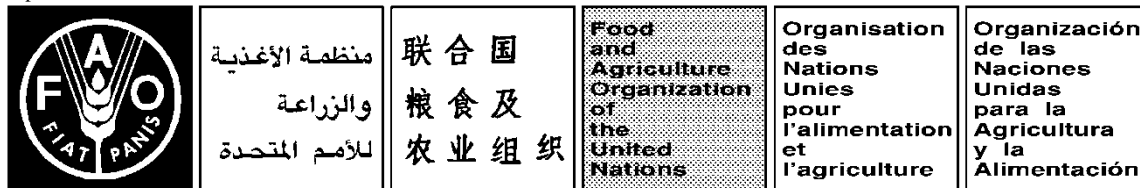


September 2015



**ASIA AND PACIFIC PLANT PROTECTION
COMMISSION**

**TWENTY-NINTH SESSION OF THE ASIA AND PACIFIC PLANT
PROTECTION COMMISSION (APPPC)**

Bali, Republic of Indonesia, 7-11 September 2015

AGENDA NO. 3

Country report

Nepal

Country report – Nepal

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Plant Protection Directorate**

Introduction

Agriculture is the mainstay of the Nepalese economy, providing a livelihood for 65 percent of the population and accounting for 38.1 percent of GDP. It offers employment opportunity to 80 percent of the total population of 28.15 million.

Agriculture Policy 2004 of Ministry of Agricultural Development (MoAD) has emphasized on eco-friendly production system, organic farming and IPM practice for sustainable agriculture development and food safety. Considering these issues the Pesticide Registration and Management Division has also emphasized for the registration of bio-pesticide/botanical pesticides, gradually reducing highly hazardous pesticides. PPD is going to issue new pesticide Act and Law for better implementation of pesticides' problem in the country.

The Directorate of Plant Protection (PPD) is the official NPPO of Nepal in terms of membership of the IPPC. As a member to the IPPC, the NPPO of Nepal aims to prevent the spread and introduction of pests of plants and plant products, and to promote appropriate measures for their control maintaining coordination with relevant stakeholders which includes environmentalist, researchers, regulators, policymakers, private sector and civil society in managing invasive alien species.

Recently NPPO Nepal has prepared a long term action plan of NPPO Nepal for identifying the area of work and services, developing organizational structure and administrative management for the PQ service, policy and legal bases and procedure and practices for delivery of services for NPPO. The main objective of to develop plan of actions of NPPO is to comply with WTO/ SPS obligations and improve access to international markets of agricultural products in line with Plant Protection Act, 2007 and Plant Protection Regulations, 2010 of Nepal.

The Plan and policies of Nepal also emphasized eco-friendly measures of agriculture production, IPM practice and organic farming which directly or indirectly support the concept of pesticide risk reduction in food safety. The preparation of pesticide policy and bio pesticide promotion directives is under way which encourages for the production, registration and use of bio-pesticides/botanical pesticides and bio-agent. The GoN is regularly organizing training and awareness program on safe use of pesticides to stakeholders and users of the pesticides.

Pesticide residue analysis in vegetable crops (Tomato, Brinjal and Potato) is carried out regularly. Frequent monitoring to the pesticides retailer, dealers, formulators and others users are done in order to check whether they follow code of conduct related to pesticide use as regulated by the Nepal Government. Last year, PPD has established Rapid Bioassay Pesticide Residue Analysis Laboratory in the whole sale vegetable and fruit market at Kathmandu and success to minimize the residue in the vegetables and fruits. Due to grand success of Rapid Pesticide Residue Laboratory, PPD is going to establish more 6 laboratories in different big cities of Nepal very soon.

Pesticides

Pesticides are widely used in agriculture to increase the yield, improve the quality, and extend the storage life of food crops. In Nepal, there are 67 pesticides importers. Ten thousand three hundred ninety six resellers have received training on safe use of pesticides and storage management. One thousand five hundred sixty one types of pesticides by trade name, 117 common names have been registered for use under Pesticides Act 1991 and Rules 1993 (Table 1). According to the latest estimate, the annual imports of pesticides in Nepal is 410 Mt. (a.i.) with 33.81 percent insecticides, 39.94 percent fungicides, 24.57 percent herbicides, 1.63 percent Rodenticides, 0.035 percent bio-pesticides and 0.015 percent others, respectively. The gross sales and values account NRs. 569.95 million (\$5.6 million) per year (Table 2). The yearly import of pesticides scenarios are given in figures 1.

Table 1. Pesticide data in brief

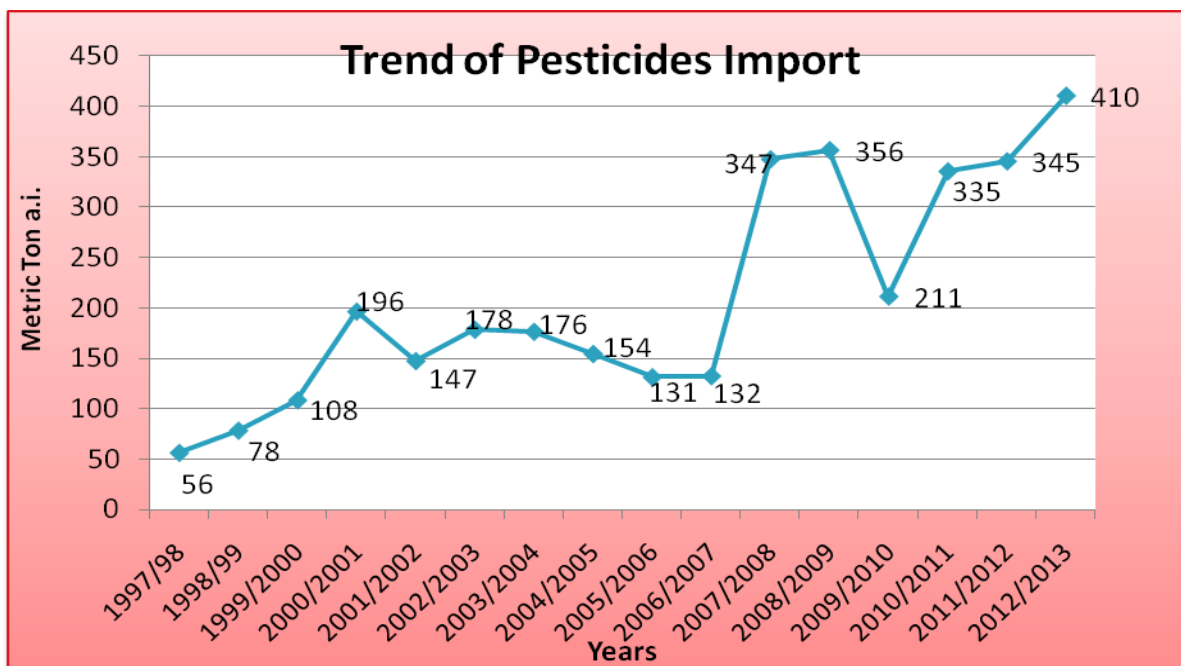
S.N.	Description	Number
1.	Pesticide registered till 2014 (Trade name)	1561
2.	Pesticide registered till 2014 (common name)	117
3.	License holder (Retailers)	10396
4.	Trained personnel (safe storage and use)	9348
5.	Formulators	5
6.	License on spraying	15

Table 2: Summary of Pesticide Imported and formulated in Nepal

S. N.	Items	Total Quantity(Kg)	a.i. (Kg)	Amount in \$	Share%
1	Insecticide	1175033.76	138761.7	3590000.942	33.81
2	Fungicide	229517	163890.8	1270700.253	39.94
3	Bactericide	58	5.8	1810	0.004
4	Herbicide	209028	100833.3	723300.477	24.57
5	Rodenticides	12402	6689.002	73250.767	1.63
6	Bio pesticide	10375	147.02	40410.7	0.035
7	Total	1636413.76	410327.6	5699500.139	

The pesticides used in Nepal are imported from India, some from China and other countries based on registration. Distribution of pesticide in Nepal is done only in the form of finished products. Nepal is included under the category of LDC which has limited use of pesticide per capita and/or hectare. So, in comparison to other countries in the Asia Pacific Region, the use of chemical pesticides in Nepal was the lowest (142 gm a.i. /ha). Recently, PPD has revealed that 396 gm a.i./ha chemical pesticides are being used in Nepal (PPD, 2015). Pesticide use, however, is much more intensive in areas that have greater access to markets. The use is higher in areas with intensive commercial farming of vegetables, fruits, tea, and cotton. Under the present scenario, judicious and prudent use of pesticide by the Nepalese farmers is largely disregarded. All types of pesticides are not only repeatedly but also carelessly used. Farmers do not always know the active ingredient. Sometimes outdated pesticides are sold to farmers. Farmers use a mixture of chemicals together, and therefore, when incidents occur, it is difficult to specify which chemical is the main cause.

Figure 1. Trend of pesticides import in Nepal



Government of Nepal has developed policy for judicious use of pesticides and safety regulations, which has not yet been materialized at the farmer's level due to lack of studies on other alternatives of pest management, such as biological, botanicals, and safe chemicals including indigenous knowledge of farmer's practices, as basic component of Integrated Pest Management. These are the basic components of IPM. The IPM-FFS was initiated in Nepal in 1997 with the support of Food and Agriculture Organization (FAO). It has been an important approach of pest control strategy which encourages applying measures that causes least disruption of agro-ecosystem. Therefore, establishment and functioning of bio-agent rearing laboratory, studies of locally available botanical pesticides and residue study laboratories can exploit locally available natural resources of pest management and substantially help farmers, researchers, and policy makers to implement related acts and regulations effectively.

The farmers and retailers of pesticides do not have adequate knowledge regarding pesticide use and health safety (Sharma et al., 2014). Some farmers even dip fruits and vegetables in pesticide solution just before bringing them to the market for selling. Others treat food grains with pesticides against storage pests. Many misuses have been reported by Giri (1998) and Dahal *et al.* (1995) generally from farmers who do not realize the extent to which pesticides are poisonous and hazardous to humans and the nature. The concept of chronic poisoning and health risks is not fully understood by farmers, distributors and importers in Nepal.

To promote environmentally sound management of chemicals, Nepal has got a pesticide registration scheme. The Pesticide Act, 1991 and the Pesticide Rule, 1993 (revised 2010) cover measures to regulate import, manufacture, sale, storage, transport, distribution and use of pesticides. It is mandatory that any pesticide before distribution and importation should be first registered in accordance with the registration procedure adopted by the Pesticide Board. Pesticides other than notified ones are not to be imported, exported, produced, used or distributed. The regulations also prohibit the sale of any pesticide, which is imported for scientific or research purposes. GoN shall, on the recommendation of the Board, publish the names of the registered pesticides in the Nepal Gazette. The licensing control of hazardous chemicals prevents unauthorized persons from handling such chemicals. Reseller License and

Importer License issued are valid for two years and five years, respectively. The Board may cancel a license if the terms and conditions of that license are not followed. The powers of Pesticide Inspectors are set out in the Pesticide Act/Regulations, which gives power to the Board to prepare and enforce any guidelines on the matters relating to pesticides for the effective implementation of the Act. Any control system, no matter how well crafted, will not be effective without rigorous enforcement.

Highly hazardous pesticides have been banned and restricted to use in most of the countries, whereas Nepal has banned only 16 pesticides till date (Table 3).

Table 3. Banned pesticides in Nepal

SN	Name of pesticides	Banned date	SN	Name of pesticides	Banned date
1	Chlorden*	March, 2001	9	B.H.C.	March, 2001
2	D.D.T*	March, 2001	10	Lindane	March, 2001
3	Dieldrin*	March, 2001	11	Phosphamidon	March, 2001
4	Endrin*	March, 2001	12	Organo-mercury fungicide	March, 2001
5	Aldrin*	March, 2001	13	Methyl parathion	June, 2006
6	Heptachlor*	March, 2001	14	Monocrotophos	June, 2006
7	Mirex*	March, 2001	15	Endosulfan	June, 2012
8	Toxaphen*	March, 2001	16	Phorate	July, 2015

Source: PRMS (2015), * POPs pesticides

A recent study showed that more than 85% of imported pesticides are applying only in vegetable farming in Nepal. Twenty one common names of insecticides were found to be used in vegetables crop. Among the insecticides used, dichlorovos was found the most popularly used pesticide followed but cypermethrin and dimethoate (Figure 2). Likewise, among the fungicides the most commonly used one was found mancozeb followed by carbandazim (Figure 3).

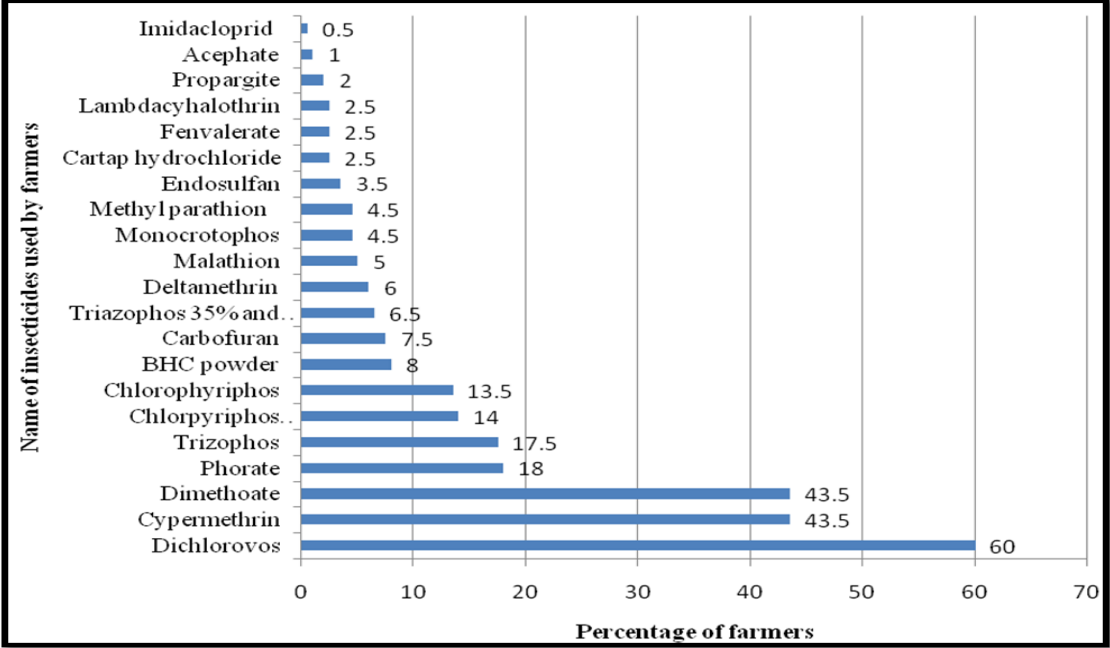


Figure 2. Use of different insecticides by farmers in vegetable crops in survey areas

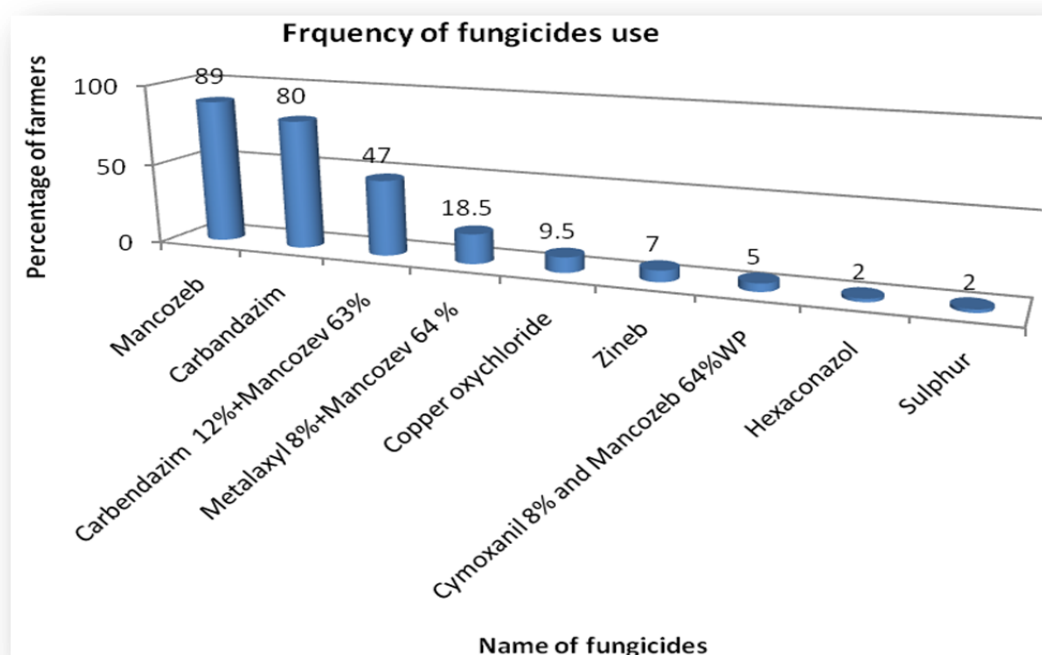


Figure 3. Use of Fungicides by farmers in vegetable growing areas

Regarding the poisoning cases insecticides were the most common causing agents among the agro-chemicals followed by rodenticides. In three-year periods, overall 61.63 percent patients were related to insecticides poisoning and remaining to rodenticides, herbicides, fungicides, fertilizer and plant growth promoters. Among the insecticides, organophosphate group was found more responsive than other groups. During the survey in major hospitals, it was also found that among the insecticides, dichlorovos, metacid and zink phosphide were commonly more responsive pesticides used for suicidal cases.

Like many developing countries, pesticides hazards on human health, persistence of toxic residues of pesticides in living organisms, impact of pesticides in living organisms, impact of pesticides on non target organisms, pest resistance due to pesticide use and other ill effects of pesticides have not been studied and monitored in Nepal. The government realizes that pesticide use creates problems to health and environment. Misuse or negligence on the direction for use, especially the pre-harvest interval can create residue problems.

Plant Quarantine

Plant quarantine program is conducted under the plant protection act 2007 and plant protection regulation 2010. The service is provided by National Plant Quarantine Program, Regional Plant Quarantine offices, plant quarantine check posts and sub check posts. Regional plant quarantine offices and plant quarantine check posts are located at different land frontiers and at international airport. Inspecting consignments, treatment of the consignments, issuance of phytosanitary certificate and entry permit, pest surveillance are some major activities performed under plant quarantine program.

Altogether 15 quarantine check points (including Plant Quarantine Check posts and Sub-check posts) are functioning within the country. Out of them, 11 are connected in Indian borders, three of them in Nepal China boarder and one is located at International Airport, Kathmandu.

Now NPPO Nepal has officially declared total of 254 Pests of 18 commodities and endorsed 33 different NSPMs and directive on domestic quarantine (Annex 1). Out of 33 NSPMs, Nepal has prepared 16 national standards since 2013 to date as below. Web based pest information management software has been prepared and manpower from whole country are trained to handle in one phase. Local E-phyto service is going to start immediately from this fiscal year FY72/73.

National standards prepared since 2013 to date are:

1. Technical Guidelines for Sampling in Consignment of NTFPs 2013 (Not Notified)
2. Technical Guidelines for Establishment, Maintenance and Verification of Area of Low Pest Prevalence 2013 (not Notified)
3. Standard Technical Protocols for Collection and Handling of Disease Samples 2013 (Not Notified)
4. Guideline for Detection, Monitoring and Delimiting Survey of Plant Pests in Natural Ecosystems 2013 (Not Notified)
5. Detection and Monitoring Techniques for Quarantine Pests 2013 (Not Notified)
6. Standard Technical Protocols for Collection and Handling of Insect Samples 2013 (not Notified)
7. Survey and Monitoring Protocol for Establishment of Area of Low Pest Prevalence for Brown Rot of Potato 2013 (not Notified)
8. Requirements for the Establishment, Maintenance and Verification of Pest Free Production Sites for Citrus Fruit Flies 2013 (Not Notified)
9. Guidelines for Detection, Monitoring and Delimiting Survey of Plant Pests in Agriculture Ecosystem 2013 (not Notified)
10. Requirements for the Establishment, Maintenance and Verification of Area of Low Pest Prevalence for Citrus Fruit Flies 2013 (Not Notified)
11. Establishment of Areas of Low Pest Prevalence for Fruit Flies (Tephritidae)- 2014 (Not Notified)
12. A Guideline on Pest Free Area Declaration for Cabbage, 2014(Not Notified)
13. Determination of pest status in an area 2014 (Not Notified)
14. Requirements for the Establishment of Areas of Low Pest Prevalence 2014(Not Notified)
15. Glossary of phytosanitary terms 2014 (Not Notified)

16. PFA guideline for bacterial disease of cabbage 2015

Pest surveillance activities

Ministry of Agriculture Development of Nepal focus pest surveillance is one of the core activities and directs the whole organization for its smooth implementation.

Plant Protection Directorate is the major responsible organization to conduct the survey and surveillance in Nepal. Close collaboration and coordination with the other organization, PPD starts to development of human resources through the training. In this period, Our officers were trained in survey surveillance.

Through the Regional Plant Protection Laboratory survey surveillance activities were conducted in rice crop in all regions of Nepal.

To promote the export of citrus in China, we started the survey surveillance in Citrus orchard our main aim is to develop the citrus orchard pest free area for the citrus greening, citrus canker and fruit fly.

Survey protocol for some important pest of citrus are published (fruit flies and some disease of Chinese quarantine concern). Survey in citrus pockets ongoing. basic database prepared, current status of fruit fly survey published and manpower for fruit fly survey is trained by regional surveillance project (GCP/RAS/286/ROK).

Field based Surveys on the pests of 5 highly exported medicinal herbs is completed in first phase. Updating national pest database is prioritized by the government (intensive survey of lentil pests and preparing national pest database is planned for this year) .

Most of the quarantine laboratories are made full of basic set of equipments and manpower with basic level of training on laboratory handling. Laboratory infrastructures at Bhairahawa, Nepalgunj check post are constructed. But the recent earthquake has ruined the 5 storied building of NPPO, where PPD, NPQP and PHMD were operating.

Outbreaks and control of specific pest including invasive species and migratory pests

Since 2013 we faced the various insect pest outbreak in different crops like maize, wheat, sugarcane, rice. Detail information about the insect pests outbreak are presented in table 4.

Table 4. List of pest out break

S. No	Name of the crop	outbreak insect pest species	Time and agro climatic condition	Main cause of outbreak	Management practices	Areas
1	Rice (<i>Oryza sativa</i>)	BPH (<i>Nilaparvata lugens</i>)	July- Aug 2014	Frequently application of pesticides at high doses.	Training for field staff, mobilization, Fact sheet development and	Banke, Bara, Parsa and Nawalparasi district of Nepal

					Campaign	
2	Rice (<i>Oryza sativa</i>)	Rice armyworm (<i>Mythimna separata</i>)	July- Sep 2014	Mainly rain fed cropping system, Unavailable of irrigation facility, Favorable climatic condition	Training for field staff, mobilization, Fact sheet development and Campaign, pesticides distribution	Bardiya and Dhailekh district of Nepal
3	Sugarcane and Maize (<i>Saccharum officinarum</i> and <i>Zea mays</i>)	Sugarcane plant hopper (<i>Pyrrilla perpusilla</i>)	April 2015	Heavy use of Chemical pesticides, Poor field management, Raton crops, Favorable temperature and humidity.	Training for field staff, mobilization, Fact sheet development and Campaign, pesticides distribution Mobilization of Mass media, Radio and TV for the dissemination of information	Sunsari, Sarlahi and Bara district of Nepal
4	Maize (<i>Zea mays</i>)	Armyworm (<i>Spodoptera separata</i> and <i>M. mauritia</i>)	May- June 2015	Heavily devastating the germinating maize at seedling stage as well as on the cob. Outbreak due to the favorable climatic condition after earthquake	Training for field staff, mobilization, Fact sheet development and Campaign, pesticides distribution	Bajang, Jajarkot, Dang, Rasuwa, Sindhupalchok, Dolkha and Solukhumbu district of Nepal

Annex 1

Pests list, NSPMs and directive on domestic quarantine are given in below web side.

www.npqpnepal.gov.np