



# Terms of Reference

of the research to be funded under the Meeting the Under-nutrition Challenge (MUCH)

## **10 Selected Research Topics**

- #1 Implications of diversified agriculture production on the economic and nutritional status of farming households .....
- #2 Post-harvest transformation, value chain and markets for healthy diets and nutrition enhancement
- #3 Estimation of overall food losses and waste at all levels of the food chain .....
- #4 Social protection for nutrition-sensitive food systems in times of heightened risk and vulnerability
- #6 Total diet study of Bangladesh.....
- #7 Nutrient density of habitual and desirable diets in Bangladesh by life cycle stage and region .....
- #10 Women's empowerment, children's diets and nutrition in urban and peri-urban settings.....
- #12 Innovation and technology in food system development and planning .....
- #14 Policy coherence and food and nutrition security in Bangladesh .....
- #15 Survey on consumer awareness of nutrition, food safety and hygiene .....

## Research proposal to be funded under Meeting the Under-nutrition Challenge (MUCH)

### Terms of Reference #1

#### Implications of diversified agriculture production on the economic and nutritional status of farming households

##### Background and rationale

Agricultural diversification is high on the Government's agenda for several reasons. It is a means to maintaining agricultural growth, especially for cereal-cereal rotations suffering from sustainability problems; a solution to the adverse effect of the depletion of micronutrients and organic matter in soil on crop yields; a way to stabilize rice prices as well as farmers' income; and also, a means to diversify production risks. But it is also a way to influence dietary diversity, boost farmers' incomes and provide value addition and to ease the country's agricultural trade deficit (GoB, 2018). Given what a priority agricultural diversification has become -it is one of the five pillars of the Bangladesh Second Country Investment Plan for Nutrition-Sensitive Food Systems (CIP2) - one would expect a rise in farming households' diversification away from the predominant rice growing, especially in view of the soaring demand for commodities such as fruits, vegetables and animal proteins, associated with the improvement in standards of living and the emergence of a middle class. Yet, recent studies have shown limited progress in overall crop diversity -defined as the percentage of area planted to non-rice crops- albeit with significant inter-regional variations (Kazal *et al.*, 2013). While diversification to non-traditional crops may be more profitable (Miah *et al.*, 2013), Dawe (2015), in a study of several Asian countries including Bangladesh, identifies price and production risk as well as the need for substantial investments as some of the impediments to diversification away from rice.

Agriculture growth has led to faster (albeit insufficient) declines in undernutrition than non-agricultural growth (Webb, 2011). While diversifying agricultural production is seen to be a promising strategy to improve dietary diversity, there is a need to generate stronger evidence. Hossain *et al.* (2016) and Sraboni *et al.* (2014) do show that households' engagement in agriculture and the diversity in agricultural production positively affect diet diversity in Bangladesh. However, in other countries, there is mixed evidence of such a causal relationship, for those involved in subsistence agriculture in particular. In Ethiopia, for households that have access to food markets, diverse production does not necessarily lead to improvements in children's diets (Hirvonen and Hoddinott, 2014). Sibhatu *et al.* (2015) find that among subsistence farmers in some African countries, market access is more effective in promoting nutrition than diversifying production. Indeed, once market transactions are considered, the relationship between production and diet diversity becomes more complex. So, in Bangladesh, are different types of farming households (subsistence or commercial for instance) economically and nutritionally better-off specializing in certain types of production such as crop production, or diversifying their production to cash crops, non-food crops, or animal produce?

As the CIP2 prioritises nutrition-sensitive agriculture, it is essential to accurately understand the transmission channels between farmers' crop choices and the economic and nutritional outcomes of these choices. Building on existing work such as the lessons learned from the FAO -UNICEF supported and USAID funded Integrated Agriculture Health based Interventions (IAHBI) project (2012-2015), the complex pathways between production diversity, commercialization and nutritional outcomes need to be unpacked to ensure the right nutrition sensitive policies are devised. This is important in a context where despite limited empirical evidence on the links between agricultural commercialisation and nutrition, projects to promote market-oriented crops abound (Carletto *et al.*, 2017).

## Objectives of the study

1. Assess and unpack the linkages between agricultural diversification (including fisheries, poultry and livestock, and non-food crops), commercialisation and farming households' income.
2. Identify, assess and analyse the linkages between agricultural diversification, commercialisation and farming households' dietary diversity and nutritional status.

## Scope and methodological considerations

- The study should distinguish between subsistence farmers and commercial farmers on the one hand, as it is expected that their strategies will vary given the different types of constraints they face, and between different agroecological zones to reflect geographies that are favourable to different types of farming. The most common types of agricultural diversification should be represented in the study. This may include diversification within crop agriculture- including non-food agriculture if relevant- and non-crop agriculture (i.e. fisheries, poultry including eggs and livestock including milk).
- Once the agroecological zones to be focused on and the types of diversification to be explored have been selected, and in keeping within the maximum possible budget for this study, the researchers will develop the sampling frame.
- Given the objectives of the study, the researchers will explore the options of using the BBS HIES 2016 (Hossain *et al.* (2016) used the data from the 2000 and 2010 BBS HIES), or the open access IFPRI Bangladesh Integrated Household Survey (BIHS) for which two rounds are now available: 2011/12 and 2015 (Sraboni *et al.* (2014) use data from the first round). These two sources of data provide nationally representative information, but the study will also need to focus on selected agroecological areas so that different agricultural settings that are favourable to different types of agriculture are reflected in the study.
- Based on previous work and existing theories, the researchers will develop and test econometric models to identify the linkages between the degree of agriculture production diversification of farming households, commercialisation and their income as well as their nutritional status, and identify associated factors. To the extent possible, effects on women's and children's dietary diversity (using the Minimum Acceptable Diet (MAD)) will be analysed. Previous work carried out on this issue should be reviewed, updated and built upon to avoid duplications but rather promote synergies. This includes the studies by Hossain *et al.* (2016), Sraboni *et al.* (2014), lessons from the (IAHBI) project and the work currently being carried out by the ANGel project which aims to reveal constraints to agricultural diversity.
- To complement the statistical and econometric analysis to be carried out using these data sets, a methodology to produce additional in-depth quantitative and/or quantitative analyses in order to fulfil the objectives of the study will be developed.
- Particular emphasis should be given on understanding the motivations behind the choices made by farmers in choosing what to produce and on the effects this has on their income and nutritional status.

## Deliverables

The selected research team will deliver:

- A draft inception report within 1 month from the date of signing of the contract which will detail and justify the planned research programme, literature and data requirements, methodology to be used including the timing and expected outputs as well as the selection of agroecological areas. The MUCH Technical Assistance Team (TAT) will provide feedback to the draft inception report within 2 weeks of its submission.

- A final inception report incorporating the MUCH TAT recommendations within 2 months from the date of signing of the contract.
- A detailed methodological note, within 3 months from the date of signing of the contract, including the approaches (e.g. sampling, area and type of farming household selection), tools to be used for the analysis (e.g. survey questionnaires, qualitative tools), and a detailed work plan for the fieldwork. Comments will be sent by the TAT and the final version of the note submitted within 2 weeks of receiving feedback.
- An interim report, within 9 months from the date of signing of the contract, presenting interim findings. The interim report should include the full literature review and data sources, preliminary findings, annotated table of contents for the final report and revised research program.
- A draft final report, within 13 months from the date of signing of the contract. The report will not exceed 30,000 words, excluding annexed and an executive summary not exceeding 2000 words. The draft final report should include:
  - A description of the purpose, relevance and background of the study
  - A literature review contextualising the present study
  - The methodology used
  - The results of the analysis
  - A section on limitations, if any
  - Based on the understanding provided by the study of how production diversification affects different types of farming households' income and nutrition status in different agroecological settings, concrete recommendations on what policy or programmatic interventions may be developed to improve food and nutrition security will be given. The report should provide practical guidance to policy makers and is not intended as an academic paper. It is essential that each recommendation is directly and explicitly linked to specific findings of the study.
- Thirteen months from the date of signing of the contract, a policy brief summarising the questions, the methodology, the findings and policy recommendations to be shared with the Government as a concrete input into their policy making. This will be finalised following MUCH TAT feedback.
- A final report, 15 months from the date of signing of the contract, which will incorporate the feedback and adjustments required by the MUCH TAT and other relevant experts.

Data collected, as relevant, will be submitted to MUCH.

The researchers will be expected to participate to regular events where they will be asked to present their ongoing and finalised research to varied audiences.

### **Duration and funding**

The study and presentation of findings will have to be completed within 15 months and the maximum funding available is USD 100,000.

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## **Research proposal to be funded under Meeting the Under-nutrition Challenge (MUCH)**

### **Terms of Reference #2**

#### **Post-harvest transformation, value chain and markets for healthy diets and nutrition enhancement**

##### **Background and rationale**

Food value chains in Bangladesh have witnessed major changes in recent years: from traditional ones where family-based smallholders sell their produce in local markets to respond to local demand, to more modern ones where food is often sold following transportation and transformation through distributors and retailers to an emerging middle class living in increasingly urbanised settings with transformed tastes and demands (Gómez *et al.*, 2013). These longer and more complex value chains and markets mean greater risks of food contamination and loss in the nutritional value of food – from contamination after harvesting, during storage and transportation, to using processing technologies that reduce the nutrient content of foods or combine foods with unhealthy ingredients during processing, or targeted advertising of unhealthy foods to children for example. Concurrently however, they also mean additional potential entry points to enhance the nutrition sensitivity of value chains (Hawkes and Ruel, 2012). Markets have also transformed with, for example, the emergence of ICTs and the expansion of new types of retailing channels such as supermarkets. A thorough understanding of post-harvest food value chains and markets, the many stakeholders and the environments they operate in is required to identify opportunities and constraints to enhance diets and make them healthier.

Yet, a value chain approach has rarely been used explicitly as a tool to achieve nutritional goals, nor have value-chain analyses been conducted in a way that has traced pathways that could potentially impact diets and nutrition (Hawkes and Ruel, 2012). Instead, the focus has been mostly on the economic benefits of food production although value chain concepts offer considerable potential for enhancing efforts to improve nutrition. Recognising that addressing nutrition requires action at all stages of the food chain, FAO (2017) has suggested a number of interventions that can render food systems nutrition-sensitive, flagging entry points at different junctions of value chains. It also makes recommendations for creating an enabling environment for nutrition-sensitive food systems. Downs and Fanzo (2016) also introduce a nutrition-focus to Porter's 1980's seminal approach to value chains which encompasses primary and support activities. They cite two case studies where this has been applied: the fats value chain in India and the vegetable value chain in Sierra Leone. In Bangladesh, while specific value chains, or part of value chains, have been studied in depth -to cite but a few: the milk (Ul Kabir *et al.*, 2018) and wheat (Kpaka *et al.*, 2012) value chains or the marketing of fruits and vegetables (Hassan *et al.*, 2013)- attention has not been on enhancing their nutritional impact which is what is proposed here.

This study should build on lessons learned during projects such as the USAID Agricultural Value Chain (AVC) project (USAID, 2017) which applied a market systems approach to agricultural value chains in Bangladesh's Southern Delta to increase access to and availability of diverse and nutritious foods in local, regional, and national markets. It will need to focus on understanding the view point of the different stakeholders to see how their involvement in optimising value chains for better FNS can be ensured. For example, the underlying objectives and operating principles of the private sector may not obviously match the goal of improving nutrition (SUN, 2011), creating challenges and barriers to designing and implementing nutrition-sensitive food value chains: this needs to be resolved since there is a clear role for the private sector in integrating nutrition into value chains (Downs and Fanzo, 2016). The SUN initiative recognises this and has called for the identification of sustainable ways and practices in which local and international business community can be better engaged in the effort to scale up nutrition at the country and global levels (GoB, 2017).

## **Objectives of the study**

1. By applying value chain analysis to nutrition as described by Hawkes and Ruel (2012):
  - identify entry points to enhance the nutritional quality of selected food items at different steps of the post-harvest value chain with concrete suggestions for interventions.
  - find weak points in the post-harvest chain where the nutritional quality of selected food items is at risk of being eroded and propose remedial solutions.

The analysis should include the markets where these foods are sold to also identify possible critical points where value to nutrition is lost or could be gained or even created, and propose suitable interventions to prevent and foster this, respectively.

2. Propose interventions (including support to Public Private Partnership) that will create an environment more susceptible to enhancing the nutritional impact on consumers of the food items selected for this study.

## **Scope and methodological considerations**

- The research group will select four foods' or groups of foods' value chains and markets that the study will examine. Products should be selected based on the following:
  - They are flagged as a priority for the country in key policy documents such as the Bangladesh Second Country Investment Plan for Nutrition-Sensitive Food Systems (CIP2)
  - They bear a substantial weight in the national diet
  - They have exceptional potential in terms of improving nutrition or economic status of the population. A value chain that is yet to be developed may be considered.

This selection process will need to involve stakeholders, including relevant members of the MUCH Technical Assistance Team. Researchers should coordinate with the group working on the research corresponding to the TOR #12 on 'Innovation and technology in food system development and planning', to avoid selecting the same value chains. These two studies may share commonalities but for this study, the focus should be on adjusting existing value chains and creating enabling environments to enhance their nutrition sensitivity, whereas the former will focus on innovation and technology to develop food systems in order to respond to all the arising challenges threatening food and nutrition security.

- For each of the selected foods or groups of foods, a mapping of the main existing value chains (e.g. traditional or modern for example) will be carried out. This should be done in detail to avoid missing out any steps of the value chain where relatively small interventions may have a substantial impact on FNS. This could be for example the labelling of food which if adequately formulated, can help consumers make more 'nutritionally-sensible' choices. This will include looking at the characteristics of the markets where foods are being sold.
- The nutrition-sensitive value chain analysis should be carried out keeping in mind the different types of consumers and focusing mostly on the most vulnerable such as children, pregnant woman or individuals from households under the poverty line whose specific needs may be met by altering certain value chains.
- The sampling frame will be devised in order to be able to systematically analyse all the steps of the post-harvest section of the value chain including markets, with a view to identifying windows of opportunities for and constraints to making them more nutrition-sensitive and improve nutrition.



- To achieve the second objective, the methodology to be developed will identify bottlenecks and opportunities to creating an environment in which the activities in the selected value chains can achieve positive nutritional outcomes, especially for the most vulnerable sections of the population. It will investigate the existing environment (e.g. taxation, infrastructure) and policy frameworks (e.g. that enable public private partnerships for example, the most common way of implementing nutrition-sensitive value chains given the trade-off between private economic objectives and public health goals (FAO, 2017)). Concrete recommendations will be made on how business may be supported to make their operations more nutrition sensitive and identify challenges to their participation and ways to overcome them.

## **Deliverables**

The selected research team will deliver:

- A draft inception report within a month from the date of signing of the contract which will detail the planned research programme, literature and data requirements, methodology to be used including the timing and expected outputs as well as the selection of foods or food groups to be analysed, with a justification. The MUCH Technical Assistance Team (TAT) will provide feedback to the draft inception report within 3 weeks of its submission.
- A final inception report incorporating the MUCH TAT recommendations within 2 months from the date of signing of the contract.
- A detailed methodological note, within 5 months from the date of signing of the contract, including the approaches (e.g. sampling, food selection), tools to be used for the analysis (e.g. questionnaires), and a detailed work plan for the fieldwork. Comments will be sent by the TAT and the final version of the note submitted within 3 weeks of receiving feedback.
- An interim report, within 10 months from the date of signing of the contract, presenting interim findings. The interim report should include the full literature review and data sources, preliminary findings, annotated table of contents for the final report and revised research program.
- A draft final report, within 16 months from the date of signing of the contract. The report will not exceed 30,000 words, excluding annexed and an executive summary not exceeding 2000 words. The draft final report should include:
  - A description of the purpose, relevance and background of the study
  - A literature review contextualising the present study
  - The methodology used
  - The results of the analysis
  - A section on limitations, if any
  - Concrete recommendations on what policy or programmatic interventions may be developed in order to enhance the nutritional impact of the selected food items at different steps of the post-harvest value chain and prevent their nutritional impact from being eroded. This will include measures that involve private sector and CSO participation. The report should provide practical guidance to policy makers and is not intended as an academic paper. It is essential that each recommendation is directly and explicitly linked to specific findings of the study.
- Within 16 months from the date of signing the contract, a policy brief summarising the questions, the methodology, the findings and policy recommendations to be shared with the Government as a concrete input into their policy making. This will be finalised following MUCH TAT feedback.
- A final report, 18 months from the date of signing of the contract which will incorporate the feedback and adjustments required by the MUCH TAT and other relevant experts.
- Within 18 months from the date of signing the contract, a tool (e.g. a guide, a short training) on how to review value chains of specific foods in view to enhancing their nutritional value for the benefit of consumers, in particular those considered most at risk of poor diets and nutrition.

Data collected, as relevant, will be submitted to MUCH.

The researchers will be expected to participate to regular events where they will be asked to present their ongoing and finalised research to varied audiences.

### **Duration and funding**

The study and presentation of findings will have to be completed within 18 months and the maximum funding available is USD 100,000.

### **References**

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## Research proposal to be funded under Meeting the Under-nutrition Challenge (MUCH)

### Terms of Reference #3

#### Estimation of overall food losses and waste at all levels of the food chain

##### Background and rationale

Food losses and waste have an impact on a country's food and nutrition security, on farmers' incomes, on the country's economic development and on the environment. Food losses are defined by FAO (2011) as 'the decrease in edible food mass throughout the part of the supply chain that specifically leads to edible food for human consumption'. Food that is lost is synonymous with resources used for production (water, land, energy and inputs) having been wasted and unnecessary CO<sub>2</sub> emissions. Food losses also mean an economic loss which for small farmers could make a real difference to their food security levels (FAO, 2011). Food waste is part of food losses and refers to food that is fit for consumption but is not consumed because it is discarded or left to spoil by retailers or consumers. Food waste directly contributes to climate change through the generation of methane gas in landfill sites which traps heat in the atmosphere. Waste Concern (2014) estimates that in urban areas of Bangladesh, 77.7 percent of total waste ending up in landfills is food. The estimated 0.56kg per capita per day estimate for daily waste generation over 60 million people living in urban settings gives a sense of the gravity of the waste issue. With waste generation increasing in direct proportion with GDP and population (Waste Concern, 2014), this problem is only set to worsen unless measures are taken to arrest it. The SDGs recognize the severity of the food loss and waste problem and calls for reducing food losses along the food value chain by 2030 (target 12.3). But a 'lack of clear knowledge about the real magnitude of food loss and waste is a major barrier to addressing the problem' (Schuster and Torero, 2016).

There are estimates of global food loss and waste, but their magnitudes vary and the variations in results are acute when looking at specific commodities. Furthermore, these estimates do not distinguish losses from waste. FAO (2011) estimates these figures to vary between 19 and 32 percent for cereals, 33 to 60 percent for root and tubers, and 37 to 55 percent for fruits and vegetables. The macro approach to measuring food losses relies on mass or energy balances in which raw material inputs are compared to produce outputs. This method provides a cost-effective indication of the overall losses along the entire value chain, but it requires data that are often not available, especially at regional level. It also precludes identifying at which stage of the value chain the losses occur. Also, it does not differentiate between edible and inedible losses.

A thorough review of postharvest losses carried out by FAO (2017) in Bangladesh identifies the existence of several studies for a selected group of fruits, vegetables, rice and wheat and the fisheries sector, but none for the livestock, poultry and processing sector. This micro approach to measuring losses is often costly and 'hampered by the inherent difficulty of collecting sufficient responses to represent an entire value chain or region' (IFPRI, 2016). Moreover, the variety of methodologies used for different studies precludes comparisons.

This present study proposes to use or adapt Delgado *et al.*'s (2017) approach which brings together three methodologies to quantify the value and volume of food losses in a more systematic and reliable manner.

With regards to food waste, there is scant evidence on the worldwide scale of food waste and in Bangladesh in particular. A study by Ahmed (1996) investigates food wastage at household level but limits itself to the Barisal district. As mentioned above, Waste Concern has created a database looking at the composition and calorific value of solid waste produced mostly in urban areas of the country. What is missing in Bangladesh is an exhaustive estimation of food waste that would consider regional and seasonal differences, if any, as well as socio-economic ones for households

on the one hand, and differences in the types of food outlets (rural *haat bazaars*, supermarkets or restaurants for example) on the other hand.

### Objectives of the study

1. Measure food losses and associated micronutrient losses for key commodities of the Bangladesh diet (in terms of quantity and/or nutritional importance) by assessing losses along the different types of value chains that exist (traditional, modern, etc.).
2. Identify the predominant sources of food and nutrient losses and provide recommendations for changes in practices along the value chain in order to reduce these losses, notably through use of appropriate processing and preservation technologies.
3. Measure food waste considering geographic and socio-economic characteristics of consumers and the different types of retailers
4. Identify the main sources of food waste and make recommendations on how to reduce food waste at all levels and on appropriate mitigation measures.

### Scope and methodological considerations

- For food losses between production and distribution, it is suggested to consider adopting and/or adapting Delgado *et al.*'s (2017) approach who propose three methodologies based on nationally representative surveys for the quantification of food loss which also characterises the nature of food loss across the value chain for different commodities, namely:
  - i) The category method: detailed data is collected from farmers, middlemen, and processors regarding the quality (based on damage coefficients established prior to data collection in collaboration with commodity specialists, local experts and value chain actors) of agricultural commodities that they use as inputs and outputs, respectively in order to quantify food loss in terms of the quality attributable to each agent across the value chain;
  - ii) The attribute method: crops are evaluated by producers and middlemen according to inferior visual, tactile and olfactory product characteristics identified prior to the survey.
  - iii) The price method: information about different types of commodity attributes (e.g., size, impurities, broken grain, etc.) is captured by ascertaining the price penalty that each of these types of crop damage entails to identify factors that diminish commodities' values and thus can quantify food quality loss based on market conditions.

Delgado *et al.* (2017) find that self-reported methods often used in the literature, are shown to consistently underestimate losses while the three alternative methods they propose are comparable in their results, as well as nationally representative.

- Once the losses are estimated, the micronutrient losses entailed may be estimated using existing information on the assessed foods' nutrient contents. The study will focus on the micronutrients most lacking in the Bangladeshi diet, especially for the most vulnerable groups (e.g. iron, zinc and vitamin A).
- Given the limited budget, this study can only be carried out on a fixed number of commodities which may be selected using national estimates of consumption to identify the most important commodities (in terms of quantity and /or nutrients consumed). Additional commodities that do not fall in that category but appear as essential in the Bangladesh dietary guidelines (BIRDEM, 2013) may also be selected. Results obtained should be applicable to the entire country. The choice should be finalised in consultation with relevant stakeholders and the MUCH TAT.

- With regards to household waste, different approaches will be needed to obtain a complete picture. A combination of methods drawing on the work of WRAP in the UK in (2012) may be considered for household-based waste: waste compositional analysis (along the lines of what Waste Concern did in Bangladesh in 2014), detailed waste compositional analysis which classifies and quantifies food and drink waste from a sample of households, and kitchen diaries recorded by a sample of households. For waste at the level of retailers and restaurants, a method that reflects their variety will need to be devised.

## **Deliverables**

The selected research team will deliver:

- A draft inception report within a month from the date of signing of the contract which will detail the planned research programme, literature and data requirements, methodology to be used including the timing and expected outputs as well as the selection of foods or food groups to be analysed with a justification. The MUCH Technical Assistance Team (TAT) will provide feedback to the draft inception report within 3 weeks of its submission.
- A final inception report incorporating the MUCH TAT recommendations within 2 months from the date of signing of the contract.
- A detailed methodological note, within 5 months from the date of signing of the contract, including the approaches (e.g. sampling, area and food selection), tools to be used for the analysis (e.g. survey questionnaires), and a detailed work plan for the fieldwork. Comments will be sent by the TAT and the final version of the note submitted within 3 weeks of receiving feedback.
- An interim report, within 10 months from the date of signing of the contract, presenting interim findings. The interim report should include the full literature review and data sources, preliminary findings, annotated table of contents for the final report and revised research program.
- A draft final report, within 16 months from the date of signing of the contract. The report will not exceed 30,000 words, excluding annexed and an executive summary not exceeding 2000 words. The draft final report should include:
  - A description of the purpose, relevance and background of the study
  - A literature review contextualising the present study
  - The methodology used
  - The results of the analysis
  - A section on limitations, if any
  - Concrete recommendations on what policy or programmatic interventions may be developed in order to decrease food losses and waste. The report should provide practical guidance to policy makers and is not intended as an academic paper. It is essential that each recommendation is directly and explicitly linked to specific findings of the study.
- Within 16 months from the date of signing the contract, a policy brief summarising the questions, the methodology, the findings and policy recommendations to be shared with the Government as a concrete input into their policy making. This will be finalised following MUCH TAT feedback.
- A final report, 18 months from the date of signing of the contract, which will incorporate the feedback and adjustments required by the MUCH TAT and other relevant experts.
- Within 18 months from the date of signing of the contract, a set of tools (questionnaires etc.) and materials used for the collection of data and a demonstration to relevant Government officials on how this has been done.

Data collected, as relevant, will be submitted to MUCH.

The researchers will be expected to participate to regular events where they will be asked to present their ongoing and finalised research to varied audiences.

## **Duration and funding**

The study and presentation of findings will have to be completed within 18 months and the maximum funding available is USD 100,000.

## **References**

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## Research proposal to be funded under Meeting the Under-nutrition Challenge (MUCH)

### Terms of Reference #4

#### **Social protection for nutrition-sensitive food systems in times of heightened risk and vulnerability**

##### **Background and rationale**

Food systems contend with three main types of stress: shocks, cycles and trends which can affect the FSN of the most vulnerable to different degrees. The first type of stress strikes with little or no warning while the other two are more predictable, allowing for some degree of adaptation (UNDP, 2012). A high proportion of Bangladesh's land and population are at heightened risk of multiple hazards. Over 20 districts are highly vulnerable to cyclones, floods, flash floods and water-logging (Musyoki and Narayan, 2016). More severe and frequent climate-related shocks, changing seasons, population pressure and the increasingly globalised nature of markets which renders the domestic market more sensitive to outside price volatility are among the factors that increase the overall risk of hunger and undernutrition through various causal pathways. In turn, food and nutrition insecure people are more sensitive, less able to cope and adapt or less resilient to climate related hazards. This new, more volatile environment with increased frequency of crises can exhaust households' coping mechanisms and render the rebuilding of livelihoods increasingly challenging or even impossible (Heltberg *et al.*, 2009). Climate change acts in conjunction with other factors, and constitutes a threat multiplier (ACF, 2012).

By addressing underlying determinants of under and malnutrition and incorporating specific nutrition goals and actions, Bangladesh's social protection programme embodied in the 2015 National Social Security Strategy (NSSS) and its Action Plan is gearing up to becoming more nutrition-sensitive, as called for in the Seventh Five Year Plan. Development partners have also taken on board the need for their interventions to become nutrition-sensitive (see for example WFP (2017) or Alderman (2016)). Social protection holds immense potential for improving nutrition sustainably by strengthening people's resilience to cope with and ability to recover from shocks and by lifting people out of poverty and enhancing access to a greater quantity and diversity of food as well as health, sanitation and education (FAO, 2015). But how can nutrition-sensitive social protection programmes be adapted to the new heightened uncertainty, thus realising people's Right to Food - even in times of acute crisis?

Alderman (2015) finds that while there is plenty of evidence on coverage and nutritional impact of social protection programmes designed to address chronic poverty, it is less clear how well similar programmes address fiscal or climatic shocks despite there being ample evidence of the negative impact of these phenomena on infant mortality, birth weight, and stunting. He quotes the fairly unique case of Ethiopia which has a contingency budget built into its public works programs thus allowing for wages and number of beneficiaries to increase as needed at short notice. Several studies look at the suitability of current social protection programmes at times of disasters without, however, covering the issue of nutrition. For instance, Coirolo *et al.* (2013) raise the question of whether existing social safety nets as they stand, can address the impacts of climate change. They find little solid evidence of their effectiveness in the context of disasters and recommend that more focus be placed on identifying and dealing with new vulnerabilities created by climate change. Awal *et al.* (2013) look into the ways to adapt social safety nets to climate change shocks in Bangladesh by coordinating and integrating disaster management, social safety nets and climate change adaptation, drawing implications from existing practices at home and abroad. More recently, there have been calls for integrating early action and preparedness in social protection to support more effective resilience-building at scale (Costella *et al.*, 2018). Scaling up social protection systems based on forecasts or early warnings is emerging as part of innovations in forecast-based action (FbA) (Wilkinson *et al.*, 2018). Under FbA, the Red Cross has started piloting forecast-based financing (FbF) for flooding in Bangladesh: by assuring predictability of funds to be automatically released before a disaster strikes and based on forecast information, this allows pre-planned programmes and activities which reduce risks to kick in.

While the benefits of early action can extend well beyond reducing loss and damage, for example by minimising damaging coping strategies, a better understanding of how social protection programmes can minimise the risks of financial, climatic and other shocks to nutrition is needed.

### **Objectives of the study**

1. Identify the drawbacks of the current social protection system with regards to its nutritional impact at policy, regulatory and programme level, in the context of the acceleration of the effects of climate change as well as other shocks (price volatility, market instability).
2. Based on best practices in Bangladesh and abroad, propose changes in existing interventions or new interventions that will enable social protection programmes to improve their shock-responsiveness and guarantee food and nutrition security of their beneficiaries even in the face of crises and stresses. This should include identifying opportunities for linking forecast-based action with programmes that affect FSN through the modification of existing social protection delivery mechanisms.

### **Scope and methodological considerations**

- Assess the pertinence of existing policies and regulatory frameworks, institutional settings and capacity, financing and investments relevant to social protection in relation to nutrition sensitive food systems in times of crises.
- In order to assess the adequacy of existing programmes to adequately and timely respond to shocks, the researchers will need to select and focus on a number of social safety nets that already address the core determinants of undernutrition i.e. nutrition-sensitive programmes. Social safety nets working in different areas of the country will be chosen -including some in ‘usually vulnerable geographies’. Attention will also be placed on selecting programmes that target and prioritize women and girls whose nutrition outcomes are disproportionately affected by the effects of climate change and shocks. These different vulnerabilities are related both to their differing nutritional requirements (for pregnant and lactating mothers for example) and to socio-cultural factors related to gender (men and boys better fed than girls, constrained access to humanitarian aid because of food insecurity or cultural norms).
- A method will be developed to systematically assess the extent to which the selected programmes are able to minimise the risks of different types of shocks and stresses to the nutritional status of the most vulnerable groups.
- Possible adjustments that may be made to the planning or implementation of existing programmes to render nutrition-sensitive even -or particularly- at the most vulnerable times will be identified and described and costs of such changes explored.
- Opportunities linking forecast-based action with programmes that affect FSN through the adjustment of existing social protection delivery mechanisms will be identified. The Red Cross’s guide on ‘Prioritization of Forecast-based Actions’ may be used as a framework for this exercise.
- The potential for introducing and developing social insurance (crop and livestock insurance for instance) will also be explored to the extent possible.

### **Deliverables**

The selected research team will deliver:

- A draft inception report within a month from the date of signing of the contract which will detail the planned research programme, literature and data requirements, methodology to be used including the timing and expected outputs as well as the selection of safety nets and geographical areas to be analysed



with a justification. The MUCH Technical Assistance Team (TAT) will provide feedback to the draft inception report within 2 weeks of its submission.

- A final inception report incorporating the MUCH TAT recommendations within 2 months from the date of signing of the contract.
- A detailed methodological note, within 3 months from the date of signing of the contract, including the approaches (e.g. area and programme selection), tools to be used or developed for the analysis, and a detailed work plan for the fieldwork. Comments will be sent by the TAT and the final version of the note submitted within 2 weeks of receiving feedback.
- An interim report, within 9 months from the date of signing of the contract, presenting interim findings. The interim report should include the full literature review and data sources, preliminary findings, annotated table of contents for the final report and revised research program.
- A draft final report, within 13 months from the date of signing of the contract. The report will not exceed 30,000 words, excluding annexed and an executive summary not exceeding 2000 words. The draft final report should include:
  - A description of the purpose, relevance and background of the study
  - A literature review contextualising the present study
  - The methodology used
  - The results of the analysis
  - A section on limitations, if any
  - Actionable recommendations on what and how programmes may be adjusted or scaled up to ensure nutrition-sensitive protection of vulnerable groups at all times. The report should provide practical guidance to policy makers and is not intended as an academic paper. It is essential that each recommendation is directly and explicitly linked to specific findings of the study.
- Within 13 months from the date of signing the contract, a policy brief summarising the questions, the methodology, the findings and policy recommendations to be shared with the Government as a concrete input into their policy making. This will be finalised following MUCH TAT feedback.
- A final report, 15 months from the date of signing of the contract which will incorporate the feedback and adjustments required by the MUCH TAT and other relevant experts.
- Within 15 months from the date of signing the contract, a set of tools and/or materials used for analysis that may be applied to other safety net programmes to test their nutrition sensitivity especially in times of crisis. If needed, a short training for Government officials may be provided to introduce them to these tools.

Data collected, as relevant, will be submitted to MUCH.

The researchers will be expected to participate to regular events where they will be asked to present their ongoing and finalised research to varied audiences.

### **Duration and funding**

The study and presentation of findings will have to be completed within 15 months and the maximum funding available is USD 100,000.

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## Research proposal to be funded under Meeting the Under-nutrition Challenge (MUCH)

### Terms of Reference #6

#### Total diet study of Bangladesh

##### Background and rationale

The right to safe food has been read into the right to life, guaranteed under Article 32 by the Supreme Court of Bangladesh (BLAST and RtF&SS, 2015). Despite the lack of an express constitutional right or a comprehensive framework law securing the right to food so far, a number of prevailing laws in Bangladesh protect different facets of this right. For example, several laws aim to ensure food safety and punish food adulteration. To name but a few: the Formalin Control Act, 2015; the Safe Food Act, 2013; the Mobile Courts Act, 2009; the Consumer Rights Protection Act, 2009. Indeed, human exposure to toxic chemicals and nutritional imbalances are responsible for a range of human health problems for which the protection of our diets from these hazards is essential. Unsafe levels of chemicals in food may also threaten the environment and the ability to trade. With recent amendments to the food safety law and updates of various acts in Bangladesh, a secure scientific basis for management and re-evaluation of standards and specifications of foods is needed which a Total Diet Study (TDS) can provide.

A TDS determines population dietary exposure not only to harmful chemical substances but also to beneficial and necessary ones across their entire diets. Data derived from food control systems are often not suitable for calculating population dietary exposure because the sampling is targeted, the samples analysed may not be representative of the food as consumed, and the analytical method may use a too high limit of detection or quantification (EFSA *et al.*, 2011). A TDS consists instead of selecting, collecting and analysing commonly consumed food purchased at retail level, processing the food as for consumption, pooling the prepared food items into representative food groups, homogenising the pooled samples and analysing them for harmful and/or beneficial chemical substance (EFSA *et al.*, 2011). TDS is recognised internationally as the most cost-effective way to estimate dietary exposures to food chemicals or nutrients for various population groups and to assess their associated health risks (WHO, 2005). It most accurately represents the levels of the compounds in the edible portion of the food at the point of consumption, taking into account losses that occur during processing, food preparation and storage (EFSA *et al.*, 2011).

There is strong evidence of the presence of compounds with high levels of toxicity for humans in certain foods of Bangladesh. In 2013, Islam *et al.* analysed selected heavy metals, trace elements and minerals in selected foods across low, middle and high-income markets using the 2010 BBS HIES. However, they did not analyse multiple samples of the contaminants, toxins and harmful residues in the foods due to cost constraints, nor did they trace the source, given the restricted geographical location of markets analysed. While they did disaggregate the analysis according to whether households were classified as poor or not, it would be interesting to further refine this disaggregation to reflect geographical variations in dietary patterns and ascertain the levels of chemicals present in foods based on multiple samples and for urban versus rural households. Multiple sample analysis helps to also measure the variation in the level of contaminants in the food sample along with adequate recoveries and minimize experimental error of the analysis. Seasonality was another factor that was not addressed in the Islam *et al.* study although it can affect some foods for which the level of specific chemical substances will vary due to climatic conditions (e.g. nitrate in leafy vegetables) or seasonal supply variations. In a follow up to the 2013 study, it will also be important to reflect the food systems approach adopted in the 2018 Second Country Investment Plan (CIP2) for Nutrition-sensitive Food Systems which will entail a ‘farm to fork’ scope for the TDS. This will involve an analysis of table-ready samples.

Thus, it is proposed that the study proposed here use carry out an up-to-date TDS which addresses the gaps of the Islam *et al.* research, including a comprehensive dietary exposure analysis. These research findings should pave the way for establishing appropriate public health improvement programmes that can be targeted to specific groups across the country.

### **Objectives of the study**

1. Carry out of Total Diet Study for Bangladesh, disaggregated by relevant groups and geographical locations using state of the art methodology, namely inductively coupled plasma mass spectrometry (ICP-MS). ICP-MS is capable of detecting metals and several non-metals at concentrations as low as one part in 10<sup>12</sup> (part per trillion).
2. Perform a detailed dietary exposure analysis to each chemical using the results from the TDS.
3. Make recommendations on which substance intakes need to be reduced in different foods to reach acceptable levels, with reference to the source of the problem if possible (e.g. use of harmful chemicals or adulterants, overuse of pesticides or fertilizers) and where efforts need to be made in order to meet dietary nutrient requirements.

### **Scope and methodological considerations**

- Based on consultations with key stakeholders, on the purpose of the study and national priorities, and keeping within budgetary restrictions, chemicals to be analysed will be selected among the following groups, making sure to include contaminants, toxins and harmful residues:
  - Natural components considered beneficial or essential (e.g. micronutrients such as vitamins, iron, iodine, and selenium);
  - Chemical substances intentionally added to foods (e.g. preservatives and colours);
  - Chemical residues of substances being deliberately applied at other points in the food production chain (e.g. pesticides and veterinary drug residues);
  - Contaminants from the environment (e.g. heavy metals, polychlorinated biphenyls (PCBs) and dioxins);
  - Naturally occurring contaminants (e.g. mycotoxins and alkaloids);
  - Contaminants formed during food processing (e.g. polyaromatic hydrocarbons (PAHs), furans and acrylamide);
  - Contaminants transferred from food packaging or food contact materials (e.g. phthalates and bisphenol A).
- Using the latest (2016) BBS HIES consumption data, a selection of representative food items will be identified and selected for the TDS. Customary food preparation and cooking processes in common use will be reviewed to select food and process combinations. Coverage of some 80-95% of food in the diet is often targeted for inclusion in the TDS food list, selected using different criteria: e.g. food consumed at > 1 g/day per person or > 10 g/day per person or consumed by >5% or at least 10% of consumers. Beverages, including water (for drinking as well as for cooking) should be included in the list. Foods that are not selected following these criteria but are known to contain important concentrations chemical substances selected for the study may be included in addition to the previous. Pooling of food items in certain combinations will also need to be decided before the analysis is carried out.
- The selection of foods should reflect the consumption of groups of interest also defined in collaboration with key stakeholders (for example and if possible: different socio-economic categories and regions, urban/rural, sex, etc.). To the extent possible, the sampling should try and address seasonality by planning more than one sampling season. Seasonality can be present in consumption, concentration data, or both (Elegbede *et al.*, 2017). For fresh and semi-processed foods, the representativeness of food samples should be ensured by considering the origin of production, the markets and the usual form for consumption.

- The methods used for transportation, storage, cooking methods of the samples should be as close as possible to the preparation in the population. The pooled samples will be analysed in a laboratory with an adequate quality assurance scheme covering the whole TDS process (sample extraction, analysis and data interpretation).
- Exposure of the population and subgroups of special interest will be assessed by using the results of the analysis for the occurrence of chemical substances to the consumption of the foods selected. This will then be compared to health-based toxicological reference values: e.g. acceptable daily values (ADI), tolerable daily intake (TDI) for potentially toxic substances and recommended daily intakes (RDI) for nutrients. The concentration of each element in food groups will be measured to understand what is driving the results found.
- The results of the analysis will have to be compared with those of Islam *et al.* (2013) for elements studied in both analyses.
- Using the analysis of the TDS and based on the literature, potential health impacts of food contamination by heavy metals, minerals and trace element on humans with specific reference to vulnerable groups such as pregnant and lactating mothers, children and infants will be identified. Diseases that may be associated with high levels of exposure to heavy metals, minerals and trace elements through food or inadequate levels of nutrients should be investigated. Also, potential sources of toxic chemicals should be sought out through existing studies along the food chain and ways to reduce it proposed.

## **Deliverables**

The selected research team will deliver:

- A draft inception report within a month from the date of signing of the contract which will detail the planned research programme, literature and data requirements, methodology to be used including the laboratory analysis, timing and expected outputs. The MUCH Technical Assistance Team (TAT) will provide feedback to the draft inception report within 3 weeks of its submission.
- A final inception report incorporating the MUCH TAT recommendations within 2 months from the date of signing of the contract.
- An interim report, within 5 months from the date of signing of the contract, presenting the finalized TDS food list, sampling plan and the selected laboratory to carry out the analysis. The relevant MUCH TAT should be included as key stakeholders in the consultations for decisions on the chemicals to include in the analysis, the sampling and the groups from the population to focus on.
- A draft final report, within 16 months from the date of signing of the contract. The report will not exceed 30,000 words, excluding annexed and an executive summary not exceeding 2000 words. The draft final report should include:
  - A description of the purpose, relevance and background of the study
  - A literature review contextualising the present study
  - The methodology used
  - The results of the analysis
  - A section on limitations, if any
  - Recommendations. The report should provide practical guidance to policy makers and is not intended as an academic paper. It is essential that each recommendation is directly and explicitly linked to specific findings of the study.
- A database, 16 months from the date of signing of the contract including the results of the food analyses to be submitted to MUCH.
- Within 16 months from the date of signing the contract, a policy brief summarising the questions, the methodology, the findings and implications of the study and associated policy recommendations

to be shared with the Government as a concrete input into their policy making. This will be finalised following MUCH TAT feedback.

- A final report, 18 months from the date of signing of the contract which will incorporate the feedback and adjustments required by the MUCH TAT and other relevant experts.

Data collected, as relevant, will be submitted to MUCH.

The researchers will be expected to participate to regular events where they will be asked to present their ongoing and finalised research to varied audiences.

### **Duration and funding**

The study and presentation of findings will have to be completed within 18 months and the maximum funding available is USD 100,000.

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## Research proposal to be funded under Meeting the Under-nutrition Challenge (MUCH)

### Terms of Reference #7

#### Nutrient density of habitual and desirable diets in Bangladesh by life cycle stage and region

##### Background and rationale

Diets are being increasingly recognized as a major determinant of food and nutrition security. The main criterion that decides whether a diet is appropriate is the spectrum of foods consumed. Discussions often revolve around indices that look at energy availability or food diversity scores. Yet, assessing energy availability only addresses hunger, and food diversity scores account for the variety of foods consumed but not the quantity of nutrients ingested. In an era where food insecurity and malnutrition and obesity are creating a triple burden on society, it is essential to adjust diets to meet the needs of the whole population both in energy as well as in nutrients. This requires estimating the energy and nutrient content of habitual diets, comparing them to estimated average requirements (EARs) and promoting more desirable diets that are affordable across the income spectrum. Because of the different needs of humans at different stages of their lives, it is essential to identify gaps in the nutrition density of individuals' diets at different stages of their life cycle.

There are sporadic examples of 'nutrient profiling' of foods consumed in Bangladesh -for rice for instance- but none gives a picture of the nutrient density of typical diets. Beal *et al.* (2017) estimate global micronutrient supplies of eight vitamins and six minerals, their bioavailability and prevalence of inadequate intake. They find that the Micronutrient Density Index has improved over the past 50 years in most regions except sub-Saharan Africa. Arsenault *et al.* (2015) estimate the micronutrient contents of Bangladesh food supplies using data from national food balance sheets. Through linear programming models, they find that diversification of crop production might help under some conditions, but the size of the micronutrient gap in Bangladesh seems too large to be filled by such approaches and needs to be met by other means, such as enhanced livestock production, food fortification, biofortification, or imports. Fielder (2015), using the 2010 BBS HIES, looks at the adequacy of farming households' nutrient availability and nutrient intake status. The study proposed here should draw on this method but use more recent data and focus on the nutrient content of actual diets of specific age groups and, budget and time permitting, other differentiating characteristics such as socioeconomic status or location (e.g. urban versus rural, district).

With regards to encouraging vulnerable groups to switch to nutrient dense diets, studies have looked at the effects of introducing complementary and supplementary foods into people's diets (for example LiST (2014)) but failed to take costing into consideration. In a randomised control trial carried out in rural Bangladesh for instance, different types of locally developed and produced ready-to-use, culturally appropriate and accepted complementary food and supplements foods were provided daily for a year out of the critical 1000 days from conception. This was found to reduce linear growth deceleration between 6 and 18 months of age and stunting at 18 months of age. While this provided an important insight for public health, it did not take into account any affordability considerations or the way to ensure regular intakes (Christian *et al.*, 2015). Rose (2016) carried out a cost-benefit analysis for a set of nine standard nutrition direct interventions that have an effect on stunting -whether it was the main purpose of the intervention or not- and found them to offer substantial economic benefits relative to the costs. However, as he points out, further research is needed among existing local nutrition programmes that can more precisely identify the costs including that of targeting, and the benefits.

Additional evidence is thus necessary to gauge the nutrient density of typical foods consumed and diets including that of vulnerable groups and identify desirable diets. Measuring the nutrition density of typical diets of reference groups and mapping them against their cost will also help guide consumers towards the most 'efficient' foods in terms of nutritional returns. The Government may also use this

information to influence planning of a minimum affordable food basket and stimulate the production of certain nutrient dense foods.

## **Objectives**

1. Plan and calculate the energy and nutrient density of typical diets for the average diet in Bangladesh and of selected groups particularly vulnerable to malnutrition and to the effects of malnutrition such as children under two and pregnant women and populations from different districts.
2. Establish a nutrient profile and cost of main foods consumed by these groups.
3. Based on the outcomes of the analysis, identify nutrient deficiencies in diets compared to estimated average requirements (EARs) and suggest desirable diets for groups most vulnerable to malnutrition considering affordability, costs, current consumption, preferences, etc.
4. Propose cost effective interventions to popularize such diets with target groups.

## **Scope and methodological considerations**

- The first step of this study will be to define the groups for whose diet's nutritional content will be measured based on priorities set in the main policy documents guiding the country to achieve FNS (the Seventh Five Year Plan, the 2018 Second Country Investment Plan (CIP) for Nutrition-sensitive Food Systems, etc.). For example, the diets of under twos, adolescent girls, pregnant and lactating women should be included in the study. The exercise will also be carried out for the average Bangladeshi diet and for each district, in order to capture geographical differences.
- A sampling plan will be established to reflect the groups of interest as well as other factors such as their geographical location and socio-economic status.
- This study will be based on secondary data. While national figures may be obtained from the 2016 BBS HIES 2016, the Nutrition Survey of Bangladesh currently carried out by INFS should provide the necessary information, but this will have to be looked into by the researchers in developing their methodology. Reference may be made to the exploratory analysis carried out by Fiedler using the 2010 HIES which identified reasons for the country's lagging nutritional status. The Food Composition Tables produced by Shaheen *et al.* (2013) will also be used for this study.
- This study will create of nutrient profile of the main foods consumed in Bangladesh by the general public and selected groups, using the most relevant index. The naturally nutrient rich (NNR) score developed by Drewnowski (2005), which is based on mean percentage daily values (DVs) for 14 nutrients in 2000 kcal food, may be considered. Use of the NNR score allows the identification of nutrient-dense foods while permitting some flexibility where the discretionary calories are concerned. However, the measure of nutrients per calorie (nutrition density score) should also be calculated in order to compare it to the measure of nutrients per unit cost for these foods.
- Based on the measurement of the energy and nutrient density of habitual diets in Bangladesh, the study will propose adjustments to reach desirable diets (in terms of energy and nutrient density) for the different groups under study. In what is proposed, the following should be taken into consideration: the ease of changing people's habits and of obtaining these foods (can they be locally developed and produced?), whether they easy to use/prepare, even in emergency situations such as floods, whether they are culturally appropriate and accepted.

## **Deliverables**

The selected research team will deliver:



- A draft inception report within 1 month from the date of signing of the contract which will detail the planned research programme, literature and data requirements, methodology to be used including the timing and expected outputs as well as the selection of groups to be focused on with a justification and questions to be investigated. The MUCH Technical Assistance Team (TAT) will provide feedback to the draft inception report within 3 weeks of its submission.
- A final inception report incorporating the MUCH TAT recommendations within 3 months from the date of signing of the contract.
- A detailed methodological note, within 5 months from the date of signing of the contract, including the approaches, tools to be used or developed for the analysis, and a detailed work plan. Comments will be sent by the TAT and the final version of the note submitted within 3 weeks of receiving feedback.
- An interim report, within 10 months from the date of signing of the contract, presenting interim findings. The interim report should include the full literature review and data sources, preliminary findings, annotated table of contents for the final report and revised research program.
- A draft final report, within 16 months from the date of signing of the contract. The report will not exceed 30,000 words, excluding annexed and an executive summary not exceeding 2000 words. The draft final report should include:
  - A description of the purpose, relevance and background of the study
  - A literature review contextualising the present study
  - The set of questions to be answered
  - The methodology used, and tools developed
  - The results of the analysis and associated recommendations. The report should provide practical guidance to policy makers and is not intended as an academic paper. It is essential that each recommendation is directly and explicitly linked to specific findings of the study.
  - A section on limitations, if any
- Within 16 months from the date of signing the contract, a policy brief summarising the questions, the methodology, the findings and policy recommendations to be shared with the Government as a concrete input into their policy making. This will be finalised following MUCH TAT feedback.
- A final report, 18 months from the date of signing of the contract which will incorporate the feedback and adjustments required by the MUCH TAT and other relevant experts.
- A booklet addressed to policy makers and other stakeholders likely to have some influence on shaping the population's diets detailing the types foods that need to be consumed by different types of individuals in order to fulfil their needs.

Data collected, as relevant, will be submitted to MUCH.

The researchers will be expected to participate to regular events where they will be asked to present their ongoing and finalised research to varied audiences.

### **Duration and funding**

The study and presentation of findings will have to be completed within 18 months and the maximum funding available is USD 100,000.

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## Research proposal to be funded under Meeting the Under-nutrition Challenge (MUCH)

### Terms of Reference #10

#### Women's empowerment, children's diets and nutrition in urban and peri-urban settings

##### Background and rationale

In recent years, attention has been drawn to the role of women in nutrition especially in the context of agriculture and therefore more focused on rural areas. Sraboni *et al.* (2014) have shown the key role of women's empowerment in improving households' food security and dietary diversity. Understanding and strengthening the pathways between the role of rural women, their empowerment levels, agriculture and nutrition has been the object of many studies in Bangladesh elsewhere, among them, the ongoing Agriculture, Nutrition, and Gender Linkages (ANGeL) Project randomized controlled trial experiment that aims to identify actions and investments in agriculture that will help to improve nutrition and empower women in Bangladesh.

However, with the fast urbanization of the country -more than half of the population is predicted to be urban by 2050 (UN DESA 2015)- understanding the role of women in providing adequate nutrition of their families in and around cities, where the nature of the challenges is very different from those in rural areas, is key. Households are almost exclusively dependent on markets for food, making them vulnerable to price fluctuations and shocks. Reliance on street foods in urban and peri-urban areas can have harmful food safety implications. The rise in female employment and changing nature of jobs often means that children must be cared for by others. This often precludes breastfeeding once the mother returns to work for example. It is now established that child care practices have an influence on the nutritional status of children. Malnutrition is no longer a problem limited to the worse off. Undernutrition, especially stunting and wasting are also found in better-off families. The Bangladesh Demographic and Health Survey 2014 shown that around 19% and 11% of under-five children in the highest wealth quintile are affected by stunting and wasting respectively. Concurrently, overnutrition is now hitting the better off in alarming ways, with significant associated health risks. Yet, little has been done to understand this phenomenon (Rahman, 2014) and even less to identify the role women can have in influencing the nutritional levels of their families in urban areas. This limits the scope of measures and programmes that can be set up to try and solve the problem of malnutrition which rather than being in decline as it is in rural areas, is only evolving in nature in urban ones.

While several studies have assessed the nutritional levels of children in urban areas, research to better understand the underlying causes of the challenges observed has only been carried out on specific groups or has focused on certain determinants. For example, BSR and GAIN (2015) observe the nutritional status of female garment industry workers and their children. Govindaraj *et al.* (2018) look at determinants of urban dwellers' nutrition but struggle to find adequate explanatory variables. They suggest that variables pertaining to behavioural risk factors, health-promoting and health-damaging behaviours (including health care-seeking behaviours), and health- and health care-related beliefs at the individual, parental, and household head levels may be needed in the models, especially for the case of slum dwellers. Fakir and Rahman Khan (2015) do introduce health knowledge and health-seeking variables but recognise some limitations in their models related to endogeneity. While they focus only on children living in slums, interestingly, they try to understand the differences in determinants between boys' and girls' nutrition determinants. Ahsan *et al.* (2017) also exclusively study the case of slums. None of these studies however, attempts to include empowerment in their analyses except Sinharoy *et al.* (2017) who are indeed the first to examine how selected resources for women's empowerment are associated with household- and individual-level dietary patterns in urban Bangladesh, directly and indirectly through aspects of women's agency. Their analysis, however, is of exploratory nature and more needs to be done to understand the linkages between women's empowerment and children's nutrition and diets, which is what this study proposes to do.

## Objectives

1. Based on previous evidence in Bangladesh and abroad, identify the maternal factors which affect children's nutritional status, diets and diet diversity in urban areas for different socio-economic categories.
2. Study the extent to which women's autonomy (e.g. their ability to control household resources, being in employment) and degree of empowerment translates into better nutrition and diets for children and the pathways through which this operates.
3. Examine the ways women's involvement in reproductive work (i.e. childcare, domestic work, and healthcare, etc.) and productive work outside the household affects maternal and child nutrition in urban areas, across the entire income spectrum.

## Scope and methodological considerations

- The term empowerment will need to be precisely defined as this will have important repercussions on the study and on the recommendations derived from it. Indeed, women's empowerment can be enhanced through a host of channels such as better access to resources and different types of capital (natural, physical, human, social, financial, etc.) or enhanced rights.
- This study should give a good representation of the socio-economic spectrum that exists in urban areas as well and ensure households with problems of undernutrition and overnutrition are reviewed.
- Peri-urban should also figure in the areas investigated as they offer specific challenges since the characteristics that define them concurrently borrow from urban and rural settings.
- The areas chosen should also include communities of people that have migrated from rural areas and keep strong ties with their villages (e.g. they systematically return home for Eid holidays, they have left close relatives behind). Indeed, these enduring connections with rural parts may influence women's degree of empowerment.
- The researchers will investigate the possibility of using existing data for the analysis, for example the Bangladesh Demographic Health Survey (BDHS). While it is preferable that the data used are based on large enough samples to draw statistically meaningful conclusions, the focus of the study should be on unravelling the linkages between women's empowerment and children's nutrition and diets. Supportive information may need to be gathered through qualitative means.
- The role of urban and peri-urban farming by women in nutrition will be looked into in order to understand how this affects children's diets.
- Special attention should be given to adolescent girls. This group -as future potential mothers- is an ideal target for programmes building awareness on nutrition-related issues that can influence family food consumption.

## Deliverables

The selected research team will deliver:

- A draft inception report within a month from the date of signing of the contract which will detail the planned research programme, literature and data requirements, methodology to be used including the timing and expected outputs. The MUCH Technical Assistance Team (TAT) will provide feedback to the draft inception report within 3 weeks of its submission.
- A final inception report incorporating the MUCH TAT recommendations within 2 months from the date of signing of the contract.
- A detailed methodological note, within 5 months from the date of signing of the contract, including the approaches, data tools to be used or developed for the analysis, and a detailed work plan for the

fieldwork. Comments will be sent by the TAT and the final version of the note submitted within 3 weeks of receiving feedback.

- An interim report, within 10 months from the date of signing of the contract, presenting interim findings. The interim report should include the full literature review and data sources, preliminary findings, annotated table of contents for the final report and revised research program.
- A draft final report, within 16 months from the date of signing of the contract. The report will not exceed 30,000 words, excluding annexed and an executive summary not exceeding 2000 words. The draft final report should include:
  - A description of the purpose, relevance and background of the study
  - A literature review contextualising the present study
  - The set of questions to be answered
  - The methodology used, tools developed, and data collected
  - The results of the analysis
  - A section on limitations, if any
  - Practical recommendations as to the measures that may be taken to enhance the levels of empowerment of women in urban and peri urban areas which the study has shown have a positive impact on children's nutrition and quality of diets. The report should provide practical guidance to policy makers and is not intended as an academic paper. It is essential that each recommendation is directly and explicitly linked to specific findings of the study.
- Within 16 months from the date of signing the contract, a policy brief summarising the questions, the methodology, the findings and policy recommendations to be shared with the Government as a concrete input into their policy making. This will be finalised following MUCH TAT feedback.
- A final report, 18 months from the date of signing of the contract which will incorporate the feedback and adjustments required by the MUCH TAT and other relevant experts.

Data collected, as relevant, will be submitted to MUCH.

The researchers will be expected to participate to regular events where they will be asked to present their ongoing and finalised research to varied audiences.

### **Duration and funding**

The study and presentation of findings will have to be completed within 18 months and the maximum funding available is USD 100,000.

### **References**

- Ahsan, K.Z., S. El Arifeen, Md.A. Al-Mamun, S.H. Khan and N. Chakraborty (2017) Effects of individual, household and community characteristics on child nutritional status in the slums of urban Bangladesh *Archives of Public Health* 75(9)
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- Fakir, A.M. S. and M.W. Rahman Khan (2015) Determinants of malnutrition among urban slum children in Bangladesh *Health Economics Review* (2015) 5(22)
- Govindaraj, R, D. Raju, F. Secci, S. Chowdhury, and J.J. Frere (2018) Health and Nutrition in Urban Bangladesh: Social Determinants and Health Sector Governance. Directions in Development. Washington, DC: World Bank.
- Rahman, S., M.T. Islam and D.S. Alam (2014). Obesity and overweight in Bangladeshi children and adolescents: a scoping review. *BMC Public Health*, 14, 70

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## **Research proposal to be funded under Meeting the Under-nutrition Challenge (MUCH)**

### **Terms of Reference #12**

#### **Innovation and technology in food system development and planning**

##### **Background and rationale**

In Bangladesh, food systems face the challenge of feeding an ever-increasing population in a sustainable and nutritious manner while providing employment, especially in the agricultural sector. Food produced needs to be affordable, good quality, safe and nutritious and adapt to consumers whose preferences are fast-evolving with the emergence of a sizeable middle class. The required sustainable development of agriculture and the food system as a whole is threatened by a host of factors such as the degradation of ecosystems, the deterioration of soil and sea productivity, the declining efficiency of pesticides, the lack of investments in machinery, and competition from global players. Against this backdrop, innovations and technological progress are paramount for the development and adequate planning of food systems if these are to transform and rise to the challenges ahead.

The importance of technological innovation in agriculture and the food processing sector is globally recognized as a means to respond to a growing food demand. Innovation is crucial to develop resource-efficient manufacturing processes that minimize the dependency on valuable crops; consume less water and energy and preserve local balances; prevent the generation of waste; produce high quality and high functionality products with an extended and predictable shelf life; and allow for diversification with respect to specific consumer demands. Innovation is also essential to develop value chains since processors are mostly engaged in processing of food products for which there is an already proven market (Innovision Consulting Private Limited, 2016). The World Economic Forum (2018) emphasises the role of technology innovation in accelerating food systems' transformation and identify 12 technology applications that illustrate the potential of emerging opportunities in food systems. Innovations can come in forms other than technology such as in the way governance mechanisms function towards making food systems effective and inclusive. For example, the FAO NADHALI project which assists municipalities to integrate food security and nutrition into urban planning has developed participatory food governance mechanisms in the shape of Food Liaison Advisory Groups (FLAGs) which when sufficiently empowered and institutionalised, can become key resources for advising planners and policy makers on approaches that will allow sustainable food system planning.

But innovations can be constrained by a number of factors. The World Bank (2007) for example find that one of the main limits to innovation is weak interaction between entrepreneurial activity and research. A report for Katalyst (Innovision Consulting Private Limited, 2016) reports that the lack of coordination among research institutions and processors means that innovations on new products by BARI (Bangladesh Agriculture Research Institute) and BARC (Bangladesh Council of Scientific and Industrial Research) are not being scaled up by private sector. In their study on private-sector agricultural research and innovation in Bangladesh, Harun-Ar-Rashid *et al.* (2012) identify many gains from privately introduced technology (for example in poultry production), but they find that most of these gains were achieved with imported technology. While to some degree, technology transfer appears to have motivated in-country research and development (R&D), because private organizations do not capture all of the benefits of innovation, they are not motivated to do the socially optimal amount of innovation and R&D.

Thus, developing new methods and technologies relies on certain enabling elements being in place such as regulation and human capacity and coordination between researchers and end users. The public sector has a central role to play in promoting interaction between all agents and creating an enabling environment. It also needs to provide and enforce an enabling regulatory framework for

the differentiated product markets; to support small-scale farmers in becoming partners in innovation systems and in adding value to their assets and skills (for example, through public-private partnerships); to provide financing and infrastructure to bring inventions to markets. It needs to invest or promote investment in rural organizations which make agricultural innovation systems more effective. There is also an essential role for actors that are critical for coordinating innovation systems such as commodity boards (World Bank, 2007). Ensuring that there are no bottlenecks in the food value chains is also a requirement to promote the adoption of innovation and the use of technology. Development of a modern retail sector is also likely to become a catalyst in improving the food supply chains in Bangladesh.

Developing and embracing innovation in food systems thus requires multidimensional interventions, from farm to the production of the final food product: from product innovation, including at farm level (often through technological developments), to market development, marketing methods, process technology and innovation, the use of information technology. Innovations in governance to ensure that planning for and development of food systems adapted to the existing and arising challenges are also needed. This study aims to review the progress, existing constraints and emerging opportunities in innovation and technology development and adoption in the agriculture and food processing sectors of Bangladesh.

### **Objectives**

1. On selected value chains, identify current constraints and opportunities to innovation and technological developments at different points of the chain and to access to these by farmers and other key actors of the value chain.
2. Based on the lessons drawn from this exercise and from success stories in Bangladesh and elsewhere, identify/propose options for innovation and technological development that may be scaled up and applied to other value chains.
3. In response to constraints identified in the first objective, propose concrete measures to create an environment that will foster innovation and technology development and adoption.

### **Scope and methodological considerations**

- The research group will select up to 6 foods or groups of foods' value chains and markets that the study will examine. Products should be selected based on the following:
  - They are flagged as a priority for the country in key policy documents such as the 2018 Second Country Investment Plan (CIP) for Nutrition-sensitive Food Systems
  - They bear a substantial weight in the national diet and include food from the following categories: fruit/vegetables; milk and milk products; meat/poultry; cereals, processed foods, fish.
  - They have exceptional potential in terms of improving nutrition or economic status of the population.
- Researchers should coordinate with the group working on the MUCH-funded research #2 on 'Post-harvest transformation, value chain and markets for healthy diets and nutrition enhancement', so as to avoid selecting the same value chains. The selection process will need to involve stakeholders including members of the MUCH Technical Assistance Team. This study may share commonalities with Research topic #2, but for this study, the focus should be on innovation and technology to develop food systems to respond to all the arising challenges threatening food and nutrition security, whereas the former will focus on adjusting existing value chains and creating enabling environments to enhance their nutrition sensitivity.



- For each of the selected foods or groups of foods, the main existing value chains (e.g. traditional or modern for example) will be mapped. This exercise should be carried out meticulously to avoid missing out on potential opportunities for innovation.
- Innovations should be understood in a wider sense: from social innovation (changes in behaviour) to organisational innovation, know-how innovation (knowledge around methods and practices) and technological innovations.
- The case studies included in Devaux *et al.* (2016) which illustrate how interventions have fostered agricultural innovations may be drawn upon to develop the approach of this study. Indeed, they highlight the importance of a systems view of innovation that accords importance to both supply and demand factors and focus on the role of multistakeholder platforms in fostering innovation.
- Consideration will be given to innovations that render value chains more inclusive and are able to open up higher-value markets to poorer farming households.

## **Deliverables**

The selected research team will deliver:

- A draft inception report within a month from the date of signing of the contract which will detail the planned research programme, literature and data requirements, methodology to be used including the timing and expected outputs as well as the selection of food or food group to be analysed with a justification. The MUCH Technical Assistance Team (TAT) will provide feedback to the draft inception report within 3 weeks of its submission.
- A final inception report incorporating the MUCH TAT recommendations within 2 months from the date of signing of the contract.
- A detailed methodological note, within 5 months from the date of signing of the contract, including the approaches (e.g. food chain selection), tools to be used for the analysis (e.g. survey questionnaires), and a detailed work plan for the fieldwork. Comments will be sent by the TAT and the final version of the note submitted within 3 weeks of receiving feedback.
- An interim report, within 10 months from the date of signing of the contract, presenting interim findings. The interim report should include the full literature review and data sources, preliminary findings, annotated table of contents for the final report and revised research program.
- A draft final report, within 16 months from the date of signing of the contract. The report will not exceed 30,000 words, excluding annexed and an executive summary not exceeding 2000 words. The draft final report should include:
  - A description of the purpose, relevance and background of the study
  - A literature review contextualising the present study
  - The methodology used
  - The results of the analysis
  - A section on limitations, if any
  - Concrete recommendations responding to the three objectives. The report should provide practical guidance to policy makers and is not intended as an academic paper. It is essential that each recommendation is directly and explicitly linked to specific findings of the study.
- Within 16 months from the date of signing the contract, a policy brief summarising the questions, the methodology, the findings and policy recommendations to be shared with the Government as a concrete input into their policy making. This will be finalised following MUCH TAT feedback.
- A final report, 18 months from the date of signing of the contract which will incorporate the feedback and adjustments required by the MUCH TAT and other relevant experts.

Data collected, as relevant, will be submitted to MUCH.

The researchers will be expected to participate to regular events where they will be asked to present their ongoing and finalised research to varied audiences.

### **Duration and funding**

The study and presentation of findings will have to be completed within 18 months and the maximum funding available is USD 100,000.

### **References**

- Devaux, A., M. Torero, J. Donovan, D. Horton (2016) *Innovation for Inclusive Value-Chain Development - Successes and Challenges* IFPRI
- Gokhberg, L. and I. Kuzminov (2017) *Technological Future of the Agriculture and Food Sector in Russia*
- Government of Bangladesh (2018) *Second Country Investment Plan (CIP) for Nutrition-sensitive Food Systems*
- Harun-Ar-Rashid, M. Ali, and D. Gisselquist (2012) *Private-Sector Agricultural Research and Innovation in Bangladesh - Overview, Impact, and Policy Options*
- Innovision Consulting Private Limited (2016) *Study on the Roles and Opportunities for Private Sector in Agro-food Processing Industry of Bangladesh* for Agri-Business for Trade Competitiveness (ATC-P) branded as Katalyst
- World Bank (2007) *Enhancing agricultural innovation: how to go beyond the strengthening of research systems*
- World Economic Forum (2018) *Innovation with a Purpose: The role of technology innovation in accelerating food systems transformation*

## **Research proposal to be funded under Meeting the Under-nutrition Challenge (MUCH)**

### **Terms of Reference #14**

#### **Policy coherence and food and nutrition security in Bangladesh**

##### **Background and rationale**

The food systems approach adopted in the 2018 Second Country Investment Plan for Nutrition-Sensitive Food Systems (CIP2) reflects the multisector collaboration that ensuring food and nutrition and security (FNS) requires. This document has been built on the premise of a solid anchoring in existing national policies and frameworks. Yet despite the links between many of the country's policies that directly and indirectly affect FNS, not much is known about their coherence and interactions. For instance, despite the links between trade, food security and nutrition, the harmonization of objectives to liberalise trade and enhance FNS has historically been weak (FAO, 2015). Historically, agricultural policies have been focused on rice intensification as a means to ensure food security. Now that Bangladesh has mostly reached self-sufficiency in rice, policies that are 'crop-neutral' as coined by Pingali (2015), and that remove distortions, allowing farmers to respond to markets signals in their crop choices, are needed to promote agricultural diversification. But Pingali finds that in spite of the rising demand, the persistence of Green Revolution era policies and other structural impediments have constrained the responsiveness of supply for vegetables and other non-staple food. So, at a time where the GoB's focus is on developing policies that are nutrition sensitive, it is paramount to ensure that different policy sectors do not undermine each other and that they all work towards improving FNS in a coherent way. Consistency between the interests and objectives of the government and other food system stakeholders, namely civil society organisations, development partners and the private sector is also essential to ensure a stronger strategy against food and nutrition insecurity.

Hawkes (2017) acknowledges the dearth of tools to analyse coherence between food systems policies and nutrition but identifies the SDG Target 17.14 'Enhancing policy coherence for development' as an opportunity to remedy this. With regards to coherence between the SDGs themselves, the Institute for Global Environmental Strategies (IGES) developed in 2015 a tool which they applied to Bangladesh that identifies the interlinkages between SDG targets based on the knowledge obtained from relevant international consultation processes on SDG indicators and a literature review. Using Social Network Analysis, the structure of the network of interlinkages is analysed which helps identify the SDG targets which play strategic roles in connecting other targets from a systemic perspective. In the wake of the SDGs, the OECD developed a Framework for Policy Coherence for Sustainable Development (PCSD) to inform policy making in the 2030 Agenda, which examines policies to see how they can ensure FNS 'in ways that balance economic, social and environmental objectives and consider potential positive and negative effects' (OECD, 2016). This tool -which can be adapted for this study- can provide 'policy-makers with key elements to consider for reconciling divergent policy objectives, anticipating impacts, strengthening coordination and guiding integrated decision-making, including at the interface between domestic and foreign policies' (OECD, 2016).

##### **Objectives**

1. Map out critical interactions between domestic policies as well as international policy documents (such as the SDGs) on which the NFP and the CIP2 are anchored, identifying obvious inter-linkages and possibilities for synergies, conflicts and trade-offs (horizontal coherence).
2. Check for vertical coherence in the approach to FNS between different levels of government.

3. Examine the main other stakeholders' strategies aiming to improve FNS for possible conflicts and complementarities.
4. Assess contextual factors and enabling conditions for ensuring FNS.

### **Scope and methodological considerations**

- A possible tool for this analysis is the OECD's Framework for Policy Coherence for Sustainable Development (PCSD). The OECD PCSD however, uses a framework based on the four pillars of food security. Given the GoB's food systems approach to FSN which has been adopted in the latest Country Investment Plan, the toolkit would have to be adapted.
- Given the large number of policies and frameworks in the CIP2 is anchored, one cannot expect this study to identify and analyse all possible conflicts. It should therefore focus on the most critical ones but should also consider policies that have not been listed in the CIP2 but whose outcomes may be in conflict with those of the food policy (for example the trade policy). The study should also investigate coherence of policies relating to different levels of government.
- In order to fulfill the third objective, important non-government contributors to achieving food and nutrition security in the country among civil society, development partners and the private sector should be identified, and their strategies reviewed for coherence, conflicts and complementarities with government policies.
- Given the evolving nature of FNS policy landscape in Bangladesh, especially with the forthcoming latest food policy, this study should propose practical steps to continue monitoring the policy coherence of future and evolving policies.

### **Deliverables**

The selected research team will deliver:

- A draft inception report within a month from the date of signing of the contract which will detail the planned research programme, literature and data requirements, methodology to be used including the timing and expected outputs. The MUCH Technical Assistance Team (TAT) will provide feedback to the draft inception report within 2 weeks of its submission.
- A final inception report incorporating the MUCH TAT recommendations within 2 months from the date of signing of the contract.
- A detailed methodological note, within 3 months from the date of signing of the contract, including the approaches, tools to be used or developed for the analysis, and a detailed work plan for the fieldwork. Comments will be sent by the TAT and the final version of the note submitted within 2 weeks of receiving feedback.
- An interim report, within 9 months from the date of signing of the contract, presenting interim findings. The interim report should include the full literature review and data sources, preliminary findings, annotated table of contents for the final report and revised research program.
- A draft final report, within 13 months from the date of signing of the contract. The report will not exceed 30,000 words, excluding annexed and an executive summary not exceeding 2000 words. The draft final report should include:
  - A description of the purpose, relevance and background of the study
  - A literature review contextualising the present study
  - The set of questions to be answered
  - The methodology used and tools developed
  - The results of the analysis. The report should provide practical guidance to policy makers and is not intended as an academic paper. It is essential that each recommendation is directly and explicitly linked to specific findings of the study.

- A section on limitations, if any
- Within 13 months from the date of signing the contract, a policy brief summarising the questions, the methodology, the findings and policy recommendations to be shared with the Government as a concrete input into their policy making. This will be finalised following MUCH TAT feedback.
- A final report, 15 months from the date of signing of the contract which will incorporate the feedback and adjustments required by the MUCH TAT and other relevant experts.
- 15 months, a simple tool to continue monitoring the FNS policy coherence (with identified SMART indicators) which selected Government officials will be trained to use.

Data collected, as relevant, will be submitted to MUCH.

The researchers will be expected to participate to regular events where they will be asked to present their ongoing and finalised research to varied audiences.

### **Duration and funding**

The study and presentation of findings will have to be completed within 15 months and the maximum funding available is USD 100,000.

### **References**

- FAO (2015) Nutrition in the trade and food security nexus *The State of Agricultural Commodity Markets IN DEPTH*
- GoB (2018) *Second Country Investment Plan (CIP) for Nutrition-Sensitive Food Systems*
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- Pingali, P. (2015) Agricultural policy and nutrition outcomes – getting beyond the preoccupation with staple grains *Food Security* 7:583–591
- OECD (2016) Policy coherence and food security in *Better Policies for Sustainable Development 2016: A New Framework for Policy Coherence*

## Research proposal to be funded under Meeting the Under-nutrition Challenge (MUCH)

### Terms of Reference #15

#### Survey on consumer awareness of nutrition, food safety and hygiene

##### Background and rationale

Achieving adequate nutrition and food security for all requires that the right foods are available, and that people are able to physically and financially access these foods. But an underlying assumption is also that people are willing to eat the right foods and prepare and to eat them in a manner that conserves their nutritious value and that is hygienic. Thus, Bangladesh still consumes far more rice per capita than recommended by dietary guidelines. Feeding and hygiene practices are often inadequate (Manikam *et al.*, 2017; Mahmud, 2016) with dire consequences for small children's nutritional status and development. This is true across socio-economic categories. All these issues materialize in poor nutritional outcomes where high rates of stunting coexist with fast-rising levels of obesity. While efforts are made all round to ensure awareness of what adequate nutrition and safe practices are, there is only scattered evidence of the progress so far, which makes a nationwide coherent strategy difficult to develop. The Second Country Investment Plan for Nutrition-Sensitive Food Systems, under its Programme III.1., proposes measures for 'Enhanced nutrition knowledge, promotion of good practices, and consumption of safe and nutritious diets'. Such strategy necessitates a thorough understanding of the baseline situation.

Recent years have seen a recrudescence of studies gauging people's knowledge and practices in FNS, translating the increased interest and interventions in this field, and guidelines exist as to how to carry them out (see FAO, 2014 for example). But for Bangladesh, these have concentrated on specific groups of the population (e.g. students in one university (Karmakar, 2017), children aged 7-12 from affluent families in Dhaka (Saha *et al.*, 2011), physicians in Sylhet (Taj Uddin *et al.*, 2008), adolescent rural girls (Alam *et al.*, 2010), etc.), Infant and Young Child Feeding (Iqbal Kabir *et al.*, 2013)), or on the impact of specific programmes and projects (e.g. Hoddinott *et al.* 2108; WFP, 2015; SPRING, 2017). In order to develop a full-fledged nationwide strategy that will ensure proper knowledge of nutrition and food hygiene basics, a nationally representative survey highlighting differences between regions, socio economic groups or stage in life cycle, is required. Building a baseline of nutrition and food safety knowledge across different populations in Bangladesh will allow the Government and other stakeholders to develop a coordinated approach where gaps in knowledge can be addressed and their progress monitored over time.

##### Objectives

1. Assess the knowledge of basic nutrition, cooking best practices, food safety and hygiene principles of a sample of the country that will be representative of different:
  - Districts of the country as well as nationally
  - Age groups and stages of the life cycle
  - Gender
  - Socio economic groups
2. Compare knowledge levels to a simple assessment of people's dietary practices, nutritional behavior and status, and overall health.
3. Identify factors associated with different levels of knowledge and awareness.

## **Scope and methodological considerations**

- This study will constitute a baseline on which further studies may base themselves. Questions should therefore be devised in a way that will allow gauging progress in the future.
- While the aim of the survey is to provide statistically significant information for different types of population disaggregates, a main constraint will be a budgetary one. The researchers will need to prioritize the information they want to obtain once they understand the costs associated with different types of sampling.
- This study will require the involvement of subject matter specialists to ensure that the survey used reflects the real food safety and nutrition knowledge of people on issues that are relevant to their consumption. Existing resources and past experience in this type of exercise should be drawn from. The UCL Institute of Epidemiology and Health Care Research Department of Behavioral Science and Health for example list the questionnaire they have used in previous surveys.
- Different questionnaires may be required for different types of respondents e.g. mothers of small children, men, adolescents.
- Given the limited resources, actual physical measurements to assess people's nutritional status will not be possible and alternatives will have to be carefully devised.

## **Deliverables**

The selected research team will deliver:

- A draft inception report within a month from the date of signing of the contract which will detail the planned research programme, literature and data requirements, methodology to be used including the timing and expected outputs. The MUCH Technical Assistance Team (TAT) will provide feedback to the draft inception report within 3 weeks of its submission.
- A final inception report incorporating the MUCH TAT recommendations within 2 months from the date of signing of the contract.
- A detailed methodological note, within 5 months from the date of signing of the contract, including the approaches (e.g. sampling, issues covered by the survey), tools to be used for the analysis (e.g. survey questionnaires), and a detailed work plan for the fieldwork. Comments will be sent by the TAT and the final version of the note submitted within 3 weeks of receiving feedback.
- An interim report, within 10 months from the date of signing of the contract, presenting interim findings. The interim report should include the full literature review and data sources, preliminary findings, annotated table of contents for the final report and revised research program.
- A draft final report, within 16 months from the date of signing of the contract. The report will not exceed 30,000 words, excluding annexed and an executive summary not exceeding 2000 words. The draft final report should include:
  - A description of the purpose, relevance and background of the study
  - A literature review contextualising the present study
  - The methodology used
  - The results of the analysis. The report should provide practical guidance to policy makers and other stakeholders involved in trying to improve food and nutrition security in Bangladesh and is not intended as an academic paper. It is essential that each recommendation is directly and explicitly linked to specific findings of the study. These recommendations should provide a platform for identifying further research needs, for example with regards to the source from which knowledge is acquired, its accuracy and its ability to be assimilated by people or with regards to its translation into adequate practices, etc. The analysis of the survey may also direct to design -possibly following further action research to test different options- interventions to modify beliefs and practices.
  - A section on limitations, if any

- Within 16 months from the date of signing the contract, a policy brief summarising the questions, the methodology, the findings and policy recommendations to be shared with the Government as a concrete input into their policy making. This will be finalised following MUCH TAT feedback.
- A final report, 18 months from the date of signing of the contract which will incorporate the feedback and adjustments required by the MUCH TAT and other relevant experts.

Data collected, as relevant, will be submitted to MUCH.

The researchers will be expected to participate to regular events where they will be asked to present their ongoing and finalised research to varied audiences.

### **Duration and funding**

The study and presentation of findings will have to be completed within 18 months and the maximum funding available is USD 100,000.

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