Studies on the Gaps and Risk Factors of Plant Quarantine Department in Bangladesh

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Abstract: The quarantine measures are of almost relevance to a country like Bangladesh whose economy is largely Agriculture based. The results of his preliminary assessment and inventorial studies show that Bangladesh did not have an effective control measure (Plant Quarantine) system to the introduction of exotic pests, diseases and weeds. It is recommended that the Quarantine administration must be based on biological principles established through scientific research, that inspection and regulation are necessary to prevent the entry and establishment of these pests, and that is our paramount duty to contribute out of our abundant opportunity to fundamental investigations of means of preventing the introduction and spread of insects and plant diseases. Bangladesh has been found to be technically active under Department of Agricultural Extension. Lack of poor understanding, knowledge, lab facilities, manpower and policy factors are making wide gaps with other countries which negatively impact trade. It is strongly recommended by FGD and stakeholder beneficiary members and food safety authorities for modern laboratory and training facilities development in the country and abroad under specific Directorate Leaders, regulatory Laws and Administrative Legislations, Ministry of Agriculture.

Key words: Plant Quarantine, Gaps and Risk Factors.

INTRODUCTION

Plant Protection services is the apex body in the country to combat the insect-pests & diseases of different crops. Plant Quarantine Unit is to prevent the introduction of invasive plant pests, soil and diseases of plants from other countries. Plant Quarantine regulations are promulgated by the national and the state governments to prevent the introduction and spread of harmful pests and pathogens. Protection of the plant and plant products by quarantine however only become the governments at the turn of, following a series of catastrophic pest and diseases epidemics in different parts of the world. With the purpose of securing common and effective action to prevent the spread and introduction of pests of plants and plant products, and to promote appropriate measures for their control, the contracting parties undertake to adopt the legislative, technical and administrative measures specified in the International Plant Protection Convention (IPPC) and in supplementary agreements pursuant to Article XVI. Importing country may maintain inspectors to examine the product before shipment at the point of origin/exit and maintaining inspectors at the point of entry with keeping testing facilities is a must. The role of the Plant Quarantine Unit is to prevent the introduction of destructive plant pests, soil and diseases of plants from other countries. The term Quarantine as Italic word literally means 40 day period. Quarantine can be defined "as a legal restriction to prevent the entrance and establishment of a plant disease or insect pest in an area where the pest or disease does not exist". Plant Quarantine regulations are promulgated by the governments to prevent the introduction and spread of harmful pests. Protection of the plant and plant products by quarantine however only become the governments at the turn of following a series of catastrophic pest and diseases epidemics in different parts of the world (Rai et al. 2014). In addition to endemic problems there are many crop pests which were entered Bangladesh from other countries because in earlier years. There is considerable cooperation between various countries, so that exporting country may furnish a certificate to the importing country which clears products or the importing country may maintain inspectors to examine the product before it leaves the country of its origin (Kahn, and RP 1983). Crafts and Robbins (1962) emphasized the importance of regulatory control of seeds, plant parts and seed certification programme to control weeds, diseases, nematodes and insects. The internationally accepted methods require Pest Risk Analysis (PRA) as a defensive method (Rajak et al., 1999).

The most satisfactory control programme for all diseases and pests is the prevention of their introduction into an area where they do not exists (Van Gundy, 1972). Quarantine programmes are the first line of defense in plant protection and they should be encouraged in every way possible in every country (Webster, 1985). Fall Army Worm, Tutaabsoluta, Eriophyid mite, Spirallying white fly, Mealybug, Scale insect, Sluges, Citrus Fruit sucking moth, Cottony cushion scale, woolly aphid, San Jose scale, the giant African snail, Parthenium Weed are some exotic pest introduced into our country and cause extensive damage. In view of increases in quantum of import and export of plant commodities during the recent years, there is a distinct possibility of moving insect pests and diseases from their original native habitation to new location. Those words were written nearly 100 years ago by W.A. Orton (Orton, 1914) in his discussion of problems facing plant quarantine, but the sentiment still holds true to this day. Orton went on to call for specific domestic actions and for greater international cooperation in preventing the spread of pests. Although pest risk analysis is a relatively new discipline, the story of quarantine and plant protection begins more than 600 years ago. This study highlighted four key components that together have brought us to where we are today in analyzing the risks

associated with the introduction and spread of pests: enacting national and international laws and regulations; understanding and analyzing scientific information as the basis for those laws; international cooperation to ensure success of those laws; and finally, establishing risk analysis as the basis for decision making. In the context as analyzed above the present research program was undertaken with the main objectives of i) identifying the historical legacy factors of plant quarantine and for finding out the use of risk factor analysis of plant quarantine services in Bangladesh.

METHODOLOGY OF THE STUDY

The study was descriptive analysis type. Documentary analysis was done for the study. Information and data were collected from different sources including directly investigative data collection and focus group discussions, seminar and conference interactions.

RESULTS AND DISCUSSION

The results obtained from the total research data collection and analysis is presented in the Tables 1-3 inn summary form. The results given in the Table 1 and Figure 1 that Time government decision factors took a very long time that is more than 100 years to formulate implementation rules after the original initiation by the British and other Governments before the independence of Bangladesh.

Table- 1: Plant Quarantine Service in Bangladesh

1914	British Indian Govt. Promulgated Destructive Insect and Pest Act
1954	Department of Agriculture established
1966	Govt. endorsed Destructive Insect and Pest Rules'
1974	Bangladesh member of IPPC
2011	Plant Quarantine e Act
2012	Improved Plant Quarantine Stations
2018	New Rules enforced
As yet no separate entity is established	

Fig. 1: Plant Quarantine trend history in Bangladesh

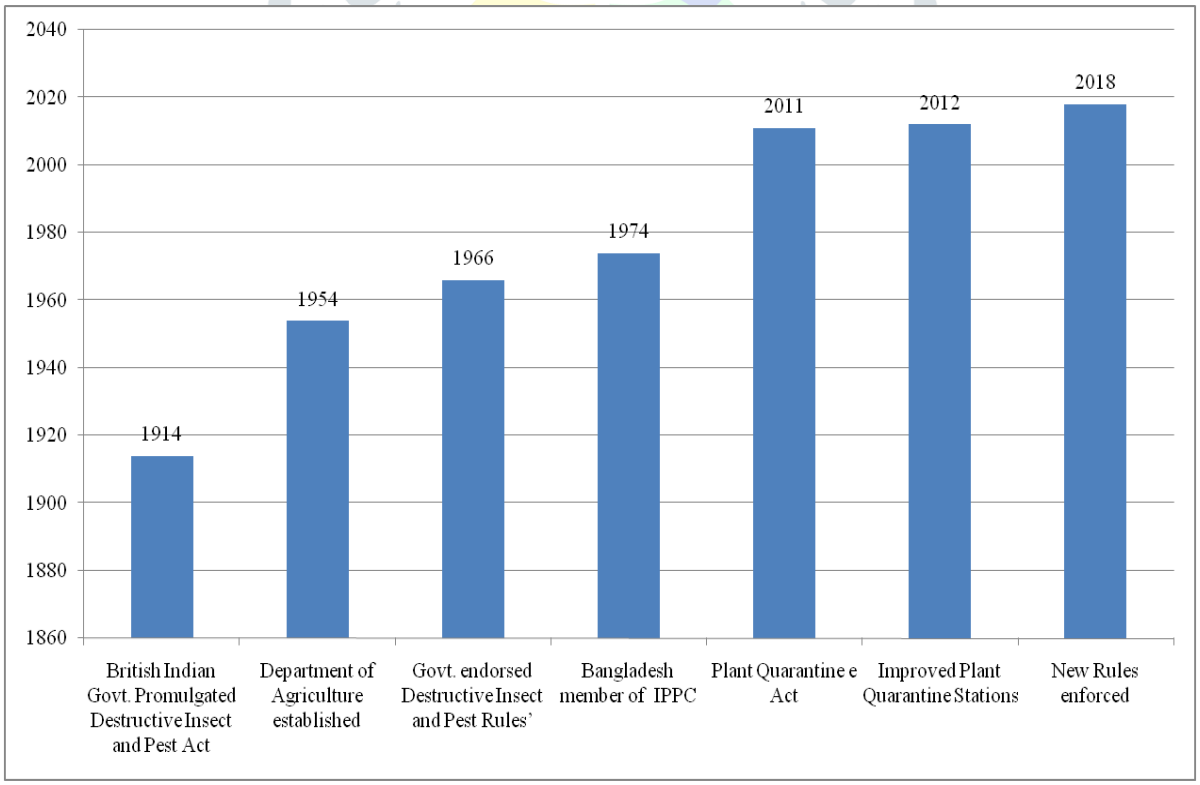

Fig. 2: Plant Quarantine Service development step-gaps in Bangladesh

	1910-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-00	00-10	10-20
British Indian Govt. Promulgated Destructive Insect Pest Act	O										
Department of Agriculture established					O						
Govt. endorsed DIP Rules'						O					
Bangladesh member of IPPC							O				
Plant Quarantine Act											O O O
Improved Plant Quarantine Stations											

Pest infestation/ Introduction in different countries

The results and evidences found on the infestation or introduction of pests in (Table 2 and 3) different countries of the world show that Sri Lanka recorded first for coffee rust and England for late blight of potato. For India it was introduced mostly from China India including Bangladesh nearby Assam.

Table2: Examples of Pests and Diseases introduced in Bangladesh from other countries

Sl. No.	Pests	Year of Introduction	Native Place
1.	Coffee rust	1879	Sri Lanka
2.	Late blight of potato	1883	England
3.	Flag smut of wheat *(Urocystistritict)*	1906	Australia
4.	Downey mildew of grapes	1910	Europe
5.	Rust of chrysanthemum *(Pucciniacarthami)*	1904	Japan/ Europe
6.	Downey mildew of cucurbits *(P. cubensis)*	1918	Srilanka
7.	Downey mildew of maize (S. philippinensis)	1912	Java
8.	Foot rot of Rice (Fusarhummoniliforme)	1930	South East Asia
9.	Black rot of crucifers (X. campestris)	1929	Java
10.	Leaf spot of sorghum	1934	South Africa
11.	Powdery mildew of rubber (Oidiumheveae)	1938	Malaya
12.	Blank Shank of Tobacco (P. nicottanae)	1938	Holland
13.	Fire blight of pear	1940	England
14.	Crown gall of Apple/pear (A. tumefaciens)	1940	England
15.	Bunchy top virus	1940	Srilanka
16.	Canker of apple (Sphaeropsis spp.)	1943	Australia
17.	Wart of potato (Synchytriumendobioticum)	1953	Netherlands
18.	Bacterial blight of paddy (X. oryzae)	1959	Philippine
19.	San Jose scale of apple	1900	Italy
20.	Wooly aphid of apple	1928	Australia
21.	Sunflower downey mildew	1985	Australia
22.	Mealybug	2008	Mexico/Central America
23.	Eriophyid mite	2008	Sri Lanka
24.	Spirallying whitefly	2008	Mexico/Central America
25.	Parthenium weed	2009	India
26.	Wheat blast	2016	Brazil
27.	Tuta Absoluta	2016	Africa
28.	Fall Army Worm (FAW)	2018	Americas

Table 3: Introduced pests and diseases

Sl. No.	Name of the pest/ diseases	Year	From	To
1.	Grape phylloxera (Phylloxeravitifoliae)	1860	USA	France
2.	Mexican boll weevil (Anthonomusgrandis)	1892	Mexico or Central USA	America
3.	Pink bollworm (Pectinophoragossypiella)	1892	India	World
4.	European corn borer (Ostrinianubilatis)	1916	Italy	North America
5.	Downy mildew of grape (Plasmoparaviticola)	-	USA	France
6.	Blight disease of chestnut (Endothiaparasitica)	1904	Europe	USA
7.	Coffee rust (Hemiliavastarix)	1896	Sri Lanka	World
8.	Colalado potato beetle (Leptinotarsadecemlineata)	During 1st world war	USA	France
Pest and diseases introduced to India				
1.	San Jose scale (Quadaraspidiotusperniciosus)	1879	China	India
2.	Potato tuber moth (Phthorimaeaopercullela)	1900	Italy	India
3.	Woolly apple aphid (Eriosomalanigerum)	1909	England	India
4.	Cottony cushion scale (Icerya purchase)	1920	Australia	India
5.	Leaf rust of coffee (Hemiliavastarix)	1876	Srilanka	India
6.	Fire blight of apple and pear (Erwiniaamylovora)	1940	England	India
7.	Smut of wheat (Urocystistritici)		Australia	India
8.	Wart of potato (Synchytriumendobioticum)	1952	Holland to India	India
9.	Golden nematode of potato (Heteroderarostochiensis)	-	Western Europe	India
10.	Onion smut (Urocystiscepulae)	-	India	India

(Source: Kothekar, 1970; Mathys and Baker, 1980)

The concept of quarantine dates back hundreds of years to the middle ages, at a time when the bubonic plagueor Black Death was spreading across Asia and Europe. (Gensini et al., 2004).In 1377, the seaport of Ragusa enacted laws that required travelers to remain in isolation or in quarantine for a period of about 2 months to prevent introducing plague to the city. Subsequent to that first law, other countries also enacted similar laws aimed at protecting their citizens from the spread of a deadly disease (Gensini et al., 2004).As time went on, the laws established, in effect, the first quarantine stations – places where individuals could be isolated from the rest of the population in order to assess whether they were carrying the disease (Gensini et al., 2004). What is remarkable about these actions and laws is that, at that time, there was a very poor understanding of disease transmission and infectious agents.

SWOT/Gap Analysis of Phtosanitary Capacity in Bangladesh

With the help of USAID the Plant Quarantine Wing of Department of Agricultural Extension conducted Phytosanitary Capacity Evaluation (PCE). The PCE provided an excellent opportunity to discuss the status of phytosanitary system in Bangladesh following the IPPC PCE Modules. It identified the gaps in regulatory, technical, financial and administrative components though an active stakeholder participation in a very comprehensive and structured manner. The PCE exercise was undertaken with all the 13 modules, which did take time and energy but was very useful in giving a holistic view of the phytosanitary scenario. Besides, the stakeholders themselves became very much aware of the various provisions of the SPS Agreement of WTO and their compliance status. The participants in all the PCE sessions were very eager and honest to share the information and were looking forward for further improvements in the system to make their work more productive.

The findings in the present studies also reiterate the earlier observations of USAID and at a broader level and it also highlight a range of activities in a very comprehensive manner for actions to be taken. The USDA while assessing the SPS Capacity Building in in Bangladesh (Alam, 2012) at a generic level had highlighted a number of areas which include improving the risk management chain by strengthening the ability of front line risk identifiers, building capacity of risk evaluators/assessors, improving risk management infrastructure, building effective laboratory network, reviewing policy and regulatory frameworks and increasing inter-departmental functioning and coordination. The present observations though in concurrence with the earlier findings of USDA/USAID, also provide a much detailed gap analysis by zooming the individual activities that need attention on different aspects of phytosanitary system exclusively.

Based on the findings in the present studies following recommendations are made:

Areas to be addressed based on gaps identified through PCE: The PCE modules that were conducted with stakeholder's participation have highlighted various domains of the phytosanitary system where in there are huge gaps in complying with the SPS Agreement of WTO. Based on this the areas to be addressed are highlighted in each of the Modules at activity level and

shown as crucial weaknesses at the end of discussions on each module (under Section V. of the report). The important and broad areas that need to be addressed in various technical aspects of the phytosanitary systems are enumerated below:

Legislation: Need provisions to empower the NPPO to develop time frame for implementing rules: need for provisions of financial powers to NPPO: Stakeholder's participation need to be included: need provisions to make NPPO responsible for protection of endangered areas and for the designation, maintenance and surveillance of pest free areas.

Environmental forces: NPPO need to be directly involved in developing and upgrading its own policies; numerous pathways for entry of pests need to be addressed; need for a written phytosanitary policy; human and infrastructural resources to be augmented.

NPPO mission and strategy: Need for a strategy plan for NPPO; mechanism for inputs from various stakeholders to be developed; a 100% cost recovery model to be developed; SOPs and Manuals to be developed; Formal inter agency collaboration yet to be developed.

NPPO structure and processes: Autonomy needed by NPPO to operate; Core technical activities (such as surveillance, pest eradication, risk communication) are need to be performed; Technical auditing needed; Operational manual system needed for functioning; need to establish a coordination unit specially to liaison at international level.

NPPO resources: Financial resources needed for undertaking variables costs; human resources needed to carry out all the functions; HR strategy plan for NPPO to be developed, need for financial support for developing proper infrastructure and logistics.

Pest diagnostic capacity: Need a plan for efficient functioning of laboratories; need for financial power and financial resources, expertise needed for specialized fields of diagnostics.

Pest surveillance and pest reporting capacity: Surveillance is yet to be an activity of an activity of NPPO; Specific surveys are done by PPW needs collaboration with collaboration with PQW; National pest database yet to be developed; Linkages among relevant stakeholders needed.

Pest eradication capacity: An eradication program needed and there is a legislative provision; Operational plan for pest eradication to be developed; Specified and skilled manpower needed; Specific budget allocation required; A coordination mechanism among agencies needed.

Phytosanitary import regulatory system: A written program or plans and documented procedures for functioning needed; sufficient skilled manpower and financial resources required; Need for good communication systems.

Pest risk analysis: A well-defined PRA program yet to be developed; Need to establish a PRA unit & designate one National Manger; Operational plan to be developed; Need for urgent in house capacity for undertaking PRA as outsourcing of all PRA's does not allow fair judgment on efficacy of PRA.

Pest free areas, places and sites, low pest prevalence areas: A well-defined program to be developed; Need to designate a focal point/national manger; An operational plan needed; Skilled capacity within NPPO needed for the task; Sufficient financial resources required.

Export certification, re-export, transit: Proper interaction/liaison among exporters and NPPO required; Documented Operational Strategic plan to be developed; Skilled Human Resources needed; Financial and logistics support needed; Need for administrative and financial power for NPPO.

CONCLUSION

The PCE identified the gaps and laps in our phytosanitary system. It clearly indicated shortcomings in all modules like NPPO process, national phytosanitary legislation, pest diagnostic capacity, pest eradication capacity, pest risk analysis (PRA), Phytosanitary import regulation, phytosanitary export certification, pest free areas and low pest prevalence, environmental forces etc. Pest risk analysis is a relatively new discipline but countries have been managing the risks associated with pests for hundreds of years except countries like Bangladesh. Still today we are not aligning with international standards by our heart or by ignorance. But in the past 150 years, countries began to cooperate internationally in managing pest risk with the aim to prevent the introduction and spread of important pests. At the same time, countries began to adopt laws and regulations at the national level to protect themselves from new pests. More recently, international treaties, like the SPS Agreement and the IPPC have been adopted to provide a framework for how countries should implement national laws and regulations related to managing the risks associated with foreign pests. Those agreements include obligations for countries to technically justify their measures through risk analysis. Thus, risk analysis has become the basis for national laws and regulations aimed at preventing the introduction and spread of new pests. To combat the situation it is mandatory and urgent to make a separate Plant Quarantine Authority first involving all stakeholders.

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