Planning Officer, Upazila Women Affairs Officer, Project Implementation Officer, etc., and local government representatives (e.g. Union Parishad Chairmen and members).

A thorough review of secondary data was undertaken. Secondary information wasgathered from both government and non-government agencies, obtained either from publicly available sources or through consultations with the relevant government divisions. In addition, the per unit cost for this study was also derived based on an examination of the secondary literature documents listed below.

List of key documents/reports:

- Supporting the National Action Plan on Nutrition: Estimating the Costs, Impact, and Cost- Effectiveness, and Economic Benefits of Expanding the Coverage of Direct Nutrition Interventions in Bangladesh, 2018, World Bank Group.
- Bangladesh Public Expenditure Review on Nutrition, 2019, UNICEF and OPM.
- SAM Action Plan 2022, NNS, MOHFW.
- Second Country Investment Plan, Nutrition-sensitive Food Systems, 2016-2020.
- Second National Plan of Action for Nutrition (NPAN2 2016-2025), Mid-term Review, 2023.
- Scaling Up of Mother and Child Benefit Program, 2023, UNICEF for MoWCA.
- Social Security Program: fiscal year 2023-24, Finance Division, MoF.
- Annual Report, Gender Budget, 2022-2023, MoWCA.
- Bangladesh WASH Accounts, 2020, Bangladesh Bureau of Statistics, 2023.

The final unit cost was determined by incorporating the inflation rates until 2023. The study added the accumulated five-year inflation rateswith the unit cost derived from the World Bank report, to decide on the final unit cost for the year 2023 . The study also collected the primary data from the local level, through Key Informant Interviews (KII) with key local stakeholders.

[19]https://global.oup.com/us/companion.websites/9780199772766/student/pdf/Chapter15E2010.pdf

2.3 Scope of Work

Though Bangladesh has conducted the first Public Expenditure Review of Nutrition (PERN) in 2019, and the second PERN exercise is ongoing. Performing a thorough cost estimation for both nutrition-specific and nutrition-sensitive interventions wouldrequire a comprehensive PERN, but due to limitations in resources and time, conducting such a review was not feasible for this study. Instead, an extensive desk research/reviewof available documents was done and consultation with stakeholders at the national and Upazila levels were conducted. This has enabledthe study team to assess the requirement of the overall budget, theirallocation and identify gaps, and the projected estimated budget that would be required for respectiveinterventionbased on this costing exercise.

3.1 Costing of Selected Priority Nutrition Interventions

3.1.1 Vitamin A Supplementation

The vitamin A supplementation occurs biannually during National Vitamin A Campaign (NVAC) days. Children aged 6–11 months receive one capsule containing 100,000 international units (IU) of retinol, while children aged 12–59 months receive a capsule containing 200,000 IU of retinol. The unit cost was determined using the National Nutrition Services budgets for the NVAC campaign, with additional expenses for transportation and supervision that were not originally part of the NVAC budget. The estimated transportation cost from Dhaka to the upazila level, not initially included in the NNS budget, was added to the Vitamin A supplement cost based on information from the CMSD. Human resource costs encompass only the expenses directly associated with service provision.

Apart from volunteers, health workers (class 3, grade 16) play a role in administering vitamin A supplementation. A hierarchical structure of supervisorsextending from the central level down to division levels, and their remuneration is accounted for in program costs. It was assumed that there would be 100 supervisors from the central/national level overseeing the NVAC. Additionally, 10 more supervisors would be designated in each of the 64 districts (amounting to a total of 640), and 2 extra supervisors would be assigned at the district level.

To calculate the human resource cost per child for each level of supervisor, the following methodology was employed by the study team of World Bank Group.

- It was assumed that each supervisor dedicates 480 minutes (8 hours) to supervision per National Vitamin A Campaign (NVAC) day.
- The total number of children "covered" by a single supervisor was determined by dividing the total number of supervisors required at that level by the overall number of beneficiaries.
- The total minutes of supervision time per child was calculated as the product of (supervision minutes × number of supervisors at that level) divided by children per supervisor.
- The cost per child was derived by multiplying (salary per minute by minute per child).
- The total human resource cost of supervision was obtained by summing the cost per child for supervisors at the national, division, district, and union levels.

Human resources (health workers delivering the intervention) were the highest cost driver of this intervention. About 39 percent of the estimated cost per beneficiary was attributable to human resources. Other program inputs—including patient registers, tally sheets, reporting sheets, field brochures, folders, flags and so forth—accounted for another 32 percent of the cost. Program management (mostly supervision)accounted for another 14 percent. Transport costs (estimated only for vitamin A Capsule) accounted for only 0.05 percent of the total.

Table 3: Estimated Unit Cost (Cost per Beneficiary): Vitamin A Supplementation

National Level Reference				
Estimated Unit Cost (Cost per Beneficiary): Vitamin A Supplementation				
Cost Category	**World Bank, 2018**			**Estimate, 2023**
	Unit Cost (USD)	**Percent**	***Unit Cost (BDT)**	**Cost adjusting inflation, 2023 (BDT)**
Consumables	0.053	15%	4.44511	6.17
Other (non-consumable) inputs	0.11	32%	9.2257	12.81
Transport	n.a.	0%	n.a	
Human resources	0.134	39%	11.23	15.60
Program cost	0.049	14%	4.11	5.70
Advocacy				
Household cost	n.a.	0%	n.a	
Total	**0.352**	**100%**	**29.52**	**41**

During consultation with the local stakeholders at the local level it was suggested to increase the budget to cover the additional costs for various activation. For instance, the current daily allocated honorarium for each volunteer should be raised from 200 BDT to 600 BDT. Similarly, the allocated cost for preparation meetings should also be raised.

Local Level Feedback		
Cost Category	**Current Government Allocation**	**Suggested Needs**
Remuneration		
UH&FPO	1,600	3,200
MTEPI	500	500
SI	500	500
HI	500	500
Volunteer	200	600
Snacks per Volunteer	80	80
Meeting for implementation		
Remuneration/honorarium	10,080	10,080
Snacks	2,000	2,000
Lunch	0	10,000
Transport for UH&FPO	0	3,000
Miking cost	1,000	1,000
Hard-to-Reach Areas	20,000	20,000
Total	**36,460**	**51,460**

3.1.2 Promotion of Optimum Infant and Young Child Feeding

Promotion of early initiation of breastfeeding; exclusive breastfeeding for 6 months; timely introduction of complementary food; age-appropriate quantity, frequency, and quality of complementary food; continued breastfeeding through two years of age; feeding during illness; and essential hygiene actions at key moments. Target groups are infants and children from conception up to two years old; mothers during pregnancy and lactation. Platforms are individual sessions mainstreamed through primary health care; group counselling sessions delivered through the health sector. Expected impacts are reduction of child mortality and morbidity and stunting.

It was presumed that a woman would participate in 24 visits from conception to the child's second birthday. These visits encompass fourantenatal care (ANC) visits, fourpostnatal care (PNC) visits, 10 growth monitoring and promotion (GMP) visits, and sixExpanded Programme on Immunization (EPI) visits. Additionally, courtyard sessions were expected to occur approximately once a month. The non-consumable inputs for the intervention encompassed the costs associated with equipment, communication materials, and job aids utilized by the providers. Transportation costs were primarily linked to the expenses of transporting growth-monitoring equipment, which could not be separated from product costs. Human resource costs covered the expenses related to direct service provision. Program costs included supervision costs, assuming that one District Nutritionist (newly proposed position) would oversee each district, totaling64 districts.

Human resources (provider time) accounted for 88 percent of the cost. Other inputs, including job aids for providers and growth monitoring equipment (height board, scales, growth monitoring cards, MUAC tape, etc.) accounted for the remaining 12 percent.After factoring in the adjusted exchange rate and accounting for inflation, the computed unit cost now stands at 414.68 BDT per cycle.

Table 4: Estimated Unit Cost (Cost per Beneficiary): Promotion of Optimum Infant and Young Child Feeding

Cost category	World Bank, 2018			Estimate, 2023
	Unit Cost (USD)	Percent	Unit Cost (BDT)	Cost adjusting inflation, 2023 (BDT)
Consumables	n.a.	0%		
Other (non-consumable) inputs	0.44	12%	36.9028	51.25
Transport	n.a.	0.00%		
Human resources	3.12	88%	261.6744	363.42
Program cost	0.001	0%	0.08387	0.12
Household cost	n.a.	0%		
Total	**3.56**	**100%**	**298.57**	**414.68**

3.1.3 Treatment of Severe Acute Malnutrition (SAM) According to the National Protocol

Management of SAM with medical complications at health facilities is one of the key actions towards improving the wasting situation and reducing the high death associated with untreated SAM cases. Costing exercise for SAM management at health facilities was done by the study team through consultation with key stakeholders, led by the National Nutrition Service (NNS). Costing was estimated based on key bottlenecks for the quality of SAM management at health facility and the annual average SAM admitted cases (12,000) managed at health facilities in the past few years. According to the estimation, capacity building of the related stakeholders (doctor, nurse, supervisors and others) accounted for 50 percent of the total cost. Advocacy and coordination accounted for the second highest percentage (21 percent) of the total cost. The computed total cost per beneficiary of admitted cases is 15,200.7 BDT.

Table 5: Estimated Unit Cost (Cost per Beneficiary): Treatment of Severe Acute Malnutrition (Hospital Admitted Cases)

Cost Category	Cost (USD)	Cost (BDT)	Percent
Capacity building	69	7600.35	50%
Therapeutic milk	16.56	1824.08	12%
Anthropometric tools and nutrition kits	15.56	1713.93	12%
Advocacy and coordination	28.98	3192.15	21%
Improvement of SAM unit	4.14	456.021	3%
Monitoring/reporting/supervision	2.76	304.014	2%
Total cost	**138**	**15,200.7**	**100%**

**Exchange rate 1 USD= 110.15 BDT (23, November, 2023)*

3.1.4 Therapeutic Zinc and Oral Rehydration Solution for the Treatment of Diarrhea

Oral rehydration therapy is a widely recognized and straightforward treatment method. Zinc supplementation has been shown to decrease the duration and severity of diarrheal episodes and the likelihood of subsequent infections for 2–3 months. Zinc supplements are generally well-received by both children and caregivers and are effective regardless of the specific type of zinc salt used.

The cost estimation for treating acute diarrhea was based on guidelines from the World Health Organization (WHO), UNICEF, and national protocols for the Integrated Management of Childhood Illnesses (IMCI). These guidelines recommend the use of oral rehydration solution along with providing 10 to 20 milligrams of zinc for 10 to 14 days for each individual case. The estimated cost per unit includes expenses for consumables, human resources, and transportation.

It was assumed in the analysis that a child presenting with acute diarrhea would be attended to by a sub-assistant community medical officer for a total of 10 minutes. At the facility, the child would be given one sachet of low-osmolality oral rehydration solution and two additional sachets for home consumption. Additionally, the child would receive zinc tablets to be taken once daily for the following 10–14 days (10–14 x 20 mg zinc tablets for children aged 6–59 months and 10–14 x 10 mg zinc tablets for children aged 0–5 months).Both the oral rehydration solution and zinc tablets were assumed to be provided to the child free of charge, without any out-of-pocket payment. Prices for locally produced oral rehydration solution and zinc tablets were sourced from the CMSD, and transportation costs from Dhaka to divisions and Upazila health complexes were factored in based on information provided by the CMSD.

The consumable cost emerged as the primary driver of expenses for this intervention, constituting approximately 53 percent of the estimated cost per beneficiary. Taking into account fluctuations in the exchange rate and adjusting for inflation, the revised unit cost now stands at 93.42 BDT.

Table 6: Estimated Unit Cost (Cost per beneficiary): Therapeutic Zinc and Oral Rehydration Solution for the Treatment of Diarrhea

Cost category	World Bank, 2018			
	Unit Cost (USD)	Percent	Unit Cost (BDT)	
Consumables	0.428	53%	35.90	49.85
Other (non-consumable) inputs	n.a	0%		
Transport	0.001	0.77%	0.0839	0.12
Human resources	0.373	46%	31.28	43.45
Program cost	n.a	0%		
Household cost	n.a.	0%		
Total	0.802	100%	67.26	93.42

3.1.5 Provision of Micronutrient Powders to Infants and Young Children

Micronutrient deficiencies, particularly in vitamin A, iron, and zinc, have been a significant focus of child health and nutrition efforts for the past three decades, with compelling evidence of their widespread prevalence and impact on morbidity, mortality, and developmental outcomes, especially in low- and lower-middle-income countries, such as those in sub-Saharan Africa and South Asia[2021].

The National Strategy for Prevention and Control of Anemia advocates for the use of micronutrient powders to combat anaemia and other deficiencies (IPHN 2007). This entails daily consumption of one sachet containing 12.5 mg of elemental iron, 300 ug of retinol, and 5 mg of elemental zinc.The distribution strategy involves providing micronutrient powder sachets on a six-month cycle. Each cycle includes a two-month supply of micronutrient powders (60 sachets, one sachet daily) followed by a four-month hiatus. This cycle is repeated twice before the child's second birthday, resulting in an average of 1.5 rounds of supplementation annually per child.Delivery of micronutrient powders wasmodelled based on existing infrastructure through the Directorate General of Family Planning in select districts. Family welfare assistants (class 3, grade 16) are responsible for distributing the micronutrient powders during home visits. These visits typically entail spending around threeminutes explaining the proper use of micronutrient powders and addressing any questions from the mothers.Cost estimates for micronutrient sachets were obtained from the CMSD, with transportation costs from Dhaka to divisions and Upazila health complexes factored in based on CMSD data.

According to the estimated cost (table 7), the consumable cost accounted for the highest 54 percent of the total unit cost following the program cost accounted for the second highest which was 30 percent of the total cost. The total unit cost for the Multiple Micronutrient Powder intervention is 824.46 BDT.

[20] Stephen Hodgins and Rolf Klemm, Global Health: Science and Practice June 2021, 9(2):216219; https://doi.org/10.9745/GHSP-D-21-00263

[21]Victora CG, Christian P, Vidaletti LP, Gatica-Domínguez G, Menon P, Black RE. Revisiting maternal and child undernutrition in low-income and middle-income countries: variable progress towards an unfinished agenda. Lancet. 2021;397(10282):1388–1399. doi:10.1016/s0140-6736(21)00394-9. pmid:33691094

Table 7: Estimated Unit Cost (Cost per Beneficiary): Multiple Micronutrient Powder

	World Bank, 2018			Estimate, 2023
Cost category	**Unit Cost (USD)**	**Percent**	**Unit Cost (BDT)**	**Cost adjusting inflation, 2023 (BDT)**
Consumables	3.791	54%	317.95	441.58
Other (non-consumable) inputs	0.08	1%	6.71	9.32
Transport	n.a	0.00%		
Human resources	1.09	15%	91.42	126.97
Program cost	2.118	30%	177.64	246.71
Household cost	n.a.	0%		
Total	**7.078**	**100%**	**593.63**	**824.46**

3.1.6 Iron and Folic Acid Supplementation in Pregnancy

It is estimated that over 40 percentof pregnant women worldwide suffer from anaemia, with at least half of this attributed to iron deficiency[22] . According to BDHS 2011, the prevalence of anaemia in reproductive-age (15-49) was 42 percent in Bangladesh. Enhancing the intake of iron and folic acid among women of reproductive age has the potential to improve pregnancy outcomes and overall maternal and infant health[23] .

In Bangladesh, the current policy recommendation entails daily iron and folic acid supplementation throughout pregnancy (180 days) and for three months postpartum (90 days), totaling 270 days. Although in practice, most mothers only receive supplementation during prenatal care, the cost estimation encompasses both preand postnatal care to align with policy guidelines.Iron and folic acid supplementation in Bangladesh is facilitated through two channels under the Ministry of Health and Family Welfare: The Directorate General of Health Services and the Directorate General of Family Planning. The distribution primarily occurs during routine visits to health facilities as part of antenatal and postnatal care. While some women may receive supplements through community outreach by the Directorate General of Family Planning, this is considered negligible for cost estimation purposes.

Unit costs are based on the provision of one tablet daily containing ferrous fumarate (200 mg) and folic acid (400 µg). Prices for locally produced supplements were sourced from the Central Medical Stores Depot (CMSD), with transportation costs factored in based on CMSD data. Delivery of supplementation is assumed to be carried out by family welfare assistants, health assistants, or community health care providers during antenatal and postnatal care visits, with an average salary corresponding to class 3, grade 16.For antenatal care, it was assumed that women attend four visits, with approximately 2.5 minutes per visit allocated for the provision of iron and folic acid, along with advice on diet and rest. Similarly, for postnatal care, it was assumed that women attend four visits, with 2.5 minutes per visit devoted to the same interventions. Salary information for health personnel was obtained from the Ministry of Finance civil servant salary grid.

As per the cost estimate, consumables constituted the largest portion, making up 55 percent of the total unit cost, while human resources accounted for the second-highest portion at 43 percent of the overall cost. The total unit cost for Iron and Folic Acid Supplementation is 190.33 BDT.

[22]https://www.who.int/tools/elena/interventions/daily-iron-pregnancy

[23]https://www.who.int/data/nutrition/nlis/info/antenatal-iron-supplementation

Table 8: Estimated Unit Cost (Cost per Beneficiary): Iron and Folic Acid Supplementation in Pregnancy

Cost category	World Bank, 2018			Estimate, 2023
	Unit Cost (USD)	Percent	Unit Cost (BDT)	Cost adjusting inflation, 2023 (BDT)
Consumables	0.9	55%	75.48	104.83
Other (non-consumable) inputs		0%		
Transport	0.038	2.00%	3.19	4.43
Human resources	0.698	43%	58.54	81.30
Program cost	n.a			0.00
Household cost	n.a.			0.00
Total	**1.634**	**100%**	**137.04**	**190.33**

3.1.7 Calcium Supplementation during Pregnancy

Currently, Bangladesh has no specific policy guidelines on calcium supplements during pregnancy. The estimated unit cost outlined here is based on twice-daily calcium supplementation, with two tablets of 500 mg calcium carbonate starting from the 20th week of gestation for 20 weeks (assuming a 40-week gestation period), totaling 280 tablets. Prices for calcium carbonate tablets were sourced from the CMSD for locally produced supplements, with transportation costs factored in from Dhaka to divisions and upazila health complexes based on CMSD data.

Delivery of calcium supplementation is assumed to be carried out by family welfare assistants, health assistants, or community health care providers (average class 3, grade 16) during antenatal care visits. It is further assumed that women attend four antenatal care visits, with approximately 2.5 minutes per visit dedicated to providing calcium supplements and advising on the consumption of calcium-rich foods. The total human resource time required for these four sessions is estimated at 10 minutes. Salary information for health personnel was obtained by the world back from the Ministry of Finance civil servant salary grid.

Consumables were the highest cost driver of this intervention. About 51 percent of the estimated cost per beneficiary was attributable to consumables. Human resources accounted for another 47 percent of the cost. Transport costs accounted for only 3 percent of the total. As adjusting the inflation total unit cost comes to 173.09 BDT in October 2023.

Table 9: Estimated Unit Cost (Cost per Beneficiary): Calcium Supplementation during pregnancy

Cost category	World Bank, 2018			Estimate, 2023
	Unit Cost (USD)	Percent	Unit Cost (BDT)	Cost adjusting inflation, 2023 (BDT)
Consumables	0.75	51%	62.90	87.36
Other (non-consumable) inputs	n.a	0%		
Transport	0.039	3.00%	3.27	4.54
Human resources	0.696	47%	58.37	81.07
Program cost	n.a	0%		0.00
Household cost	n.a.	0%		0.00
Total	**1.486**	**100%**	**124.63**	**173.09**

3.2 Cost of Selected Nutrition-Sensitive Interventions.

3.2.1 Mother and Child Benefit Program (MCBP)

The Mother and Child Benefit Program (MCBP) is formulated with the aim of enhancing nutritional status, cognitive abilities, and developmental outcomes during pregnancy and early childhood. This program is administered by the Ministry of Women and Children Affairs (MoWCA) with technical support from the World Food Programme (WFP). Currently, the MCBP Program extends its coverage to 1.25 million beneficiaries, which will scaled-up to cover the entire country in future. The MCBP offers a monthly cash allowance of 800 BDT to qualifying impoverished mothers till three years of age of her child to enhance nutrition among mothers and their children. As outlined in the Detailed Implementation Plan (DIP) of MCBP the total unit cost per person per year is 9,944 BDT, in which 344 BDT (3.5 percent) is the program cost and 9,600 BDT (96.5 percent) is the cash benefit.

Table 10: Estimated Unit Cost (Per Beneficiary): Mother and Child Benefit Program (MCBP)

Cost Items	Unit Cost	Percent	Unit
Cash Benefit	9,600	(96.5%)	BDT/Person/Year
Programme Cost	344	(3.5%)	BDT/Person/Year
Total Cost	**9,944**	**(100%)**	**BDT/Person/Year**

3.2.2 Vulnerable Women Benefit (VWB)Program

One of the most extensive safety net programs is the Vulnerable Women Benefit Program (VWB), executed by the Department of Women Affairs (DWA) under the Ministry of Women and Children Affairs (MoWCA). The VWB (formerly known as the Vulnerable Group Development Programme) was initially launched in 1974 by the United Nations World Food Programme (WFP) as a relief effort for the vulnerable population in a war-torn country grappling with famine. Over the subsequent decades, the program underwent numerous transformations in terms of its activity design and objectives. The primary beneficiaries of the VWB program are impoverished women and their households in rural areas without a consistent source of income. VWB serves as a vital tool for the government to introduce sustainable and cost-effective solutions to address chronic hunger and poverty among women. Through the VWB program, the Government of Bangladesh provides 30 kilograms of rice per month for two years as food support to poor and vulnerable women in the country. According to financial details from the Finance Division, the allocated budget for the VWB program in the fiscal year 2021-2022 amounted to 18,930,422,000 BDT, catering to a total of 1,040,000 beneficiaries. The calculated per-head cost, based on this budget, stands at 18,202 BDT.

Table 11: Estimated Unit Cost: Vulnerable Women Benefit Program

VWB	Year 2021-2022	
Cost Items	Unit Cost	Unit
Total Per Beneficiary Cost	18,202 (100%)	BDT/Person/Cycle
Food Cost (Rice)	17,079 (84%)	BDT/Person/Cycle
Transport	278 (1.5%)	BDT/Person/Cycle
Training	409 (2.2%)	BDT/Person/Cycle
Management	436 (2.4%)	BDT/Person/Cycle

3.2.3 Vulnerable Group Feeding Program (VGFP)

Following the famine in 1974, the Government of Bangladesh, in collaboration with the World Food Program (WFP), initiated the Vulnerable Group Feeding (VGF) program. VGF offersa monthly allocation of 31.25 kg of wheat per household per month for a consecutive two-year period. Presently, VGF remains a humanitarian initiative that delivers food transfers to those in need. This program is implemented by the Ministry of Disaster Management and Relief. VGF distributes food assistance to impoverished households during religious events such as Eid-ul-Fitre and Eid-ul-Azha. Additionally, the program extends food aid to individuals affected by natural calamities and operates concurrently with or in coordination with Gratuitous Relief (GR). As per the financial details from the Finance Division, the budget allocated for the Vulnerable Group Feeding (VGF) program in the fiscal year 2022-2023 amounted to 1542.19 Crores, catering to a total of 25,714,000 beneficiaries. After computing the overall consumable cost, the unit cost was determined to be 599.75 BDT, focusing specifically on the cost of rice. Local-level investigations revealed that the designated budget for transportation was set at 250 BDT per ton, while local stakeholders indicated that the actual cost of transportation was 1 BDT per kilogram. Additionally, the distribution cost is adjusted through the sale of sacks.

Table 11: Estimated Unit Cost: Vulnerable Women Benefit Program

National Level Reference					**Upazila Level Cost**		
Cost Items	**Unit Cost**	**Unit**	**Calculation**		**Transport**	Current Allocation (BDT)	Actual Cost*
Total Cost (only Consumable Item)	599.75	BDT/ Person	Total Cost	15,421,900,000	**Per ton**	250	
			Total Beneficiary	25714000	**Per KG**	1	2

3.2.4 Water, Sanitation, and Hygiene (WASH)

Water, Sanitation, and Hygiene (WASH) plays a crucial role in determining health and nutritional status. For instance, unsafe WASH conditions contribute to nine percent of deaths and seven percent of the burden of disease among children under fiveyears old. This accounts for almost nine percent of all disability-adjusted life years (DALYs) in this age group. Repeated parasitic infections can lead to anaemia and hinder both physical and cognitive development. Nearly half of all malnutrition cases worldwide are associated with repeated episodes of diarrhoea or intestinal worm infections caused by unsafe water, inadequate sanitation, or insufficient hygiene. Diarrhoea is a primary cause of death among children under fiveyears globally, and its prevalence in low-income settings significantly contributes to undernutrition.

WASH is a combination of water, sanitation, and hygiene. As per Bangladesh National WASH Accounts 2023, a person spends Tk 3,491 on water, sanitation and hygiene per year amounting the total expenditure per household (family) Tk 11,574, which is 4.3 percent of the household's annual income. The report further revealed that, a person spends Tk 2,093 on hygiene, Tk 500 on water and Tk 898 on sanitation. About 60 percent of the total WASH expenditure is spent on hygiene, 26 percent on sanitation, and 14 percent on potable water. Expenditure related to hand washing and menstrual hygiene management accounts for 96 percent of total hygiene expenditure.

Table 13: Estimated Unit Cost for WASH Program

Cost item	**Cost (BDT)**	**Percentage (%)**
Water	500	14
Sanitation	898	26
Hygiene	2,093	60
Total WASH expenditure (Taka) per year	**3,491**	**100%**

Table 14: Type of Cost for Provision of WASH Services

Type of cost	Percentage (%)
Capital investments	28.9%
Operations and maintenance	71.0%
Financial cost	0.0%
Support activities	0.1%
Total	**100%**

3.3 Summary of the Estimated Unit Cost for the Selected Priority Nutrition Interventions

Table 15: Summary of the Costing of the Selected Nutrition Interventions

SL. NO	Interventions (Sensitive and Specific)	Unit Cost (BDT)	Unit
1	Iron and Folic Acid Supplementation in Pregnancy	190.33	BDT/ person
2	Calcium Supplementation during Pregnancy	173.09	BDT/ person
3	Promotion of Optimum Infant and Young Child Feeding	414.68	BDT/person/year
4	Vitamin A Supplementation	41.00	BDT/Person/cycle
5	Therapeutic Zinc and Oral Rehydration Solution for the Treatment of Diarrhea	93.42	BDT/person/ episode
6	Provision of Micronutrient Powders to Infants and Young Children	824.46	BDT/Person/ cycle
7	Treatment of Severe Acute Malnutrition According to the National Protocol	15,200.00	BDT/person
8	WASH	3,491.00	BDT/person/year
9	Maternal and Child Benefit Program	9,944.00	BDT/Person/year
10	Vulnerable Women Benefit Program	18,202.00	BDT/person
11	Vulnerable Group Feeding Program	599.75	BDT/ person

4. Costing Tool for the Local Level Stakeholders

Asimple costing estimationtool has been preparedfor local-level GoB stakeholders and community-led organizations so that they can easily calculate the cost needed forthe selected priority nutrition interventions and identify the resource gapintheir operation areas. The tool is preparedin an Excel sheet (Table 16), requiring only the input of the number of beneficiaries. The resource gapcan also be estimated by deducting central allocationfrom the local program needs. As a result, the tool will generate the total cost needed for the specific interventions.

Step 1. Selection of priority interventions and their beneficiaries: Select the priority nutrition interventions (both specific and sensitive) for the costing, and the total number of beneficiaries for each of the interventions as per the need of your program, and available resources.

Step 2. Estimating the cost: Put the total number of beneficiaries against each of the interventions into the Excel table (Table 16, attached).

Step 3. Estimating the funding gap:Deduct the government allocation (column 5 in the table) for the respective interventions from the actual cost required for the intervention (column 4in the table). The calculation for the gap (column 6 in the table), i.e. 6= 4-5.

Figure 2: Process of estimating the cost of selected nutrition interventions and funding gaps in local levels

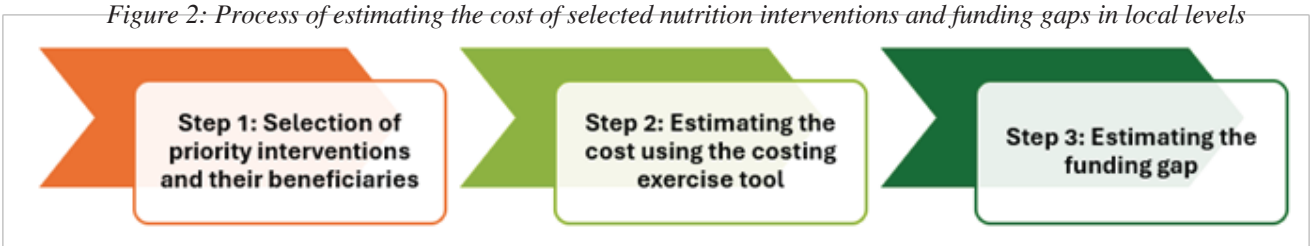


Table 16: Costing exercise tool for selected interventionsat the local level

SL. NO.	Interventions	Estimated cost per beneficiary BDT	No. of beneficiary (under 5)	Total cost (2*3) BDT	Central Allocation BDT	The gap in resource (4-5) BDT	Remarks
		2	3	4	5	6	
1.	Promotion of Optimum Infant and Young Child Feeding	414.68					
2.	Treatment of Severe Acute Malnutrition (SAM) - inpatient	15,200.7					
3.	Vitamin A Supplementation	41.00					

4.	Provision of Micronutrient Powders to Infants and Young Children	824.46					
5.	Iron and Folic Acid Supplementation in Pregnancy	190.33					
6.	Calcium Supplementation during Pregnancy	173.09					
7.	Therapeutic Zinc and Oral Rehydration Solution for the Treatment of Diarrhea	93.42					
8.	WASH	3,491.00					
9.	Mother and Child Benefit Program (MCBP)	9,944.00					
10.	Vulnerable Women Benefit Program	18,202.00					

5. Recommendation

Priority Budget Allocation for Nutrition at the National Level: Allocate the required additional budget for the NPAN2 implementation averaging about BDT 1,246.3 crore per year and the recommended investment for direct nutrition interventions averaging USD 53.7 million annually as suggested by the World Bank Study, 2018. Establish a multisectoral financial tracking system to monitor nutrition allocation and expenditures by sectors at different levels.

Adoption of Cost Estimation Tool: The local-level cost estimation tool provides invaluable insights into financial requirements, budget allocations, and gaps at the program implementation level, through empowering local-level planners to make evidence-based advocacy for additional budget allocation. R2G and its partners may engage in advocacy for the adoption of this cost estimation tool with the respective DNCC, UNCC, UDCC and local CSOs. Considerable capacity building may be required, particularly for the CSOs who would facilitate DNCC and UNCC, on the utilisation of this tool. Sensitisation workshops may also be needed with the DNCC, UNCC and UDCC for adoption of this tool, focusing on the potential positive impacts of the tool.

Local level linkage of nutrition profile and nutrition investment:It is envisaged that with the nutrition profile estimation (detailed out in part one of this report), the local level stakeholders (e.g., the UNCC, supported by local CSOs) will be able to develop a profile of the under-five children in their respective Upazila. From that profile, the local level stakeholders will also be able to identify the priority activities requiring further strengthening/reinforcing of different nutrition-specific or nutrition-sensitive interventions in their particular upazila or union. (For example, the priority activities may include expanding door-to-door searching upon completion Vitamin A campaign to identify children left out, particularly in hard-to-reach areas, further enhancing SBCC activities to improve nutrition counseling in the Mother and Child Benefit Programme, etc.). With the help of the cost estimation template, they will be able to identify specific costs for different nutrition-sensitive and nutrition-specific interventions, at the

activity level. After combining the findings from these two models, the local level stakeholders will be able to identify specific activities under nutrition-specific/sensitive interventions requiring additional budget. For example, taking the aforementioned example, the local level stakeholders may consider hiring additional healthcare workers/volunteers for door-to-door searching; or engaging a local level service provider to develop a drama and display it in different locations through mobile screening vans, etc. Once these specific activities are identified, then the local level stakeholders can be engaged for advocacy to increase additional funding to implement those specific/additional activities to improve nutrition situation in their respective upazila/unions.

Sectoral advocacy for Increasing Sectoral Budget for Nutrition Interventions: Depending on the nature of interventions, the nutrition intervention to be reviewed by the local level stakeholders would be under the purview of at least one Ministry or Division of Government of Bangladesh, implemented by the respective implementing agencies of that Ministry or Division. Once the specific activities are identified (which have positive impacts in improving nutrition status of under-five children), the stakeholders need to review the specific sectoral/operational budgets of those implementing agencies allocated for their respective upazila/union. The local level stakeholders then will have to conduct advocacy with the respective line departments to rationalize the budget allocation under the specific budget line for specific activities in their respective geographical locations. The advocacy may include developing a comprehensive under-five children of the upazila, (in case of any deviation in the profile than expected) developing a costing model showing nutrition interventions under that particular department targeting under-five children, determining the additional resources (funding, human resources, others) required to improve those activities, and illustrating the possible improvements of nutrition situation in that particular upazila if the additional resources are provided. The local level stakeholders may engage in policy dialogue with the senior officials in the line departments (e.g., DGHS and DGFP for Vitamin A Supplementation and IYCF counseling, Department of Women Affairs for Mother and Child Benefit Programme, LGD for WASH interventions, etc.). The policy dialogues should also emphasise on linking improvements in under-five children's nutrition with the broad sectoral/departmental goals of those particular line departments (e.g., in the case of DGHS and DGFP, the broad sectoral goal would be Universal Health Coverage and targets of NPAN2).

Advocacy for Increasing Local Level Budget for Nutrition Interventions:While sectoral advocacy is a “top-down” approach, this particular advocacy is a “bottom-up” approach. In this approach, the local level stakeholders will identify potential sources of funding those can be diverted to enhance the identified activities under the selected nutrition interventions. The budget of local government institutes (mostly the Union Parishad) is one of the largest and most accessible funding sources in this regard. In addition, there are significant private sector actors engaged in relevant sectors of the identified nutrition interventions. For example, companies like Unilever and Reckitt Benckiser have significant budgets for increase mass awareness on WASH issues. SMC has a promotional budget for Monimix, a brand of its Micronutrient Power (MNP). Once a comprehensive list of local level fundings is identified, the local level stakeholders need to do specific advocacy with the respective stakeholders of those sources for additional funding. For example, target for advocacy in this regard may include the Local Government Representatives (e.g. Mayor/Upazila Parishad Chairmen, UP Chairmen), and regional and national officials of private sector actors. These potential funding providers may also be included as part of the local-level committees (e.g., DNCC and UNCC) as part of the advocacy.

ANNEXURE

ANNEX ONE:

APPROACH AND METHODOLOGY FOR CHILD PROFILE ESTIMATES AS PER THE APPROVED PROTOCOL

1. Approach for the Profile Development of U5 Children

The profiling approach was based on the UNICEF Conceptual Framework on the Determinants of Maternal and Child Nutrition[24]. The framework presented the causes of malnutrition on a scale of immediate determinants (diets and care), underlying determinants (food security, caring/feeding practices, and access to health and environments) and enabling determinants (resources, norms and governance), with interactions taking place both within and between various levels in this framework. The profile to be developed was based on this framework that identify and measure the outcomes of nutrition for U5 children in the surveyed areas and the different enabling, underlying and immediate determinants for the nutrition status. Particularly, the following issues were included in the profile:

- Anthropometric data of U5 Children to determine Nutrition Outcomes in the target areas: Measurement of age, weight, height/length and Mid-Upper Arm Circumference (MUAC) value to determine height-for-age, weight-for-age, weight-for-height, and body mass-index-for-age.
- Dietary availability and Dietary practices of U5 Children as underlying and immediate determinant: Dietary intake and dietary practices to measure Minimum Acceptable Diet (MAD), Minimum Dietary Diversity (MDD), age-appropriateness in dietary practice, nutrient-contents of diet, food preparation practices including hygiene practices, etc.
- Food security as an underlying determinant: Status of income, livelihood, food security (in terms of availability, accessibility, and utilization throughout the year), coping mechanisms during food insecurity, etc.
- Access to nutrition-sensitive services as underlying determinants: Access to health, nutrition, education and WASH services and social safety schemes.
- Socio-cultural, geographic and other external factors: E.g., dietary culture like salt intake, food habits due to climactic conditions (e.g., consumption of sea fish), etc.

We used the following approaches for collection and analysis of different types of data for development of the profile, as indicated below:

1.1 Anthropometric Data

For collection of Anthropometric data for the profile development, we used the recommended approaches of WHO and UNICEF, that was developed in 2016 by the WHO-UNICEF Technical Expert Advisory Group on Nutrition Monitoring (TEAM)[25]. Four anthropometric data were collected in this approach – Age of the children (0 to 59 months) in months, height/length in centimeter, weight in kilogram and upper-arm circumference using the mid upper-arm circumference (MUAC) tape. Step-by-step process of the data collection was detailed out in section 3 of this document. For analysis of the anthropometric data, we used the WHO Anthro Survey Analyser[26]. The Anthro Survey Analyser is an online tool developed by the Department of Nutrition for Health and Development at the World Health Organization (WHO), that allows comprehensive analysis of anthropometric survey data. The tool is interactive and allows users to visualize outcomes on input data, z-score distributions, data quality assessment summaries. In addition, it provided a semi-filled summary survey report template with main results, including graphs and tables.

[24]https://www.unicef.org/media/113291/file/UNICEF%20Conceptual%20Framework.pdf

[25]Recommendations for data collection, analysis and reporting on anthropometric indicators in children under 5 years old. Geneva: World Health Organization and the United Nations Children's Fund (UNICEF), 2019. Licence: CC BY-NC-SA 3.0 IGO.

[26]WHO. 2019. WHO Anthro Survey Analyser: Quick Guide. https://worldhealthorg.shinyapps.io/anthro/

1.2 Food Security Data

For collection and analysis of Food Security related data, we used the Food Insecurity Experience Scale (FIES) of Food and Agriculture Organization (FAO)[27] . The FIES is an experience-based metric of food insecurity severity. It relies on people's direct responses to questions about their experiences facing constrained access to food. It consisted of eight questions regarding experiences of the individual respondent or of the respondent's household as a whole on their access to adequate food. The set of eight questions composed of a scale that covers a range of severity of food insecurity (figure 1).

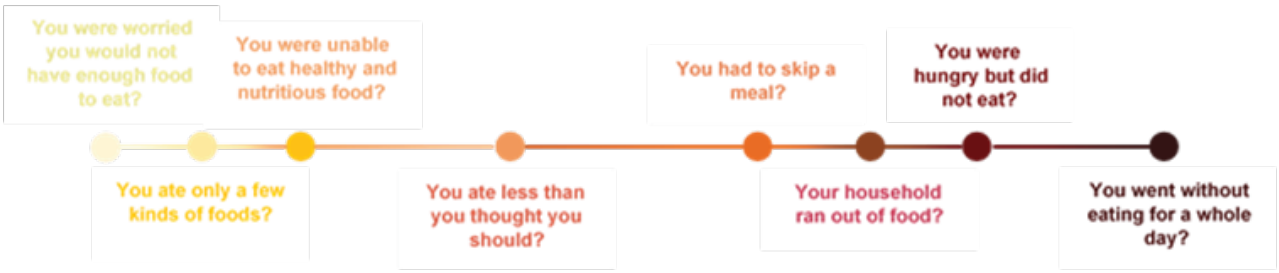


Figure 1: FIES Global Reference Scale - the output from the FIES-SM to be conducted in the assignment (source: FAO website https://www.fao.org/in-action/voices-of-the-hungry/fies/en/)

The Food Insecurity Experience Scale Survey Module (FIES-SM) is composed of eight core questions with dichotomous yes/no responses. The FIES-SM generates data that can be used to produce measures defined on a scale covering a range of severity of food insecurity. Being a flexible tool, FIES-SM incorporates choice of individual-vis-household and food insecurity in the past 12 months-vis-30 days. In this particular assignment, we used both the recall of 12 months and 30 days data.

1.3 Data on Food Insecurity Coping Mechanism

For analyzing the coping mechanism against food insecurity, we used reduced Coping Strategy Index (rCSI)[28] method. This is an indicator used to compare the hardship faced by households due to a shortage of food. The index measures the frequency and severity of the food consumption behaviors the households had to engage in due to food shortage in the 7 days prior to the survey.

1.4 Data on Dietary Pattern

For collection and analysis of dietary practices, we used the Food Consumption Score module of World Food Program (WFP)[29]. FCS is an index that was developed by the World Food Programme (WFP) in 1996. The FCS aggregates household-level data on the diversity and frequency of food groups consumed over the previous seven days, which is then weighted according to the relative nutritional value of the consumed food groups. For instance, food groups containing nutritionally dense foods, such as animal products, are given greater weight than those containing less nutritionally dense foods, such as tubers. Based on this score, a household's food consumption can be further classified into one of three categories: poor, borderline, or acceptable. The food consumption score is a proxy indicator of household caloric availability.A brief questionnaire was used to ask respondents about the frequency of their household's consumption of eight different food groups over the previous seven days. To calculate the FCS from these results, the consumption frequencies were summed and multiplied by the standardized food group weight. Households were then be further classified as having poor, borderline, or acceptable food consumption by applying the WFP's recommended cut-offs to the food consumption score.

[27]https://www.fao.org/in-action/voices-of-the-hungry/fies/en/

[28]https://resources.vam.wfp.org/data-analysis/quantitative/food-security/reduced-coping-strategies-index

[29]https://resources.vam.wfp.org/data-analysis/quantitative/food-security/food-consumption-score

2. Methodology

2.1 Secondary Literature Review

The assignment involved a rapid review and included all available literature that provided information on costing of nutrition-sensitive and nutrition-specific interventions among U5 children in Bangladesh. The search was done through PUBMED, MEDLINE and WORLDCAT databases for articles published on the Bangladesh situation. The search terms used included "Costing", "Cost Estimation", "Cost Benefit Analysis", "Nutrition Sensitive Interventions", "Nutrition Specific Interventions", "Under Five Children", and "Bangladesh". Searches were limited by English language and for WORLDCAT as some key words were limited to book and archival material. In addition to the articles found from this method, a number of Grey Literature was also collected and reviewed from the websites of MOHFW, DGHS, NNS, BNNC, SUN, Cabinet Division, R2G, UNICEF, WHO, BBS and Save the Children. The secondary literature review also included a review of relevant acts, regulations, policies, strategies and guidelines. The consultants in the TTC team conducted a number of policy reviews on health and nutrition-related policies in Bangladesh. A list of the policy documents for review was developed and finalized in discussion with Save the Children and R2G consortium members.

2.2 Household Survey with U5 Children and their HH Members

For the first components of this assignment, i.e., the child profile estimate, households of the U5 children were the respondents. As the project was implemented in two administrative divisions in selected coastal areas the survey collected data from the selected districts of those administrative divisions. The sample size was calculated based on one division and then multiplied by 2 to determine the total sample size for both divisions. We used the following formula:

n = N*X / (X + N – 1),

where,

X = Zα/22 *p*(1-p) / MOE2,and Zα/2 is the critical value of the Normal distribution at α/2, MOE is the margin of error, p is the sample proportion, and N is the population size. Considering the confidence level of 95% and the MOE of 5%, the sample size in a given population comes to 385. To address any non-response issues, we considered a design factor of 20%, which increased the sample size to 461. Multiplying by 2, the total sample size for both divisions was 922. The samples were taken using the following sample distribution.

Division	District	Upazila	Sample Size
Khulna	Khulna	Dumuria	188
	Satkhira	Debhata	187
Barishal	Barguna	Taltoli	187
	Patuakhali	Sadar	180
		Galachipa	180
		Total	**922**

We had taken the list containing households with at least one U5 child, taking support from the responsible person of registering for birth. From this list of households with at least one U5, we took the required number of samples allocated for that union and Paurasava randomly.

Survey Manual

A survey manual was developed to appropriately manage the data collection through the survey. The manual included a clear description of field data collection procedures adapted for use by the survey teams. It included specific instructions for the interviewer on local customs and how to introduce the team to respondents, identify sampled households, initiate call-backs based on the protocol for full completion of the questionnaire and perform anthropometry measurement procedures correctly, etc. A chapter describing how to perform supervision tasks and conduct standardization procedures to ensure quality assurance during data collection was also included in this manual.

Selection and Training of Survey Team

A team of ten enumerators was engaged for conducting household surveys, with two third of them being female. There were two supervisors in the team to supervise the data collection process, ensure completeness and quality of data and on-time completion of the survey. The recruitment was done from the internal pool of field resources of TTC. The recruitment was done based on the previous experience of the members, their relevant academic performance and their knowledge of the geographical area and socio-cultural context.

The team was trained by the senior team members of TTC, including the Team Leader and the team statistician. Experts from Save the Children also participated in the training as resource persons. There were three days of training – two days in the class-room setting and one day in the field. Team members were clearly informed about the requirements of the survey: time needed for field work and ensuring commitment, local conditions (lodgings, transportation, per diem, remuneration), security issues and the length of the working day or week in order to limit drop-outs. The training ensured that field team members were aware of and followed the sampling plan (households should not be replaced in the field for any reason), and performed call-back procedures (minimum of 2 call-backs at different times of the day if the initial visit did not provide a completed interview) and complete the household questionnaire.

Administration of the Survey

After the training was completed, the supervisors visited the respective unions and with the support from the local CSOs, collected the list of households having U5 children from the local Union Parishad (UP) secretary. From this list, the supervisors were to randomly take the number of samples allocated for the respective union of the upazila and prepare the list of respondents. This was the primary list of sample respondents. The supervisors then will use the same process and prepare a second list of respondents, which would contain 20% of the samples of the primary list. This second list was used as an alternative sample respondent list. If in any case the respondent from the primary list were not available, even after the callbacks, then the sample was replaced with one of the respondents randomly selected from this alternative list.

The enumerators, under the supervision of the supervisors, visited the respondents' households and administered the FIES-SM, rCSI, FCS and access to survey modules of the tool. Household heads were the target respondents to respond to the questions. The enumerators ensured that the respondents were in a safe and comfortable space. The enumerator explained the purpose of the survey, and the objectives, and indicated that the participation of the respondentswas voluntary. The enumerator also mentioned that the respondent would be able to withdraw from the survey before or during the questioning process. After explanation, the enumerator asked for the verbal consent of the respondent. If the respondent provided consent, then the administration of the tools was initiated. The enumerator followed the manual, delivered the questions and recorded the responses in the ODK tool.

2.3 Taking Anthropometric Measurement

The eligible children and their parents/caregivers were gathered at the nearest Community Clinic, taking support from the partner CSOs of the R2G project. In the clinic, the anthropometric measures were taken by the Community Healthcare Provider (CHCP), who were already trained by respective DGHS departments on taking anthropometric measures that this assignment was interested in. The enumerator recorded the values of the anthropometric measures in the respective sections of the tool. The following issues will be carefully considered while taking the anthropometric measures:

- **Recording the date of birth:**
  - Checked documentary evidence for taking the date of birth and calculating the age of the children. Evidenceincluded the birth registration certificate or health card of the children.
  - If documentary evidence was not available then it was asked the mother/caregiver the date of birth.
  - If mother/caregiver couldn't rememberthen a local event calendar was used and asked the mother/caregiver to approximately point out the date of birth.
  - If the local events calendar were used, it was impossible to identify the exact day of birth. In that case, the enumerator had entered 98 (unknown) for the day of birth and entered the birth month and

year as determined by the local events calendar.

- The source of the information was recorded in the questionnaire for the age of the children

- **Preparation for Anthropometric Measurement:**
  - Anthropometrists (CHCP or female enumerator) did nothave long fingernails and their hands were clean before approaching children who were about to be measured. Anthropometrists removed any object from their hands and wrists such as clunky watches or bracelets so as to prevent them from getting in the way and hampering the measurement or even harming the child. No member of the field team smoked while working.
  - A careful choice was made about where to place the measuring board and scale. Ideally, it was a sturdy, flat surface for the measuring board and digital weighing scale, and sufficient light for the measurements to be read with precision. If the floor were not flat, a wooden board was used in order to stabilize the scale.
  - When a child is brought into contact with any measuring equipment (length/height board or weighing scale), the child is held carefully so that he or she does not trip or fall. Children were never left alone with a piece of equipment; physical contact with the child, except for the few seconds while taking his or her weight, was always maintained. Remembered that the caretaker was not assisting in the measurement process but could and should talked to and soothed the child while measurements were carried out.
  - When taking weight and length/height measurements, the child needed to be as calm as possible. A child who was excited or scared could make it very difficult to get an accurate measurement. Infants and young children were held by their mother to foster a sense of security. This was done right up to the point of measurement, but not during measurement for length. If a child had shown distress this can have a big emotional impact on the other children who were waiting to be measured. It was better to leave the distressed child to calm down and come back later to weigh and measure that particular child. In some cases, it was possible to weigh and measure a distressed child after he or she had seen other children— especially siblings—go through the measurement process.
  - Children under 2 years of age or who cannot stand still were best weighed with the mother holding them ("tared weight"). In this case, weighted first the mother, then switched the scale to the tared mode and weighted the mother together with the baby: the scale displayed the baby's weight. If the child was not able or willing to stand on the scale, the tared weight were used. The tared weights were used for a child of any age provided the child was held properly by the mother. Children two years of age or older were weighed alone, provided the child stood still or did not jump while standing on the scale. If the child was fidgety it was better to adopt the tared weighing procedure instead.
  - For children less than 2 years, length was measured. Shoes were taken off before measuring the length. Anthropometrist will ensure that the board was in the right position and placed on level ground. If the anthropometrist were unable to get the child to put both legs outstretched in the correct position, s/he made sure at least one leg was straight with the foot flexed against the footpiece. Allowing the child to adopt a position with only one straight leg was regarded as an exception and permitted only when extremely difficult children were being measured. In every case, the actual position adopted (lying down/recumbent length will be systematically recorded.
  - Height was measured for children of 2 years or older. When measuring a child, an anthropometrist asks the parent/caretaker to place the child on the board and kneel in front of the child. In every case, the actual position adopted (standing) was systematically recorded in the questionnaire.

- For taking the MUAC value, the anthropometristexplained the process to the child's mother or caregiver. It ensured that children were not wearing any clothing on their left arm. The child stood straight and sideways to the measurer. The measureswere to bend the child's left arm at 90 degrees to the body, find the midpoint of the upper arm and mark with a pen the mid-upper arm point. Using both hands, the measurer placed the MUAC tape window (0 cm) on the midpoint. While keeping the left hand steady, the measurer wrapped the MUAC tape around the outside of the arm with the right hand. Then, the measurer was fed the MUAC tape through the hole in the tape while keeping the right hand planted on the arm. The tape was pulled until it fits securely around the arm while keeping the right hand steady on the child's arm. The readings were recorded at the window of the MUAC tape to the nearest millimeter level.

Quality Assurance for Anthropometric Data Collection

- Accurate anthropometric measurements play a crucial role in both clinical and epidemiological research, serving as a foundational element for reliable data analysis. Inherent variations in measurement methods can stem from biological diversity or measurement errors, which, while unavoidable, can be mitigated to a significant extent. To ensure data quality, we employed technical error measurement methods. Reliability, a key aspect of measurement quality, encompasses precision and dependability. Precision indicates the consistency of repeated measurements over time, while dependability considers physiological fluctuations within individuals. Accuracy, on the other hand, assesses how closely a measurement aligns with its true value. Random errors impact reliability, whereas inaccuracy results from systematic bias. Observer-related factors, such as inconsistencies in landmark identification or instrument pressure application, and subject-related factors, like variations in respiration or posture changes, influence reliability. Inaccuracy may arise from instrument errors or mistakes in measurement techniques.
- In terms of the percentage of Technical Error of Measurement (% TEM), an intraobserver range below 1.5% and an interobserver range below 2% are considered acceptable. In the specific study at hand, the % TEM results were found to be well within the acceptable range, standing at less than 1% for both intraobserver and interobserver measurements. A meticulous approach was taken during data collection, with a high level of supervision maintained throughout the process. Enumerators were dedicated to achieving accuracy in all anthropometric data collection, reinforcing the commitment to maintaining an acceptable % TEM and ensuring overall data quality.

Annex Two:
Tools Used for the Research

Child Profile Estimates and Costing Model Development to Reduce Child Undernutrition in Coastal Area of Bangladesh

Household Survey Questionnaire

A. IDENTIFIER AND GEN ERAL QUESTIONS:		
101. Name of the Respondent: |_____|		
102. Age: |__|__|	**103. Gender**: |__| (*Female = 1; Male = 2; Others = 3*)	
104. Village: |_____|	**105. Union:** |_____|	
106. Upazila: |__|__|_|	**107. District:** |__|__|	
108. Interview ID: |_____|	**109. No of Household Members:** |__|__|	
110.a. Age specific number of household members :		
Age of HH Member 1: ---------- Years		
Age of HH Member 2: ---------- Years		
Age of HH Mem ber 3: ---------- Years		
Age of HH Mem ber 4: ---------- Years		
Age of HH Member 5: ---------- Years		
Age of HH Member 6: ---------- Years		
110.b Male: |__|__| Female: |__|__|		
111. No of Earning Members: |__| 111. a. Male: |_|_| 111.b. Female: |_|_|		
113. No of School-aged Children: |__|__|	**114. No of Children Going School:** |__|__|	
115. Educational Qualification of Respondent: |__|		
(*Illiterate = 1; Primary/Ebtidai or equivalent= 2; Secondary = 3; SSC/ Dakhil or equivalent = 4; HSC/Alim or equivalent = 5; Graduation/ Fazil or Higher = 6; Others = 7*)		
116. Primary Occupation of the Respondent[34]:|__|	**117. Secondary Occupation[35]:**|__|	
(*Homemaker = 1; Field -crops farming = 2; Poultry = 3; Dairy = 4; Beef Fattening = 5; Tailoring = 6; F ish culture = 7; Other Agriculture = 8; Other Aquaculture = 9; Grocery Shop = 10; Handicrafts = 11; Govt. Service = 12; Private Service = 13; Informal Sector Employment = 14; Others (Specify) = 15*)		
118. Marital Status: |__| (*Married = 1; Unmarried = 2; Div orced/Separated = 3; Widowed = 4; Other Marital Status = 5*)		
119. No of Persons with Disability in the Family : |__|__|		
120. Did your child attend to the govt. pre -primary school? (Early Childhood Education Program)	[ ]Yes	[ ] No →1301.a
120a. Did your child attend to the private pre-primary school?	[ ]Yes	[ ] No
121. Do your children attending the primary school before 5 years of age? (children aged 3 -5 years)	[ ]Yes	[ ] No
1303. Educational status of mother:	|__| (Use appropriate code)	
(*Illiterate = 1; Primary/Ebtidai or equivalent= 2; Secondary = 3; SSC/ Dakhil or equivalent = 4; HSC/Alim or equivalent = 5; Graduation/ Fazil or Higher = 6; Others = 7*)		

[34] Profession in which the respondent puts majority of the time in a day, and/or profession from which majority of the income of the respondent comes (in appropriate cases)

[35] Profession in which the respondent puts less time than primary occupation, but, earns some income

B. ANTHROPOMETRIC DATA	
201. Name of the children (U5): |_____|	202. Date of Birth [DD/MM/YY]:
202. Age (Months): |_____|	203: Weight (Kilogram): |_____|
204. Height (centimeter): |_____|	205. MUAC value: |_____|
206. Age of Mother/ Caregiver: |__|__|	

C. HOUSEHOLD ECONOMIC QUESTIONS:
301. Total Household Expenditure[36] : BDT |_|_|_|_|_|_| per Month
302. Total Household Food Expenditure: BDT |_|_|_|_|_|_| per Month
303. Total Household Non -Food Expenditure: BDT |_|_|_|_|_|_| per Month
304. House hold Savings: BDT |_|_|_|_|_|_| per Month
305. Total Household Income[37] : BDT |_|_|_|_|_|_| per Month or BDT |_|_|_|_|_|_| per Year
306 a. Income from Field Crops: BDT |_|_|_|_|_|_| per Cycle; b: No of Cycle/Year: |_|
307 a. Income from Vegetabl es: BDT |_|_|_|_|_|_| per Cycle; b: No of Cycle/Year: |_|
308 a. Income from Other Agriculture: BDT |_|_|_|_|_|_| per Cycle; b: No of Cycle/Year: |_|
309 a. Income from White Fish: BDT |_|_|_|_|_|_| per Cycle; b: No of Cycle/Year: |_|_|
310 a. Income from Shrimp/Prawn: BDT |_|_|_|_|_|_| per Cycle; b: No of Cycle/Year: |_|_|
311 a. Income Crab Fattening: BDT |_|_|_|_|_|_| per Cycle; b: No of Cycle/Year: |_|_|
312. Income from Dairy: BDT |_|_|_|_|_|_| per Month or BDT |_|_|_|_|_|_| per Year
313. Income from Beef Fattening: BDT |_|_|_|_|_|_| per Year
314. Income from Goat/Sheep Rearing: BDT |_|_|_|_|_|_| per Year
315. Income from Poultry[38] : BDT |_|_|_|_|_|_| per Month
316. a. Salary from Services: BDT |_|_|_|_|_|_| per Month b: No of Month/Year: |_|_|
317. a. Earning from Labour/Rickshaw Pulling: BDT |_|_| per Day b. No of Day/Year: |_|_|
318. a. Remittance: BDT |_|_|_|_|_|_| per Month b: No of Month/Year: |_|_
319. a. Income from Informal Works: BDT |_|_|_|_|_| per Mon th b: No of Month/Year: |_|_|
320. a. Income from Handicrafts: BDT |_|_|_|_|_| per Month b: No of Month/Year: |_|_|
321. a. Income from Entrepreneurship[39]: BDT |_|_|_|_|_| per Month b: No of Month/Year: |_|_|
322. Other Income: BDT |_|_|_|_|_| per Mon th b: No of Month/Year: |_|_|

[36] Amount in 302 should be equivalent to sum of 303 and 304

[37] Combined income of all the earning household members, expressed either in BDT/Month or BDT/Year

[38] Combined income from selling birds, eggs and other poultry produces

[39] NOT included the income from the CSO Community Store or CSO business

D. ACCESS TO SOCIAL SECURITY SCHEMES
401. Is there anyone in the household receiving any of the following supports ? [Yes=1, No=0]
a. Old Age Allowance |__|
b. Allowance for Widow, Deserted and Destitute Women |__|
c. Allowance for Financially Insolvent Disabled |__|
d. Mother and Child Benefit Programme |__|
e. Vulnerable Group Development (VGD) |__|
f. Vulnerable Group Feeding (VGF) |__|
g. Money for Work |__|
h. Food for Work |__|
i. Employment Generation Program for Poor (EGPP) |__|
j. Test Relief |__|
k. Agricultural Subsidy |__|
l. Women's Skill Based Training for Livelihood |__|
m. Special Assistance Fund for Women Development and Women Entrepreneurs |__|
n. National Service |__|
o. Ashroyan |__|
p. OMS
q. TCB Card
r. Joyeeta |__|
s. Income Support Program for the Poorest |__|
t. Others (Specify)……
402. What is the total economic benefit you receive from these social security schemes? (*Multiple answers are possible*)?
a. BDT |_|_|_|_|_|_| per Month for |_|_| Months
b. Work for |_|_ Days at a rate of BDT |_|_ _|_| per Day
c. One time materials worth of BDT |_|_|_|_|_|
d. Interest-free loan of BDT |_|_|_|_|_|
e. Food support worth of BDT |_|_|_|_|_| per month
f. Others (specify) |_____|

E. FOOD INSECURITY EXPERIENCE SCALE SURVEY (12 MONTHS+ 30 Days)					
	0 1	No Yes	98 99	Don't Know Refused	*If "Yes", ask 501a (otherw ise go to 502)*
501a. Did this happen in the past 4 weeks (30 days)?	0 1	No Yes	98 99	Don't Know Refused	
502. Still thinking about the 12 months , was there a time when you or others in your household were unable to eat healthy and nutritious food becau se of a lack of money or other resources?	0 1	No Yes	98 99	Don't Know Refused	*If "Yes", ask 502a (otherwise go to 503)*
502a. Did this happen in the past 4 weeks (30 days)?	0 1	No Yes	98 99	Don't Know Refused	
503. During the last 12 months , was there a time when you or others in your household ate only a few kinds of foods because of a lack of money or other resources?	0 1	No Yes	98 99	Don't Know Refused	*If "Yes", ask 503a (otherwise go to 504)*
503a. Did this happen in the past 4 weeks (30 days)?	0 1	No Yes	98 99	Don't Know Refused	
504. During the last 12 months , was there a time when you or others in your household had to skip a meal because there was not enough money or other resources to get food?	0 1	No Yes	98 99	Don't Know Refused	*If "Yes", a sk 504a (otherwise go to 505)*
504a. Did this happen in the past 4 weeks (30 days)?	0 1	No Yes	98 99	Don't Know Refused	
505. Still thinking about the last 12 months , was there a time when you ate or others in your household less than you thought you sho uld because of a lack of money or other resources?	0 1	No Yes	98 99	Don't Know Refused	*If "Yes", ask 505a (otherwise go to 506)*
505a. Did this happen in the past 4 weeks (30 days)?	0 1	No Yes	98 99	Don't Know Refused	
506. In the past 12 months , was th ere ever no food to eat of any kind in your house because of lack of resources to get food?	0 1	No Yes	98 99	Don't Know Refused	*If "Yes", ask 506a (otherwise go to 507)*
506a. Did this happen in the past 4 weeks (30 days)?	0 1	No Yes	98 99	Don't Know Ref used	
506b. How often did this happen in the past 4 weeks (30 days)?	1 Rarely (1 or 2 times) 2 Sometimes (3 -10 times) 3 Often (more than 10 times) 98 Don't Know 99 Refused				

1106Jswt If "yes": Was the drink or were any of these drinks sweetened?	1	2	9
QUESTIONS ABOUT FOODS **Questions about foods are asked for all living children under two years.**			
Question	**Response and code**		
Now I would like to ask you about foods that [NAME] had yesterday during the day or at night. I am interested in foods your child ate whether at home or somewhere else. Please think about snacks and small meals as well as main meals. I will ask you about different types of foods, and I would like to know whether your child ate the food even if it was combined with other foods in a mixed dish like Please do not answer "yes" for any food or ingredient used in a small amount to add flavour to a dish. Yesterday during the day or at night, did [NAME] eat:			
1107A. Yogurt, other than yogurt drinks?	1	2	9 If "no" or "DK", skip to 1107B
1107ANum. If "yes": How many times did [NAME] eat yogurt? If more than 7, record "7" *If number of times not known, record "9"*	Number of times _____		
1107B. bread, rice, noodles, puff rice, Chira	1	2	9
1107C. Pumpkin, carrots, sweet red peppers, squash or sweet potatoes that are yellow or orange inside?	1	2	9
1107D. Plantains, white potatoes, yams, radish	1	2	9
1107E. Dark green leafy vegetables such as spinach, Pui, red leave, broccoli, carrots, peppers, green beans, eggplant, cauliflower, raw banana, cabbage brinjal	1	2	9
1107F. Any other vegetables, such as cucumber, tomato	1	2	9
1107G. Ripe mangoes or ripe papayas or , Bangi, Hog plum, date palm	1	2	9
1107H. Any other fruits, such as bananas, apples, lemon, orange, guava, jujube (boroi), jackfruit, black berry, lychee, watermelon, sugar cane etc.	1	2	9
1107I. Liver, kidney, heart or	1	2	9
1107J. Sausages, hot dogs/frankfurters, Burger?	1	2	9
1107K. Any other meat, such as beef, lamb, goat, chicken, duck	1	2	9

507. In the past 12 months , did you ever go to sleep at night hungry because ther e was not enough food.	0 1	No Yes	98 99	Don't Know Refused	*If "Yes", ask 507a (otherwise go to 508)*
507a. Did this happen in the past 4 weeks (30 days)?	0 1	No Yes	98 99	Don't Know Refused	
507b. How often did this happen in the past 4 weeks (30 days)?	1 Rarely (1 or 2 times) 2 Sometimes (3 -10 times) 3 Often (more than 10 times) 98 Don't Know 99 Refused				
508. During the last 12 months, did you ever go a whole day and night without eating anything at all because there was not enough food?	0 1	No Yes	98 99	Don't Know Refused	*If "Yes", ask 508a (otherwise end)*
508a. Did this happen in the past 4 weeks (30 days)?	0 1	No Yes	98 99	Don't Know Refused	
508b. How often did this happen in the past 4 weeks (30 days)?	1 Rarely (1 or 2 times) 2 Sometimes (3 -10 times) 3 Often (more than 10 times) 98 Don't Know 99 Refused				

F. REDUCED COPING STRATEGIES INDEX

601. During the past 30 days, did anyone in your household have to engage in any of the following behaviors due to a lack of food or a lack of money to bu y food or meet other basic needs? [*Put 1 = no, I did not face a shortage of food 2 = no, because I alr eady sold those assets or exhausted this activity and cannot continue to do it 3 = yes 4 = N/A*]

Coping Strategy	Response
601a. Selling household goods (Mobile, solar panel, television, other HH goods, etc.)	|__|
601a Selling jewelry/gold or similar household assets	|__|
601a. Spent savings	|__|
601a. Bought food on credit	|__|
601a. Borrowed money to buy food	|__|
601a.Selling productive assets or me ans of transport (Sewing machine, livestock, etc.)	|__|
601a.Reduce essential non-food expenditures such as education, health and clothes	|__|
601a. Withdrew children from school	|__|
601a. Children (under 15 years old) are working to contribute to hous ehold income	|__|
601a. Children (15 -17) are working long hours (>43 hours) or work in hazardous conditions	|__|
601a . Adults (18+) are working long -hours (>43 hours) or in hazardous conditions	|__|
601a .Marriage of children under 18	|__|
601a Begging	|__|

601a Accept high risks, illegal temporary job	|__|
601a Sold house or land	|__|
601a. Reduced expenses on agricultural, livestock or fisheries inputs	|__|
601a.Depending on support from neighbors and relatives as only food/income source	|__|
601a. Selling labor in advance	|__|
602. During the **last 7 days** , were there days (and, if so, how many) when your household had to employ one of the following strategies (to cope with a lack of food or money to buy it)?	Frequency (number of days from 0 to 7)
602a.Relied on less preferred, less expensive food	| __ |
602b. Borrowed food or relied on help from friends or relatives	| __ |
602c.Reduced the number of meals eaten per day	| __ |
602d.Reduced portion size of meals	| __ |
602e.Restricted consumpt ion by adults in order for small children to eat	| __ |

G. HOUSEHOLD DIETARY DIVERSITY

Now I would like to ask you about the types of foods that you or anyone else in your household ate yesterday during the day and at night.

Breakfast	Snack	Lunch	Snack	Dinner	Snack

When the respondent recall is complete, fill in the food groups based on the information recorded above.
For any food groups not mentioned, ask the respondent if a food item from this group was consumed

#	Food Group	Exampl es	YES=1 NO=0	
A	CEREALS	Rice, flour bread (Ruti), Noodles, Biscuits, Corn, Wheat		
B	WHITE ROOTS AND TUBERS	White Potatoes, taro (Mukhi kochu), Yam (Pesta Alu_		
C	VITAMIN A RICH VEGETABLES AND TUBERS	pumpkin, carrot, squash, or sweet potato, caulifl ower, raw banana,		
D	ARK GREEN LEAFY VEGETABLES	spinach, cabbage other leaves		
E	OTHER VEGETABLES	Tomato, Onion, eggplant etc		
F	VITAMIN A RICH FRUIT	Bananas, apples, Ripe mango, ripe papaya, orange,		

G	Other Fruits	guava, jujube (boroi), jackfru it, black berry, lychee etc.		
H	ORGAN MEAT	liver, kidney, heart or other organ meats		
I	FLESH MEATS	beef, lamb, goat, chicken, duck, other birds		
J	EGGS	eggs from chicken, duck and others		
K	FISH AND SEAFOOD	fresh or dried fish or Seafood		
L	NUT S AND SEEDS	dried beans, lentils, nuts, seeds or foods made from these		
M	MILK AND MILK PRODUCTS	milk, cheese, yogurt or other milk products		
N	OILS AND FATS	oil, fats or butter added to food or used for cooking		
O	SWEETS	sugar, honey, sweetened sod a or sweetened juice drinks, sugary foods such as chocolates, candies, cookies and cakes sugar, sweets, molasses, honey, sugary drinks, sweet snacks (cake, etc.)		
P	SPICES, CONDIMENTS, BEVERAGES	tea, coffee, salt, garlic, ginger, spices, tomato paste or sauce, a small amount of milk for tea/coffee		
Q	Did you or anyone in your household eat anything (meal or snack) OUTSIDE the home yesterday?			

H. WATER SANITATION AND HYGIENE		
Water Sources		
801. What is the main source of drinking water for members of this household?	**Improved water source**	**Unimproved water source**
	[_] 1. Household connection	[_]5. Unprotected dug well
	[_] 2. Tubewell or Borehole	[_] 6. Pond, river or stream
	[_] 3. Protected dug well	[_] 7. Unimproved rainwater collection
	[_] 4. Improved rainwater collection 1	[_] 8. Vendor-provided water
		[_] 9. Bottled water
		[_] 10. Tanker truck water
		[_] 11. Others, specify
802. Do you use the main water source all year or only part of the year?	[_] 1. Whole year	→ 805
	[_] 2. Dry Season only	→ 804

	[_] 2. Wet Season only	→ 804
804.During the other part of the year (dry or wet season), what is th main source of drinking water for members of this household?	**Improved water source**	**Unimproved water source**
	[_] 1. Household connection	[_]5. Unprotected dug well
	[_] 2. Tubewell or Borehole	[_] 6. Pond, river or stream
	[_] 3. Protected dug well	[_] 7. Unimproved rainwater collection
	[_] 4. Improved rainwater collection 1	[_] 8. Vendor-provided water
		[_] 9. Bottled water
		[_] 10. Tanker truck water
		[_] 11. Others, specify
805. What is the main source of water used by this household for handwashing?	Improved water source	Unimproved water source
	[_] 1. Household connection	[_]5. Unprotected dug well
	[_] 2. Tubewell or Borehole	[_] 6. Pond, river or stream
	[_] 3. Protected dug well	[_] 7. Unimproved rainwater collection
	[_] 4. Improved rainwater collection 1	[_] 8. Vendor-provided water
		[_] 9. Bottled water
		[_] 10. Tanker truck water
		[_] 11. Others, specify

Sanitation Facilities		
901. Do you have a latrine?	[_] Yes	[_] No
901a. If yes, is the latrine functioning/ usable now?	[ ] Yes →901c	[_] No → 901.b
901b. If no, why not?	Check appropriate boxes →	
	[_] 1. Dirty	[_] 6. Not finished building
	[_] 2. Full	[_] 7. Used as storage
	[_] 3. No water to flush	[_] 8. Smells bad
	[_] 4. Slab broken	[_] 9. Prefer the field/ forest
	[_] 5. Superstructure broken/ missing	[_] 10. Other
902. What kind of latrine do you have? Check appropriate box	Improved	Unimproved
	[_] 1. Flush or pour flush to sewerage	[_] 5. Flush or pour flush to elsewhere
	[_] 2. Flush or pour flush to se ptic tank or pit	[_] 6. Open pit latrine without slab
	[_] 3. Pit latrine with slab	[_] 7. Latrine overhanging water
	[_] 4. Public or shared latrine (any type)	[_] 8. Other
903. Was your latrine flooded in th past year?	[ ]Yes	[ ] No

905. What do you do when your latrine is broken/ collapsed/ become unusable?	Check appropriate box	
	[_] 1. Build new latrine 906	[_] 5. Use public latrine
	[_] 2. Fix/ repair latrine 906	[_] 6. Revert to OD
	[_] 3. Use neighbor's latrine	[_] 7. Others, specify
	[_] 4. Use relative's latrine	
906. What do you do when your latrine is broken/ collapsed/ become unusable?	Check appropriate box	
	[_] 1. Immediately/ ASAP	[_] 4. After rainy season
	[_] 2. When have money/ materials	[_] 5. Others, specify
	[_] 3. When receive external support/ assistance	
Handwashing and Hygiene practice		
1001. Do you have a habit of handwashing?	[ ]Yes	[ ]No,→ 1002
1001.a If yes, what do you usually use in handwashing? (Choose only one)	[_] 1. Water only	[_] 4. Others, specify
	[_] 2. Water and soap	
	[_] 3. Water with ash	
1001b. If yes, when do you wash your hands with (Please check all that apply)	[_] 1. when hands are dirty	[_] 6. Before preparing food
	[ ] 2. when returning to house from work/ from outside	[ ] 7. After cleaning infant who has defecated
	[_] 3. Before eating	[_] 8. After touching animals
	[_] 4. After eating	[_] 9. After disposal of animal faeces
	[_] 5. After defecation	[_] 10. Others, specify
1002. Do your children (under 5 yrs) have a habit of handwashing?	[ ] Yes	[ ] No
1002 a. if yes, what do your children usually in handwashing? (choose only one)	[_] 1. Water only	[_] 3. Water with ash
	[_] 2. Water and soap	[_] 4. Others, specify
1002b. If yes, when do your children wash their hands with _ (Response in 58a)? Please check all that apply	[_] 1. when hands are dirty	[_] 6. Before preparing food
	[_] 2. when returning to house from work/ from outside	[_] 7. After cleaning infant who has defecated
	[_] 3. Before eating	[_] 8. After touching animals
	[_] 4. After eating	[_] 9. After disposal of animal faeces
	[_] 5. After defecation	[_] 10. Others, specify
1003. (If there is an infant in the HHs) Where do you usually dispose of infants' faeces? Please check only one.	**Dry Season**	**Wet Season**
	[_] 1. Bury	[_] 1. Bury
	[_] 2. Throw in forest/ bush/ water body	[_] 2. Throw in forest/ bush/ water body
	[_] 3. Throw in your own latrine	[_] 3. Throw in your own latrine
	[_] 4. Throw in neighbour latrine	[_] 4. Throw in neighbour latrine
	[_] 5. Others, Specify	[_] 5. Others, Specify

HOUSEHOLD OBSERVATION GUIDE		
Latrines		
1. (For Pit Latrines) – Is there a cover for the hole?	[ ] Yes	[ ] No
2. Is the slab smooth and easy to clean?	[ ] Yes	[ ] No

1. Does the latrine have walls, a roof, and a door?	[ ] Yes	[ ] No
2. Are human faeces visible on the floor or slab of latrine?	[ ] Yes	[ ] No
3. Is there a handwashing place inside or just outside the latrine?	[ ] Yes	[ ] No
If yes, please note down what types of handwashing materials		
a. Supply water line with tap	[ ] Yes	[ ] No
b. Jar and Water	[ ] Yes	[ ] No
c. Soap	[ ] Yes	[ ] No
d. Ash	[ ] Yes	[ ] No
e. Sand	[ ] Yes	[ ] No
f. Others/ specify……..		
Main drinking water source		
6. Are the immediate surroundings of the drinking water source clean? (not muddy, no human or animal faeces/ wastes, garbage)	[ ] Yes	[ ] No
7. Are animals loitering and/ or drinking from the drinking water source?	[ ] Yes	[ ] No
8. Are there observable indications that people take a bath in/at the drinking water source? (Soap/ soap leftovers, clothes, towels, etc.)	[ ] Yes	[ ] No
Handwashing Station		
A fixed HAND-WASHING AREA IS IDENTIFIED, OBSERVE FOR THE FOLLOWING		
9. Is there water at the fixed handwashing facility?	[ ] Yes	[ ] No
10. What handwashing materials are observed? Check appropriate box	[ ] 1. Bar soap [ ] 2. Liquid soap [ ] 3. Powder soap [ ] 4. Ash	[ ] 5. Sand [ ] 6. Others, specify
11. Is there a water supply line with a tap?	[ ]Yes	[ ]No
12. Is there a water jar with a bucket?	[ ]Yes	[ ]No
No DESIGNATED HAND -WASHING AREA IS IDENTIFIED, observe th e following in the area where handwashing is usually done:		
13. In which place family members wash their hands?	[ ] 1. The main water collection point [ ] 2. front of drinking water source [ ] 3. Any place in the courtyard	[ ] 4. At the kitchen/ beside th e kitchen [ ] 5. Near to the toilet [ ] 6. Others/ specify……
14. is there water?	[ ]Yes	[ ]No
b. What handwashing materials are observed? Check appropriate box	[ ] 1. Bar soap [ ] 2. Liquid soap [ ] 3. Powder soap	[ ] 4. Ash [ ] 5. Sand [ ] 6. No materials their [ ] 7. Others, specify

NUTRITION-IYCF			
Ask for all live births that occurred in the last 24 months and are thus generally applicable to women of reproductive age.			
Question	**Response**	**Code**	**Skip**
1101. Was [NAME] ever breastfed?	Yes No	1 2	If "no", END questions about retrospective feeding
1102. How long after birth was [NAME] first put to the breast? *If immediately, circle "000"* *If less than one hour, record "00" hours If less than 24 hours, record hours Otherwise, record days*	Immediately Hours: Days:	000 1|_____|_____| 2|_____|_____|	
1102. Did you breastfeed your baby every two hours until 6 months of age?	[ ] Yes →1102.b	[ ] No	
1102.b Where did you get the message	[_] 1. CHCP [_] 2. UHC [_] 3. Govt. frontline Health Worker (HA/HI) [_] 4. Private hospital/ clinic [_] 5. Private practitioner	[_] 6. Community Paramedic [_] 7. UHFWC [_] 8. Neighbours [_] 9. Others, Specify	
1103. In the first two days after delivery, was [NAME] given anything other than breast milk to eat or drink – anything at all like water, infant formula,	Yes No	1 2	
QUESTIONS ABOUT CURRENT BREAST - AND BOTTLE -FEEDING **Please ask for all living children under 24 months.**			
Question	**Response**	**Code**	
1104. Was [NAME] breastfed yesterday during the day or at night?	Yes	1	
	No	2	
	Don't know	9	
1105. Did [NAME] drink anything from a bottle with a nipple yesterday during the day or at night?	Yes	1	
	No	2	
	Don't know	9	
QUESTIONS ABOUT LIQUIDS **Questions about liquids should be asked for all living children aged under two years.**			
Question	**Response and code**		
1106. Now I would like to ask you about liquids that [NAME] had yesterday during the day or at night. Please tell me about all drinks, whether [NAME] had them at home, or somewhere else. Yesterday during the day or at night, did [NAME] have…?			

1107L. Eggs?	1	2	9
1107M. Fresh or dried fish?	1	2	9
1107N. Beans, peas, lentils, nuts, seeds?	1	2	9
1107O. Sweet foods such as chocolates, candies, cakes, biscuits, or frozen treats like ice cream sugar, sweats, honey,	1	2	9
1107P. Chips, French fries, instant noodles	1	2	9
1107Q. Any other solid, semi-solid or soft food? *If "yes":* What was the food? *[mark food group if it is not yet coded "yes"]*	1	2	9
Other questions			
1108. How many times have you visited Upazila Health Complex/Community Clinic/ UHFWC/Other Health Care Service Point/ Health Worker for regular check-ups during your pregnancy?	[_] 1. [_] 2. [_] 3.	[_] 4. [_] 4+.	
1109. Did your child receive Vitamin A supplement? (for 6-59 months aged children)	[ ]Yes	[ ] No	
1110. Do you use iodized salt for your regular cooking?	[ ]Yes	[ ] No	

J. HEALTH		
1201. Did your child receive the first dose of Measles and Rubella vac cination at 9 months of age?	[ ]Yes	[ ] No
1202. Has your child experienced diarrhea in the last two weeks?	[ ]Yes →1202.a	[ ] No
1202.a Did you bring your child to the UHC/CC/ UHFWC and treated with ORS and Zinc?	[ ]Yes	[ ] No →1202.b

ANNEX THREE:

QUESTIONNAIRE FOR COMMUNITY-LED CHILD PROFILE ESTIMATES AT LOCAL LEVELS IN BANGLADESH

Consent Form

Assalamu Walaikum. I am …… I am in a team that is working on developing a Child Profile in your Union/ Upazila. The profile would be used for advocacy purposes by a number of stakeholders for increased resource mobilization for the reduction of child undernutrition. As a participant, you are an important stakeholder in our study. Hence, we would like to talk to you about this project to clarify our understanding and better conduct the study. We will ask you some questions, and we would like you to answer those from your perception. We want to know certain things from you about your child's nutrition status and hygiene practice. Your opinion is very important. However, it is completely up to you to participate in this question-answer session.

Before I ask you if you are interested in participating in the question-answer session, I would like to inform you that your participation is entirely voluntary. You can decide to participate or not to participate in the session. It is your decision. The information that we collect will be stored in a secured place and your information will be used only for this study. None of the information will individually be reported, rather these will be reported collectively. So, the report will not be connected to your individual identity. If any questions make you feel uncomfortable or embarrassed to give your opinion, you may skip any question you do not want to answer and you may stop the discussion at any time. Your participation in this discussion will have no effect on your getting services from this project. You do not have to talk with me if you do not want to. If you decide to take part, you can tell me to stop at any time.

Do you want to participate this survey?

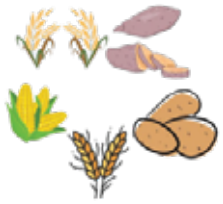
[ ] Yes (Continue with the survey)
[ ] No (Stop the survey)

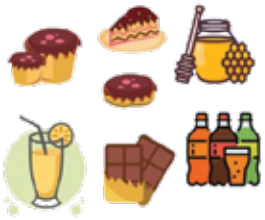
A. Identifier and General Questions:					
101. Name of the Respondent: |_____|					
102. Age: |__|__|	**103. Gender**: |__| (*Female = 1; Male = 2; Others = 3*)				
104. Village: |_____|	**105. Union:** |_____|				
106. Upazila: |__|__|__|	**107. District:** |__|__|				
108. Interview ID: |_____|	**109. No of Household Members:** |__|__|				
110.a. Age specific number of household members					
Age of HH Member 1: ---------- --- Years					
Age of HH Member 2: ---------- Years					
Age of HH Member 3: ---------- Years					
Age of HH Member 4: ---------- Years					
Age of HH Member 5: ---------- Years					
Age of HH Member 6: ---------- Years					
111. No of School-aged Children: |__|__|	**112. No of Children Going School:** |__|__|				
113. Educational Qualification of Respondent: |__|					
(*Illiterate = 1; Primary/Ebtidai or equivalent= 2; Secondary = 3; SSC/ Dakhil or equivalent = 4; HSC/Alim or equivalent = 5; Graduation/ Fazil or Higher = 6; Others = 7*)					
114. Primary Occupation of the Respondent [40] : |__|	**115. Secondary Occupation [41] :** |__|				
(*Homemaker = 1; Field-crops farming = 2; Poultry = 3; Dairy = 4; Beef Fattening = 5; Tailoring = 6; Fish culture = 7; Other Agriculture = 8; Other Aquaculture = 9; Grocery Shop = 10; Handicrafts = 11; Govt. Service = 12; Private Service = 13; Informal Sector Employment = 14; Others (Specify) = 15*)					
116. Marital Status: |__| (*Married = 1; Unmarried = 2; Divorced/Separated = 3; Widowed = 4; Other Marital Status = 5*					

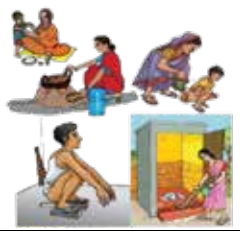
B. Anthropometric Data					
201. Name of the children (U5): |_____|	202. Date of Birth [DD/MM/YY]:				
203. Age (Months): |_____|	203. Male |__| Female |__|				
204. Wasting/GAM Measurement (Family MUAC)  [Put tick on the appropriate color][42]					
205. Age of Mother/Caregiver: |__|__|					

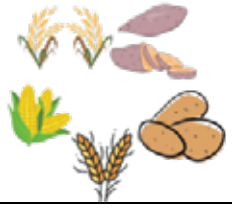
D. Household Food Consumption Score and Household Dietary Diversity					
Fill in the food groups based on the informationprovided. For any food groups not mentioned, ask the respondent if a food item from this group was consumed					
#	**Food Group**	**Examples**	**YES=1 NO=0**	**Number of days eaten in the past 7 days**	**Weighted Score**

[40] Profession in which the respondent puts majority of the time in a day, and/or profession from which majority of the income of the respondent comes (in appropriate cases)
[41] Profession in which the respondent puts less time than primary occupation, but, earns some income
[42] Note: To check if a child is malnourished is by measuring the circumference of their upper arm using a color-coded band. Ensure the band is securely wrapped around the upper arm without being too tight or too loose for accurate measurement.

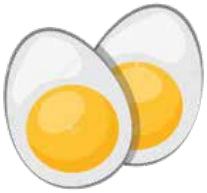
1	**1.1 Cereals, grains,** such as: Rice, flour bread (Ruti), Noodles, Biscuits, Corn, Wheat,				Number of days* 2=?
	1.2 roots and tubers; White Potatoes, taro (Mukhi kochu), Yam (Pesta Alu etc.				
2	**Pulses/legumes, nu ts and seeds**; such as: dried beans, lentils, nuts, seeds or foods made from these etc.				Number of days* 2=?
3	**Milk and other dairy products**; such as: milk, cheese, yogurt or other milk products etc.				Number of days* 3=?
4	**4.1 Flesh Meat,** such as: beef, lamb, goat, chicken, duck, other birds,				Number of days* 4=?
	4.2 Organ meat: liver, kidney, heart and / or other organ meats				
	4.3 fish fresh or dried fish or Seafood,				
	4.4 Eggs ; eggs from chicken, duck and others etc.				
5	**5.1 Orange vegetables (vegetables rich in Vitamin A):** carrot, red pepper, pumpkin, sweet Potato				Number of days* 1=?
	5.2 Green leafy Vegetable such cauliflower, raw banana, spinach, cabbage broccoli, and/or other dark green leaves,				
6	**Fruits** such as: Bananas, apples, Ripe mango, ripe papaya, orange, berry, lychee etc.				Number of days* 1=?

7	**Oil/fat/butter;** such as: oil, fats or butter added to food or used for cooking etc.				Number of days* 0.5=?
9	**Sugar, or sweet**; such as: sugar, honey, swe etened soda or sweetened juice drinks, sugary foods such as chocolates, candies, cookies and cakes sugar, sweets, molasses, honey, sugary drinks, sweet snacks, etc.				Number of days* 0.5=?
10	**Condiments / Spices:** tea, coffee/cocoa, salt, garlic, spices , yeast/baking powder, tomato/sauce,				Number of days* 0=?
			Sum of Score		

E. Water Sanitation and Hygiene		
Sources of safe drinking water		
401. Do you have access to safe drinking water?	**Example** Piped water, Tube wells, Protected dug wells, Improved Rainwater, or packaged water. (within the premises)	
Sanitation Facilities		
402. Do you have access to use improved latrine? (Please Observe the latrine)	**Example** Flush or pour-flush to piped sewer system, septic tank pit latrines, ventilated-improved pit latrines, or pit latrines with slab or composting toilets	
Handwashing and Hygiene practice		
403. Handwashing with water and soap?	[ ]Yes [ ]No → Skip to Next Section	
404. If yes, when?	[ ] After defecation [ ] After handling feces from a child or adult [ ] After cleaning the environment [ ] Before preparing food [ ] Before eating	

J. Child Food Poverty			
Ask for all live births that occurred in the last 24 months and are thus generally applicable to women of reproductive age.			
Question	**Response**	**Code**	**Skip**
501. Did your child (0-5) months of age) fed only breast milk during the previous day?[43]	[ ] Yes	[ ] No	
QUESTIONS ABOUT CURRENT BREAST FEEDING And FOOD **Please ask for all living children under 24 months.**			
501. What is your baby's name?	Male [ ] Female[ ]		
Question			**YES=1 NO=0**
502. Was[NAME]breastfedyesterdayduring theday orat night?			
503. Was [child's name] fedGrains, Roots, tubers bread, rice, noodles, white potatoes, sweet potatoes, radish			
504. Was [Child's Name] fed Vitamin A-rich Fruits and vegetables dark green leafy vegetables such as spinach, Pui, red leave, broccoli, carrots, pumpkin, carrot, squash, or sweet potato, cauliflower, raw banana, peppers, green beans, cauliflower apples, Ripe Mango, Ripe Papaya, lemon, orange, guava			
505. Was [child's name] fedFlesh Foods beef, lamb, goat, chicken, duck			

[43] No other food, or drink, not even water. However, prescribed medicine, oral rehydration solution, vitamins, and minerals are not counted as food.

506. Was [child's name] fed beans, peas, lentils, Nuts, seed		
507. Was [child's name] fed Eggs		
508. Does [child's name] eat, Other Fruits and Vegetables Tomato, Onion, eggplant. jujube (boroi), jackfruit, black berry, lychee, watermelon, Coconut flesh, Pineapple, Olive		
509. Does [child's name] eat Dairy Products		

K. HEALTH		
701. Has your child experienced diarrhea in the last two weeks?	[] Yes	[ ] No

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The study was supported by Right2Grow Program Consortium Bangladesh and funded by The Netherlands Government