

Past achievement and current situation on pest surveillance issues, prioritized area to be improved in Nepal

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The Country

- Land locked country
- Birth place of **Lord Buddha**
- Bordering countries:
 - China (Tibet): North
 - India: East, south and west
- Geographical region: (3)
- Altitude ranges from few meters to 8,848m
- (Mt Everest; the highest peak of the world)

Major crops :

Rice, Wheat, Maize, vegetables, potatoes and fruits.

Cash crop- Tea, Coffee, Sugarcane, Jute and cardamom

NEPAL



Geographical and Political division of Nepal

Geographical division: 3 Eco-zones

Mountain (16 districts)

- 35% of total area. (4800 masl and above)
- Yak/Nak, sheep, alpine goats (*Chyangra*) and mule rearing forms the way of life of people in this region.

Hills (39 districts)

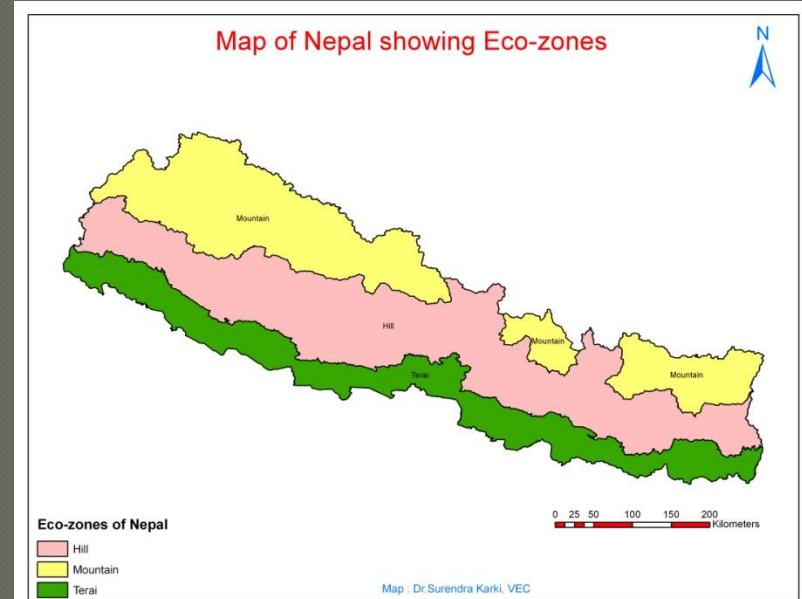
- Covers about 42% area. (300 to 4800 masl.)
- Agro-based livestock industries and horticultural production in the region are the main source of income of the people.

Terai (20 districts)

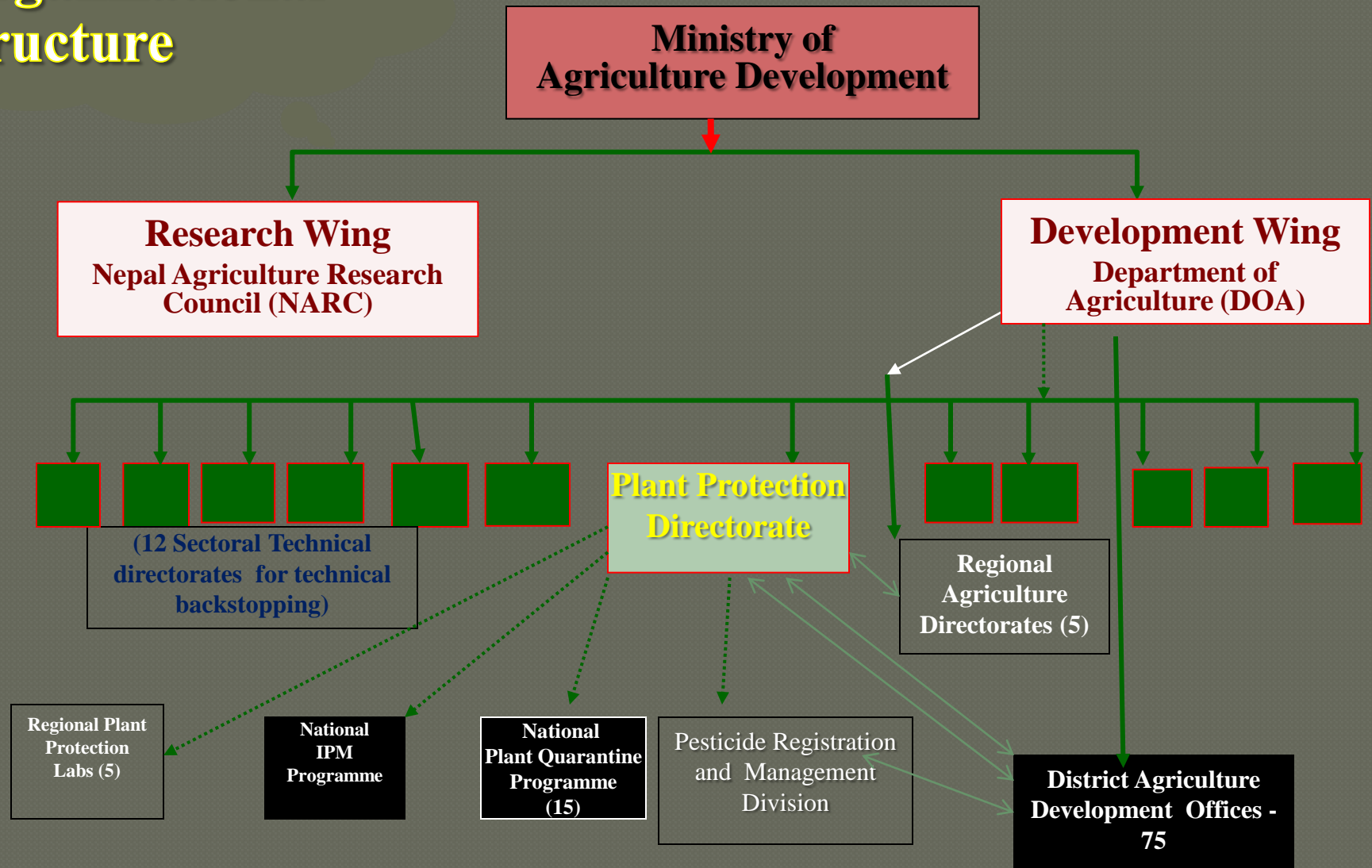
- Covers about 23% of the total area. (<300 masl.)
- This region serves as a main source of food supply to other region of the country.

Administrative division

- 5 Development regions
- 75 Districts
- 3995 Village Development Committees



Organizational structure



Vegetation and Biodiversity

- 118 ecosystems
- 75 vegetation types and 35-forest types
- Shares nearly 0.03 percent of the total landmass of the world.
- Existence of 7000 flowering plants. Out of which 245 species are endemic
- Over 500 plant species are edible, out of which 200 species are cultivated.



Development of Institutional and legal Framework in Agriculture

- ◉ Agriculture is the major sector for National economy in Nepal (33.5% GDP)
- ◉ National priority on commercialization, diversification and specialization of agriculture
- ◉ NPPO is established : Plant Protection Directorate (PPD) is Secretariat of NPPO

Development in Plant Protection sector....

- Legal framework is revised : Plant Protection Act, and Plant Protection Regulation.
- Amendment of Pesticide act is in process
- National IPM policy is in process of approval
- Various working procedures including pest survey surveillance are being developed.
- Pest survey/surveillance is recognized as one of the core activity under plant protection.

PAST ACHIEVEMENT ON PEST SURVEILLANCE ISSUES

- Agricultural crop pest surveillance was a part and parcel of research and development efforts of Department of Agriculture until 1990 when research and development units were jointly functioning for agriculture development in Nepal. **Establishment of Reference Insect Museum in Entomology Division** (presently functioning under Nepal Agricultural Research Council; NARC) consisting of **1863 authentic identified insects and mites** is the product of that effort.

PAST ACHIEVEMENT.....

- First general surveillance **21 crops** (lentil, ginger, mustard, potato, onion, radish, wheat, citrus, mango, tea, coffee, cardamom, linseed, paddy, maize, coriander, pea, tomato, cabbage, banana, chiraito (*Swertia chirata*) **was conducted during FAO approved TCP/NEP/2903(A)** project STRENGTHENING PLANT QUARANTINE SERVICES on **4 September 2003** and an authentic **National Pest Database of these crops was submitted**. The pest **database included detail information** on insects, diseases and nematodes of the said crops.
- In the subsequent years, insect pests and diseases of mung bean (*Vigna radiata*), finger millets and strawberry, based on general surveillance, were also added in the National Pest Directory.

PAST ACHIEVEMENT.....

- Several national standards, including pest surveillance complying with international phyto-sanitary standards (ISPMs) prepared .
- National standards on domestic quarantine being prepared.
- Plant wise program ie Plant Clinic has been established in the Country.
- Detection survey on sweet orange and junar in tow districts completed & process to declare PFA for Fruit fly is ongoing to facilitate export to China.
- Strengthening of Quarantine labs with regular training of staffs and equipments support.

PAST ACHIEVEMENT.....

- Pest surveillance in Nepal is done for taking some management decisions, no delimiting survey has been done so far.
- National pest database (secondary source) prepared on 25 important commodities.
- PRA (Generic) on 20 different commodities done and prepared the quarantine pest lists.
- District wise pest mapping in all the cultivated crops of Nepal is prepared.
- National IPM program is running as pillar of agriculture to minimize the chemical pesticides and protect the environment and human health.

Pest survey/Surveillance Program of NPPO

- Pest survey/surveillance program is performed at three level in Nepal.
- At the local level it is performed by District Agriculture Development Office (DADO)
- At the Regional level Regional Plant Protection Laboratories (RPPL) - conduct the survey. surveillance and prepares regional pest map
- At the centre level PPD as its capacity to NPPO - coordinate, support and perform the activities
- In cases of need and availability support from research institutes and universities are obtained.

Pest surveys that Nepalese NPPO is performing

- General survey is practicing in a regular fashion by the existing structure.
- Monitoring surveys : this survey is performed regularly by DADO and RPPL
- Delimiting surveys : This survey is not practicing
- Detection surveys : Practicing in a general survey.
- By the working experience of the PPD it has been necessitated the capacity development in survey/surveillance

Pest survey.....

- ◉ Conversely, whatever the pest data are generated, mostly based on general survey/surveillance practiced
- ◉ Regular reporting, notification to the RPPO is not practiced regularly.
- ◉ Pest information to the trading partners are sent only on demand

Basis for setting Survey/ surveillance in regular program

- Importance of crop –
 - major crop,
 - coverage of crop,
 - commercial crops
- Availability of resources - financial and technical
- Incidence of pest - frequently occurring pest and its devastating nature
- In special cases - in accordance with agreement to export in aboard.
- To adopt the pest management strategy

CURRENT SITUATION ON PEST SURVEILLANCE ISSUES

- Every year potential candidates for Pest Survey-Surveillance in Plant Protection Directorate are being trained
- Specific pest detection surveys of Fruit flies (*Bactrocera* spp.), Asian citrus psylla (*Diaphorina citri*), Huanglongbing bacterial disease, and citrus canker (*Xanthomonas axonopodis*) on citrus crops in Sindhuli and Syangja districts are near to commence during 2014 and 2015. **Survey protocols has ben prepared** . A team from Plant Protection Directorate, Department of Agriculture will involve in this event.

CURRENT SITUATION ON PEST SURVEILLANCE ISSUES Cont.....

- Specific pest **detection survey** limited to **preparing pest and disease inventory on four medicinal plants** (Figwort *picrorhiza* (*Neopicrorhiza scropulariiflora*) (local name: Kutki), chiretta (*Swertia chirayita*) (local name: chiraito), asparagus (*Asparagus racemosus*) (local name: kurilo), soapnut (*Sapindus mukorossi*) (local name: riththa) and Nepalese pepper (*Zanthoxylum armatum*) are ready to commence in 2014 and 2015. **Recently, a team of potential candidates for the survey is trained for the surveillance effort.**

PEST SITUATION

- White grub and red ant are coming as major threats to farmers especially in hill & high hill areas.
- White fly in tomato & cucurbits, Fruit fly in tomato, citrus & cucurbits are becoming major pests and distributing rapidly through out the country.
- Recent outbreaks of BPH in rice, hopper in sugarcane, armyworm in rice in many districts in 2013.
- Tomato & Potato: *Phytophthora infestans* is becoming difficult to manage

PEST SITUATION

- **Root knot nematode** (*Meloidogyne* spp) : spreading and difficult to manage
- Recent outbreaks of **Rice Neck blast** (*Pyricularia oryzae*) in narrow gene incorporated rice variety in 2013
- **Banana weevil, borer and Banana Bunchy Top Virus** is collectively compelling farmers for shifting crop in some areas
- Development of Yellow Rust resistant varieties like WK 1204, Vijaya (Victory) has been adopted by farmers against yellow rust
- **Maize borer** (*Chilo partellus*) is also becoming as a major threat to farmers
- **Hot Pepper: *Phytophthora* rot is challenging** for small scale to commercial farmers

PEST SITUATION

- Brinjal shoot and fruit borer (*Leucinoid arobonalis*) is spreading
- Cole crop growing soils of several areas are infected with *P. brassicae* (Club root) and is spreading rapidly
- Commercial citrus growing pockets are being destroyed rapidly- Citrus greening, *Tristeza* virus and decline
- Potato tuber moth, bacterial wilt and potato wart are spreading rapidly
- *Amarlata* entered with Barseem Seed and now infesting forage crops and pulse crops including lentil fields
- Entry of *Embellesia alli* from China greatly affecting garlic export

PEST SITUATION

- Invasive species like *Mikania micranta*, *Eupatorium adenophorum*, *Lantana camara*, *Parthenium* etc are becoming serious problems in various forest and agricultural ecosystems
- Large Cardamom: **Rhizome rot**, **chhirke**, **phurke** and Jurjure (viral diseases) are spreading rapidly
- *Pestalotia* on guava and *Udbatta* in rice are threatening currently.
- **Ginger: Rhizome rot** disease in potential growing areas
- Herbs: No pest database, hindering export
- Pine trees are wilting due to *Bursaphelenchus xylophilus* (Pine wilt nematode)

Major exported commodities

- ◉ Lentil,
- ◉ Large cardamom,
- ◉ Ginger,
- ◉ Tea,
- ◉ Coffee,
- ◉ Different vegetables,
- ◉ Orange,
- ◉ Mango
- ◉ Various herbs as well as
- ◉ Forest products

PRIORITIZED AREA TO BE IMPROVED

Good Surveillance Practice

- Trained survey-surveillance personnel with enhanced pest sampling skill.
- Supply of appropriate surveillance equipment.
- Use of technically valid survey-surveillance methodology.
- Collaboration of different institutions possessing common expertise for an effective surveillance in the country
- Following of Internal Quarantine practices for at least high value and export potential crops/plants/herbs first and then gradual improvement of such practices to other plants in future

PRIORITIZED AREA TO BE IMPROVED IN NEPAL Cont..

Technical Requirements for Diagnostic Service

- Gradual improvement of Central Laboratory so as it can be developed as internationally accredited laboratory in recent future.
- Expertise in disciplines relevant to pest and host identification.
- Adequate diagnostic facilities and equipment.
- Access to specialists for verification.
- Facilities for record keeping.
- Facilities for processing and storing of voucher specimens.
- Use of standard operating procedures.
- Popularizing phenomenal taxonomic works in concern disciplines.

PRIORITIZED AREA TO BE IMPROVED Cont..

Pest database server computer unit establishment in NPPO-Nepal

- Central pest database server master computer unit
- Facility development to empower different quarantine check-posts and relevant public sector stakeholders to use pest database developed in NPPO-Nepal.

PRIOPRIORITIZED AREA TO BE IMPROVED IN NEPAL Cont..

- Preparation of national level list of pests based on survey & surveillance ranked on majority basis
- Preparation of national pest map & stratification of high pest risk zone, area of low pest prevalence, pest free areas
- Strengthening of international quarantine system coordinating with Department of Foreign Affairs, Department of Trade and National Chamber of Commerce & Industry
- Establishment of meteorological stations on prioritized crop production zones

PRIORITIZED AREA TO BE IMPROVED Cont..

- Institutionalize and strengthen NPPO with comprehensive work plan and aggressive implementation modality, establish direct mechanism for collaboration, coordination among domestic and foreign stakeholders (NPPO as single window).
- Long-term vision and strategy for pest surveillance need to be prepared by competent manpower so that the government will be compelled to allocate resources for pest surveillance every year.
- NPPO need to design several protocols for survey of several specific pests of selected commodities (Manage Manpower: very few manpower is trained in this aspect)
- Specific survey for some important pests of highly exported commodities is urgent to perform , so that declaration of ALPP, PFA and IQ management would be easier.

PRIORITIZED AREA TO BE IMPROVED IN NEPAL Cont..

- Survey and surveillance on the pests of 15 highly exported medicinal herbs (List of the department of Plant resources) is required, because several importing countries are asking for their PRA reports before imports.
- Linkage of (electronic) pest database with the international hub for better information exchange
- Develop strategies to stand alert for limiting invasive alien species
- Prepare guidelines on GSP and conduct regular survey-surveillance and pest risk analysis to update the database for efficient decision making
- Use of standard operating procedures - where available

Our vision in development of pest survey/surveillance in plant Protection

- ◉ Development of pest identification capabilities to the ISPM standards
- ◉ Technical manual preparation
- ◉ Operational plan to perform survey/surveillance
- ◉ Data base to develop pest management strategy.

SUMMARY

- Great scope on plant protection sector
- Surveillance is the centre point of Plant Protection .
- Coordination between existing stakeholders is more important rather than creating new infrastructure (except few important and not existing yet).
- NPPO has to have with full exercise legally especially to create one door system on plant protection activities throughout the country.
- Competitive and more specified human resources have to be developed & accredited .
- Enough resources (financial) has to be allocated .

THANK YOU