

Assessing SPS Capacity in Bangladesh



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Cover Illustrations:

Top Left: <http://pakagri.blogspot.com/2011/07/overcoming-problems-in-agriculture.html>

Top Right: Kaptan Bazaar retail chicken market in Dhaka, M. Alam, 2012

Bottom Left: Goat meat stalls at Kaptan Bazaar, M. Alam, 2012

Bottom Right: Vegetables at Karwan Bazaar, T. Jackson, 2012

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LIST OF ACRONYMS

ALPP	Areas of Low Pest Prevalence
APSU	Agricultural Policy Support Unit
APHIS	Animal and Plant Health Inspection Service (USDA)
BAEC	Bangladesh Atomic Energy Commission
BARC	Bangladesh Agricultural Research Council
BAREC	Bangladesh Agricultural Research and Extension Council
BARI	Bangladesh Agricultural Research Institute
BAS	Bangladesh Academy of Science
BCSIR	Bangladesh Council of Scientific and Industrial Research
BLRI	Bangladesh Livestock Research Institute
BSFF	Bangladesh Shrimp and Fish Foundation
BSTI	Bangladesh Standards and Testing Institute
CEED	Center for Entrepreneurship and Executive Development
Codex	Codex Alimentarius Commission
CRSP	Collaborative Research Support Program
DAE	Directorate of Agricultural Extension
DANIDA	Danish International Development Agency
DG	Director General
DGF	Director General Food
ECTAD	Emergency Center for Transboundary Animal Diseases
EU	European Union
FAO	Food and Agriculture Organization (of the United Nations)
FAS	Foreign Agricultural Service (USDA)
FDA	Food and Drug Administration (of United States)
FIQC	Fish Inspection and Quality Control
FFP	Food for Progress
IFRB	Institute of Food and Radiation Biology (IFRB)
IPSM	International Standards for Phytosanitary Measures
GAPs	Good Agricultural Practices
GAqPs	Good Aquaculture Practices
GLPs	Good Laboratory Practices
GoB	Government of Bangladesh
H5N1	Avian Influenza Virus
HACCP	Hazard Analysis and Critical Control Points
Hortex	Horticulture Export Foundation
ICDDR-B	International Center for Diarrheal Diseases Research, Bangladesh
IEC	International Electro-technical Commission
IFPRI	International Food Policy Research Institute
IFST	Institute of Food Science and Technology (in Bangladesh)
IPH	Institute of Public Health (in Bangladesh)
IPM	Integrated Pest Management
IPPC	International Plant Protection Convention
ISO	International Organization for Standardization
ILC	Inter Laboratory Comparison

JIFSAN	Joint Institute for Food Safety and Applied Nutrition
MoA	Ministry of Agriculture
MoFDM	Ministry of Food and Disaster Management
MoFL	Ministry of Fisheries and Livestock
MoLGRD	Ministry of Local Government and Rural Development
MoHFW	Ministry of Health and Family Welfare
MRL	Maximum Residue Level
NFSAC	National Food Safety Advisory Council (Bangladesh)
NGO	Non-Government Organization
OIE	World Organization for Animal Health
PFA	Pest Free Areas
PPR	Peste des Petits Ruminant
PRA	Pest Risk Analysis
PRM	Pest Risk Management
PRICE	Poverty Reduction by Increasing the Competitiveness of Enterprises
PT	Proficiency Testing
PVS	Pathway for efficient Veterinary Services
REAP	Rural Enterprise for Alleviating Poverty
SAARC	South Asian Association for Regional Cooperation
SEAF	Small Enterprise Assistance Funds
SPS	Sanitary and Phytosanitary
USAID	United States Agency for International Development
USDA	United States Department of Agriculture

Executive Summary

In May 2012, the US Department of Agriculture (USDA) formed an expert team to travel to Bangladesh with the purpose of assessing the Bangladeshi Sanitary and Phytosanitary (SPS) Systems. This team met with stakeholders representing government agencies, private business, and non-governmental organizations as well as toured public and private agricultural facilities. The objective of these meetings was to determine the capacity, limitations, and constraints to establishing a viable and sustainable SPS system that could ensure the safety of the domestic food supply as well as increase opportunities for economic growth through international trade.

It became clear during interviews with the various Bangladesh authorities, stakeholders, and assistance organizations, that nearly all aspects of the SPS systems in Bangladesh are extremely weak –

- 1) The system of oversight is redundant and complicated;
- 2) Laws and regulations governing SPS systems are often not implemented;
- 3) Field and technical officers do not have the skills and/or experience, or are not required by their jobs, to investigate possible hazards;
- 4) Physical infrastructure is not adequate to analyze hazards;
- 5) Risk evaluators do not have the technical knowledge to make scientifically based, sound assessments; and
- 6) Regulatory authorities have very little capacity to manage responses.

The entire food safety risk chain in Bangladesh needs not only to be strengthened, but in many cases a whole system needs to be defined, developed and supported. The inability to manage food safety risk is a major detriment to food security and domestic public health, and is a major obstacle for developing any type of export program.

Of the little export sector that does exist, it has been hindered with detentions, rejections, and import alerts by the importing countries – for chemical residues, pests, filth and contaminants. While discreet shipments of Bangladeshi exports are not always significant, if they are regularly detained for any reason the reputation and integrity of the entire Bangladeshi regulatory system becomes suspect. Additionally, in some cases, the export emphasis takes valuable resources from establishing/supporting a domestic food safety program.

This is not entirely the negligence of the producers and exporters, as they rely on the regulatory authorities to help identify and characterize potential hazards in the exported products – which they cannot do. As a result, products are exported with:

- **insects** (as seen firsthand by the USDA/ Food and Drug Administration (FDA) team);
- **contaminants** (import alerts as recognized by the USDA/FDA team). Every day in the newspaper during the visit, there were stories about adulterated produce in the markets (e.g., formaldehyde dipping to preserve mangos, and carbide treatments to enhance ripening);
- **pesticides exceeding trade standards** (as described by the Plant Protection Wing during the USDA/FDA visit).

The agricultural sector is governed by 13 divisions housed in nine separate ministries, but there is little coordination between these offices – aggravating an already complicated and confusing system. For example, in a meeting with the USDA team, the Ministry of Livestock and Fishery noted there is no coordination between research and extension and between animal husbandry and animal health (veterinarian medicine). Thus there is an extreme need to clearly establish links within each agency and for cross consultation between these agencies/ministries to ensure better

communication and coordination of their work as well as to better define each agency's roles and responsibilities. During the USDA/FDA visit, it was evident that there is much overlap of roles without appropriate coordination or communication for information sharing. Bangladeshi authorities must evaluate departmental functioning and coordination with eye toward building a new framework if they expect to operationalize effective SPS systems. To support and enable improved departmental oversight framework, SPS policies and regulations need to be thoroughly reviewed and updated. This will provide a solid management base for decision makers and provide strong enforcement mechanisms to back the policies.

A common theme among capacity needs identified during the USDA/FDA SPS assessment visit was the understanding and management of food safety risk, along the whole risk assessment chain. This chain is critical to ensure hazardous risks are detected before they enter the food supply. Therefore, as a priority, the Bangladeshi government must reinforce and build-up the entire risk chain from risk identification in the field to risk characterization and evaluation in labs to risk management decision making with high-level officials.¹ There are no records of risk assessment work in Bangladesh except the development of a rice pest list showing areas of prevalence. Quarantine officials currently use Codex Alimentarius Commission (Codex) and United Nations' Food and Agriculture Organization (FAO) values and guidelines for inspection. The values for maximum residue levels (MRLs) have not yet been developed for Bangladesh environmental conditions.

Of additional concern is the state of SPS related laboratories. In nearly every meeting in which the USDA team participated, Bangladeshi officials emphasized the necessity to build the capacity of the laboratory network. Few labs are well equipped or well maintained. Most of them lack a maintenance budget and resources – equipment and trained personnel. There is a lack of coordination in procedures and methods of testing, few mechanisms for sharing of knowledge or information, and no means to track results electronically.

Given the enormity of need in Bangladeshi SPS systems, USDA recommends a systematic, holistic approach that will strengthen what does exist and develop new enabling aspects throughout the systems – from farmer education to technician training to departmental capacity building to enabling policies and regulations.

¹ See Appendix A provides a complete discussion of the risk management.

Evaluative Method

In order to assess current SPS systems in Bangladesh, USDA formed a team of food safety and animal and plant health technical experts. This team traveled to Bangladesh in May 2012 to review SPS systems and make recommendations that, if acted upon, will increase overall food security through strengthened SPS systems that increase the safety of the domestic food supply and opportunities for agricultural trade. Expert assessors making up the team were technicians that work directly for US regulatory agencies, have been involved in a broad range of international SPS capacity building efforts, and/or are experts in Bangladeshi agriculture². These experts evaluated a number of parameters in the current Bangladeshi SPS systems to:

- assess the current status and associated needs of
 - institutional and legal frameworks;
 - food safety and quality;
 - plant and animal health;
 - laboratory testing, capability and capacity; and
 - the country's ability to meet international SPS standards;
- provide technical recommendations to overcome constraints impeding a safe domestic food supply and increase the opportunities for international trade.

In order to accomplish this review, the assessors participated in a variety of meetings and field visits with the purpose of viewing regulatory processes and monitoring and inspection practices. As a result, missing or weak areas were identified in which efforts are required to implement desirable SPS applications or join in partnership to supplement or complement existing efforts. The assessors then extrapolated findings from these visits to determine where the greatest needs are within the larger Bangladeshi SPS systems in order to make relevant recommendations.

Background

Shortly after gaining national independence in 1972, Bangladesh began exporting fruits and vegetables to ethnic markets in the United Kingdom, the Middle East, and other neighboring countries. Currently, Bangladeshi fruits and vegetables are exported to more than 30 market destinations. Bangladesh's seafood processing industry expanded rapidly in the late 1970s, but facility conditions, technology transformation, and training on sanitary handling lagged far behind that of competing countries. The industry continued to deteriorate so much so that by 1997 the European Union (EU) banned imports of fishery products from Bangladesh because the products failed to meet SPS standards. This ban resulted in a loss of \$15 million in Bangladesh within a five-month time period.³ Both the industry and the economy of Bangladesh were substantially impacted.

Bangladesh, a country with limited mineral resources, must generate foreign earnings from the exportation of specialty and value-added agricultural products. The agricultural industry provides production jobs such as harvesting, grading, packaging, storing, and transporting. However, the export market requires the implementation of SPS measures that will safeguard human health and protect against the spread of undesirable diseases or pests borne by animal and plant products. In order to realize the opportunities of international trade, exporters must be aware of SPS requirements.

The Government of Bangladesh (GoB) is aware of international SPS standards; however the country has few policies or regulatory infrastructure to adequately implement sound SPS systems. Currently

² Background on each technical expert can be found in Appendix E.

³ Cato, J. C. and S. Subasinge. 2003. Food safety in Food Security and Food Trade: Case study: The Shrimp Export Industry in Bangladesh. IFPRI, Washington, DC, USA.

there are eight ministries in the government who are directly involved in controlling affairs of food and food safety while four others are involved indirectly, but have substantial influence in the affairs of food. Table 1: Bangladeshi Ministries and Departments Involved in Food Control describes these entities. Coordination and cooperation between these multifaceted control systems is complex and difficult.⁴ The stakeholders remain unaware, untrained, or unconcerned. Table 1 lists the major stakeholder ministries involved in controlling food and food safety.

Table 1: Bangladeshi Ministries and Departments Involved in Food Control

Ministry	Department/Organization	Major Activities
Ministry of Agriculture	Directorate of Agricultural Extension (DAE) Plant Protection Wing	<ul style="list-style-type: none"> ▪ Phytosanitary certificate for imported/exported plants/plant products ▪ Pesticide use control ▪ Fertilizer use control
Ministry of Food	Directorate General of Food (DGF)	<ul style="list-style-type: none"> ▪ Quality Control of Public Food Distribution System (PFDS), Stock, Procured Food grains/Food Stuff, Imported food etc. ▪ Food Control in the Market (not doing at present)
Ministry of Health & Family Welfare	Directorate General of Health; District & Upazila Health Administration and Institute of Public Health	<ul style="list-style-type: none"> ▪ Food Quality and Sanitation Control in Upazila/District level ▪ Testing vendor food samples
Ministry of Ministry of Local Government and Rural Development (MoLGRD)	City Corporation & Pourashava Health Units	<ul style="list-style-type: none"> ▪ Sanitary inspection ▪ Lab food quality control/lab analysis
Ministry of Fisheries & Livestock	A) Department of Fisheries, Fish Inspection and Quality Control Wing (FIQC)	<ul style="list-style-type: none"> ▪ Fish Quality Control & Certification for export ▪ Same for the domestic market
	B) Department of Livestock	<ul style="list-style-type: none"> ▪ Animal Health ▪ Animal Product ▪ Imported Animal
Ministry of Industries	Bangladesh Standards and Testing Institute (BSTI)	<ul style="list-style-type: none"> ▪ Frame Standards of Food Products ▪ Testing & Certification Marks and Surveillance.
Ministry of Science, Information and Communication Technology	Bangladesh Atomic Energy Commission (BAEC)	<ul style="list-style-type: none"> ▪ Test for Radiation level of Imported Food items ▪ Test for Pesticides Residues

⁴ Gascoine, D. and A. K. Azad. 2006. Review of the National SPS Infrastructure of the People's Republic of Bangladesh. Dhaka, Bangladesh. ITC-BGD7521A.

	Institute of Food Science and Technology (IFST) Bangladesh Council of Scientific and Industrial Research (BCSIR)	<ul style="list-style-type: none"> ▪ Testing of Food Items; ▪ Research and Development
Ministry of Home	Bangladesh Police	<ul style="list-style-type: none"> ▪ Assist the food inspection agencies
Ministry of Law, Justice & Parliamentary Affairs	-	<ul style="list-style-type: none"> ▪ Formulation, Vetting, Parliamentary Approval etc.

Existing Mechanisms for Compliance

The Departments of Plant Quarantine and of Livestock Services in Bangladesh have responsibilities for plant and animal health and serve as contact points for respective international standard setting organizations – International Plant Protection Convention (IPPC) and the World Organization for Animal Health (OIE).

Plant Health Provisions

Plant protection measures are implemented under the following legislations:

- Destructive Insects and Pests rule, 1996, amended in 1989, and now Plant Quarantine Law has been enacted in 2011, which includes provisions of SPS measures and provision for establishing a Plant Quarantine Authority.
- Pesticide Ordinance, 1971, and Pesticide Rules, 1985

Oversight of plant health provisions is administered by several areas of the Ministry of Agriculture (MoA) as follows:

Table 2: Plant Health Oversight

Department/Organization	Major Activities
Plant Protection Wing	<ul style="list-style-type: none"> ▪ Sets and maintains standards for optimum use of chemical fertilizers, pesticides, and prevention of entry of harmful plants, and insects, or disease. ▪ Inspects consignments and assigns phytosanitary certificates for materials destined for sale in foreign markets by using quarantine check posts located at 26 different entry/exit points to and from Bangladesh.
Plant Quarantine Wing	<ul style="list-style-type: none"> ▪ Provides services in Plant Quarantine, Pesticide Administration and Quality Control involving testing pesticide for registration, Operation, Surveillance and Forecasting, and Integrated Pest Management (IPM)
Plant Protection Wing Bangladesh Agricultural Research Council (BARC) BSTI	<ul style="list-style-type: none"> ▪ Set standards, formulate rules and procedures, propose Acts and Laws in accordance with the IPPC

The DAE under the Ministry of Agriculture houses the Plant Protection Wing. There are only two chemists and no toxicologists in the Wing.⁵ Existing laboratories are not fully equipped and do not have the properly trained personnel to manage the lab or perform risk assessments. There is a need to develop skilled field personnel, entomologists, chemists, and toxicologists to perform risk assessments.

Animal Health Provisions

The following legislations provide guidelines and set standards for animal health issues:

- Fish Protection and Conservation Act 1950, amended in 1995
- Marine Fisheries Ordinance and Rules 1983
- Fish and Fish Products Inspection and Quality Control Ordinance, 1983, Rules 1997
- Animal Diseases Act 2005
- Animal and Animal Products Quarantine Act 2005
- Bangladesh Feed Law (This law was passed in early 2012; it bans harmful ingredients in feed and provides quality control, inspection, registration, adulteration control, etc.)

Oversight of animal health provisions is administered by the Ministry of Fisheries and Livestock (MoFL) as follows:

Table 3: Animal Health Oversight

Department/Organization	Major Activities
Department of Fisheries	<ul style="list-style-type: none"> ▪ prevention and control of diseases in fishes and aquatic animals. ▪ responsible for the safety and quality of fish and aquaculture products.
Department of Livestock	<ul style="list-style-type: none"> ▪ inspects for disease and provides quarantine as necessary for imported animals, poultry, and fish ▪ surveillance within the country for any outbreak of disease, and provides vaccines or veterinary medicine ▪ maintains liaison with OIE and proposes new rules and standards, when deemed necessary

Bangladesh has one of the highest cattle densities⁶ (145 large ruminants per square kilometer compared to 90 for India) with the poorest of animal health conditions and care. The livestock sector provides 15 percent of total employment in the country contributing around 3 percent of the agricultural GDP. However, widespread diseases, inadequate feed, and an inefficient extension services⁷ are considered the most binding constraints to livestock production and development.

⁵ <http://www.dae.gov.bd/>

⁶ National Livestock Development Policy, 2007, Government of the People's Republic of Bangladesh, Ministry of Fisheries and Livestock (www.dls.gov.bd/files/Livestock_Policy_Final.pdf)

⁷ Livestock Sector Brief - Bangladesh, 2005, Food and Agricultural Organization of the United Nations -FAO

Food Safety Provisions

The principal legislations for food safety are:

- Pure Food Ordinance, 1959 provides governs processing controls of food for human consumption and sale. This Ordinance is under revision as 'The Bangladesh Pure Food (Amendment) Act'. It is proposed that a National Food Safety Council be formed, headed by the Ministry of Health and Family Welfare (MoHFW), and there be provision to establish Food Courts.
- Pure Food Rules, 1967, which provides generic standards for 107 food products. This is under revision as well.
- Radiation Protection Act, 1987, which provides the Institute of Food and Radiation Biology (IFRB) of BAEC to primarily engage in food irradiation research and development.
- Fish and Fish Product (Inspection and Quality Control) Rules, 1997 and related provisions.
- Bangladesh Standards and Testing Institution (Amendment) Act, 2003, which supersedes the Ordinance of 1985. This provides the legal mandate for establishment of BSTI whose task besides developing standards included certification of the quality of commodities and materials for local consumption as well as export and import.
- Animal Slaughter (Restriction) and Meat Inspection Act, 2005
- Bangladesh Accreditation Law of 2006, which provides for the independent inspection and quality check of laboratories and provides accreditation according to International Organization for Standardization (ISO) and International Electro-technical Commission (IEC) standards.
- Bangladesh Consumer Rights Protection Law of 2009.

As stated above, oversight to ensure safe food in Bangladesh is complicated with no less than 9 Ministries involved in ensuring a safe and wholesome food supply. The food safety system in Bangladesh is plagued by inefficiencies and lack of coordination, leaving the potential for unsafe food to reach consumers. The evidence of this is documented regularly in local newspapers and other periodicals.⁸

Table 4: Food Safety Oversight

Ministry	Department/Organization	Major Activities
Ministry of Food	Directorate General of Food (DGF)	<ul style="list-style-type: none"> ▪ Quality Control of the Public Food Distribution System (PFDS), Stock, Procured Food grains/Food Stuff, Imported food etc. ▪ Food Control in the Market (not doing at present)
Ministry of Health & Family Welfare	Directorate General of Health; District & Upazila Health Administration and Institute of Public Health	<ul style="list-style-type: none"> ▪ Food Quality and Sanitation Control in Upazila/District level ▪ Testing food items ▪ Research and development
Ministry of Local Government & Rural Development	City Corporation & Pourashava Health Units	<ul style="list-style-type: none"> ▪ Sanitary inspection ▪ Lab food quality control/lab analysis

⁸ Examples of these kinds of articles can be found in Appendix B.

Ministry of Industries	Bangladesh Standards and Testing Institute (BSTI)	<ul style="list-style-type: none"> ▪ Frame Standards of Food Products ▪ Testing & Certification Marks and Surveillance.
Ministry of Science, Information and Communication Technology	Bangladesh Atomic Energy Commission (BAEC)	<ul style="list-style-type: none"> ▪ Test for Radiation level of Imported Food items ▪ Test for Pesticides Residues
	Institute of Food Science and Technology (IFST) Bangladesh Council of Scientific and Industrial Research (BCSIR)	<ul style="list-style-type: none"> ▪ Testing of Food Items; ▪ Research and Development
Ministry of Education	Director Generals for Primary and Secondary Education Boards, Text Book Board, Universities	<ul style="list-style-type: none"> ▪ School feeding programs
Ministry of Home	Bangladesh Police	<ul style="list-style-type: none"> ▪ Assist the Inspection Agencies
Ministry of Law, Justice & Parliamentary Affairs	-	<ul style="list-style-type: none"> ▪ Formulation, Vetting, Parliamentary Approval etc.

Laboratory Infrastructure

To ensure consumer's access to safe and suitable food it is necessary to enable a network of well-equipped food testing laboratories run by a trained and skilled staff in a transparent manner. An effective laboratory network tests and validates the safety of food from production through harvest and processing. Such a network protects domestic crops from foreign pest and disease, helps monitor for and keep microbiological and chemical contaminants and residues out of food and water supplies, and contributes to assessments of environmental impacts of, for example, pesticides.. Additionally, the laboratory network certifies exported food meets international standards.

There are approximately 25 food laboratories (excluding branches) under government, autonomous or semi-government, and international organizations in Bangladesh^{9,10}, only a few operate at the regional or district level. Few labs are well equipped or well maintained. Most of them lack a maintenance budget and resources – equipment and trained personnel. There is a lack of coordination in procedures and methods of testing, few mechanisms for sharing of knowledge or information, and



Photo 1: Jason Sandahl and Marc Gilkey visit the pesticide testing lab used for checking the formulation prior to recommendation for registration. Chemist, Dr. Moniruzzaman and B. U. Ahmed, explain the procedures. The lab lacks latest equipment and trained personnel for testing modern bio-pesticides and pyrethroids.

⁹ Gascoine and Azad. 2006. Review of the National SPS Infrastructure of the People's Republic of Bangladesh.

¹⁰ A partial list of SPS laboratories can be found in Appendix C.

no means to track results electronically. These labs need to be accredited by accreditation boards, both national and international.

A recent survey of food testing laboratories suggests 80% of labs out of 25 surveyed have an acceptable infrastructure such as the building, electricity, gas and water supply system. However, these labs face problem with power supply, back-up electricity, emergency safety shower, emergency eye wash, and emergency exits. Approximately only 20% of these labs maintain quality according to the national and international standards. The labs lack accreditation, proficiency testing (PT), and Inter Laboratory Comparison (ILC). The waste disposal system is poor and most of the labs desire for a central waste disposal treatment plant to properly treat or dispose waste and save the environment.¹¹

Summary of Visits & Key Observations

The team met with government officials, private sector enterprises, and Non-Government Organizations (NGOs) to assess the extent of activities currently underway for food safety, plant and animal health either independently or in partnership with donor agencies. Private and public facilities were toured to determine the capacity, limitations, and challenges that stakeholders and the GoB face in establishing a viable and sustainable domestic SPS systems and international trade of agricultural products for economic growth.

Below is a summary of each visit¹².

VISITS WITH OFFICIALS AND ROUNDTABLE EVENTS

International Food Policy Research Institute (IFPRI)

Dr. Akhter Ahmed, Chief of Party

Summary:

IFPRI is occupied with identifying policy barriers to food security in Bangladesh. Of initial concern for Bangladesh are health and nutrition, food security through production, access to food for low income groups, and income generation of farmers.

IFPRI is also performing market-oriented research and currently engaging in a large value chain study that will include inland fish and shrimp as well as dairy value chains. The team suggested this value chain study include information on the adverse impact of pesticide use on paddy fields as it pertains to shrimp production and quality, since the paddy fields are adjacent to shrimp ponds.

Observations/Issues Identified:

According to Dr. Ahmed, three areas of grave concern exist in regards to food safety for domestic as well as export markets:

- the adulteration of inputs such as seeds, fertilizer, and Agro chemicals;
- the use of preservatives such as formalin for fish and fruits; and
- inspector corruption.

Elaborating on corruption, he mentioned inflated reporting of bird flu cases, resulting in denied compensation payments to producers. This corruption has prompted producers to hide bird flu cases and knowingly sell sick or dead birds, thus posing a great threat to human health.

¹¹ Alam, A. 2012. "Need for food testing and food testing laboratories in Bangladesh", The Financial Express,

¹² Visits are presented the order that they took place.

Bangladesh Agricultural Research Council (BARC)

Dr. Wais Kabir, Executive Chairman

Summary:

Dr. Kabir stated that consumers are looking for quality food, such as more long grain and aromatic varieties of rice, thus the present research agenda focuses on quality.

Dr. Kabir also discussed the Horticulture Export Foundation (Hortex), the foundation was established to promote export of horticulture products. It was created under the Company Act of Bangladesh and is under the supervision of the Ministry of Agriculture. This group later added fishery and livestock and acquired cold chain vehicles.¹³

Currently, pesticide registrations are processed through two committees. The National Technical Committee provides recommendation for registration to the National Pesticide Regulatory Committee based on efficacy trials conducted on experiment stations in collaboration with pesticide companies. Due to a lack of in-country MRLs, Codex and FAO values are used. The National Pesticide Regulatory Committee approves registration.

Observations/Issues Identified:

In Dr. Kabir's opinion, the biggest SPS issue is a lack of organization. He believes that SPS should not only focus on export markets, but local consumers as well. His concern is the need for human capacity development for food safety inspectors and research scientists, both in quality and quantity. The adulteration of inputs, such as seed, fertilizer, and chemicals is a serious concern in production and safety. The use of formalin to maintain the fresh look of fish or lengthen the shelf-life of fruits is concerning to local consumers, as well as the use of carbides for artificial ripening of fruits.

According to Dr. Kabir, standards for chemical use are lacking. MRLs have not been established for utilized chemicals, and a system for residue testing or surveillance is lacking. Recently, a laboratory has been established at Bangladesh Agricultural Research Institute (BARI) located in Joydebpur in Gazipur District, which is within the National Agricultural Research System (NARS) under BARC purview. The MRL project is being initiated by the Institute, BARI. However, Dr. Kabir remains concerned about the consistency of control of any standard being established. (The tour schedule of the team did not permit a visit to BARI).

Pertaining to animal health issues, the lack of cooperation and coordination between livestock research and extension was mentioned with a great concern during the general discussion.

Food Safety Roundtable

Institute of Public Health (IPH) Officials and FAO Advisory Team

Summary:

Dr. Deon Mahoney, Chief Technical Advisor from FAO, explained that the number of food-borne illnesses in Bangladesh exceeds 80 thousand per day, totaling about 30 million cases each year. He presented a glimpse of the status of the food, but conceded that a very limited amount of analytical data exists. He reported the presence of pesticide residues in food crops exceeding MRL (33% out of 404 samples and 9.5% in vegetables), DDT in fish, and salmonella and V. Cholerae in poultry.

¹³ No representative from Hortex was present at the meeting.

An FAO project aims to develop food safety policy, standards, regulations, and management. The project will address preventative approaches by educating sanitary inspectors, developing and enhancing food inspection and enforcement, and most importantly, establish food analysis capacity. The FAO is in the process of building a capable central laboratory facility at the Institute of Public Health.

Current activities of the FAO team include:

1. Drafting a national Food Safety and Quality Policy
2. Providing support for the National Food Safety Advisory Council (NFSAC), established in 2005
3. Developing and establishing a Food Safety Emergency Response Plan
4. Creating a repository/center for safety documentation

Observations/Issues Identified:

According to Dr. Mahoney, Chief Technical Advisor of FAO to National Food Safety Project in Bangladesh, food safety management in Bangladesh is poorly developed and lacks cohesive food safety policy. Present food laws and rules are outdated and incomplete. The inspection system is poorly coordinated, lacks supervision, and is poorly equipped with a limited number of trained staff. A central analytical testing facility is lacking and the test facilities have few trained analysts and no standard testing procedures. Educational and outreach materials focusing on preventative approaches are also lacking.



A Bangladesh Standards and Testing Institution mobile court carrying out an anti-adulteration drive

A significant challenge exists in the area of food inspection. A large number of trained inspectors are needed, as well as necessary guidelines for food inspection and trained analyst, chemist, and microbiologists for food analysis. The FAO is implementing a comprehensive capacity building project titled Improving Food Safety, Quality and Food Control in Bangladesh at Mahakhali, Dhaka. The laboratory at the IPH is being remodeled and upgraded to be the central national laboratory. Construction phase is almost complete and laboratory equipment is being installed. The hope is to have five more regional laboratories coordinating activities with the central national laboratory.

The national level laboratory should conduct food analysis for heavy metals, pesticides, antibiotics, aflatoxin, food additives, food colors vs. dyes, etc.

Street vendors and food servers should also be trained and educated about hygiene. Healthy marketplaces should be promoted and food-courts should be established within the marketplaces. The team leader desires to initiate a communication campaign and create informed consumers while developing a strong advocacy group for safe food. The intention is also to develop industry manuals for the implementation of systematic internal checks and maintenance of records for inspectors' periodic checks.

International Center for Diarrheal Diseases Research, Bangladesh (ICDDR-B)

Dr. Aminul Islam

Summary:

Dr. Aminul Islam presented an overview of the research activities in food safety being conducted by his group at ICDDR- B.

Food testing services for third parties are available at this center. Currently, the Center is conducting surveillance tests to assess the status of milk marketed in Bangladesh. Recently they have also tested betel leaf which was contaminated with Salmonella. Besides conducting tests of food items, the Center provides training to the FAO food safety project microbiologists.

The future plan of ICDDR-B includes the following as top priority:

1. Microbiological Risk Assessment
2. Setting microbiological standards
3. Conducting studies on major food-borne pathogens – sources and transmission routes of anti-microbial resistance

The secondary priorities include:

4. Mycotoxin or aflatoxins in food
5. Chemical contaminations
6. Establishing an early alert system
7. Providing support in food production chain.

Observations/Issues Identified:

Dr. Islam expressed the need for accredited labs along with an Independent Accreditation Board of Bangladesh which may certify the labs based on condition, proficiency, reliability, and quality assurance. Presently, government labs in Bangladesh are low in capacity, poor in performance, and not properly funded.

Golden Harvest Food Processer¹⁴

Mr. Mohius Samad Chowdhury, Chief Executive Officer

Summary:

Mr. Chowdhury received the SPS Capacity Building Assessment Team at the Golden Harvest Agro Industry Processing Plant site in Bokran, Monipur in the Gazipur district. The purpose of the visit was to see and understand current food safety procedures in the private sector. Dr. A. B. Siddiqui of Poverty Reduction by Increasing the Competitiveness of Enterprises (PRICE), working for Chemonics International was present to meet the group. (Chemonics provides consultancy to Golden Harvest.)

Mr. Chowdhury presented a historical background of the company and mentioned that the plant began in 2005 with support received from the Danish International Development Agency (DANIDA). Exports were undertaken through independent distributions to



Blanched long bean (Lubea) being packaged and weighed prior to deep freezing at the Golden Harvest agro processing plant in Gazipur, Bangladesh.

¹⁴ The Golden Harvest Agro Industries Ltd. is on FDA's Import Alert list. Products from this company are subject to Detention without Physical Examination (DWPE) due to "possible adulteration associated with filth, decomposition, or presence of Salmonella".

European, US, and Australian ethnic markets. At present, there are many competitors in these markets, such as Asoka, Vadilal, and Swad of India as well as others from Myanmar and Vietnam. The local consumer market has also changed. The upper and high-middle class buyers in Dhaka are afraid of contaminated local food products and frequently purchase imported foreign food products. Due to this, Golden Harvest decided to provide the local market with quality products and changed their name to the English name of Golden Harvest in 2008.

Mr. Chowdhury explained that Golden Harvest is now careful about the presence of filth, antibiotic, nitro furan, and concerned about decomposition of seafood for lack of appropriate cold chain facility, etc., and as such has stopped its shrimp and frozen fish business. Moreover, the cleanliness of the surroundings and personal hygiene of workers is an important matter for Golden Harvest. The Company, with the help of PRICE, is trying to maintain traceability of their purchased products as far as possible; however it is difficult due to the fact that most of the producers are small farmers and produce is collected by a middle man for delivery. Mr. Chowdhury acknowledged the technical support Chemonics and Winrock International.

Observations/Issues Identified:

Mr. Chowdhury mentioned Golden Harvest is building a chicken processing plant and needs help throughout the cold chain. According to Mr. Chowdhury, Golden Harvest needs technical support in establishing a cold chain system so they can pursue additional export markets.

During the visit, the team observed record keeping in progress on source plant products being delivered. General cleanliness of the facility, washing, and wearing of gloves by the workers seen at the time of the visit was of acceptable quality. However, hand written records of past activity were not validated.

DAE Plant Protection Wing of the Ministry of Agriculture

Krishibid Mohammad Abu Hanif Miah, Plant Protection Wing Director

Summary:

The Wing provides pesticide administration and management including pesticide registration, and quarantine services for both import and export activities for the purpose of plant protection in Bangladesh. Currently, the Plant Protection Wing has registered 123 generic pesticides. Wing services also include management, surveillance, forecasting, and collaboration with FAO projects on IPM and plant protection programs.

Bangladesh has 26 ports for entry and exit of agricultural products. Of those ports, 20 are land ports with India, 1 land port with Myanmar, 3 airports, and 2 seaports. Currently, 10 diagnostic labs are available to help quarantine applications.

The Bangladesh parliament has enacted the Plant Quarantine Law 2011, published in a gazette notification on April 5, 2011. This law permits the formation of a Plant Quarantine Authority. The law lists the functions of the Authority and includes requirements of present-day world trade in relation to the implementation of SPS requirements. Chapter one provides definitions of words or phrases used to describe plant health, quarantine actions, pest management issues, and personnel-implementing actions. For example, the "Phytosanitary Certificate" is defined for both import and export activity. In the case of imports, this certificate will be issued by the appropriate authority of the country of produce origin. For export purposes, the issuing of a Phytosanitary Certificate will follow a pre-export examination. If the consignment presented to the quarantine authority is found

suitable for issuing a certificate, the quarantine officer will issue the Phytosanitary Certificate according to the rules and regulations set for the procedure.

Chapter two of the gazette notification of the law lists 25 action and jurisdiction items. These include Pest Risk Analysis (PRA), Pest Risk Management (PRM), surveillance, and field research. Similarly, chapter three details import-export procedures, the examination of import-export permits, declarations, sample collection permission, and procedures. Chapter four lists pest containment and eradication procedures, and chapter five includes matters of violation and punishment procedures. A translation of these laws in English will be produced, but in case of any controversy between these two versions, the Bengali version will hold precedence.

Observations/Issues Identified:

The lack of trained personnel for operating lab equipment and conducting pesticide toxicology tests, the non-availability of test equipment to quantify the less toxic pesticides such as pyrethroids and bio-pesticides for registration, the lack of establishment of MRLs, and the non-availability of test equipment for Sudan dye and bacterial organisms, are all hindering the desired functions of the Plant Protection Wing.

Plant health officials present at the meeting expressed the need to frame action rules to supplement the 2011 Plant Quarantine Law. They expressed the need for capacity building on Pest Risk Assessment or Analysis and to build ability of lab personnel to analyze the latest pesticides, such as pyrethroids, biopesticides, etc, thus enabling the registration process. The need for trained toxicologists and lab technicians was also mentioned in order to help develop MRLs.

The Additional Director, Anowarul Huq, requested collaboration on formulating rules to implement the 2011 Quarantine Act, help in:

- developing biological control through training on sterile insect testing;
- training on citrus canker;
- process of export certification;
- on-site tailored training for plant quarantine;
- on-site risk assessor training provided by trainers from USA; and
- the development of pest profiles.

Bangladesh Academy of Science (BAS)

Dr. Quazi Abdul Fattah, Vice President

Summary:

BAS has funding to operate and conduct science educational conferences, seminars, and educational dialogue. The academy has held two symposia on food safety issues and the need for risk assessment of Genetically Modified (GM) foods.

The Academy also provides grants for science projects; to date, 20 projects have been funded in a variety of agricultural, environmental, and social science fields.

Observations/Issues Identified:

Knowledge gaps in practical aspects of microbiology applications, specialization, and the lack of trained toxicologists were mentioned in the discussion. The group emphasized the need for curriculum development of education on hygiene and microbiology starting from the primary level. The Academy scientists showed interest in participating in any future SPS applications projects for Bangladesh.

Animal Health Round Table

Department of Livestock Services on Animal Health

Summary:

Dr. Mat Yamage, FAO Senior Technical Coordinator and Country Team Leader of Emergency Center for Transboundary Animal Diseases (ECTAD) stationed in Bangladesh, presented the latest report of Avian Flu incidences. Most outbreaks occur in the months of April-May; in 2012 only 21 cases have been reported.

This year 3 positive cases of avian flu were detected in the wholesale market in Kaptan Bazaar and New Market. Six cases of human infection of H5N1 (Avian Influenza

Virus) were reported from the Tejgaon market, but no fatalities occurred. Dr. Yamage stated that the payment of compensations to producers stopped which may have decreased the reports of avian flu cases. Sick birds are probably coming to the market and the H5N1 is spreading unnoticed. Poultry handlers and retail sellers may be becoming symptomless carriers. Dr. Yamage opined that the unsold birds should not be held or returned but slaughtered. The authorities have successfully implemented a day of closure of the wholesale market at Kaptan Bazaar for cleaning purposes. It is expected that similar success will also be achieved soon for the New Market wholesale market. The US Agency for International Development (USAID) has helped in the process of observing cleanliness and sanitary practices by providing Virkon-S livestock disinfectants, gloves, and aprons. The FAO project also is helping to improve the drainage system of both Kaptan Bazaar and New Market wholesale poultry markets.



A retail chicken market at New Market Dhaka, Bangladesh



Goats going to the Kaptan Bazaar meat market for slaughter.

Dr. Abdul Baqi, National Consultant and FAO Expert on Bio Security for Live Bird Market, gave a presentation on goat health and the prevalence of Peste des Petits Ruminants (PPR) or goat plague. Goats are important in the rural economy of Bangladesh because raising goats has given economic empowerment to poor women of Bangladesh. The estimated numbers of goats are 21.6 million, as compared to chicken which numbers 221.5 million birds. Black Bengal and Jamunapuri goats are the two predominant varieties in Bangladesh with Black Bengal being most popular. A large number of sheep are raised in rural Bangladesh, as well.

A pilot project on livestock health care is undertaken by FAO in Upazillas. This is a grassroots program which trains community animal health care workers. Presently, vaccination is done by volunteers with supplies of vaccine provided by the livestock department.

Observations/Issues Identified:

The incidence of PPR was first detected in Meherpur, a bordering district with India, in 1993. PPR is a trans-boundary disease originating from India, where about 32 percent of goat population is lost

every year. Control of PPR is still the most neglected area in Bangladesh. The vaccine production facility in Mahakhali produces only 3 million vaccines but is supposed to have a capacity for the production of 10 million vaccines. The production system is old, requiring authorized certification for production and obtaining of cross checking. The present vaccine is thermo unstable and loses its effectiveness due to heat. A thermo stable vaccine needs to be developed and provisions need to be made for a cool chain for storing and transporting vaccines. An advantage of vaccination is that it brings a life-long immunity and revaccination is unnecessary.

PPR was identified as an important issue for animal health, so a laboratory is being established in Savar with support from FAO and OIE which will serve as the regional reference lab for South Asia Association for Regional Cooperation (SAARC). However, field level detection laboratories are still necessary to develop. Since PPR is a trans-boundary disease, an effective trans-boundary veterinary service network needs to be created and transparency in reporting must exist.

FIELDS TRIPS

Karwan Bazaar (Vegetable Market)

Observations/Issues Identified:

The wet markets are generally crowded, unorganized, and there are piles of trash in every nook and corner. Proper drainage and cleanliness is a problem in these open markets.



Vegetables in open market at Karwan Bazaar.

Agora Super Market

Observations/Issues Identified:

The indoor super market in Gulshan, Dhaka, is near to the foreign diplomat area and is clean and neatly organized. The company, Agora, has opened branch markets in other upscale neighborhoods of Dhaka. It was observed that there is an abundance of produce from Western countries to cater to the demand of middle and upper class consumers. This may partly be due to non-availability of local finished products or because of growing concern of adulterated or toxic preservative mixed food products that have been found in a variety of locally grown vegetables, fruits, and fish. The unit prices of each product are displayed and there is no need to bargain or haggle. The market authorities claimed that they buy from reputable local sources and also



Fruits on display in Agora super market.

conduct tests of produce to ensure consumers that their products are free of contaminants.

Kaptan Bazaar (Live Bird/Livestock Market)

Observations/Issues Identified:

The team visited the wholesale chicken market at Kaptan Bazaar where more than half a million birds are sold every day in the early morning hours. The team also visited the New Market chicken market where a drainage facility for the market stalls is being fixed by a FAO livestock project.



Goat meat stalls at Kaptan Bazaar.



Kaptan Bazaar retail chicken market in Dhaka

Bangladesh Agricultural Development Corporation Cold Storage and Sorting Facility

Observations/Issues Identified:

The team visited the small cold storage and sorting facility at the Dhaka International Airport. This facility provides a room to sort or temporarily store fresh export items and a cold storage area for frozen food items. Imported fish, such as salmon, are stored in this cold storage waiting for retrieval by the importing business entity. The team saw the sorting and packing of exotic citrus (*Citrus aurantifolia*) from a village in Shibpur in Narsingdi district. The producer brought the commodity to this facility for the exporter. He said that his farm had been inspected for canker by agricultural inspector.

Some of the SPS Assessment Team members held one on one visits with members of NGOs, such as Bangladesh Shrimp and Fish Foundation (BSFF) and Hortex Foundation, engaged in agricultural production and market development in Bangladesh.

ADDITIONAL MEETINGS

Bangladesh Shrimp and Fish Foundation (BSFF)

Dr. Mahmudul Karim, Executive Director

BSFF is a non-profit private research and advocacy organization registered under Trust Act 1882. The mission of the foundation is to provide services and support to shrimp and fish raised in aquaculture systems. BSFF organizes conferences, participates in research and demonstrations, and engages in dialogue advocating adoption of Good Aquaculture Practices (GAQPs) for shrimp culture.

Dr. Karim co-authored a useful booklet in Bengali, the title of which translates as "Good Aquaculture Practices for Shrimp in Bangladesh". This booklet addresses the requirements of EU and US-FDA regulations, and foreign buyers. The booklet is based on published materials of FAO, Best Aquaculture Practices of Global Aquaculture Alliance, GAQPs, and requirements of the EU.

The booklet describes all GAQPs for shrimp culture and is a good source of information on record keeping for traceability. Information may be used to develop extension materials, such as chart for activity check-off, list of things to do and avoid, time table for shrimp culture related activity, list of usable chemicals and dosages, and record keeping. BSFF may serve as a link for SPS program delivery to the producers and industry by organizing train the trainer educational program for healthy and economical aquaculture industry.

Hortex Foundation

Dr. Saleh Ahmed, Hortex Consultant

The Horticulture Export Development Foundation was formed in 1993; it is one of the oldest organizations to deal with SPS issues in relation to exports of plant products. The objectives of the Foundation are to promote high value fresh and processed agricultural products through contract farming, provide market intelligence, training, post harvest management, and ensure SPS standards for better environment management and exportability.

Hortex Foundation supports farmers through, for example, organizing seminars on international fresh produce export requirements and providing training materials such as a booklet titled "Introduction to Sanitary and Phytosanitary Issues for Fresh Produce Exporters".

Dr. Ahmed has observed dwindling attendance in the SPS short course trainings and lamented on a lack of interest on the part of the horticultural industry in the matter of SPS matters. This may be the result of a couple of things:

- It is possible that growers and processors feel that meeting SPS requirements entails unnecessary expense and hassle because in many cases, they are unaware of possible losses due to detention and rejections by foreign importers at the entry point.
- The industry is focused primarily on overseas ethnic markets catering to Bangladeshis living overseas. Industry owners are able to use unorthodox means to manage their way through the Bangladeshi regulatory system or take advantage of poorly trained inspectors in identifying and/or characterizing hazards. Additionally, some exporters set up store fronts as quick money, simply to take advantage of a single opportunity. They are not concerned with quality or reputation.
- There is also some corruption within the Hortex Foundation. He cited the example of refrigerated trucks acquired by Hortex Foundation for industry members to use on a rental basis. These trucks are now being rented out to pharmaceutical industries rather than being used for horticultural products.
- The country lacks a central regulatory authority; the current regulatory system is weak and there is little enforcement to ensure compliance.

Conclusions and Recommendations

The Bangladesh Constitution clearly states it is a fundamental responsibility of the Government to ensure the basic necessities of life for its citizens, including access to safe food and nutritional value for the improvement of public health.¹⁵ This is evidence that consumer protection runs deep within the Bangladeshi psyche and culture, however, in reality consumers in Bangladesh are regular victims of serious food adulteration and contamination of harmful chemicals and pathogens; food borne illness and death is common. The issues of food safety violations, food borne disease, and death are frequently raised by the media. Many existing food laws have not been implemented and standards are often not adequate to ensure a safe and wholesome food supply.

The Bangladeshi SPS system meant to govern agricultural production and food safety is wrought with dysfunction and lack of coordination. There is little physical and regulatory infrastructure in place to enable the assessment of food safety risk and technicians responsible for monitoring animal and plant health and food safety are few and ill-trained. Growers do not always understand safe production methods and the government extension officers charged with helping them are not linked well to current research on Good Agricultural Practices (GAPs). The policy and legal mechanisms to ensure farmers have access to the best possible inputs are broken. Given all these factors, improving the SPS system in Bangladesh is daunting and requires a systematic approach that can address fundamental problems.

A recurring theme during the assessment visit was the lack of risk management throughout the risk chain. Field extension officers are not adequately trained to identify potential risks in the field. There are no mechanisms to communicate the risks and provide solutions to the farmers or food producers. Nor do laboratory/field technicians have the necessary equipment to perform critical analyses. Staff needs to be trained in updated analytical methods and techniques and to participate in proficiency and validation programs ensuring they maintain relevant skills going forward. Regulatory officials, who assess risk and determine if actions need to be taken, are not knowledgeable about basic risk assessment concepts. SPS policies and regulations need to be thoroughly reviewed and updated in order to provide a solid management base for decision makers, and provide strong enforcement mechanisms to back the policies.

With this in mind USDA makes the following recommendations that, if implemented, will begin a process toward improved SPS systems in Bangladesh. Wherever possible, these recommendations should be executed in coordination with efforts currently being implemented.¹⁶

Pesticides in Litchis Cause 14 Kids to Die

Our Correspondent, Dinajpur

Experts investigating why 14 children died in Dinajpur and Thakurgaon this month with almost identical symptoms believe that pesticides used in litchis could be the reason for their deaths. The children, aged between two and 16, died between June 1 and June 20.

Experts at the Institute of Epidemiology, Disease Control and Research (IEDCR) suspect that they died after eating litchis on which pesticides were used or after coming in contact with such litchis.

The IEDCR collected blood and urine samples from children with similar symptoms but in their primary tests they could not determine the reason for their deaths with certainty.

ASM Alamgir, an expert at IEDCR, told The Daily Star that the Institute lacked the facilities for a thorough test. Samples have been sent to the Centre for Disease Control and Prevention in Atlanta, USA for tests.

The Daily Star: Your Right To Know
Sunday, July 1, 2012

¹⁵ Bangladesh Constitution, Article 15 and Article 18

¹⁶ A partial list of national and international SPS capacity building efforts can be found in Appendix D.

Improve the Risk Management Chain

1. Strengthen the ability of front line risk identifiers
 - a. Provide training within the extension service at all levels
 - Producers (farmers and fish pond managers)
 - Inputs (sales, distribution, marketing and application)
 - Harvest
 - Post Harvest Loss
 - b. Establish integrated systematic inspection, sampling and monitoring programs at all critical control point stages along the food safety supply chains associated with products in the sectors of agriculture, seafood (aquaculture & wild-caught), plant and animal production, harvest, manufacturing process, distribution, and sales.
2. Build capacity of risk evaluators/assessors
 - a. Assess the current system of pesticide registration and make recommendations and provide technical assistance to strengthen processes. Bangladeshi farmers will not have access to safer pesticides until the government is able to review these and register them effectively.
 - b. Provide pesticide registration officials training in toxicological reviews. Currently, there are four residue chemists who are also responsible for reviewing pesticide registration applications and making toxicological decisions (based on what the manufacturers are providing to them). They also need a dedicated toxicologist in the review process.
 - c. Build the capacity of the Plant Quarantine Wing to perform the information gathering, evaluation, and recording necessary to develop recommendations for a position or action in response to a specific pest risk. This will ensure that policy makers have the proper information to allocate resources in the event of invasion, incursion or infestation.
3. Improve risk management infrastructure:
 - a. Update pesticide, contaminant, and food pathogen policies for pesticide registrations, enforcement of regulations, and standard setting (compliant with international standards)
 - b. Strengthen the traceability documentation protocol existing across the food sector to ensure its implemented in a consistent and understandable manner. Provide training in traceability monitoring for personnel in food processing plants and to government regulators to ensure these staff are sufficiently knowledgeable regarding what specific violative practices to look for when inspecting a raw material source-farm as part of periodic verification of proof of origin certificates at Hazard Analysis and Critical Control Points (HACCP) receiving steps in food processing plants.
 - c. Implement a computerized database and record-keeping system for sample collection, inspection, and enforcement actions.
 - d. Expand the legal enforcement system for prosecuting food safety violations and mechanism for product reconstitution or destruction.

- e. Expand food safety inspection services (and operations manuals) for monitoring and enforcement at food production, distribution, manufacturing, import and export facilities.
- f. Collaborate with FAO to provide technical assistance in formulating quarantine rules.
- g. Assess current mechanisms for early detection and rapid response (ED&RR) should an invasive species be introduced in Bangladesh. The assessment would identify gaps and build the foundation for responding to this risk. The ED&RR plan would include the use of active and passive detection networks and would require research and training plans.

Build Effective Laboratory Network

1. Identify four/five key laboratories and conduct a comprehensive assessment for upgrading and providing necessary equipment. For example plant health quarantine lab for registering biopesticides; PPR lab in Savar in cooperation with SAARC initiatives; food safety lab in Institute of Public Health; and the labs at ICDDR-B
2. Implement a laboratory technician certification program that builds the capacity of laboratory technicians to employ Good Laboratory Practices (GLPs) and perform analytical diagnostics (including but not limited to microbiological and pesticide residue detection in food, water, and soil; animal disease evaluation; and plant pest identification).
3. Collaborate with the recently established Accreditation Board of Bangladesh and the FAO's current laboratory infrastructure building project to enable a network of certified and reliable laboratories capable of conducting food safety analysis such as pest identification, pesticide and vet medicine residue, identification or quantification of microbiologic pathogens, etc.

- a) Identify, strengthen, and enable at least one fee for service laboratory for potential exporters.

There is a huge potential (and desire) to have a certification system in place for exporters. Exporters want to make sure that their products comply with trade standards – but there is no lab that can do this. The export companies rely on shipping their samples to foreign labs that can take two months to return results. This obviously doesn't make sense for exporters of perishable products such as fresh produce.

- b) Build the physical and human capacity of the Plant Protection Wing laboratory or transfer its responsibilities to another laboratory.

An enormous problem is that many new chemistry pesticides cannot be registered for use because the formulation testing laboratory does not have the necessary equipment or training to analyze the pesticide product to support a registration.

- c) Identify a laboratory capable of handling the domestic monitoring programs. There is very little capacity to monitor the safety of the domestic food supply for pesticides, or contaminants (and worse, identification of chemical adulterants) or determine the environmental impacts of agricultural production.

- d) Identify or establish and enable a research laboratory that can conduct pesticide residue analysis on horticultural crops; the most likely place for such a lab is the BARI. There is very limited capacity to perform pesticide research that could be used to support the registration and application of new, safer pesticide chemistries.
4. Build the capacity of plant health officials to accurately characterize pest risk, for example: the ability to conduct PRAs, pest surveillance, and prepare pest lists. International obligations dictate a transparent science based PRA process as outlined in the International Standards for Phytosanitary Measures (ISPM) No. 2. This system evaluates scientific evidence to determine whether an organism is a pest.
 5. Assist in establishing post-entry quarantine centers. As a net importer of plants and plant products, Bangladesh requires a mechanism to conduct post-entry quarantine assessment of preparative material. In accordance with ISPM No. 34 Bangladesh needs to adopt guidelines for the design and operation of post-entry quarantine (PEQ) stations for holding imported consignments of plants, mainly plants for planting, in confinement in order to verify whether or not they are infested with quarantine pests.
 6. Assist in establishing Areas of Low Pest Prevalence/Pest Free Areas. Recognition of pest free areas (PFAs) and areas of low pest prevalence (ALPPs) is a technical and administrative process to achieve acceptance of the phytosanitary status of a delimited area. This is outlined in ISPM No. 29 and serves as a powerful tool for addressing pest pressure and establishing the ability to export commodities (e.g. citrus to the EU).
 7. Help build the capacity of the Quarantine office, laboratory, training center etc. In previous visits and in the recent USDA/FDA assessment visit, USDA officials have noted a significant lack of human capacity endemic throughout the Plant Quarantine Division. The entire infrastructure of the Division requires upgrade and investment, particularly in human resource capital.

In addition to human capital investments, In order to effectively perform pest identification, the Division requires exposure to and the establishment of a “digitized” record keeping system. Such a database is used for interception records of plant pests, an electronic phytosanitary certification system, and to determine regulatory actions.

Review Policy and Regulatory Frameworks

1. Cooperate with the Agricultural Policy Support Unit (APSU)¹⁷ to review current laws and standards to determine which are effective as well as what gaps exist.
2. Develop a set of food safety regulatory policy recommendations detailing a road map of actions the GoB can follow to improve agricultural development.

Increase Inter-Departmental Functioning and Coordination

1. Implement an in-depth assessment of current roles and responsibilities of entities governing sanitary/phytosanitary functions in Bangladesh.
2. Based on this assessment build an improved framework that defines overlaps and makes recommendations regarding consolidations and efficiencies. The framework should clearly define each agency’s roles and establish responsibilities within each agency and for cross consultation between these agencies/ministries to ensure better communication and coordination of their work.

¹⁷ The APSU is a new entity grown from collaboration between the Ministry of Agriculture and IFPRI. The APSU is mandated to inform policy makers about regulatory reforms and mechanisms that can increase agricultural development in Bangladesh.

3. Build the operational capacity of the extension service and link it to the BARC. The mechanism to inform producers of the most up-to-date research does not function. Each ministry and department run their own extension service, which are, in many cases, rudimentary and lack training and support for their officers. There is often little coordination or cooperation within a single ministry between the research and extension branches.
 - Similar to BARC, the apex umbrella organization for national research, there is a need for an apex umbrella organization for extension. Better yet if the BARC is mandated to be the BAREC (Bangladesh Agricultural Research and Extension Council).

Improve Animal Health

1. Based on this visit as well as previous visits by team members, it is evident to the team that the animal health sector requires a great deal of attention. Thus we strongly encourage the MoFL to utilize the OIE Pathway for efficient Veterinary Services (PVS) Tool and share these findings with strategic partners. The OIE PVS Tool promotes a culture of raising awareness and prioritizes areas of improvement. Firstly, the OIE PVS Tool helps to raise awareness and improve the understanding of all sectors regarding the fundamental components and critical competencies that the veterinary services of Bangladesh must have in order to function effectively. Secondly, a sustained commitment on the part of all relevant stakeholders is required to form strategic actions, investments are evaluated and agreed to, and commitments made and implemented. Continuity of this process requires a true partnership between the public and the private sectors. Leadership on the part of the GoB is a fundamental and critical component of adoption and application of improvement measures.
2. The present vaccine for PPR is thermo unstable and loses its effectiveness due to heat. A thermo stable vaccine needs to be developed and provisions need to be made for a cool chain for storing and transporting vaccines. An advantage of vaccination is that it brings a life-long immunity and revaccination is unnecessary.
3. PPR was identified as an important issue for animal health, so a laboratory is being established in Savar with support from FAO and OIE which will serve as the regional reference lab for SAARC. However, field level detection laboratories are still necessary to develop. Since PPR is a trans-boundary disease, an effective trans-boundary veterinary service network needs to be created and transparency in reporting must exist.

Consumer Outreach and Education

1. Develop outreach materials and education campaign to educate consumers about common food safety practices. This should include a grassroots campaign targeting school age children, particularly elementary school, to ensure safe food practices are learned early.
2. Conduct community events with the purpose of educating households regarding safe handling of food.

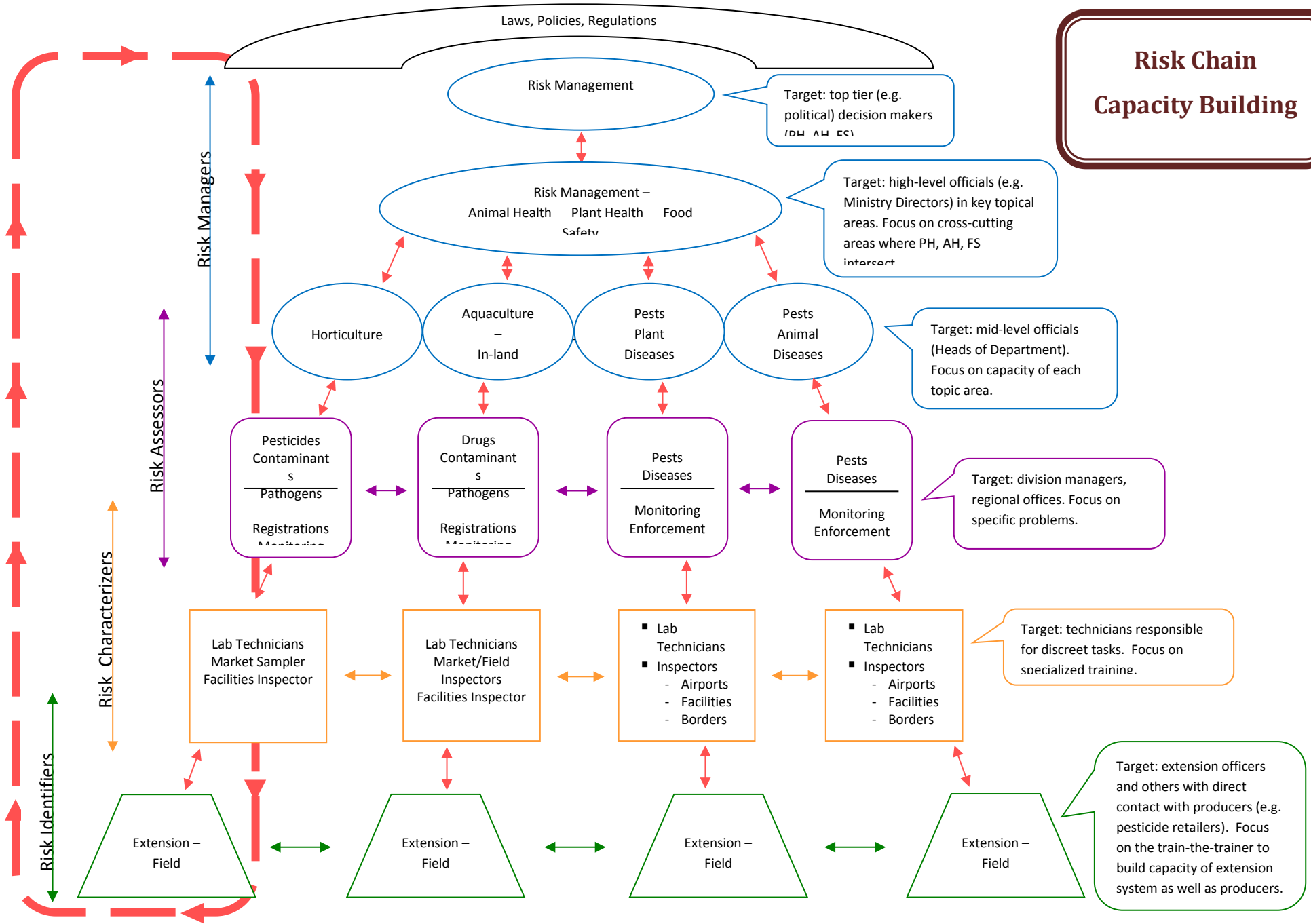
APPENDIX A

Risk Management Capacity Building

Risk management is a process by which farmers, government officials and other decision makers detect, evaluate, and choose mitigating measures that will reduce the risk of food contamination and/or adulteration throughout the food chain. The process consists of the following actions:

- 1) Hazard identification: this is the beginning of a process where a risk (real or perceived) is identified and an action (decision) is needed in order mitigate the risk. For example, this can be a field extension officer noticing an insect on a crop, or an officer noticing adulterated produce in the central distribution market. They may not know exactly if the insect or chemical is really dangerous or not. They take a sample and hand it over to an analytical expert at a laboratory.
- 2) Hazard characterization: a laboratory technician receives the insect or food product sample; it is their job to characterize what that hazard is. The technician will identify the insect or analyze the residue on the produce to determine exactly what the insect or chemical is. They will report this information up to a risk evaluator.
- 3) Risk evaluation/assessment: a higher ranking official receives the report describing the insect or chemical, and learns that the insect is a thrip, or the chemical is a registered (legal) pesticide. The job of the risk evaluator is to determine the extent of the hazard – is it a real or perceived hazard? Is the thrip of significant danger to the crop or whole industry? Is its occurrence widespread or an isolated case? What was the level of pesticide found? Does it exceed human health standards, or is it within safety limits?
- 4) Risk management: this information will be passed to a regulatory (enforcement) authority that will make a decision about a response. If the pesticide exceeded human health safety standards or contains a quarantine pest, the authority may decide to pull the produce from the market and destroy it. If it does not exceed limits, but is close, the authority may decide to enhance sampling and monitoring.

Risk Chain Capacity Building



Feedback Loop:

- ↓ Policies provide direction – Assessors implement actions to enforce policies – Technicians then know what to test for – Field officers know what to look for.
- ↑ Field officers find a problem – Technicians identify the problem – Assessors determine the problem’s importance – Policy makers can set new guidance.

APPENDIX B: Relevant Food Safety Articles

The Daily Star**Tuesday July 14, 2012****Editorial****Beware of Adulterated Food****Assumes critical proportions during Ramadan**

Food adulteration in Bangladesh is a year-long problem. Almost all food items ranging from rice, fish and vegetables to fruits contain deleterious adulterants which we are forced to consume with the responsible government agencies turning a blind eye to the adulterators. The month of Ramadan setting in, it is just heightened. Textile colours are rampantly used in most iftari items to make them crispier. Considering this rising trend during Ramadan, we welcome the commerce minister's instructions to the deputy commissioners to ensure "exemplary" punishment to food adulterators. His suggestion that the special drive teams be accompanied by "local elites" sounds apt.

We, however, feel that strengthening monitoring during Ramadan, though essential, is but an ad hoc measure. This fails to address the real reasons behind this abysmal situation in which profiteering gets the better of public health considerations. Extremely harmful industrial colours are used in candy, chocolate, cake, chewing gum, ice cream, biscuit, colourful sweetmeats etc. all the year round. So is the case with other basic food items including rice, fish and vegetables. Therefore, we believe that effective monitoring throughout the year should be conducted to arrest the culprits and thus bring the situation under control.

As we understand it, food adulteration is a seriously punishable crime under the Pure Food Ordinance (1959) and there are several agencies including Bangladesh Standard and Testing Institution (BSTI), Directorate of Consumers Rights Protection (DCRP) and local government bodies to constantly monitor and contain adulteration. Then why has the government utterly failed to control the situation?

Often, lack of co-ordination and sheer manpower shortage in the agencies are cited as reasons behind this. In addition to these reasons, we believe the government has yet to put it in its priority list. As well as increasing co-ordination between relevant agencies, the government must set it as one of its top agendas in order to ensure food security for all throughout the year.

The Daily Star**Tuesday June 2, 2009****Editorial****Pesticide poisoning confirmed****Supervised application must be ensured for safety**

A test by the Atlanta Centre for Disease Control and Prevention, the US, has confirmed that the four children who died in two villages in Dhmarai Upazila were actually victims of pesticide poisoning. The test results have removed whatever doubt there was regarding the cause behind the deaths which looked rather abnormal.

The US centre has found organophosphate, a poisonous ingredient used in pesticides, in the biological and environmental samples sent by our health ministry for testing. Now the worrying news is that organophosphate is used in preparing no fewer than 48 kinds of insecticides that local farmers spray on crops and vegetables. The danger is a very potent one, considering the fact that people consume various types of vegetables and cereals on a regular basis. It is feared that the poison might have entered the food chain extensively. The children appear to be most vulnerable. It seems many consumers are surviving rather luckily. But nobody should overlook the disastrous long-term consequences on the people at large. Such poisoning, besides leading to death, can have a crippling effect on the population at large.

Clearly, things went wrong as an overdose of pesticides was applied by the farmers in Dhamrai. The agriculture officers concerned have themselves admitted the unpalatable truth that the farmers were not following the safety rules while spraying pesticides. It has been confirmed by the Atlanta centre, but the question is whose duty was it to tell the farmers that they should never cross the permissible levels while using pesticides? Is it enough to register a pesticide and allowing it to be marketed while doing nothing to train its users?

The Dhamrai tragedy has exposed the extent of the hazards associated with using pesticides indiscriminately. Farmers have to be trained on scientific use of pesticides and fertilisers. This is no doubt a huge task, but considering the threat that indiscriminate use of pesticides poses to public health, there is no other option open to us. The agriculture experts should address the issue with a view to finding a solution to the problem of applying insecticide overdoses. A survey should also be conducted to find out what is going on all over the country. The Dhmarai case could only be the tip of the ice-berg.

The Daily Star

Tuesday, May 5, 2009

Killer pesticides

Mindless use in Dhamrai farmlands causes death of 3 kids in a month; many others ill

Pinaki Roy

Excessive use of pesticides on farmlands in two villages of Dhamrai upazila caused death of at least three children last month. It also killed a number of calves, dogs and fowls. Besides, 13 more children, all aged below seven, were hospitalized, while some farmers fell sick during the same period.

A committee formed by the Institute of Epidemiology, Disease Control and Research (IEDCR) under the health ministry reveals this in a primary investigation report.

Talking about reasons behind the recent deaths in Dhamrai's Malancha and Naogakaith villages, IEDCR Director Dr Mahmudur Rahman told The Daily Star, "We are sure it was pesticide poisoning. And we think it's happening in other parts of the country as well."

During a visit to the villages yesterday, this correspondent found that the families did not yet know their kids had in fact died of toxic poisoning, not of any mysterious illness. Abdus Samad, grandfather of Meem, a 32-month-old girl who died on April 2, told The Daily Star, "We had breakfast together that morning. We talked a lot and she did not show any symptoms of sickness. After some time, she went out, but came back seriously ill."

Asked what she thought was the cause of her daughter's death, Meem's mother Asma Begum said, "The doctors could not diagnose the disease."

During investigation, the IEDCR committee gathered that the farmers in the villages used furadan or carbofuran (recently banned in Kenya for being used in killing lions and other predators) on paddy fields. Besides, some villagers were using organophosphate insecticides like cypermethrin, malathion and chlorpyrifos many times the recommended dose.

Local Agricultural Officer Khairul Alam said the farmers in Malancha and Naogakaith spray pesticides in amounts way more than what is safe. Halim, an aubergine grower in Malancha, has applied eight to 10 kilograms of furadan and 63 bottles (120 ml each) of liquid pesticide on his .75-acre land. "Using that much pesticide is highly dangerous. We don't even recommend strong pesticides like furadan for eggplants. He should have used only 600 ml of liquid pesticide and that too in three phases," said Khairul.

The IEDCR's primary investigation found quite a few examples of overuse of pesticides. For instance, Khaleque treats his chilli on a small piece of land with 500 grams of furadan. Barek applies three kilograms of furadan for his 2.57-acre paddy, while Shukur treats the edge of his field with rat poison.

Nizam of Malancha sprayed his mango trees with chlorpyrifos in the early morning of April 2. His daughter Meem plucked a mango from one of the trees at around 7:30am and died within an hour, the IEDCR report states.

Locals said most of the victims fell sick between April 2 and April 14. Each had a sudden onset of symptoms--reduced consciousness, frothy discharge, respiratory distress, constricted pupils and convulsions.

Before expiry, the dogs and calves were bellowing, jerking heads and off feeding, the IEDCR report reads. "Initially, it was hard to detect what was wrong with the patients. But as symptoms emerged, we treated them for poisoning," said Dr Nitya Gopal Chowdhury, medical officer (disease control) of Dhamrai upazila health complex. Asked why the children are more prone to pesticide poisoning, he said, "It's their weaker resistance to pesticides." He said none of the affected children's breath however reeked of any chemicals, and it suggests they did not swallow pesticide grains.

Meanwhile, IEDCR has launched an awareness campaign against pesticides in those two villages. It cautioned the villagers against letting their children go to the crop fields and using clay to make toys or ovens.

The IEDCR team has collected many biological and environmental samples including those of blood, urine, stool, cough and breast milk from villagers. The samples have been sent abroad for further tests.

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APPENDIX C

Partial List of SPS Laboratories

Primary laboratories:

MoHFW Institute of Public Health

Dhaka Public Health Laboratory

Annually tests some 5,000 food samples sent by sanitary inspectors.

The FAO of the United Nations (UN) is implementing a capacity building project for this Public Health Institute in Dhaka. The plan is to update this lab to a modern national facility associated with five satellite labs spread throughout the country.

Directorate of Food under the Ministry of Food and Disaster Management (MoFDM) Food Testing Laboratory

Tests samples of rice, wheat, and edible oils.

MoLGRD

Dhaka City Corporation Food Testing Laboratory

Tests food and oil samples.

MoA Plant Protection Wing laboratory

Tests both imported and exported vegetables and fruits under quarantine function. This lab also does pesticide tests for registration purpose, however, does not have equipment to perform tests for bio-pesticide to help register newer, safer pesticides. This lab conducts test for quarantine certification, but has no facility for testing the presence of harmful textile or fluorescent dye in foods, or perform biological tests.

MoFL Department of Livestock Laboratory

MoFL Quality Control Laboratories at Khulna and Chittagong

Tests Frozen fish

Ministry of Energy and Mineral Resources' Institute of Food Radiation Biology, Atomic Energy Commission

MoA BARI Central Laboratory and the Laboratory of Post Harvest Technology

MoA Bangladesh Rice Research Institute Laboratory

Ministry of Defense Armed Forces Food and Drug Testing Laboratory

Bangladesh Agricultural University in Mymensingh Departments of Dairy Science and Biochemistry, Department of Food Technology and Rural Industry Laboratories.

Ministry of Home Affairs Chemical Examination Laboratory

Ministry of Environment and Forests Directorate of Environment, Environment Laboratory

The following are the laboratories of semi-government or autonomous and private agencies:

BSTI Laboratory

ICDDR-B Laboratories

BCSIR Laboratories

Nestle Bangladesh Ltd. Laboratory

ACME Laboratories

PRAN-RFL Group Laboratories

SGS Bangladesh Ltd Laboratories

The Advanced Chemical Industries Laboratories

APPENDIX D

National and International Efforts in SPS Capacity Building

USDA believes it is important to for readers of this report to be aware that there are current and on-going SPS capacity building aimed at improving systems and thereby improving human and animal health as well as increase international trade opportunities. This list is meant to be illustrative of such projects where there are possibilities to build on synergies and create complementary projects that will expand capacity building efforts. This list should not be viewed as exhaustive.

Organization	Projects/Activities
BAS	BAS has received funding to operate and conduct science educational conferences, seminars, and educational dialogue. The academy has held two symposia on food safety issues and the need for risk assessment of Genetically Modified (GM) foods.
Bangladesh Livestock Research Institute's (BLRI)	Supports a virology lab has developed vaccines for poultry and goats. SAARC has agreed to designate the lab as the regional laboratory for PPR. This lab may help towards achieving better animal health in the country.
FAO	<p>Shrimp/Prawn Production: the project builds trade capacity of small-scale shrimp and prawn farmers in Bangladesh. The aim is to organize small-scale producers in manageable clusters for adoption of Best Management Practices.</p> <p>Food Safety Policy: Another FAO project aims to develop food safety policy, standards, regulations, and management. The project will address preventative approaches by educating sanitary inspectors, developing and enhancing food inspection and enforcement, and most importantly, establish food analysis capacity. The FAO is in the process of building a capable central laboratory facility at the Institute of Public Health.</p> <p>The present activities of the FAO team involve:</p> <ol style="list-style-type: none"> 1. Drafting a national Food Safety and Quality Policy 2. Providing support for NFSAC, established in 2005 3. Developing and establishing a Food Safety Emergency Response Plan 4. Creating a repository/center for safety documentation <p>Animal Health: A pilot project on livestock health care is undertaken by FAO in Upazillas. This is a grassroots program which trains community animal health care workers. Presently, vaccination is done by volunteers with supplies of vaccine provided by the livestock department.</p>
Food and Drug Administration (FDA) Joint Institute for Food Safety and Applied Nutrition (JIFSAN)	GAQPs training program is helping shrimp producers of Bangladesh. Trained producers will be capable to produce acceptable good quality for local and export market and thereby become economically sustainable.

IFPRI	<p>IFPRI is occupied with identifying policy barriers to food security in Bangladesh. Of initial concern for Bangladesh are health and nutrition, food security through production, access to food for low income groups, and income generation of farmers.</p> <p>IFPRI is also performing market-oriented research and currently engaging in a large value chain study that will include inland fish and shrimp as well as dairy value chains. The team suggested this value chain study include information on the adverse impact of pesticide use on paddy fields as it pertains to shrimp production and quality, since the paddy fields are adjacent to shrimp ponds.</p>
USAID	<p>IPM Collaborative Research Support Program (CRSP): A project titled Facilitating the Development and Spread of IPM is successful in reducing the prevalence of pests and diseases of eggplant, tomato, Okra, cabbage, and variety of cucurbits. This is a collaborative project with a consortium of U. S. Universities including Virginia Tech and Penn State working with agricultural scientists of BARI.</p> <p>Chemonics: Providing training to private sector entities on traceability and record maintenance.</p>
USDA/Animal and Plant Health Inspection Service (APHIS)	<p>Courses in Plant Health Systems Analysis and PRA.</p>
USDA/Foreign Agricultural Service (FAS) Food for Progress (FFP)	<p>Cornell University: Over a period of approximately three years, Cornell has enhanced agriculture production technology for small farmers by providing training and loans to farmers for adoption of liming, raised bed, and arsenic management technologies; assist agribusiness development to support farmer technology adoption through development of machinery, tillage service businesses and input supply chains; improve the capacity of National Agricultural Institutions, NGOs and input supply dealers to provide technical and knowledge support to farmers through training and infrastructure development.</p> <p>Small Enterprise Assistance Fund (SEAF): The FY2012 project will establish a Center for Entrepreneurship and Executive Development (CEED) for agribusiness entrepreneurs; develop seed, farm, aquaculture and livestock production and processing capacity through a small agribusiness lending facility; develop preservation and warehousing capacity through an investment into a medium-sized agribusiness; and develop livestock and aquaculture feed processing capacity through an investment into a medium-sized Agribusiness.</p> <p>Winrock International: In FY 2011, Winrock International (Winrock) was awarded a FFP agreement to monetize 11,780 MT of hard red wheat. The proceeds from such sale are used to improve productivity and increase high-value sales of the aquaculture, horticulture and livestock sub-sectors; develop business-oriented cooperatives for domestic and export-oriented markets; increase access to markets through public-private partnerships with leading agribusiness firms and trade associations; increase dietary diversity for the most vulnerable</p>

	<p>groups, particularly women, through specialized training in food production and nutrition; and build capacity of local agricultural entities, including local non-governmental organizations (NGOs) and extension agents to ensure long-term program sustainability.</p> <p>Winrock International: The Rural Enterprise for Alleviating Poverty (REAP) project has helped develop prawn farming. Sixty prawn farmers developed and operated nurseries in a pilot program producing more than 450,000 juvenile prawns in a two year project. These were sold to growers for raising marketable prawns. This is just one example of USDA's FFP program. (Gorsack, USDA-FAS)</p>
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APPENDIX E
Team Biographies

Professor Mahbub Alam is an emeritus faculty in the Department of Biological and Agricultural Engineering at Kansas State University, Manhattan, Kansas. Dr. Alam received his undergraduate degree in agriculture and agricultural engineering and his MS degree in Irrigation Sciences from the American University of Beirut (AUB), Lebanon, and his doctoral degree from Colorado State University (CSU), in Soils and Irrigation. Dr. Alam has worked with: the FAO Team in the then East Pakistan as an Irrigation Specialist for Ganges-Kobadak Irrigation Project of Water and Power Development Authority; the BARC as a Principal Scientific Officer; the CSU as an Irrigation Specialist; and the Kansas State University as faculty and an Extension Specialist Irrigation. At KSU, Dr. Alam provided leadership and assistance in planning, coordinating, and conducting educational programs in irrigation, improved water management technology, research and demonstration of latest irrigation methods, waste water utilization, and water quality in cooperation with State and Area Extension Specialists during his tenure as a faculty. He received a Senior Fulbright Scholar award from the U.S. State Department in recognition of his contribution to the International Programs in the 2003-2004 academic year, during which he helped a private university in Dhaka to develop irrigation curriculum and worked with BARC. Dr. Alam also received International Award from the Epsilon Sigma Phi professional association of Cooperative Extension. Internationally, he has established collaborative research and education program with China Agricultural University.

Marc Gilkey currently serves as the Associate Regional Manager for APHIS in New Delhi and covers all of South Asia. Has worked for APHIS 18 years, serving in numerous positions; India, Mexico, Afghanistan and China. Was the Trade Director for Japan, China and Mexico on the Phytosanitary Issues Management staff. While working at the Port of San Francisco, was the first Smuggling Interdiction and Trade Compliance Officer, enforcing a myriad of SPS issues.

Bruce Ross began his service with the Food and Drug Administration as the FDA Country Director (India) in August 2008. Prior to his deployment to India in the summer of 2009, he was the Acting Director of the Asia, Africa and Capacity Building office in FDA's Office of International Programs. He brings a wide-range of U.S. Government and international public health experience having served in five different countries over the past 14 years. During this time, Bruce worked for the Department of Health and Human Services (HHS), as the Health Attaché in Beijing, China 2006-2008; with the Centers for Disease Control and Prevention (CDC), as the Associate Director for Operations in Bangkok, Thailand 2002-2006 and in Kampala, Uganda 2000-2002; on detail to the Carter Center's Global 2000 Guinea Worm Eradication Program as the Resident Technical Advisor for south Sudan, based in Nairobi, Kenya, 1998-2000; and on detail with the USAID Regional Mission for Central Asia, as CDC's Deputy Director, based in Almaty, Kazakhstan 1995-1998.

Dr. Jason Sandahl has been with the USDA Foreign Agricultural Service for six years as a food safety specialist, leading international technical assistance programs worldwide. His expertise is in the area of international pesticide regulations, standard setting, and laboratory analyses. As an FAS International Program Manager, Jason works with U.S. regulatory agencies, international bodies, and foreign governments to provide capacity building in emerging markets to promote the use of international standards and address technical barriers. Jason came to USDA originally as a science policy fellow under the American Association for the Advancement of Science Fellowship program. Prior to his employment with USDA, Jason worked abroad as a toxicology assistant professor in Swaziland under the Fulbright Scholar program, and in Japan under the Japan Society for the Promotion of Science program. He received a B.S. in Chemistry (1993) and a Ph.D. in Toxicology (2003) from Oregon State University.

Dr. John Sproul began service in January 2009 as an Investigator with the Food & Drug Administration Office of Regulatory Affairs in the Seattle District Office where he focused both on Import Operations and food facility inspections (domestic & foreign). His professional background includes seafood international trade and food safety policy. His current deployment to India as the Assistant Country Director (Foods) is augmented by his 30+ years of pre-FDA work as a Sustainable Community Development Economist and Policy Analyst specializing in Pacific-Rim and S.E. Asia fisheries and aquaculture. Dr. Sproul's integration of food safety regulatory, policy, international trade, and socio-economic elements contributes holistic approaches to promotion of global public health. He conducted this work residing with his family in multiple Asia-Pacific countries under various capacities. These include, but are not limited to, academia (Japan, Canada, Singapore, USA), government (USA - Alaska, Washington, Hawaii), and non-profit international humanitarian relief organizations (e.g. Cambodia, Thailand, India, Sri Lanka, etc.). Dr. Sproul's relief work includes participation in multi-country relief assessments of coastal fishing communities following the environmental disaster of the December 2004 tsunami in the Indian Ocean.

The team was accompanied by:

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New Delhi, India

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