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Bangladesh Country Paper

1.0 Introduction

1.1 Background Information

This paper is an excerpt of the report made by the National Taskforce on Food Safety formed by the government following the request and suggestions of FAO Country Representative in Dhaka.

This paper attempts to describe status of food safety (standards, control system and mechanism) in Bangladesh to match the themes of the FAO/WHO Conference; identify issues and constraints, suggest policy options to overcome those, and possible stands of Bangladesh to the regional action plan to be framed.

1.2 Food Security Situation: Bangladesh Context

- Bangladesh has made substantial progress in increasing food grain production over the last two decades. The production of food grains in 2002-03 was 26.70 million metric tons, which is expected to reach 28.60 million tons in the year 2003-04. This has led to improve overall food security situation, where per capita availability of food grains (rice+wheat) for FY03 was estimated to be 202 kgs/capita/year.
- Poverty head count ratio remains at the level of 44.3% (5.5 million people lying under food-based absolute poverty line). The hard core poverty head count ratio, though, declined over the years still counts more than 24.5 million people. *Both rural and urban Poor* have low incomes and thus low purchasing powers, which increase the chances of consuming food of poorer quality that may well be also unsafe.
- Nutrition and food utilization are increasingly recognized as key components of food security in Bangladesh- having one of the highest rates of malnutrition in the world. Economic analyses indicated that without improvements in the nutritional status of the population, 22.9 Billion US\$ in productivity will be lost to the country between 2000 & 2010 (UNICEF & ADB, 1980). (HFA in Bangladesh: Lessons Learnt, Henry B Parry, 2000).

1.3 Importance of Food Safety

- Food safety and sanitation are considered to be a key issue to ensure overall food security in Bangladesh.
- Food is the major source of human exposure to pathogenic agents, both chemical and biological (viruses, parasites, bacteria), from which no individual is spared. The importance of food safety

stems from: (1) food being the primary mode of transmission of infectious disease; (2) the intricate linkage with development- governs individual and community health, national productivity, and promotes export potential & thus earn foreign exchange; (3) emerged as prominent sources of conflict in international agricultural trade.

- *Biotechnology has raised some food safety concerns as new scientific methods to assess the safety of food derived from biotechnology have yet to be developed and agreed upon internationally.*
- In Bangladesh >90 % tube wells of 61 districts (out of 64) are contaminated with arsenic.
- Urban population are gradually shifting from cereal-based diets and would likely generate a demand for fish, livestock, horticultural, forest produce as well as processed items, in turn necessitating safety load of associated transport, storage and marketing infrastructure.

2.0 National Position on the objectives and revised draft agenda themes

Bangladesh pays due importance on the objectives and themes of the conference having huge outcome on the national and regional food safety. Though there seems to have some over laps in themes of the conference. Below are some descriptions about national position related to these themes.

2.1 Food safety legislation-science and risk-based approaches to harmonization

2.1.1 Potential risks in food

- A wide range of food borne diseases (endemic---hyperendemic---epidemic---pandemic) is encountered in Bangladesh.
- **Naturally occurring toxins**, such as mycotoxins, marine biotoxins, cyanogenic glycosides and toxins occurring in poisonous mushrooms, periodically cause severe intoxication.
- **Bovine Spongiform Encephalopathy** (BSE, or "mad cow disease"), are suspected to cause new variant Creutzfeldt-Jakob Disease in humans. Recently occurring "bird flue" disease in poultry caused by avian viruses is also a threat.
- **Persistent organic pollutants (POPs):** Dioxins and Polychlorinated Biphenyls (PCBs) exist in the environment and in the human body, which are carcinogenic.
- **Metals**, such as lead and mercury, cause neurological damage in infants and children. Exposure to cadmium can also cause kidney damage, usually seen in the elderly.

2.1.2 Food Safety load: Major areas

- Primary Production:
 - Yearly food grain (rice+wheat) production is about 26.69 million metric ton (mmt) from 117 million farm holdings; Maize 0.2 mmt; Vegetables about 1.52 mmt; Fruit 1.49 mmt; Oil seed 0.36 mmt; Spices 0.37 mmt;
 - 95 % of cereal seed requirement is met through farmers to farmers exchange and the rest by public sector corporation;
 - Chemical Fertilizer consumption-3.2 million metric ton; Pesticides consumption- 16.5 thousand metric ton;
 - Cattle & buffalos-223 million; goat & sheep-146 million; fowls & ducks-1266 million (Agri census-1996)
- Post harvest processing: Rice mills-10000; Flour mills-650; about 630 registered food processing industries in Bangladesh (Formuzul, 1999); fish processing- 129 plants, no of depots-2300, ice plant-653.
- Transport, handling and storage: 193 cold storages; 636 LSDs, 13 CSDs and 5 Silos (1.0 million ton per year);

- **Import and export:**

Item	Import (000 metric ton)	Export (000 metric ton)
Rice	1500	2.5
Wheat	1600	-
Maize	800	-
Pulses	140	-
Edible oil	2600	-
Vegetables	16	10
Fruits	109	2.5
Fish	N/A	47

- Domestic Market and consumption: Population is nearly 137 million; No. of household – 26 million; About 13135 markets in the country (DAM, 2000)

2.1.3 Bangladesh Food Safety Laws and Regulations

Pure Food Ordinance, 1959 and Pure Food Rules, 1967; The Animals Slaughter (Restriction) and Meat Control (Amendment) Ordinance – 1983; BSTI ordinance 1985 (has been amended as BSTI (amendment) Act 2003); Destructive Insects and Pests Rules (Plant Quarantine) 1966, amended up to 1989; Agricultural Produce Market Act 1964 (revised in 1985); Fish Protection & Conservation Act, 1950 (latest amendment in 1995); Marine Fisheries Ordinance 1983 and Rules 1983; Fish & Fish Products (Inspection & Quality Control Ordinance, 1983; Fish & Fish Products (Inspection & Quality Control) Rules' 1997; The Essential Commodity Act 1957, 58, 64; The Food or Special Courts Act 1956; The Food Grain Supply (Prevention of Prejudicial Activity) Ordinance 1956; The pesticides Ordinance-1971 & The pesticides Rules-1985.

2.1.4 Policy Linkages

Food Safety in all stages of the food chain, that is, from farm to table has been focused with due importance in all the relevant policies of GOB. The policies are- Bangladesh Environment Policy; Bangladesh Food and Nutrition Policy 1997 and NPAN 1997; Bangladesh Food Policy 1988; Comprehensive Food Security Policy 2001 and New National Food Policy 2001(draft); National Agriculture policy; Bangladesh Health Policy; The Exim Policy etc.

Though Food Safety has been focused in all relevant policies of GOB, the basic food laws, Pure Food Ordinance 1959 & the Pure Food Rules 1967, did not accommodate Codex standards, guidelines & practices including HACCP (Hazard Analysis and Critical Control Point). However, Fish & Fish Products (Inspection & Quality Control Ordinance 1983 and Fish & Fish Products (Inspection & Quality Control Rules 1997) have received due importance of HACCP principles. The Bangladesh Standard and Testing Institution (BSTI) also adopted HACCP as Bangladesh standard.

2.1.5 Food Standards:

- 107 food items are covered under Pure Food Rules 1967.
- 190 food standards by BSTI of which 52 should have compulsory certification marks.
- 28 Codex standards adopted as Bangladesh standards.

2.1.6 Major Stakeholder Ministries and Departments for Food Control in Bangladesh

Sl. No	Ministry	Department/Organization	Major Activities
1.	Ministry of Agriculture	Plant Protection Wing, DAE	<ul style="list-style-type: none"> • Phyto Sanitary certificate for Import/Exported plants/plant products • Pesticide Use Control • Fertilizer Use Control
2.	Ministry of Food	Directorate General of Food (DGF)	<ul style="list-style-type: none"> • Quality Control of PFDS, Stock, Procured Food grains/Food Stuff, Imported food etc. • Food Control in the Market (not doing at present)
3.	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
4.	Ministry of LGRD	City Corporation & Pourashava Health Units	Have Sanitary Inspector, Labs and Public Analyst for food quality control in their command areas.
5.	Ministry of Fisheries & Livestock	A) Department of Fisheries (FIQC Wing)	<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
6.	Ministry of Industries	BSTI	<ul style="list-style-type: none"> • Frame Standards of Food Products • Testing & Certification Marks and Surveillance.
7.	Ministry of Science, Information and Communication Technology	BAEC	Test Radiation level of Imported Food items; Pesticides Residues
		IFST, BCSIR	Testing of Food Items; Research and Development
8.	Ministry of Education	DG, Primary, DG, Secondary, Text Book Board, Universities	Food safety, Nutrition & Environmental issues in the text book of all level of education
9.	Ministry of Information	PIB BTV Radio Bangladesh	Broad cast issues for awareness building
10.	Ministry of Home	Bangladesh Police	Assist the Inspection Agencies
11.	Ministry of Law, Justice & Parliamentary Affairs	-	Formulation, Vetting, Parliamentary Approval etc.

So, food control in Bangladesh is a multi-sectoral responsibility.

2.1.7 Conformity Assessment Infrastructure:

There are about 25 (excluding the branches) food laboratories under various government, autonomous and international organizations in Bangladesh. However very few are operating down to the regional and district level. It was observed that only a few of the laboratories are well equipped and well maintained. They have shortages of maintenance budget, inadequate technological resources (equipment+manpower) and, above all, lack of coordination in procedures/methods of testing. International accreditation is also missing except a few.

2.1.8 Coordinating Mechanism:

- ❑ **Policy Structure:** Cabinet is the only universal coordinating and controlling infrastructure. No separate coordinating mechanism exists in respect of food safety in the policy structure.
- ❑ **Food control (Management and Inspection):** No single organization exists in Bangladesh to oversee/coordinate food control activities.
- ❑ **Mandatory Minimum Standard Formulation:** There is no structure of Food Safety Advisory Committee or Minimum Standard Fixing Committee.
- ❑ **Auxiliary Standard making:** Standard Wing of BSTI formulated about 365 food & agricultural product standards and services among those only 190 are Food Standards. BSTI has right to adopt International Standards (ISO, IEC, Codex etc) as Bangladesh Standards. Till now 150 International Standards have been adopted as Bangladesh Standards. Standards Wing of BSTI is being assisted by 6(six) Divisional Committee and 70 Sectional/Technical Committees. 17-sectional committees under Agricultural & Food Divisional Committee are working for Food Standards. The members of the committee include representatives from stakeholder Ministries and departments, universities/research organizations, CAB, Business and trade associations/chambers etc.
- ❑ **Lab Activities and Research:** Coordinating mechanism among the laboratories should be strengthened in terms of research and routine test methods.
- ❑ **Accreditation Body-** A draft act has been prepared and sent to different ministries for comments.

2.1.9 Empowering countries to enforce food legislation

Each and every food safety related laws and rules in Bangladesh have empowered respective authorities to enforce the provisions regarding inspect, sample, test & sue, if applicable, against the producers/marketing agents.

2.2 Application of risk analysis in food control- challenges and benefits

2.2.1 Trade impact due to new stringent standards

Asaduzzaman and Hossain (2003) shows that the Bangladesh face welfare loss of **US\$ 16.3 million**. She losses mainly on two counts- due to terms of trade effect as well as endowment effect. Endowment effect is the loss of income of the unskilled (production) labourer. In terms of changes in output, GDP or export or import trade, none appear to be substantial. While the results are preliminary, there are two explanations for the apparent small adverse effects. The first is that except for shrimps, the rest of the food trade does not account for more than 2% of total trade and hence the changes become almost imperceptible to them. Secondly, and probably more importantly, there is little change in shrimp related magnitude because, the changes (investment) in the shrimp sector had by and large taken place and adjustments made against the new standards to affect the sector now. It is needed to analyze industry by industry situation.

2.2.2 Impact of EU ban on Bangladesh shrimp in 1997

- Simulation exercises based on **with** or **without** ban scenarios: US\$65.1 million as the cost of the EU for Bangladesh.
- Investment to ensure HACCP compliance: US\$18 million (facilities and equipment, training staff and workers for achieving acceptable SPS and technical standards; annual cost of US\$ 2.4 million for maintaining HACCP programme).

2.2.3 Bird flu impact

- In Bangladesh, the quantitative impact was not yet available but the poultry industry have suffered a huge set back as the domestic poultry market collapsed for months and import of poultry was banned with a bid to restrict influx of the pathogenic avian influenza.

2.2.4 Food Borne Disease Load: Some evidence for Bangladesh

- 'Diarrhea diseases' is one of the major public health problems in Bangladesh around 70% of which are food and water borne. UNICEF (2000) study revealed that prevalence of diarrhoeal diseases among under five children is 16.7%. A Report of the Directorate General of Health Services (DGHS,2001) showed that the diarrhoeal diseases is the most prevailing one among all age groups including 5.9 % deaths (1997).
- Diarrhoeal diseases in Bangladesh still causes 5.7 million disabilities adjusted life years 61% of total DALYs (Disability Adjusted Life Years).
- The Government epidemic surveillance system reported a total of 16,57,381 cases and 2,064 deaths from acute diarrhea in 1998 (ICDDR,B Annual Report, 1998) excluding post flood (1998) diarrhea (14,86,197 cases and 1,836 deaths).
- **Hygiene related diseases in Bangladesh costs US \$ 80 million each yr for treatment alone (BBS, 1998)**

Salmonella infections (typhoid):

It is highly endemic in Bangladesh and is an important cause high morbidity and economic loss, which are known to cause a wide spectrum of disease syndromes in man and animals (Bowmer, 1968) like gastroenteritis, enteric fever, bacteremia, focal abscess or as an asymptomatic infection i.e. carrier state (Rubin et al., 1977); Ashdown et al., 1990). However, data on salmonellae in Bangladesh remain scanty (Blaser et al,1982) & limited to few clinical reports (Stoll et al.,1983; Roy et al.,1985;Butler et al., 1991) & Salmonella Meningitis (Hook, 1991).

Cholera:

- In Bangladesh, cholera outbreaks occur regularly twice a year, both before and after monsoon. (ICDDR, B Annual Report, 1998)
- Case-control studies have shown that, in Bangladesh, the rate of contamination of household water with *V. cholerae* 01 is significantly higher in water used for cooking than in water used for drinking.
- However, only 0.13% of the food samples cultured were contaminated with *V. cholerae* 01. indicating the risk of food-borne transmission of cholera during the non-epidemic season.

- Nevertheless, *V cholerae* 01 has been isolated from aquatic flora and fauna in this region (Islam MS, Miah MA, Hasan MK, Sack RB), including blue- green algae (reservoir of *V. cholerae* 01. (Islam MS, Miah MA, et al)
- Transmission of cholera through contaminated foods served by street vendors and restaurants should be considered: in Dhaka, there were two outbreaks of cholera in 1974 and 1975.

Post Flood health consequences in Bangladesh:

In 1998, the devastating flood affected 52 districts causing shock to 30.52 million people and killed 918 persons. The water was contaminated with faecal coliform (94% of WASA and 86% of surface H₂O, and none from TW water, as expected. (Yesmin J & D Banu. PHAB journal 1999, VI (172):1-5).

2.3 Food Safety Monitoring Results: Though not representative still raise concern

Organization	Monitoring results 2002-03
Bangladesh Standard and Testing Institute (BSTI)	Number of Surveillance team/mobile court-250; Number of sample collected from open market for testing-226; Number of show cause notice issued to manufacturer of sub-standard products-117; Number of cancellation of license-45; Number of legal actions-35;
Ministry of Food: DGF Central laboratory	Rice Sample-242 of which 206 were found out of specification; Wheat Sample-291 of which 73 were found out of specification; Oil Sample- 6; out of specification- none;
MOHFW: Institute of Public Health	<ul style="list-style-type: none"> • Around 3000-6000 food samples are usually tested per annum in IPH. Test results showed about 50 percent of the samples as adulterated. • Samples of Butter oil, Banspati Dalda, and Condensed milk were seen 100 percent adulterated. • Percentage of contaminated water samples is decreasing. • Food hygiene of street vended food and personnel hygiene of the vendors have been of great concern.
Ministry of Agriculture: DAE Plant Protection Wing	<ul style="list-style-type: none"> □ 2731 imported vegetables and fruit sample tested; all satisfactory □ 1500 exported vegetables and fruit sample tested; all satisfactory □ imported (2928.00 MT) vegetable seed sample tested □ 58979 Cereal sample tested; all satisfactory
MOFL: Deptt. of Fisheries	Total lot exported- 3940; Rejected lot in country- 49; Rejected lot outside the country-8; Causes- Salmonella, v-cholera, e-coli, filth, antibiotic; Action taken as per FIQC/97
MOLGRD: Public Health Laboratory of Dhaka City Corporation	Food samples are-Cereals and Pulses, Fruits, Vegetables and their products, Fats and oils, Spices & condiments, Sweetmeats etc.; Physical and routine chemical analysis and some biological tests are carried out; 960 samples tested, 713 found adulterated

2.4 Information exchange, education and communication

Two projects are running currently, one under the Ministry of Food (under FAO technical assistance) and another under the Ministry of Health and Family Welfare (under WHO technical assistance), and are working for capacity strengthening, training, research and awareness building in the

area of food safety. Following the completion of HACCP implementation project in 97-98 in the Dept. of Fisheries, a total of 2000 personnel engaged in fish processing business were trained on various components of HACCP. Ministry of Agriculture have their own training and research activities and awareness building program.

2.4 Case studies: Impact of Awareness Building and Training; Impact of IPM activities in Boro paddy and vegetables during 2002-03

Boro 2002-03 (winter): Applications of pesticides were reduced by 88% on an average while yields increased by 11% in the sample farms.

Vegetables 2002-03 (winter): Applications of pesticides were reduced by 82.0% on an average while yields increased by 6.0% in the sample farms.

2.5 Current Status of Utilization of Biotechnology in Agriculture in Bangladesh

Bangladesh is a signatory to the convention on Biological diversity and the Cartagena Protocol on Bio safety. While acknowledging the benefits of Biotechnology in increasing food production, management of pest and diseases, improved diagnostics, high nutritional quality etc, she is also concerned with the associated risk if any and developing risk management system. Use of biotechnology is at infancy stage in Bangladesh. Nearly 150 agri-scientists are doing some biotech research and development works. In fisheries and livestock sector the progress is also insignificant.

Funding in different organization of Bangladesh involved in Biotech Research during the last 10-yrs shows that total funding was Tk 60.777 crore of which GOB funding was Tk 39.720 crore (Lump grant and revenue expenditure Tk 39.09 crore; Regular research funds Tk 63.0 lakh). Funding by foreign agencies was Tk 17.057 crore, while investment by private Biotech labs was Tk 04.00 crore.

Enabling Regulatory Measures:

- Bio-safety Guidelines (2002) are being revised and National Institute of Bio-tech established and formation of NCBB, IBC, BSO, FBC are in progress;
- A national steering committee headed by Principal Secretary to the Prime Minister has been working;
- Draft Bio-safety Act & Draft Plant Variety Protection Act are under consideration;
- The Seed ordinance/Act, 1997; The Seed Policy, 1993 & Rules, 1998 are in place.
- National Biosafety Monitoring and Control Authority has been proposed.
- Bio-tech policy is required.
- **A TAPP is under consideration to start a project on the whole issue.**

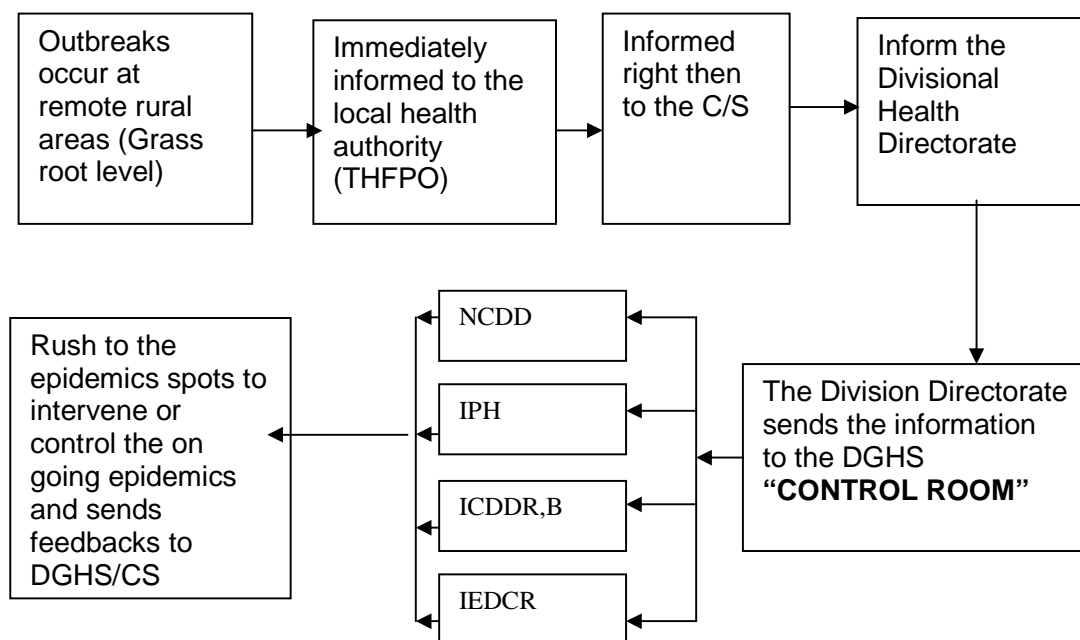
2.6 Food borne disease monitoring and surveillance systems

Food borne diseases (FBD) plays important role in country's public health, the GOB has its own monitoring and surveillance system in its paradigm of epidemiological back up mechanism (good reporting systems/accurate information/robust data base/quick-response oriented rapid action plan). Moreover it has a ready-in-hand Epidemiological Control Preparedness Team to combat such disease outbreaks.

The cause specific types of FBD that are generally encountered by the public health authorities, are:
i) Sudden disease outbreaks (diarrhoea, vomiting, intoxications, etc.) are reported following large parties (after mass consumption of same food); ii) Gradual increasing trend in primary & secondary attacks rates following the consumption of a particular food / food habit / practice; iii) Chronic outbreaks due to environmental pollution like heavy metals that may contaminate our food, viz., recent catastrophic

contamination of ground water with high levels of trivalent Arsenic; iv) Seasonal outbreaks of ‘Cholera’ or ‘Dysentery’, related to seasonal changes.

To address the above mentioned vital epidemiological components towards taking accurate & in time measures the GOB has developed the following mechanisms, based on the following steps:



Factors leading to the Prevalence of food borne diseases are rapid industrialization; Urbanization; Changing lifestyle; Changing Population; Polluted environment; Poverty; Lack of food preparation facilities, etc.

3.0 Efforts towards establishing food safety by the GOB

- Formulating/updating food safety laws/policies related to food safety, standard and certification system. The Pure Food Ordinance, 1959 is in the process of amendment.
- Building Policy linkages
- Public-Private Sector Interaction & Human resource / lab infrastructure development
- Adoption of International standards: 28 Codex (including Guideline for the application of HACCP, **Code of practice General Principle of Food Hygiene** etc.
- Phytosanitary measures adopted by DOF-SoQ etc.
- Membership in Trade Arrangements-WTO SPS and TBT
- Strengthening the information, surveillance and alert service at DLS.
- Draft Consumer Protection Act; Draft Feed Act; Animal Quarantine Act and Animal Disease Control Act are also awaiting approval;
- Working with SAARC for harmonization of standards on food products.

3.1 Efforts by NGOs:

A wide range of activities on food safety awareness are being undertaken by a series of NGOs as follows-

- i) Consumers Association of Bangladesh (CAB)
- ii) Bangladesh Paribesh Andolon (BAPA)
- iii) DOSHER Bangladesh, etc.

4.0 Activities in Regional/International Arena

□ SAARC initiatives

SAARC member states has recently identified food safety as a topic of priority concern to ensure that both consumers and smallholder farmers in SAARC countries duly benefit from food trade and also to prevent farmers from marginalization due to food safety concerns in the process of globalization. SAARC Food Security Reserve Board (SFSRB), at its 9th Meeting held in Islamabad, Pakistan in December 2002, urged the member states to consider harmonizing food laws, regulations, standards, quality control system, and control mechanism to facilitate maintenance of food safety for enhancing food trade. SAARC (under RIPA) also organized a workshop in Kathmandu, Nepal which adopted some recommendations likely to be communicated to the respective government.

□ **FAO-ILSI initiatives:** 4-workshops/seminars have already held.

□ **WHO 10-Points Regional Strategy for Food Safety in the South East Asia Region**

5.0 Issues and Constraints for Bangladesh

- Food control activities are implemented unorganized form, including scanty information on food contamination.
- Food laws & regulations do not embody recent development/ recommendations by Codex, SPS & TBT Agreements
- Weak coordination among activities like plant quarantine, food control, standards, enforcement and labs
- Weak Consumer/public awareness programs
- GM food, one of the main issues of concern for human health
- Compliance cost.
- Financial resource constraints.
- Dynamic Factors Influencing Food Safety Policies;
- Food Safety Concerns in Technology Improvement Research: Production technology research; Post harvest Technology Research; Policy Research and Food Safety
- Absence of proper enforcement
- Knowledge of standards, laws/regulations are too low among the producers and consumers.
- Safe limits of arsenic in food yet to be ascertained.

6.0 Conclusion and Recommendations

6.1 Recommendations for Improving Bangladesh Food Safety System

Food Safety Policy

- A comprehensive Food Safety Policy should be formulated having an appropriate institutional framework to operationalize it.

Laws, Regulations, Standards

- The Food Ordinance/Rules and Regulations and other relevant Acts should be updated from time to time in view of the changing requirements.
- Enactment of Consumer Protection Act, Feed Act etc. should be made as early as possible.
- Harmonization of provisions/standards in various laws/rules are also necessary.
- At the retail level, work to ensure the adoption of science-based standards and to foster HACCP-type preventive approaches-largely through the Food Code process.
- Guidelines should be issued on Good Agricultural Practices and Good Manufacturing Practices (GMPs) for all foods including fruits and vegetables.
- CAC standards do not fully take care of a number of foods manufactured/grown in the country for their quality and safety standards. In such cases, the internationally accepted food certification system should rely on the National standard for marketing.
- Food Standards in PFR and those set by BSTI should have similarities in respect of parameter definition/limits/testing methods etc.
- A comprehensive labelling law with appropriate labelling provisions for local and imported packaged food in conformity with CODEX should be formulated and properly implemented.

Technical Assistance (TA) needs:

Training for the national regulation agencies concerning the preparation of technical regulations (TBT principles); for implementing certification, accreditation and reinforcement; evaluating the impact of the standards/procedures/guidelines; Seminar/workshop for creating awareness among private and public sectors; Preparation of a SPS and TBT accomplishment guidelines.

Infrastructure of Food Control

- Include measures to modernize food inspection, manufacturing procedures, research on food borne disease outbreaks;
- Establishment of bodies for accreditation, regulation and certification;
- Development of consultants ;
- Feasibility and methods for post-marketing monitoring of GM food products
- Institutional changes- complement HACCP, ISO management System etc.
- An apex body for policy formulation and development task of Food Quality and Safety Programs (FQSP) should be formed including all stakeholders;
- Institutional mechanism such Food Safety Council, Food Safety Technical Comm. Monitoring Committee etc.
- A National Food Control Agency should be established.

Training and Human resource development

Should be targeted for i) food inspectors, ii) food scientists and analysts, iii) policy makers, iv) microbiologists, v) public health physicians, vi) food technologists, vii) serial librarians and documentation officials, viii) food law experts etc.

Conformity Assessment Infrastructure

- Adequate testing facilities including microbiological and safety parameters analysis should be developed from farm to production to assist the compliance of HACCP, quality certification system and for continual improvement of a produce.
- Food safety and other certification system should be reviewed through unified efforts of industries, farmers, regulators, scientists, academicians & consumers to develop a state-of-the-art, food safety quality system.
- Cleaning, grading, testing, standardization, packing, storage, labeling and marketing based on well documented principles of good practice, HACCP, scientific storage should be encouraged at farmers' level so as to promote direct integration of food processing units with producers.
- Capacity strengthening is required for the laboratories of different institutions.
- Strong co-ordination among the conformity assessment infrastructure.
- There is a need to establish/review safe limits for food additives and contaminants, study data on these mycotoxins, level of risk and recommendation of Codex. Laboratories should follow simple method for detection and quantification of toxins in mycotoxin prone food items.
- An electronic certification (E-cert) system may be developed.
- It is very important that the sampling procedure is standardized and it is transparent.
- The procedures for inspection and drawing samples should be laid down in accordance with the standards prescribed and should be in tune with the international practice.

Food Safety Database

- Adequate data should be generated for pesticide residues, toxic metals in different food crops for use in risk assessment work, for ensuring consumer's protection and for harmonization of standards with that of safety standards under Codex.
- The food safety information database should be expanded to provide more complete information on the incidence of food borne disease by pathogen and by food.
- Surveillance program to collect more precise information about the incidence of food borne illness, especially illness caused by chemical and microbiological poisoning including *Salmonella* and *E. coli* O157:H7.
- Growing a networking system on nationwide food borne diseases and its risk assessments.
- Share information/data for mutual usage & wider utilization (particularly to reduce risks).

Production and Market Places Development

- Encouragement to organic production of farmed and processed farm products should be on the priority food list, which is an alternative to safe food, produced through conventional techniques.
- Integrated quality system from farm to market should be developed to ensure that there is no deterioration in the quality of the organic food and it is properly transported, stored and marketed. Depending upon food crops, concept of ISO 9000 and HACCP should be developed and practiced at farm level. Integrated quality marketing approach should be adopted at farm, from pre-harvest to post harvest including scientific storage, grading, standardization, certification, labeling, traceability, transportation and marketing.
- Technology, innovation and enterprise development should be the keys in attaining food safety.
- Development of scientific storage facilities in food chain would facilitate in retaining the quality of the produce.

Coordination among GOB organizations and GO-NGO activities

- Domestic harmonization of activities, procedures, method of testing etc. among the GOB agencies are very much required in the first place.
- A national commitment and the collaboration of all ministries concerned with health, agriculture, finance, commerce, food, industry, municipality and concerned NGOs are to be ensured.

Law Enforcement

- The laws in place should be implemented with full force and hurdles in implementing the existing laws against adulteration to be eliminated.

Facing Arsenic

- Scientists, researchers, consumers, NGOs, donors should come forward with integrated efforts to formulate a strategic plan to solve the problem.
- Awareness should be built up among the consumers to select and purchase the safe food from open market.

Awareness building

- Education, awareness and training through manuals, material, and practical demonstration as a priority to regulatory measures should be given to farmers, food processors, govt. regulators, policy makers, vendors and other persons involved in the system for compliance.
- Adequate knowledge and guidance should be available to farmers for strict application of good agricultural and marketing practices for their food crops & programs to educate consumers about food safety should be launched.

Research and Study

- Food Safety Policy research should be launched in the fields of production, processing, marketing and consumption.
- Study of collective impact of unsafe food intake should be carried out for which a technical assistance might be sought.

6.2 Some recommendations for Regional Action Plan for food safety

- Review of laws/infrastructure/coordinating mechanism and provide technical assistance to update those towards regional harmonization.
- Review of standards and certification systems in purview of international requirements.
- Review of research and study programmes and help conducting research and study projects.
- Technical assistance in 10 years' training/awareness building programmes.
- Assist in developing risk analysis infrastructure and making risk limits for adulterants/contaminants.
- Provide support for publishing a regional food safety bulletin containing news and views on food safety data/events/information/development.
- Assist in establishing food safety cell or commission or council at the SAARC secretariat.
- All of the SAARC countries should prioritize their efforts in establishing and evaluating priorities in food borne disease prevention & control.

- Establish a Regional epidemiological network among the SAARC countries on all possible ways to combat FB-disease outbreaks, particularly the possible risks of being contaminated with a used range of FB-diseases in all countries of SAARC.
- Chalk out long term & sustainable resources, means & ways to fight back FB-illnesses from respective countries.

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