

Launching of the Bangladesh Integrated Food Policy Research Program

Proceedings

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Foreword

Since the founding of the nation, Bangladesh has ventured a difficult path, one much harder than its neighbors, to shape its food and agricultural policies. Haunted by the memories of famine and political instability linked to food prices, the country had placed great emphasis on increasing rice production. By the late 1980s, the policies began to pay off: the Green Revolution started taking root, rice prices began falling in real terms, and the Bangladesh was enjoying overall economic growth. However, with years of sustained growth, food policy context is rapidly changing in the country. It is now recognized that the food policy focus needs to be broadened, with both infrastructure and institutions related to food policy needing an upgrade. This is the context in which the Bangladesh Integrated Food Policy Research Program was conceptualized, as an important part of the Modern Food Storage Facilities Project (MFSP). This project is expected to conduct quality research, build analytical capacity, and get the institutions ready for performing cutting edge policy making in the 21st century.

The vision of this project is matched with the political commitment of the government. It was evident in the launching event. The Honorable Minister of Food, Qamrul Islam, MP, has been particularly supportive of the program and attended the launching event as the chief guest. The Chairman of the Parliamentary Standing Committee on Food Affairs, M. A. Wadud, MP; and Rajashree Paralkar, Acting Director of World Bank, Bangladesh, served as the special guests. The leadership of all three partner institutions also actively participated in the event. Director of the Development Strategies and Governance Division, IFPRI, Director General of BIDS, Khan Ahmed Murshid, and the Director of University of Illinois' International Program, Alex Winter-Nelson made special remarks at the occasion; and the event was chaired by the then Secretary of Food, M. Badrudduja. We express our deep gratitude to all them for their supports to the programs. We also thankful for Badrul Hasan, Director General of Food, and Dr. Emmanuel Sene of the World Bank for their continued support in this research program. Their encouragement and support have been instrumental in making the launching event a success.

Several colleagues from the Project Management Unit, IFPRI-Dhaka, and BIDS have contributed to making the launching event a success. We are grateful to Rezaul Karim, Deputy Project Director, Kamal Salehin, communication specialist, and Syed Rafiqul Alam, procurement specialist, in enabling coordination between the GoB and the JV partners. We are thankful for our office colleagues at IFPRI-Dhaka for their generous support. We are particularly thankful to Khandaker Aminul Islam, Julie Ghostlow, Samita Kaiser, and Nazrul Islam for their supports in producing the communication materials; Prodip Bashu and Saiful Islam for their administrative supports; and to Dr. Getnet and Dr. Yunus for overseeing the planning and logistics.

We look forward to your continued support in the future.

Shahidur Rashid
IFPRI-BIDS-Illinois Lead

Md. Gazi Ur Rahman
Project Director, MFSP

For more information on the launching event and the Bangladesh Integrated Food Policy Research Program (BIFPRP), please contact: Dr. Shahidur Rashid (s.rashid@cgiar.org) or Mr. Gazi Ur Rahman (gaziur60@gmail.com)

Acronyms

ACES	College of Agricultural, Consumer and Environmental Sciences (ACES)
BIDS	Bangladesh Institute of Development Studies
BIFPRP	Bangladesh Integrated Food Policy Research Program
FPMU	Food Planning and Monitoring Unit
GOB	Government of Bangladesh
IFPRI	International Food Policy Research Institute
JV	Joint Venture
KG	Kilogram
MOF	Ministry of Food
MFSP	Modern Food Storage Facilities Project
PRSSP	Policy Research and Strategy Support Program
SDG	Sustainable Development Goal
ICT	Information and Communication Technologies

About the Organizers

International Food Policy Research Institute (IFPRI)

IFPRI was established in 1975 to identify and analyze alternative strategies and policies for meeting the food needs of the developing world, with particular emphasis on low-income countries and on the poorer groups in those countries. Under the Integrated Food Policy Research Program, IFPRI will be responsible for leading the research component of the Modern Food Storage Facilities Project (MFSP) of the Ministry of Food, Bangladesh. For more information on IFPRI, please visit: www.ifpri.org

Ministry of Food, Government of Bangladesh

The Ministry of Food emerged as an autonomous ministry in 2012 with a vision to ensure dependable and sustained food security for all at all times. Under the Integrated Food Policy Research Program, the Ministry of Food will be responsible for providing high-level policy recommendations. The Ministry will also facilitate the project team's efforts in strengthening the capacity of the Ministry's Food Policy Monitoring Unit. For more information, please visit: <http://www.mofood.gov.bd/>

Bangladesh Institute of Development Studies (BIDS)

The Bangladesh Institute of Development Studies (BIDS) is an autonomous public multi-disciplinary organization which conducts policy oriented research on development issues facing Bangladesh and other developing countries. Its mission is to facilitate learning in development solutions by conducting credible research, fostering policy dialogue, disseminating policy options, and developing coalitions to promote informed policy making. The Institute also conducts training on research methodologies and carries out evaluations of development interventions. Under the Integrated Food Policy Research Program, BIDS will facilitate and undertake research activities and foster overall institutional collaboration. For more information on BIDS, please visit: <http://bids.org.bd/index.php>

University of Illinois at Urbana-Champaign, USA

The University of Illinois at Urbana-Champaign (UoI-UC) is charged by the state of Illinois, USA, to enhance the lives of citizens in Illinois, across the nation, and around the world through its leadership in learning, discovery, engagement and economic development. Under the Integrated Food Policy Research Program, UoI-UC will be responsible for the technical research and capacity building components of the project. For more information on the University of Illinois at Urbana-Champaign, please visit: <http://illinois.edu/index.html>

1. Notes on the Preparation of the Event

1.1 Background

Holding a launching event was proposed by the Project Management team during a meeting in early October. The two main objectives were to (a) bring together team members and introduce them to the policy stakeholders in Bangladesh and (b) to create awareness about the vision of the project with participation from the high level policymakers. A third objective was to hold a brainstorming session to discuss project implementation strategies, including work plan and methodology development.

Through a series of consultations with the project management team, IFPRI-Dhaka, and the BIDS, a list of 150 participants was prepared. The participants included policy makers, civil society organizations, and development partners, as well as national and international research organizations. The team also worked on ensuring high level participation and succeeded confirming attendance of the Honorable Minister of Food, M. Qamrul Islam, MP; Secretary of Food, M. Badruduza; Chairman of the Parliamentary Standing Committee for Food Affairs, MA Wadud, MP; acting director of the World Bank, Ms. Rajashree S. Paralkar, as well as senior leadership team members from IFPRI, BIDS, and the University of Illinois. A day long program was designed that included both technical and non-technical presentations, with morning session focusing on overviews, remarks, and formal launching, and the afternoon session focusing on the emerging food policy issues and technical analytical needs.

A half-day brainstorming session was held at BIDS on December 5, 2016. Among others, the session was attended by Paul Dorosh, Director of IFPRI's Development Strategy and Governance Division; Professor Alex Winter-Nelson, Director of the institute of international studies at the University of Illinois, and Nicholas Minot, Interim Director of IFPRI's Markets and Trade division. The Director General of BIDS, Dr. KAS Murshid, made welcome remarks; and requested Mohammad Yunus of BIDS and Kindie Getnet of IFPRI to open the discussion. Other participants commented on their presentations and some broad decisions regarding methods, timing, and capacity building were made.

Prior to the launching event on December 6, 2016, selected background documents were distributed to participants, which reflected food policy challenges in both the global and country context. The documents included Global Food Policy Report (2016); the Global Hunger Index (2016); and Highlights of IFPRI Research and Partnerships in Bangladesh. In addition, a press release was prepared and shared with the local print and digital media. As the table below shows, the event received wide media coverage

Date	Article Title	Source
December 6, 2016	Ministry of Food and Partners Inaugurate Innovative Food Security Research Program in Bangladesh (link) ¹	IFPRI
December 7, 2016	Food ministry launches research programme on food security (link) ²	The Daily Observer
December 8, 2016	IFPRI Food Security Research Launched (link) ³	The Asian Age
December 8, 2016	Food ministry launches research programme on food security (link) ⁴	The Daily Star
December 8, 2016	National News Agency of Bangladesh (link) ⁵	National News Agency of Bangladesh

The rest of this proceeding is organized as follows; The next section presents the synopsis of the Inaugural session, which is followed by the section that presents policy notes on the technical presentation. There are four technical notes produced by Drs. Paul Dorosh (on evolving roles of PFDS and private sector), Alex Winter-Nelson (on modern storage); Vivian Hoffman (on food safety) and Nicholas Minot (on price stabilization). The power point slides of the technical presentations and the newspaper articles covering the event are presented in the Annex.

2. Inaugural Session

2.1 Welcome Remarks

Mr. Badrul Hasan (Director General, Directorate General of Food) inaugurated the session by welcoming the Chief Guest, Special Guests and all dignitaries present at the event. Mr. Badrul described the current context of food and food prices in Bangladesh and emphasized the roles that modern food storage can play in stabilizing food prices. He pointed out that scientific analysis is critical for sound policy making and that the Bangladesh needs to update its food policy analysis. Therefore, Mr. Hasan pointed out that there is a high expectation among the policy stakeholders to generate research-based evidences in order to improve food policy making and public food storage management in Bangladesh. He called for research, academia and international partners to bring together shared knowledge, skill and efforts to make Vision 2020 and the SDG goals of Bangladesh possible.

2.2 Overview

Mr. Gazi Ur Rahman (Project Director, MFSP, and Joint Secretary) provided an overview on the Modern Food Storage Facilities Project (MFSP). Mr. Gazi elaborated the following as the specific objectives of MFSP: develop 8 silo complexes of capacity 535,500 metric tons (MT); reduce grain quality and quantity loss; adopt best-suited technologies for preservation of food grain quality, quantity and

¹ <https://www.ifpri.org/news-release/ministry-food-and-partners-inaugurate-innovative-food-security-research-program>

² <http://www.observerbd.com/details.php?id=47138>

³ <http://dailyasianage.com/news/40560/ifpri-food-security-research-launched>

⁴ <http://www.thedailystar.net/business/food-ministry-launches-research-programme-food-security-1326649>

⁵ http://www.eobserverbd.com/share.php?q=2016%2F10%2F26%2F16%2Fdetails%2F16_r2_c6.jpg&d=2016%2F10%2F26%2F

nutritional level; ensure safe food grain storage during calamities; ensure safe and long storage free of chemicals such as insecticides and preservatives; ensure better monitoring and improved governance and management of food stocks, and; facilitate household access to domestic silos to ensure household level food security. It was underscored that MFSP, in achieving the above stated objectives, will be supported by the BIFPRP on three thematic areas: storage and transport logistics, market and policy analysis, capacity strengthening and outreach.

Dr. Shahidur Rashid (Senior Research Fellow, IFPRI) provided a historical overview of the food security challenges that Bangladesh has gone through. He pointed out that Bangladesh's success in improving food security and reducing poverty is globally recognized. Poverty has declined from almost 70 percent at the country's birth in 1971 to about 24 percent today; the country has moved from being constantly deficit to being almost self-sufficient in food; wages are increasing; and there are clear signs of economic transformation. While these are remarkable accomplishments, Dr. Rashid pointed out, they do not mean that need for food policy analysis has diminished. Instead, these changes imply the emergence of a new set of food policy changes, which will involve upgrading food policy architecture of the country. The food policy institutions cannot operate the way they have been, they have to embrace digital technology. The policy focus should shift to ensuring safe and balanced food, not just feeding rice and wheat. He concluded by expressing hopes that IFPRI-BIDS-Illinois partnership will play important roles in dealing with many of the emerging food policy challenges. .

2.3 Speeches

Advocate Md. Qamrul Islam, MP (Honourable Minister of Food) was the chief guest of the inaugural session. The Honourable Minister emphasized that Bangladesh has achieved milestones since the adoption of a new strategy and vision by the Honourable Prime Minister Sheikh Hasina in 2009, and is evolving to the status of a middle-income country. It was disclosed during the speech that the Ministry of Food hopes the country will achieve more success in the future to be identified as a developed nation by 2041. Bangladesh has attained food self-sufficiency and food aid has diminished to almost zero. It was learnt from the speech that Bangladesh now ranks fourth among rice producing countries and has recently exported aid relief of total 20 thousand metric tonnes of rice to Nepal during the recent disaster calamity. Rather, the country is concerned about improving food security and safety standards for the entire population. The Honourable Minister appreciates IFPRI's commitment, as leader of the IFPRI-BIDS-Illinois Joint Venture (JV), to support the Government of Bangladesh in modernizing its public food storage system, and expressed his expectation that IFPRI and its partners will make the best possible effort to successfully implement the research program and along with advisory role to evaluate food safety and quality standards and institutionalize online food transit system for better availability, accessibility using appropriate Information and Communication Technology (ICT). He endorsed the World Bank for supporting this BIFPRP as comprehensive initiative and anticipated in future the nation will also welcome new public-private partnerships.

Ms. Rajashree S. Paralkar (Operations Manager & Acting Country Director, World Bank, Bangladesh) emphasized that the comprehensive MFSP supported by the World Bank is expected to ensure food security for about 10 million people prone to extreme weather conditions. She noted that the project supports the construction of 8 steel silos capable of storing more than 500 metric tonnes of rice and wheat for up to 3 years while retaining nutrition quality. She expressed her confidence in the ability of IFPRI-led to effectively manage complex food policy research, generate new knowledge, and

enhance capacity in the process. She concluded her remarks by mentioning that the World Bank is proud to support BIFPRP.

Mr. Md. Abdul Wadud, MP (Chairman of the Parliamentary Standing Committee on Food Affairs). Reflected on development process that Bangladesh has experienced so far to attain food self-sufficiency. He asserted that today's Bangladesh welcomes advanced food policy research to inform the next generation of policy reforms. He thanked BIDS for its policy research work, University of Illinois and IFPRI for undertaking this important collaborative program. He expressed hopes and optimism that the new food policy paradigm in the country will fulfil the dreams of the late father of the nation to turn Bangladesh to a country where no one goes hungry. He asserted that Bangladesh is well on its way to fulfilling that dream. Mr. Wadud concluded with special thanks to the Ministry of Food and the Directorate General of Food for leading the BIFPRP initiative.

Dr. Khan Ahmed Sayeed Murshid (Director General, Bangladesh Institute of Development Studies) mentioned that Bangladesh has been doing better in food production. Dr. Murshid opined in how agricultural productivity across Bangladesh advanced with greater pace, but also that there is saturation in technology use. He reiterated the need to look into unresolved issues such as food stock and storage, waste management, market instability and declining cereal prices, as well as the need to introduce technological innovation in food production to improve productivity. This collective technological advancement and appropriate management of food market will add value by reducing cost and increasing profit for farmers. He perceived that the research agenda envisioned under BIFPRP over the coming years will form strong technical partnerships among joint venture partners, not only for the food sector, but also for the agricultural sector by enhancing the capacity of key stakeholders in the latter.

Dr. Alex Winter-Nelson (Director of the International Program, University of Illinois at Urbana-Champaign, USA) mentioned that BIFPRP will have relevance first to conduct research on unexplored areas of food security challenges and strategies, and second to base food policy on the framework of an entire food system (from seed development to on-farm production, post-farm production, and processing and distribution), as the food system is complex and interlocked. While such food sector complexity can present new challenges and opportunities for Bangladesh, the opportunities require new interventions to get the outcomes the country wants to see. He stressed that UoI-UC will, in particular, play a pivotal role in facilitating the capacity building component of BIFPRP.

Dr. Paul Dorosh (Director of the Development Strategy and Governance Division, IFPRI, Washington) remarked on IFPRI's collaboration with the Bangladesh government (the Ministry of Food and the Bangladesh Institute of Development Studies) over the last 25-30 years to implement different food security-related projects in the country. He mentioned his engagement and role in such previous project activities and assured his enthusiasm and commitment (as Director of the Development Strategy and Governance Division of IFPRI) to successfully implement BIFPRP.

Mr. A.M. Badrudduja (Secretary, Ministry of Food) welcomed the participants by reminding that December is the month on independence and saluting those who sacrificed their lives in the liberation war. Ensuring food security for all was an important part of the broader vision of independence. Today, Bangladesh is moving forward in that direction. He expressed particular interest in the program, as it is envisaged to agriculture, food, and nutrition—all three of which are of high priority for the government. Recognizing IFPRI and its partners' global reputations, Mr. Secretary requested the JV to

focus on the strengthening advanced food policy-making in Bangladesh. The secretary requested the Ministry of Food and the Food Planning and Monitoring Unit (FPMU) to extend their support to the JV to make the program a success. He formally concluded the inaugural sessions with a special note of thanks to IFPRI, BIDS, the World Bank, and the University of Illinois for their gracious presence.

3. Technical Session

The objective of the technical session was to bring together experts to discuss evolving food policy challenges in the context of Bangladesh. There were four topics—two related to new challenges of the traditional stock and price stabilization policies and the other two dealing with modern storage and food safety respectively. The session began with a presentation by Dr. Paul Dorosh, Director of the Development Strategy and Governance Division at IFPRI. His presentation provided an overview of the PFDS and emerging roles of the private sector. The second presentation was by Professor Alex Winter-Nelson, who presented both global and preliminary Bangladesh study results on how post-harvest loss prevention can improve food security and overall cereal availability. The third presentation was by Dr. Nicholas Minot on the experiences of food price stabilization. This presentation brought together experience from a wide range of countries and highlighted the challenges of stabilizing food prices, which has received increased attention following the 2007/8 global food crisis. The final presentation was by Dr. Vivian Hoffman on the challenges of ensuring safety and enriching food. Given the richness of these presentations, the organizers requested the presenters to produce short notes on each of these presentations. These notes are presented in the following section afterwards.

4. Take Away Messages

BIFPRP is designed to meet the food policy needs of a growing Bangladesh. The program will contribute to this by informing the food value chain, public food stock management, disaster response, and price stabilization efforts using evidence-based research results from state-of-the-art analytical methods. The program's cross-cutting research activities will focus on a full spectrum of food policy considerations – storage and transport, market and policy analysis, as well as capacity building and outreach. In addition to conducting collaborative research and analysis, the program is expected to enhance the capacity of officials and staff from the Ministry of Food and other relevant government institutions, so that the officials and staff can analyze and manage complex food policy issues.

The Government of Bangladesh has high expectations of BIFPRP. The IFPRI-led consortium is expected to build synergies with key government institutions such as the Food Policy Monitoring Unit and the Directorate General of Food at the Ministry of Food and with the private sector to better deliver on the envisaged research activities.

Policy notes on the technical presentations

5. Policy Notes on Technical Session

Note #1: Evolving Roles of PFDS and Private Sector Trade in Bangladesh⁶

Paul A. Dorosh

*Director, Development Strategy and Governance Division
International Food Policy Research Institute*

The food economy of Bangladesh and the country's food policy have undergone massive changes since liberation in 1971. Cereal (mainly rice and wheat) production have greatly increased; food aid is no longer a major source of supply, poverty has been reduced and overall nutrition (not just calorie consumption) is now a major policy objective. With these changes in the food economy, the public food grain distribution system has also evolved, along with the role of international trade.

Food Grain Production and the Public Food Grain Distribution System (PFDS)

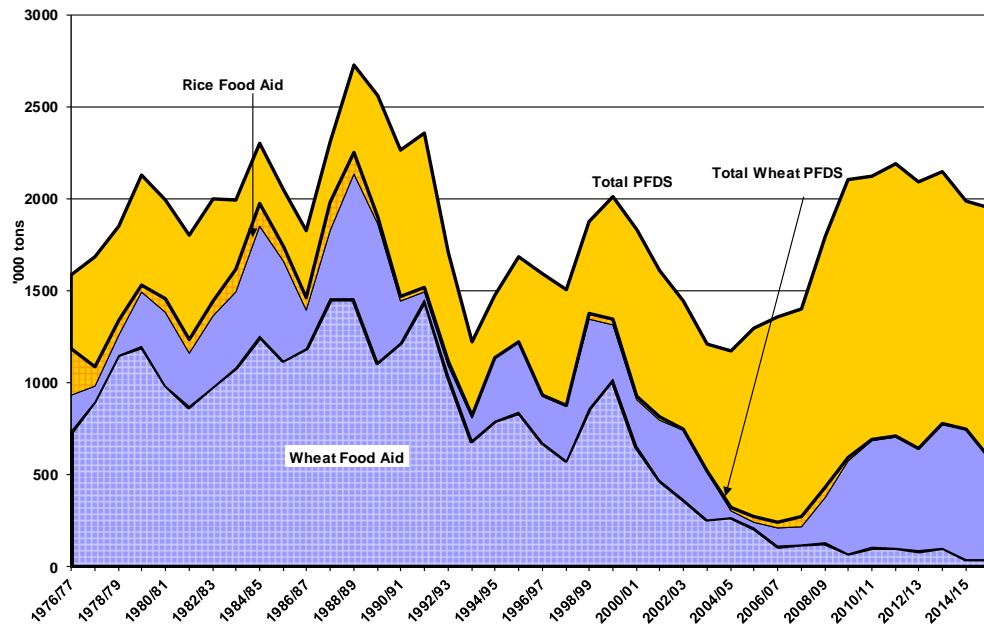
Increases in food grain production in the 1980s and 1990s, made possible by adoption of Green Revolution technology (improved seeds, fertilizer and irrigation) enabled Bangladesh to eliminate its “food gap” by 2000. Rice production more than doubled from independence in 1971 to 1999/2000. Most of this production increase was due to the expansion of *boro* (winter season) rice as privately owned tube well irrigation expanded dramatically. Since 2000, adoption of improved varieties has led to increases in *aman* (monsoon season) rice production, as well.

As the result of the increase in production and the elimination of the food gap, food aid has dramatically declined, from over 1 million tons per year in the late 1980s and early 1990s to only about 600 thousand tons per year in the early 2000s to only 74 thousand tons per year in 2015/16 (Figure 1).

The decline in food aid has had major implications for the PFDS, as well. In the 1980s, wheat food aid accounted for about half of total food grain distribution, which averaged over 2 million tons per year. Major reforms in the early 1990s led to the elimination of major subsidized sales channels (Urban Rationing and Rural Rationing), creation of the targeted Food for Education program and an overall decline in distribution to about 1.5 million tons per year throughout most of the 1990s. As food aid declined further in the early 2000s, total distribution fell to about 1.3 million tons per year, almost all of which was sourced from domestic procurement of rice.

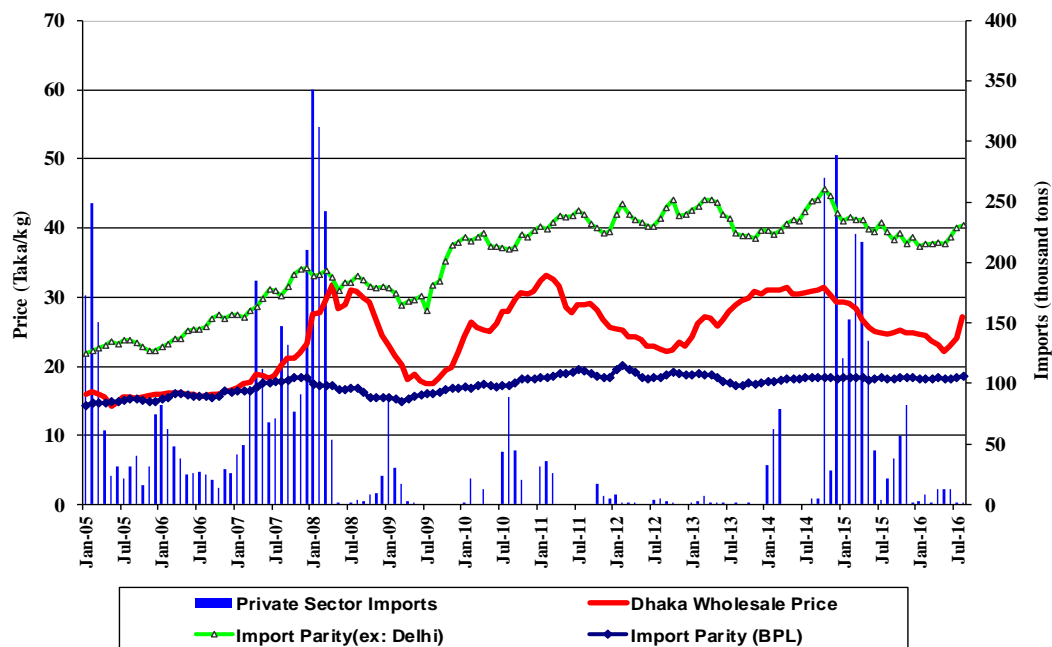
⁶ This paper draws heavily on Dorosh (2016), “Promoting National and Household Food Security in Bangladesh: The Evolving Roles of Public Stocks, Cereal Distribution and Private Trade”, (unpublished manuscript).

Figure 1: Bangladesh Food Aid and PFDS Distribution, 1976/77 – 2015/16



Source: Author; Food Planning and Monitoring Unit (FPMU) data.

Figure 2: Bangladesh Import Parity Prices and Private Sector Rice Imports, 2005-16



Source: Author; Food Planning and Monitoring Unit (FPMU) data.

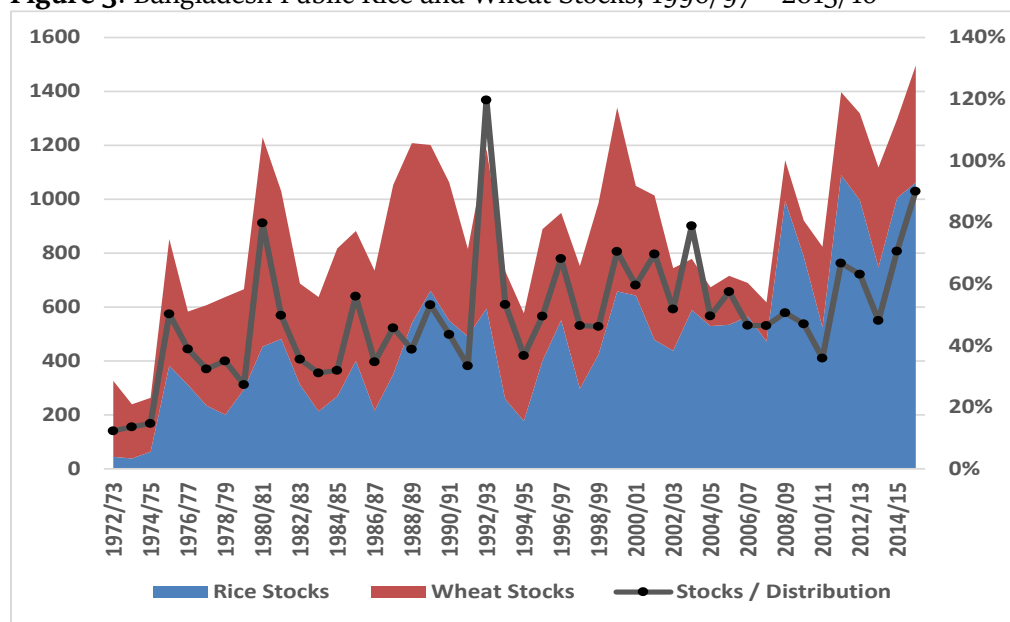
The role of international trade

Bangladesh liberalized its import trade in rice in the early 1990s. In years of relatively poor harvests in the mid- to late 1990s, import parity prices provided a price ceiling for Bangladesh domestic market prices. Following the 1998 flood, private sector imports exceeded 200 thousand tons/month for seven consecutive months, stabilizing domestic prices at import parity (based on India wholesale market prices plus transport and marketing costs).

During the early 2000s, private traders in Bangladesh continued to import rice from India, most of which derived from sales of Indian government rice stocks at subsidized prices (Dorosh and Rashid, 2013), (Figure 2). However, in 2007/08, as world food prices rose, India put a temporary ban on its exports of non-basmati rice leading to a major price increase in Bangladesh. Ultimately, Bangladesh negotiated for a limited amount of commercial imports from India, but the temporary disruption of rice imports from India has led to a major shift in government policy with lesser reliance on international markets. Public cereal stocks have been increased, along with domestic procurement and public distribution (including a return to rationed sales). Nonetheless, private sector imports of rice and wheat continue on a large scale.

As shown in Figure 3, total annual average PFDS stocks have increased substantially in recent years, and exceeded 1.3 million tons in four of the last five years. Current stocks consist mainly of rice (averaging about 1.0 million tons per year in this period). In part, this is due to ability to better dry paddy and milled rice and thereby reduce storage losses related to high moisture content that generally limited storage of rice to about six months. There are plans for investments in expanded grain storage and drying facilities that would enable storage of rice for longer periods without major quality deterioration.

Figure 3: Bangladesh Public Rice and Wheat Stocks, 1996/97 – 2015/16



Source: Author; Food Planning and Monitoring Unit (FPMU) data.

Summary

Bangladesh has had several major food security achievements over the past several decades. Rice production more than doubled from independence in 1971 to 1999/2000. These production increases reduced dependence on imported cereals, helped to raise rural incomes and contributed to a decline in the real price of rice from the early 1980s to the late 1990s thereby benefitting poor net consumers of rice. Trade liberalization in the early 1990s also enhanced national food security as private sector imports have added to total cereal supply, and played a particularly important role following a major production shortfall caused by the 1998 flood. In addition, reforms in the PFDS led to creation of several well-targeted distribution programs (e.g. Food for Education and Vulnerable Group Development) that have improved household food security (both access and nutrition).

Looking forward, new investments in public storage facilities offer the opportunity to reduce storage losses and provide greater flexibility in the PFDS with regard to needs for stock rotation. International trade, both public and private imports, will likely continue to provide a low cost option for enhancing domestic supplies in times of unforeseen shortfalls. Maintaining an appropriate balance between public interventions and international markets will remain a key food policy challenge, necessitating strong analytical capability within the Government of Bangladesh.

Note #2: Modernizing Food Storage - Technologies and Policies

Prasanta Kalita

*Director, ADM Institute for Prevention of Postharvest Losses
University of Illinois and,*

Alex Winter-Nelson

*Director, Office of International Programs
Professor of Agricultural and Consumer Economics, University of Illinois*

The food loss challenge and opportunity

The world faces a challenge of meeting rapidly growing food demand with little scope for increasing land, water or labor inputs devoted to agriculture and pressing imperatives to protect the natural environment and adapt to a changing climate. These challenges are especially severe in Bangladesh where economic growth has led to changes in diet and accelerated food demand, while natural resources are highly constrained and vulnerability to severe weather events is a serious concern.

New production technologies constitute one important mechanism to help meet the challenge of food security. Because a large share of the food that we currently produce is lost to waste and spoilage, another valid approach to achieving and maintaining food security may be to avoid losses to the food that we produce and store.

Scale of postharvest losses

Globally about one third of the food that is produced is lost or wasted (FAO, 2011). This amounts to 1.3 billion tons of cereal equivalent per year. The losses emerge in both quantity and quality from factors including weight loss, breakage and fracturing, nutritional losses, mycotoxin multiplication, and seed viability loss.

This loss represents a tremendous cost in terms of resource misallocation. Considering land use, 198 million hectares, more than 18 times the total amount of arable land in Bangladesh, is devoted to producing food that is lost or wasted each year. The cost of producing food that is ultimately wasted or lost extends beyond land. There is a significant environmental effect, such that one tenth to once twelfth of the world's greenhouse gas emissions (3.3 Gtonnes of carbon dioxide) can be attributed to the production and handling of food that is wasted or lost. These losses also include an economic loss to smallholder farmers whose production loses value as a result of postharvest loss. Addressing postharvest food losses could thus help to address food insecurity, poverty and environmental damages.

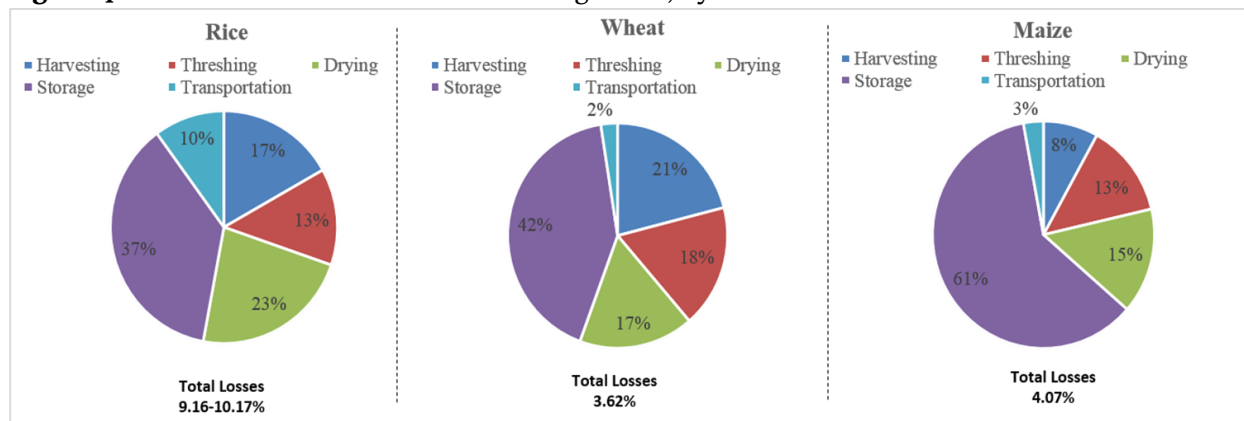
Nature of postharvest losses in Bangladesh

According to FAO (2011), losses to cereals account for 53% of total postharvest loss when measured by food energy. The largest share of these avoidable losses emerges as a result of techniques used in

drying and storing grain. Thus, interventions to improve drying and storage of cereals hold promise for reducing postharvest loss.

Information about losses in Bangladesh suggest postharvest losses in rice come to between 10 to 15% of harvested volume (Calverley, 1996; Bala, 2010), but losses in value that may be twice as high.. Consistent with other locations, most of this loss is attributable to procedures in drying and storing grain (Figure 4).

Figure 4: Estimated Postharvest Losses in Bangladesh, by Cereal



Source: Bala et al. (2010).

While the largest share of losses emerges in these two stages, there are significant losses experienced throughout the system, including at harvesting, threshing and milling. Losses in harvesting and threshing are observed at a similar range of rates whether the practice is conducted manually or with the use of machines. For these tasks, management and timing can be important determinants of losses making gains from technology change a function of practices as well as equipment. For drying, storage and milling, in contrast, modern, mechanized processes have significant impact reducing on losses. In Southeast Asia, the International Rice Research Institute finds observed losses during sun drying or three to five percent. Mechanical drying demonstrates losses of one to two percent. Meanwhile losses through open storage come to five to ten percent while sealed storage results in one to two percent losses. As a large share of grain in Bangladesh is sun dried and stored in sacks that are open to air and water, there is considerable scope for reducing postharvest loss. Such reductions could occur through improvements in private on-farm practices, improved practices by private moves through private grain merchandisers, and improvements in the public storage and distribution system.

Recent work through the ADM Institute for Prevention of Postharvest Loss (ADMI-PPHL) at the University of Illinois and the Bangladesh Agricultural University (BAU) has quantified some losses experienced in on-farm postharvest practices. Losses in quality and quantity of stored grain correlate to moisture content. Ideally, grain in storage will have a moisture content of no more than 12 percent. Data collected from 200 households in eight villages in Phulpur showed that after two months in on-farm storage, only 22% of farms produced samples of grain with moisture content of 12 percent or less. A full 15% of the samples had moisture content of over 20 percent. The moisture content correlated closely to quality markers in the stored grain. For example, 18% of the grains were moldy when the

moisture content was over 20% compared to 4% of the grains being moldy when the moisture content was 12% or less. Insect populations rose markedly as the moisture content increased in the samples. The moisture content also correlated with poor seed performance. Samples that had a moisture content of over 18% had only an 18% germination rate when used as seed compared to germination rate of 94% where the moisture content was less than 12%. (ADMI Institute work in Bangladesh, in collaboration with Bangladesh Agricultural University and Feed the Future Innovation Lab at Kansas State University).

Table 1: Kalita, 2016 study quantified losses experienced in on-farm postharvest practices

Range of M.C. (%)	No. of Samples	Grain Discoloration (%)			Insect Population (Number of insects)	
		Brownish	Spotted	Moldy	Moth	Weevil
10-12	44	1	2	4	2	0
12.1-14	37	1	3	7	5	6
14.1-16	61	2	2	11	7	8
16.1-18	14	4	2	15	12	9
18.1-20	07	5	3	16	19	11
>20	30	7	3	18	23	15

Source: Kalita, 2016.

Another dimension of loss during on-farm storage relates to food safety. A sample survey conducted through the partnership between the ADMI-PPHL and BAU analyzed 72 rice samples from on-farm rice stocks in Jessore and Mymensingh. That analysis revealed that 20% of the samples had aflatoxin levels of over 20 parts per billion, which is the maximum tolerance that is considered safe in Bangladesh and in the US. In some samples the aflatoxin concentration was over two times this limit. As with mold aflatoxin concentration tends to increase with moisture in the grain.

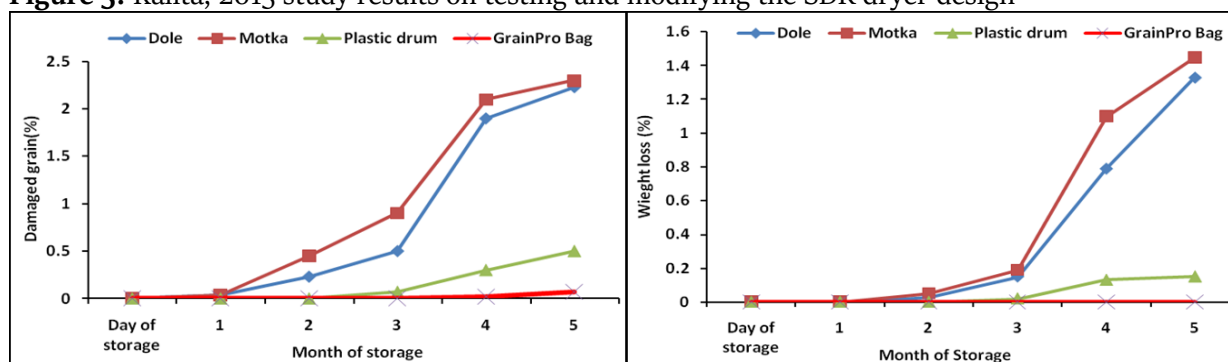
Technology and policy options

Aspects of existing postharvest practices are contributing to losses in the quantity and quality of rice available in Bangladesh. Fortunately, there are many technology options available that are appropriate for rice producers in the country.

Low-cost moisture meters are widely available, easy to use, portable and effective for monitoring moisture content. Such devices are essential elements if moisture is to be managed. Access to such measurement and understanding of the importance of moisture are key first steps to achieving improved postharvest management and reduced postharvest loss in the private and public storage and distribution systems.

Low-cost drying technologies that are suitable for use in small rural communities are also necessary and in existence. The STR Dryer developed in Vietnam, for example, can use farm or animal waste to warm air which is circulated through grain and can dry 500 kilograms of paddy to a 12% moisture content in less than 5 hours. The STR dryer with 500 kilogram capacity is a proven technology and can be manufactured for \$500. Engineers at the BAU with ADMI-PPHL are testing and modifying the SDR dryer design to make it even more suitable for conditions in Bangladesh (Kalita, 2015).

Figure 5: Kalita, 2015 study results on testing and modifying the SDR dryer design



Moisture control is a critical factor for reducing loss in storage. Because rice absorbs moisture from the atmosphere, the benefits of careful drying can be lost over a short time, unless grain is stored in airtight containers. Hermetic bags, such as the GrainPro bags, provide an option. Such bags can hold 50 kilograms of rice and cost less than \$2.00. Analysis conducted by BAU and ADAMI-PPHL (Kalita, 2016) shows that after 75 days in storage, grain that was dried to a moisture content of 12% and stored in a GrainPro bag remained at 12% moisture. In contrast, grain stored in a traditional dole or motka or a plastic drum without an airtight seal had moisture contents of 13% to 14% after 75 days. Performance in terms of weight loss, damage to grains, and germination loss were notably greater under all storage systems that were not airtight. Other systems for airtight storage can be expected to yield similar benefits in terms of reduced grain loss in storage.

The technologies described above are already available, but are not in widespread use in Bangladesh. Defining policies to promote adoption of practices to reduce postharvest loss in the private storage and distribution systems could be an important element of a food security strategy. Promotion of improved on farm storage may be an effective way to address postharvest loss and would also affect the appropriate mix of private and public storage to ensure food security in a country. The policy factors that may help relax constraints to adoption might involve regulatory issues like financing interventions, commodity pricing, trade openness, and the definition and application of grades and standards. Likewise, greater adoption of the practices to reduce postharvest losses may require greater information and awareness on the part of agents at all stages of the commodity value chain.

Concluding comments

Given pressure to meet growing food demand, it is increasingly important to ensure that a growing share of food that is produced reaches the consumer. There is considerable evidence that current storage and distribution systems are subject to limitations in moisture control which results in large losses in grain quantity and quality during storage.

Addressing postharvest losses is likely to mean taking steps to improve drying and storage practices among smallholder farmers, private grain merchandizers and the public systems. There exist many technical options to enhance postharvest management and reduce losses. Determining what policies are appropriate to encourage cost-effective storage and the specific roles to be played by public and private agents is an ongoing challenge.

Note #3: Public Grain Reserves - Issues and Future Directions

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Introduction

Public grain reserves are stocks of food, usually staple grains that are owned and managed by the government in order to serve one of several public functions. The grain may be procured locally from farmers and traders or it may be imported. The distribution of the grain may be through sales at market prices, through subsidized sales, or through free distribution to targeted populations.

The overall objective of public grain reserves is to improve food and nutrition security, defined as ensuring that all people at all times have access to sufficient nutritious food for a healthy, active life. Public food reserves can improve food security in three ways. First, the reserves may serve a public food distribution system, in which grain is supplied to chronically poor households. Second, the reserve may be used for emergency relief, to feed people affected by floods, drought, or other natural disasters. Third, public stocks may be used to stabilize the price of politically-sensitive food grains by buying up surplus when there is a glut and selling off stocks when shortages cause price spikes.

Current issues

There are a number of key issues in the management of public grain reserves, such as the optimal size of the stock, the guidelines for procurement and for distribution, and the spatial distribution of storage facilities. Since the management of the stock depends largely of the objectives, we discuss the issues separately for each of the three objectives discussed above.

Public food distribution

Public food distribution involves the distribution of food, usually grains and other staples, to chronically poor households for free or at subsidized prices. Since the volume of food needed is relatively stable over time, and it is being delivered to the same locations every month, the management of public reserves for food distribution is relatively simple. If the procurement is carried out locally, then reserves are needed to hold the grain from the harvest season to the off-season. If the procurement is through imports, then storage is only needed to hold grain in transit in between modes of transportation.

The effectiveness of using public food reserves for food distribution systems depends on the effectiveness of targeting. Studies of public food distribution sometimes find a significant share of the food is “leaked” to non-poor households. There is a trend to move from food assistance to cash assistance, which reduces delivery costs and provides more flexibility for beneficiaries.

Emergency relief

Public food reserves can also be used to provide emergency relief in the event of a natural disaster. Unlike public food distribution, the food requirements occur only sporadically and the location varies from year to year. The required storage capacity depends on two factors. The first factor is the maximum size of the emergency (in terms of the number of beneficiaries) to be covered. Addressing the requirements of a large, once-in-a-century emergency obviously requires a larger stock than covering a smaller once-in-a-decade emergency. Second, the size of the stock depends on how long beneficiaries will need to be fed, which is typically the time needed to mobilize food imports and re-establish functioning markets or a needed depends on the maximum size of an emergency that might need to be covered, as well as the time needed to mobilize imports. The management of stocks for emergency distribution is complicated because of the challenge of defining eligibility criteria, adapting to different supply routes each year, and addressing transport bottlenecks that may be caused by the natural disaster.

Price stabilization

Public food reserves can also be used as a buffer stock to stabilize the price of staple grains by selling when the price is too high and buying when the price is low. Unlike public food distribution and emergency relief, buffer stocks generally do not target beneficiaries. Instead, they sell to any buyer with the idea that the volume of sales will be sufficient to lower the market price of grains. Similarly, procurement is carried out on a least-cost basis because the only goal is to procure enough grain to support the market price.

In reducing the variability of grain prices, the government will generally reduce the incentives for the private sector to store grain, which increases the cost of the scheme to the government as it takes on full responsibility for holding grain from the harvest to the off-season and from years with a bumper crop to years with a poor harvest. Economists often recommend announcing a price band, including the floor (buying) price and the ceiling (selling) price, to ensure transparency and provide predictability. A wide band allows more price fluctuation, but requires less frequent intervention and reduces costs. In contrast, a narrow band reduces volatility but costs more because it is necessary to intervene frequently. The success of the buffer stocks depends on setting the price band well. If it is too high, the government will end up buying more than it sells, accumulating stocks until capacity or budget limits are reached. If the price band is set too low, the government will end up selling more than it can purchase, eventually exhausting the stock.

International experience

In practice, many public food reserves are designed to serve multiple objectives, including public distribution, emergency relief, and/or price stabilization. In addition, many reserves do not announce buying and selling prices ahead of time. Instead, procurement and distribution decision are made on an ad hoc basis, depending on prices, the expected size of the harvest, and political pressure from stakeholders. These patterns are illustrated by three case studies described below.

Indonesia

BULOG, the government food logistics agency, is responsible for public food reserves, which it uses mainly for price stabilization. From 1967 to the mid-1990s, BULOG defended a minimum farm price and maximum ceiling price for rice, which was adjusted roughly every year. It maintained a legal monopoly on rice imports, restricting imports and supporting the price to promote self-sufficiency. Studies have shown that BULOG keeps prices higher but more stable than world prices, but there have been problems of smuggling and corruption. One study estimated that the costs to consumers of the high rice price were US\$ 400 million per year.

In 1997, the Asian financial crisis and a poor harvest meant that the country was forced to turn to the International Monetary Fund for emergency credit. Over 1998-2000, rice trade was liberalized, leading to a surge in imports. In 2001, BULOG was restructured as state-owned enterprise and was once again given a monopoly on rice imports. A tariff keeps the domestic price above international prices in an effort to promote rice self-sufficiency.

A study in 2006 showed that a majority of rural farmers in Indonesia are net rice buyers, relying on other crops, non-farm businesses, and wage labor to purchase rice. This implies that most rural farmers are hurt by the policy of supporting rice prices above the import parity level. There remains concern about the high cost and inefficiency of BULOG, but strong political interest in maintaining current policy has preserved its central role in Indonesian rice marketing.

Philippines

In 1972, the National Food Authority (NFA) was formed with the goal of stabilizing price and promoting rice self-sufficiency. Like BULOG, it carried out local procurement in surplus zones, as well as maintaining a monopoly on rice imports. It also maintains emergency and strategic reserves and carries out rice distribution which is supposed to be targeted at poor households.

However, NFA has been accused of importing unneeded quantities of rice, of implementing emergency distribution systems which overlap with other government programs, and allowing 50% leakage to non-poor households in its public distribution system. In addition, the above-market price of rice in the Philippines imposes high costs on urban consumers and many net buyers in rural areas.

The government has debated various proposals to reform the NFA to focus on rice and announce a price band to improve predictability in rice markets. Others have suggested privatizing the NFA or allowing the private sector to compete with the NFA in importing rice.

Vietnam

Before 1986, most of the economy in Vietnam was under centralized government planning. Under the socialist regime, agricultural production was carried out on collective farms, where farmers were paid a salary based on the output of the farm. Government cooperatives and state enterprises managed agricultural marketing, including rice milling and distribution to consumers. Vietnam had relatively low rice yields and, as a result, was a chronic rice importer.

In 1986, the government began to implement the *Doi Moi* policy, which allocated collective farm land to individual farm households. Initially, farmers were required to sell a quota to the government at fixed prices, but were allowed to sell any surplus to emerging private traders. Eventually, the quotas were phased out and milling and marketing was increasingly carried out by small private entrepreneurs. With greater incentives to maintain irrigation works and use modern inputs, Vietnam quickly transformed itself to a major rice exporter.

However, two large state-owned enterprises, Vinafood 1 in the north and Vinafood 2 in the south, were given a monopoly on rice exports, as well as managing large rice mills and storage facilities. Unlike in Indonesia and the Philippines, they were not involved in price stabilization, neither supporting farm gate prices nor limiting consumer prices. In the late 1990s, the rice export quota was gradually lifted and then eliminated, allowing Vietnam to become the second-largest exporter in the world. In spite of limited export liberalization, Vinafood 1 and 2 retain 70% of Vietnamese rice exports, operating primarily as commercial firms. The state enterprises incur high costs and require annual subsidies to continue operating, causing some researchers and policy makers to question their continued role in Vietnamese rice marketing.

Future directions

Many Asian countries are experiencing rapid income growth, urbanization, and the development of private and public institutions, all of which have implications for public food reserves. Income growth has reduced the level of poverty and food insecurity in most Asian countries. In addition, income growth is reducing the share of food in household budgets and causing diets to diversify from rice and other staples toward fruits, vegetables, dairy, meat, and processed goods. Per capita consumption of rice is growing slowly in low-income countries like Bangladesh and is stagnant or declining in middle- and high-income countries like South Korea and Japan.

Agricultural production is also diversifying in response to changing demand. An increasing share of agricultural land is allocated to fruits, vegetables, cash crops, and aquaculture, meaning that farmers are less reliant on rice production than they used to be. Finally, transportation networks have improved, reducing the cost of agricultural marketing, while markets themselves have become more sophisticated with better access to credit, grown in scope and sophistication, resulting in greater capacity to move products quickly.

These trends have weakened tended to weaken the economic rationale for public food reserves. Poverty reduction and the declining role of rice in the economy means that the need for public food distribution and price stabilization has declined. The fact that international agricultural markets are better capitalized undercuts the rationale for state monopolies on rice trade. In addition, there is growing evidence that cash assistance can be as effective as food distribution in improving food security. Cash assistance is not effective where agricultural marketing systems are disrupted by poor infrastructure or natural disaster, but in many cases can deliver assistance to the poor at a lower cost.

Conclusions

Public food reserves are used to supply public distribution systems, to facilitate emergency relief, and to stabilize grain prices. The optimal size of the stock depends on the objectives of the stock, that is, the nature of the risks that they are designed to insure against. Managing reserves for public distribution

is relatively simple because of the steady demand. In contrast, managing reserves for emergency relief and price stabilization requires detailed understanding of the risks and the willingness to pay for risk reduction.

Case studies from Indonesia, the Philippines, and Vietnam illustrate the variety of goals, activities, and performance in the agencies managing public food reserves. BULOG in Indonesia and the NFA in the Philippines have attempted to stabilize prices and promote self-sufficiency with mixed success, while Vinafood 1 and 2 focused on rice milling and export. These examples also illustrate the high costs of public reserves, particularly if they attempt to significantly reduce price volatility and/or promote self-sufficiency.

Rapid income growth has resulted in falling poverty rates. Rice is becoming less important to consumers and farmers than previous decades. These trends weaken the economic rationale for public food distribution and rice price stabilization. They create space for government to shift from managing rice markets to directly addressing problems of food and nutrition insecurity. In some situations, well-targeted cash assistance may be as effective as food aid, while costing less to deliver.

Note #4: Ensuring Safety and Enriching Food

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Introduction

In addition to providing access to affordable food of sufficient quantity, a key role of the government is to ensure that this food meets safety standards. Public management of a strategic grain reserve, and distribution through the Public Food grain Distribution System (PFDS), also represents an opportunity to enhance the nutritional quality of food consumed by vulnerable populations through micronutrient fortification. This presentation covered two primary topics. First, core principles of food safety were discussed, with particular attention to the case of rice in Bangladesh. Second, the extent of micronutrient malnutrition in the country was described, and the opportunity to address this problem through fortification of rice distributed through the PFDS was discussed.

Ensuring food safety

Risk-based analysis

There is an international consensus that food safety risks are best approached through a risk analysis framework. This framework makes the important distinction between hazards and risks. Hazards have the *potential* to cause harm, whereas risk is the *probability* that a particular hazard will result in harm. Foods may contain many hazards that can make people sick, either immediately or by increasing the likelihood of chronic disease. Hazards may include microbial pathogens, zoonotic diseases, parasites, adulterants (e.g., formalin); mycotoxins (e.g., aflatoxin); antibiotic drug residues; pesticide residues; and heavy metals (e.g., arsenic). In the case of rice, however, many of these hazards are of little or no consequence, because rice is cooked thoroughly prior to consumption, killing most pathogens.

Risk analysis involves first determining which risks are the most important – that is, which are most likely to cause serious harm to human health. Next, the acceptable level of risk must be decided. Eliminating risk entirely is impossible. Further, reducing risk typically entails costs. Deciding on the level of acceptable risk is therefore a context-specific public policy decision, which depends on the resources available and the value competing uses to which these resources could be put. Finally, in order to maximize the impact of available resources, the most efficient strategy for risk reduction should be identified.

In the context of rice, there are three primary categories of risk. Likely the most important of these is that of contamination with fungal toxins (mycotoxins). Mycotoxins are byproducts of particular species of fungi. Several of these, including aflatoxin, which affects rice, are known carcinogens. Aflatoxin has also been implicated as a possible cause of stunting in children. While aflatoxin is not nearly as common in rice as in other crops (maize and groundnut are the most affected commodities), it can become a

concern if rice is not well dried prior to storage, or if storage conditions are poor. Contamination of rice with aflatoxin has been documented in Bangladesh.

As noted above, most pathogenic contamination not a concern in rice. However, some pathogens can survive boiling temperatures. One of these, which commonly infects rice, is *Bacillus cereus*. Because this bacterium is commonly found in soil, it is almost impossible to prevent contamination in food crops. The recommended control measure is to consume rice immediately after cooking, and cold storage of any which remains.

Rice has been shown to take up heavy metals present in the environment. In Bangladesh, the primary heavy metal of concern is arsenic. Across studies reviewed by Heikens (2006) a substantial portion of rice samples (from 15% to over 50%) contain above 0.15 mg/kg of inorganic arsenic. 0.15 mg/kg is China's food safety standard for arsenic in rice, and is recommended by the FAO for Bangladesh as well, due to the large share of the diet comprised by rice. Previous studies have used the much higher Australian standard of 1 mg/kg – by that standard, the prevalence of rice considered unsafe is much lower. When arsenic-contaminated water is used for irrigation, arsenic builds up in the soil over time, implying that the importance of this issue will only grow. Experimental studies have shown a strong negative effect of arsenic contamination on rice yields, leading to recommendations against using contaminated water in irrigation.

Finally, while agro-chemical residues pose a potential food safety hazard and have been shown to affect the health of farm workers, their importance as a food safety risk is not well documented.

Hazard Analysis and Critical Control Point system (HACCP)

The Hazard Analysis and Critical Control Point system (HACCP) is a systematic preventive approach to food safety, and has been adopted globally for the reduction of food safety risks. Under this approach, points in the production process at which hazards might occur are identified. Actions are then taken at each step of the production process to monitor and control these hazards.

In the context of grain storage, a HACCP system typically includes testing incoming grain for moisture content and presence of mycotoxins (for rice, primarily aflatoxin). Both aflatoxin and moisture content are relatively inexpensive to test for. Ensuring that incoming grain is sufficiently dry (and remains so during storage) prevents fungal growth, and is therefore important for maintenance of both quality and food safety. Inspection of incoming grain for foreign matter and pests is likewise important for ensuring quality and potentially food safety. In Bangladesh, testing incoming rice for arsenic contamination could also be considered, both to ensure the safety of PFDS rice and also as a means of monitoring and tracking over time the level of this contaminant in rice in different parts of the country.

To prevent fungal contamination during storage, maintaining a hygienic and climate-controlled store, and one that is secure against pests and intruders, is critical. Regular fumigation approved pesticides and/or fungicides can also prevent infestation during storage. Grain should be rotated through the store on a first-in first-out basis, and routine sampling and testing of stored grain allow managers to monitor for any potential concerns.

Enabling approach to food safety

In general food safety regulation and enforcement should focus on building capacity within the food industry to meet standards. This can include offering information and training to farmers, processors, retailers, and consumers on food safety risks of greatest concern and best practices for reducing these. It can also involve providing affordable access to food safety testing equipment and supplies by lowering or eliminating import duties on these.

In general, it is best to avoid overly punitive measures, as food safety hazards can be impossible to avoid, even when using best practices. If firms fear punitive enforcement action if they fail to comply with standards, this may drive them underground, making them even more difficult to regulate. An exception is the adulteration of food with harmful additives (as long as the perpetrator of adulteration is clear).

Enriching food

High levels of micronutrient malnutrition

Micronutrient malnutrition is prevalent in Bangladesh. Zinc is the most common micronutrient deficiency in the country, affecting 45% of children and 57% of non-pregnant women. Inadequate zinc affects immune system function, resulting in higher risk of serious illness and death due to infectious disease, especially among young children. Iodine deficiency is the next most common deficiency. This affects 40% of children and 42% of women, and is a serious concern due to its importance for brain development at a young age. Iodine deficiency is the most common reason for cognitive impairment globally, but can be addressed relatively easily through mandatory fortification of salt. 33% of children and 26% of women in Bangladesh are anemic. Even though many of those affected by anemia do not appear iron deficient based on blood tests due to the high iron content of groundwater in the country, the bioavailability of this type of iron is low, thus increasing dietary iron intake with bioavailable forms of iron remains critical for anemia reduction. Anemia is associated with cognitive impairment in children, as well as lower physical energy, reduced immune system function, and maternal and fetal health problems. Vitamin A deficiency is likewise causes immune system problems and impairs fetal development. It can also lead to vision problems. This deficiency affects 21% of children and 5.4% of women in Bangladesh. Finally, vitamin B12 (also known as folate or folic acid) affects 9.1% of women in the country and is known to increase the risk of severe birth defects.

Potential for micronutrient fortification of rice

As rice accounts for 70% of average caloric intake in Bangladesh (FAOStat, 2013), improving its micronutrient content has the potential to significantly address many common micronutrient deficiencies. Rice can be fortified with iron, zinc, vitamin A, and vitamin B12. While several methods of fortification exist, the most common is the inclusion of fortified manufactured kernels made of rice flour and a micronutrient pre-mix at a ratio of between 50 and 200 rice kernels to one fortified kernel. The fortified kernels are indistinguishable from rice kernels and do not affect its flavor. They have been shown in studies to be highly acceptable to consumers, and to reduce various micronutrient deficiencies.

Globally, mandating fortification of staple grains is a common strategy to reduce ensure adequate micronutrient intake of the population. According to the Food Fortification Initiative, 86 countries have

passed legislation to require the fortification of at least one industrially milled cereal grain⁷. In Bangladesh, most of the rice consumed is not industrially milled (and that consumed by the poorest is least likely to be processed in this way). Thus, such legislation would have only limited impact. However, a significant share of food distributed through the PFDS is targeted to poor and vulnerable populations who are also the most likely to suffer from micronutrient malnutrition. Fortifying PFDS rice targeted to these groups could have a strong beneficial impact on reducing micronutrient malnutrition. Fortification of PFDS grains would have the added benefit of creating a large and steady demand for fortified kernels, thus encouraging growth in local supply of these, which would bring down their cost.

The cost of rice fortification, at 3-6% beyond the cost of rice itself, is potential challenge to its adoption by the Government of Bangladesh. However, its likely benefits to current productivity and to the future health and cognitive ability of the citizens are substantial. The labor productivity impact of correcting iron deficiency anemia alone has been estimated at between 4 and 17% depending on the type of work (Horton, 2006). Benefits of correcting other deficiencies are more difficult to measure because of their long-term implications on child development, but are likely to be even higher.

⁷ http://www.ffinetwork.org/global_progress/

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Annex A: Press Releases

Ministry of Food and Partners Inaugurate Innovative Food Security Research Program in Bangladesh Dec 6, 2016 [IFPRI]

Five-year research program integrates all aspects of food policy to enhance food security across Bangladesh.

Dhaka, Bangladesh, December 6, 2016 – The Ministry of Food announced Tuesday a new comprehensive food security research program, together with the Bangladesh Institute of Development Studies, International Food Policy Research Institute (IFPRI), and University of Illinois at Urbana-Champaign. About 150 representatives attended the launching ceremony, including from civil society organizations and partner institutions from Bangladesh and the United States.

The Bangladesh Integrated Food Policy Research Program, as the program is called, opens a new phase of addressing Bangladesh's food security. It will combine policy research with capacity strengthening to tackle all four aspects of food security – availability, access, utilization, and stability – in a holistic and sustainable approach. “Bangladesh is prone to natural disasters that can wipe out the country's supply of cereals if they are not properly stored,” said Arul Islam, honorable minister of food. “Government is committed to protecting the poor and vulnerable with the use of modern engineering and information technology as part of the Digital Bangladesh vision.”

The Bangladesh Integrated Food Policy Research Program is designed to meet the food policy needs of a growing Bangladesh. Specifically, the new program will improve the food value chain, public food stocks, disaster responses, and price stabilization with state-of-the art methods and the application of effective digital technologies. The program's cross-cutting research activities will focus on a full spectrum of food policy considerations – storage and transport, market and policy analysis, and capacity building and outreach.

As the lead partner of the consortium, IFPRI will work with its two partners to provide overall guidance on analytical works, capacity building, and best policies and practices on grain storage management.

“In the last half of the twentieth century, food policy in most Asian countries focused on ensuring the availability of cereals,” said Dr. Shahidur Rashid, Senior Research Fellow at IFPRI and the program's lead. “But sufficient cereal availability and rapid economic growth in many of these countries, including Bangladesh, has highlighted the need to upgrade the food policy architecture with modern technology and stronger institutions; so, it is crucial we use a sound analytical basis to build and manage the new policy architecture.”

In addition to carrying out collaborative research and analysis, the program will build capacity within key government institutions, so that the country can manage the complex issues of food policy in the context of fast economic growth. In doing so, the IFPRI-led consortium partners will build synergies with key government research institutes such as the Ministry of Food's Food Policy Monitoring Unit and the Directorate of Food, as well as the private sector.

This program is a part of the Ministry of Food's Modern Food Storage Facilities Project, financed by the World Bank.

The International Food Policy Research Institute (IFPRI) seeks sustainable solutions for ending hunger and poverty. IFPRI was established in 1975 to identify and analyze alternative national and international strategies and policies for meeting the food needs of the developing world, with particular emphasis on low-income countries and on the poorer groups in those countries. www.ifpri.org.

Govt mulls to bring food supply, security under monitoring

Staff Correspondent

Published: Wednesday, 7 December, 2016 at 12:00 AM [The Daily Observer]

Food Minister Qamrul Islam has said the government is planning to bring its food supply and security system under strong monitoring. The Minister this while speaking at the launching ceremony of Bangladesh Integrated Food Policy Research Programme under the food ministry at a city hotel on Tuesday. He said complete database of food management system and its beneficiaries will be prepared to prevent overlapping. Chairman of the Parliamentary Standing Committee on Food Ministry Abdul Wadud Dara, World Bank's Acting Country Director Rajashree S Paralkar, International Food Planning and Research Institute's (IFPRI-Washington) Director Paul Dorosh, Bangladesh Institute of Development Studies (BIDS) Director General Khan Ahmed Sayeed Murshid, Director General (DG) of Food Badrul Hasan and Project Director of Modern Food Storage Facilities Project Gaziur Rahman also spoke at the programme with Food Secretary AM Badruddoza in the chair. Qamrul said the activities of all government food warehouses and silos will be brought under online system. As a result, the authorities concerned will be able to know about the stock of food grain from Dhaka. He said modernisation of food storage facilities is underway to tackle all four aspects of food security like availability, access, utilisation and stability under integrated food policy research programme. Under the program, the government will construct eight silos at all divisional cities with financial support from the World Bank, Qamrul said.

"We are going to inaugurate five lakh household silos at different flood-prone and coastal areas within two months (January-February). Five lakh families of those areas will be able to preserve 30kg of food grain in each silo," the minister said.

He said Bangladesh is prone to natural disasters that can affect the country's supply of cereals if they are not properly stored. The government is committed to protect the poor with the use of modern engineering and information technology, he added.

IFPRI in collaboration with the Food Ministry, BIDS and the University of Illinois at Urbana-Champaign, USA organized the programme.

IFPRI food security research launched

By Special Correspondent: 08 December 2016 [The Asian Age]

Five-year research program launched here on Tuesday envisages integrating all aspects of food policy to enhance food security across Bangladesh. The Ministry of Food announced a new comprehensive food security research program jointly with the Bangladesh Institute of Development Studies, International Food Policy Research Institute (IFPRI), and University of Illinois at Urbana-Champaign.

The new program, Bangladesh Integrated Food Policy Research Program, opens a new phase of addressing Bangladesh's food security, says a press release of IFPRI. It will combine policy research with capacity strengthening to tackle all four aspects of food security - availability, access, utilization, and stability - in a holistic and sustainable approach.

"Bangladesh is prone to natural disasters that can wipe out the country's supply of cereals if they are not properly stored," said Food Minister Qamrul Islam. "Government is committed to protecting the poor and vulnerable with the use of modern engineering and information technology as part of the Digital Bangladesh vision."

The Bangladesh Integrated Food Policy Research Program is designed to improve the food value chain, public food stocks, disaster responses, and price stabilization with state-of-the art methods and the application of effective digital technologies.

The program's cross-cutting research activities will focus on a full spectrum of food policy considerations - storage and transport, market and policy analysis, and capacity building and outreach. "

Sufficient cereal availability and rapid economic growth in most countries, including Bangladesh, has highlighted the need to upgrade the food policy architecture with modern technology and stronger institutions; so, it is crucial we use a sound analytical basis to build and manage the new policy architecture," said Dr Shahidur Rashid, Senior Research Fellow at IFPRI and the program's lead.

IFPRI-led consortium partners will build synergies with key government research institutes such as the Ministry of Food's Food Policy Monitoring Unit and the Directorate of Food, as well as the private sector. This program is a part of the Ministry of Food's Modern Food Storage Facilities Project, financed by the World Bank.

Food ministry launches research programme on food security

12:00 AM, December 08, 2016 / LAST MODIFIED: 12:00 AM, December 08, 2016 [The Daily Star]

Star Business Desk

The food ministry announced the launch of a new comprehensive food security research programme together with Bangladesh Institute of Development Studies (BIDS), International Food Policy Research Institute (IFPRI) and University of Illinois at Urbana-Champaign on Tuesday.

Around 150 representatives from civil society organisations and partner institutions from Bangladesh and the United States took part in the event, IFPRI said in a statement yesterday.

The Bangladesh Integrated Food Policy Research Programme will combine policy research with capacity strengthening to tackle all four aspects of food security—availability, access, utilization and stability—in a holistic and sustainable approach.

“Bangladesh is prone to natural disasters that can wipe out the country's supply of cereals if they are not properly stored,” said Qamrul Islam, food minister.

The programme is a part of the food ministry's Modern Food Storage Facilities Project financed by the World Bank.

Govt. working for strengthening food storage facilities [National News Agency of Bangladesh]



DHAKA, Dec 6, 2016 (BSS) – Food Minister Advocate Quamrul Islam today said the government is working for modernizing food storage facilities with modern technology and stronger institutions to tackle all four aspects of food security like availability, access, utilization and stability under integrated food policy research program.

The food minister said this while addressing as the chief guest at the opening session of launching

ceremony of Bangladesh Integrated Food Policy Research program held at hotel Sonargaon here.

Under the program, the government will construct silos at the eight divisional cities across the country with the fund of the World Bank, said the food minister, adding “we are going to inaugurate five lakh household silos at different flood prone areas during January-February period.”

He added: “Bangladesh is prone to natural disasters that can wipe out the country’s supply of cereals if they are not properly stored.” The government is committed to protecting the poor and vulnerable with the use of modern engineering and information technology as part of the digital Bangladesh vision, he said.

International Food Policy Research Institute (IFPRI) in collaboration with the Ministry of Food, Bangladesh Institute of Development Studies (BIDS) and the University of Illinois at Urbana-Champaign, USA organized the programme.

Operation Manager and Acting Country Director of the World, Bangladesh Ms Rajashree S Paralkar and Chairman of Parliamentary Standing Committee on Food Affairs Md Abdul Wadud MP spoke as the special guests while Food Secretary AM Badrudduja, chaired the inaugural session.

The Bangladesh Integrated Food Policy Research Program is designed to meet the food policy needs of a growing Bangladesh, said Md Abdul Wadud in his address.

Specially, the new program will improve the food value chain, public food stocks, disaster responses, and price stabilization with state of the art methods and the application of effective digital technologies, , said Director General of BIDS Dr Khan Ahmed Sayeed Murshid.

The program’s cross-cutting research activities will focus on a full spectrum of food policy considerations—storage and transport, market and policy analysis and capacity building and outreach, he said.

“In the last half of the twentieth, food policy in most Asian countries focused on ensuring the availability of cereals,” said Dr Shahidur Rashid, Senior Research Fellow at IFPRI in his welcome address. “But sufficient cereal availability and rapid economic growth in many of these countries including Bangladesh, has highlighted the need to upgrade the food policy architecture with modern technology and stronger institutions, so it is crucial we use a sound analytical basis to build and manage the new policy architecture.”

Director General of Food Md Badrul Hasan, Project Director of Modern Food Storage Facilities Project Md Gazi Ur Rahman, Director of the International Program of the University of Illinois Dr Alex Winter-Nelson and IFPRI Director Dr Paul Dorosh, among others, spoke on the occasion.

Annex B: Technical Presentations

Refer to the section for policy notes on technical sessions.

Annex C: Event in Pictures









Annex D: Program

INAUGURAL SESSION

Chair: Mr. A.M. Badrudduja, Secretary, Ministry of Food

9:00	9:30	REGISTRATION
9:30	9:40	Welcome: Mr. Md. Badrul Hasan, DG-Food & Dr. Shahidur Rashid, IFPRI
9:40	9:50	Overview: Mr. Md. Gazi Ur Rahman, Project Director (Joint Secretary), Modern Food Storage Facilities Project
9:50	9:55	Address: Dr. Khan Ahmed Sayeed Murshid, Director General, BIDS
9:55	10:00	Address: Dr. Alex Winter-Nelson, Director of the International Program, University of Illinois at Urbana-Champaign, USA
10:00	10:05	Address: Dr. Paul Dorosh, Director of the Development Strategy and Governance Division, IFPRI-Washington
10:05	10:15	Address: Ms. Rajashree S. Paralkar, Operations Manager & Acting Country Director, World Bank, Bangladesh
10:15	10:25	Address: Barrister Sheikh Fazle Noor Taposh, MP, Member, Parliamentary Standing Committee on Food Affairs
10:25	10:40	Address: Mr. Md. Abdul Wadud, MP, Chairman, Parliamentary Standing Committee on Food Affairs
10:40	10:50	Inauguration address: Advocate Md. Qamrul Islam, MP, Honorable Minister, Ministry of Food
10:50	11:00	Address by the Chair Mr. A.M. Badrudduja, Secretary, Ministry Food
11:00	11:30	TEA / COFFEE BREAK

TECHNICAL SESSION: Bangladesh Food Policies in a Global Context

Chair: Mr. Manobendra Bhowmik, Additional Secretary, Ministry of Food

11:30	11:45	Presentation: Evidence Based Food Policy Research in Bangladesh: Achievements and Challenge by Dr. Akhter Ahmed, IFPRI Country Representative, Bangladesh
11:45	12:00	Presentation: Promoting National and Household Food Security in Bangladesh: The Evolving Roles of Public Distribution and Private Trade by Dr. Paul Dorosh, Director, Development Strategy and Governance Division, IFPRI-Washington
12:00	12:15	Presentation: Optimizing Public Food Stocks in Transforming Economies by Dr. Nicholas Minot, Interim Director, Markets Trade, and Institutions Division (MTID), IFPRI-Washington
12:15	12:30	Presentation: Modernizing Food Storage: The Technologies and Policies, Professor Prasanta K. Kalita, Director of the ADM Institute for the Prevention of Postharvest Losses, University of Illinois at Urbana-Champaign, USA
12:30	12:45	Presentation: Ensuring Safety and Enriching Food: Bangladesh and International Best Practices by Dr. Vivian Hoffmann, IFPRI-Washington
12:45	13:05	Open Discussion
13:05	13:10	Closing Remarks and Way Forward by Chair Mr. Manobendra Bhowmik, Additional Secretary, Ministry of Food
13:10	14:30	LUNCH

Annex E: List of Participants and Invitees

No.	Name	Designation	Organization
1	Advocate Md. Qamrul Islam, MP	Honorable Minister	Parliamentary Standing Committee on Food Affairs, Ministry of Food
2	Mr. Md. Abdul Wadud, MP	Chairman	Parliamentary Standing Committee on Food Affairs, Ministry of Food
3	Barrister Sheikh Fazle Noor Taposh	Member	Parliamentary Standing Committee on Food Affairs, Ministry of Food
4	A. M. Badrudduja	Secretary	Ministry of Food
5	Manobendra Bhowmik	Additional Secretary (Admin)	Ministry of Food
6	Shaoli Sumon, NDC	Additional Secretary (Planning & Development)	Ministry of Food
7	Abul Kalam Azad	Joint Secretary (Budget & Audit)	Ministry of Food
8	Md Ataur Rahman	Joint Secretary (Procurement & Supply)	Ministry of Food
9	Md. Mostofa	Joint Secretary (Coordination & Parliament)	Ministry of Food
10	Anowarul Wahed Chowdhury	Joint Secretary (Audit)	Ministry of Food
11	Md. Sherajul Islam	Joint Secretary (Admin-1)	Ministry of Food
12	Salma Momtaz	Joint Secretary	Ministry of Food
13	Dr. Anima Rani Nath	Joint Secretary (Internal Procurement)	Ministry of Food
14	Mohsena Khan	Deputy Secretary (Budget & Accounts)	Ministry of Food
15	Swapan Kumar Modak	Deputy Secretary (Audit-3)	Ministry of Food
16	Shirina Delhur	Deputy Secretary (Supply-2)	Ministry of Food
17	Most. Kamar Jahan	Deputy Secretary (Inquiry)	Ministry of Food
18	Md. Kawser Ahammed	Deputy Secretary (Supply)	Ministry of Food
19	Md. Saiful Islam	Deputy Secretary (Service)	Ministry of Food
20	Ahmed Faysal Imam	Deputy Secretary (Admin-2)	Ministry of Food
21	Md. Ayatul Islam	Deputy Secretary (Internal Admin-1)	Ministry of Food
22	Muhammed Helal Hossain	PS to Minister (Deputy Secretary)	Ministry of Food
23	Mohammad Zahirul Islam	PS to Secretary (Deputy Secretary)	Ministry of Food
24	Dr. Munira Sultana	Deputy Secretary	Ministry of Food
25	Md. Humayun Kabir	Deputy Chief (Planning)	Ministry of Food
26	Muhammad Abu Kawsar	Senior Assistant Chief	Ministry of Food
27	Sumon Mehedi	Senior Information Officer	Ministry of Food
28	Mr. Md. Badrul Hasan	Director General	Directorate General of Food (DG Food), Ministry of Food
29	Md. Abdul Halim	Director, Administration	DG Food, Ministry of Food
30	Chitta Ranjan Bepari	Director, Accounts & Finance & MSS	DG Food, Ministry of Food
31	Sukumara Chandra Roy	Director, SDM	DG Food, Ministry of Food
32	Swapan Krishna Banik	Director, Accounts & Finance	DG Food, Ministry of Food
33	Md. Abdul Aziz Mollah	Director, Procurement Division	DG Food, Ministry of Food

34	Kazi Nurul Islam	Director, Training	DG Food, Ministry of Food
35	Shaikh Zakir Hossain	Director, Inspection, Development and Technical Services Division	DG Food, Ministry of Food
36	Ms. Roxana Quader	Additional Secretary (PH and WHO), Country Focal Person, Nutrition and SUN	DG Food, Ministry of Food
37	Md. Gazi Ur Rahman	Project Director (Joint Secretary)	Modern Food Storage Facilities Project (MFSP), DG Food, Ministry of Food
38	Md. Rezaul Karim Shiekh	Deputy Project Director (Deputy Secretary)	MFSP, DG Food, Ministry of Food
39	Md. Mohiuddin	Project Coordinator (Deputy Secretary)	MFSP, DG Food, Ministry of Food
40	Md. Zahangir Alam	Project Coordinator (Deputy Secretary)	MFSP, DG Food, Ministry of Food
41	Md. Moazzaim Hossain Majumder	Project Coordinator (Deputy Secretary)	MFSP, DG Food, Ministry of Food
42	Bimol Bhuiyan	Project Coordinator	MFSP, DG Food, Ministry of Food
43	Syed Rafiqul Alam	Senior Procurement Specialist	MFSP, DG Food, Ministry of Food
44	Kamal Najmus Salehin	Sr. Outreach and Awareness Specialist	MFSP, DG Food, Ministry of Food
45	A.K.M Aminul Islam	Sr. Technical Specialist (Mechanical)	MFSP, DG Food, Ministry of Food
46	Dr. Zahurul Karim	International Consultant for Coordination of Research Program	MFSP, DG Food, Ministry of Food
47	Md. Naser Farid	Director General	Food Planning and Monitoring Unit (FPMU), Ministry of Food
48	Md. Selim Akhter	Research Director	FPMU, Ministry of Food
49	MD. Hazikul Islam	Research Director	FPMU, Ministry of Food
50	Ms. Rajashree Paralkar	Acting Country Director	World Bank
51	Mr. Manievel Emmanuel Sene	Task Team Leader	World Bank
52	K.M. Maqsoodul Mannan	Consultant	World Bank
53	Prof Alex Winter-Nelson	Director of International Programs	University of Illinois at Urbana-Champaign
54	Prof Prasantha K. Kalita	Associate Dean for Academic Programs	University of Illinois at Urbana-Champaign
55	Prof Juan Andrade	Assistant Professor of Nutrition	University of Illinois at Urbana-Champaign
56	Dr. Khan Ahmed Sayeed Murshid	Director General	Bangladesh Institute of Development Studies (BIDS)
57	Dr. Rushidan Islam Rahman	Research Director	BIDS
58	Dr. Asadujjaman	Ex-Research Director, BIDS	BIDS
59	Dr. Nazneen Ahmed	Senior Research Fellow	BIDS
60	Dr. Mohammad Yunus	Senior Research Fellow	BIDS
61	Dr. Monzur Hossain	Senior Research Fellow	BIDS
62	Dr. Md. Mainul Hoque	Research Fellow	BIDS
63	Dr. Quazi Shahabuddin	Former DG	BIDS

64	Dr. Akhter Ahmed	Country Representative	International Food Policy Research Institute (IFPRI), Dhaka
65	Dr. Paul Dorosh	Director, Development Strategy and Governance Division	IFPRI-Washington
66	Dr. Nick Minot	Deputy Director, Markets, Trade and Institutions Division	IFPRI-Washington
67	Dr. Vivian Hoffmann	Research Fellow	IFPRI-Washington
68	Dr. Shahidur Rashid	Senior Research Fellow	IFPRI-Dhaka
69	Dr. Ricardo Hernandez	Senior Research Fellow	IFPRI-Dhaka
70	Dr. David Spielman	Senior Research Fellow	IFPRI-Dhaka
71	Dr. Kindie Getnet	Research Fellow	IFPRI-Dhaka
72	Julie Ghostlaw	Project Coordinator	IFPRI-Dhaka
73	Tofazzal Hossain	Consultant	IFPRI-Dhaka
74	Khandaker Aminul Islam	Senior Database Manager	IFPRI-Dhaka
75	Saiqa Siraj	Senior Project Manager	IFPRI-Dhaka
76	Aklima Parvin	Senior Project Manager	IFPRI-Dhaka
77	Nusrat Zaitun Hossain	Senior Research Analyst	IFPRI-Dhaka
78	Salauddin Tauseef	Research Analyst	IFPRI-Dhaka
79	Md. Latiful Haque	Research Analyst	IFPRI-Dhaka
80	Farha Deba Sufian	Senior Research Assistant	IFPRI-Dhaka
81	Md. Shafiqul Karim	Communications Specialist	IFPRI-Dhaka
82	Nazrul Islam	Senior IT Specialist	IFPRI-Dhaka
83	Alphonse Prodip Bashu	Senior Finance and Administrative Manager	IFPRI-Dhaka
84	Shaila Arjuman Banu	Accounts Specialist	IFPRI-Dhaka
85	Samita Kaiser	Administrative Coordinator	IFPRI-Dhaka
86	Mohammad Moinuddin Abdullah	Secretary	Ministry of Agriculture
87	Md. Mosharaf Hossain	Additional Secretary, Extension Wing	Ministry of Agriculture
88	Syeda Afroza Begum	Additional Secretary, Research	Ministry of Agriculture
89	Mr. Md Toufiqul Alam	Joint Secretary	Agricultural Policy Support Unit (APSU), Ministry of Agriculture
90	Md. Jamal Hossain Mojumder	Deputy Secretary	Economic Relations Division (ERD), Ministry of Finance
91	Naquib Bin Mahabub	Chief	General Economics Division (GED), Planning Commission, Ministry of Planning
92	Professor Dr. Shamsul Alam	Member (Senior Secretary)	GED, Planning Commission, Ministry of Planning
93	Dr. Sattar Mandal	Former Member	GED, Planning Commission, Ministry of Planning
94	AN Shamsuddin Azad Chowdhury	Chief	Agriculture, Water Resources, and Rural Institutions, Ministry of Planning

95	Ms. Nasima Begum	Secretary	Ministry of Women and Children Affairs
96	Mohammad Mahfuzul Haque	Chairman (Additional Secretary)	Bangladesh Food Safety Authority (BFSA)
97	Mr. Roland Van Hauwermeiren	Country Director	Action Contre la Faim (ACF)
98	Ms. Farah Kabir	Country Director	ActionAid Bangladesh
99	Mr. Kazuhiko Higuchi	Country Director	Asian Development Bank (ADB)
100	Dr. Abul Kalam Azad	Executive Chairman	Bangladesh Agricultural Research Council (BARC)
101	Dr Md Rafiqul Islam Monda	Director General (DG)	Bangladesh Agricultural Research Institute (BARI)
102	Dr. Sultan Hafeez Rahman	Executive Director	BRAC Institute of Governance and Development (BIGD)
103	Dr. Bhagya Rani Banik	Director General (DG)	Bangladesh Rice Research Institute (BRRI)
104	Mr. Jamie Terzi	Country Director	CARE Bangladesh
105	Prof. Mustafizur Rahman	Executive Director	Centre for Policy Dialogue (CPD)
106	Dr. Mohammad A Jabbar PhD	Agricultural Economist	Civil Society
107	Cornelis de Wolf	Country Director	Concern Universal
108	A. K. M. Musha	Country Director	Concern Worldwide
109	Ms. Sarah Cooke	Country Representative	Department for International Development (DFID)
110	Mr. Graham Gass	Team Leader	DFID
111	Mr. Michael Field	Chief of Party	Development Alternatives International (DAI)
112	Professor Dr. A. K. Enamul Haque	Professor, Department of Economics	East West University
113	Mr. Sajjad Zohir	Executive Director	Economic Research Group
114	Mr. Olivier Brouant	Head of Office	European Union (EU)
115	Ms. Assunta Testa	Programme Manager, Nutrition & Food Security	EU
116	Mr. Manfred Fernholz	Attaché, Operations/Programme Manager, Food Security	EU
117	Mr. Mike Robson	Country Representative	Food and Agriculture Organization of the United Nations (FAO)
118	Lalita Bhattacharjee, PhD	Nutritionist	FAO
119	Dr. Lalita Bhattacharjee	Nutritionist	FAO
120	Dr. Rezaul Karim Talukder	Poverty and Social Protection Adviser	FAO
121	Mr. Tobias Becker	Country Director	German Corporation for International Cooperation (GIZ)
122	Dr. Rudaba Khondker	Country Manager	Global Alliance for Improved Nutrition (GAIN)

123	Dr. Tahmeed Ahmed	Director and Senior Scientist, Centre for Nutrition & food Security	International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B)
124	Mr. Nicolas Syed	Country Program Officer	International Fund for Agricultural Development (IFAD)
125	Dr. Thakur Prasad	Country Representative	International Maize and Wheat Improvement Center (CIMMYT)
126	Mir Ali Asgar	Country Manager	International Potato Center (CIP)
127	Mr. Timothy Russell	Chief of Party	International Rice Research Institute (IRRI)
128	Mr. Mikio Hataeda	Chief Representative	Japan International Cooperation Agency (JICA)
129	Mr. Snehal V. Soneji	Country Director	OXFAM
130	Dr. Khurshid Alam	Director	Policy Research Institute (PRI)
131	Dr. Zaidi Sattar	Chairman	PRI
132	Dr. Ahsan H. Mansur	Executive Director	PRI
133	Hossain Zillur Rahman	Executive Chairman	Power & Participation Research Centre (PPRC)
134	Mr. Michael McGrath	Country Director	Save the Children
135	Mr. Edouard Beigbeder	Country Representative	United Nations Children's Fund (UNICEF)
136	Dr. Anuradha Narayan	Chief of Nutrition	UNICEF
137	Ms. Janina Jaruzelski	Mission Director	United States Agency for International Development (USAID) Bangladesh
138	Dr. Selim Raihan	Professor, Department of Economics	University of Dhaka
139	Dr. Atonu Rabbani	Associate Professor	University of Dhaka
140	Mr. Martin Brakel	Chief of Party	World Fish Bangladesh
141	Dr. Christa Rader	Country Representative	World Food Programme (WFP)