



SECARD Nepal
DADO, Kathmandu

Plant Health Clinic Initiative in Nepal



Raj Kumar Adhikari
SECARD Nepal



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SECARD Nepal

SECARD Nepal is a not-for-profit, non governmental organization registered and affiliated with Government of Nepal. Our main aim is to develop sustainable agriculture system with optimal use of local resources with conservation of agro ecological landscape. SECARD Nepal advocates for the promotion of eco-friendly ecological and sustainable organic farming practices through its different programs and projects.

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DADO, Kathmandu

District Agriculture Development Office, Kathmandu is a government organization under Department of Agriculture Government of Nepal under Ministry of Agriculture and Cooperatives. Our major role is to plan and implement effective extension of relevant agriculture technologies for development of agriculture sector in the district. We work through our organized institutional framework as well as in collaboration with other government and non-governmental organizations active in the district.

Global Plant Clinic

The Global Plant Clinic (GPC) is managed by CABI in alliance with Rothamsted Research and the Central Science Laboratory. The GPC provides and coordinates plant health services in Africa, Asia and Latin America. It has an expert diagnostic service for all plants and types of problems and regularly publishes new disease records. The GPC trains plant doctors and scientists, establishes plant health clinics and builds plant health systems. We link extension, research and farmers work in all sectors to improve regular and reliable access to technical support and advice. Our aim is to create durable plant health services for those who need them most.

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Acknowledgement

Concept of plant doctor and plant clinic is a new concept among different stakeholders of agriculture development in Nepal even among the agriculture technicians. SECARD Nepal is proud to be the actor of plant health service through this innovative concept of plant clinic in Nepal. Global Plant Clinic is duly acknowledged for organizing the training how to become a plant doctor module one in support of World Vision International Nepal.

I am highly indebted to Dr. Eric Boa, Head of Global Plant Clinic and Dr. Rob Harling for their effort to introduce the concept in Nepal along with his knowledge sharing through training facilitation, constant encouragement and support to run the plant clinic.

On behalf of SECARD Nepal, I am pleased to World Vision International Nepal, Lamjung Area Development Programme for providing the opportunity to participate the training. Mr. Surendra Dhakal, Team Leader and Mr. Bed Prasad Khatiwada, former Community Development Coordinator of WVIN, Lamjung ADP (Currently, Program officer of Helvetas Nepal) are especially thankful in this regard. All the staffs of WVIN Lamjung, participants of the training are also acknowledge for their cooperation.

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Last but not the least, farming communities of the clinic site are highly acknowledged.

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Acronyms and Abbreviations

CBOs	Community Based Organizations
CBS	Central Bureau of Statistics
DADO	District Agriculture Development Office
GDP	Gross Domestic Product
GON	Government of Nepal
GPC	Global Plant Clinic
NGO	Non Government Organization
SECARD	Society for Environment Conservation and Agricultural Research and Development
UK	United Kingdom
UNDP	United Nation Development Program
VDC	Village Development Committee
WVIN	World Vision International Nepal

Executive Summary

Plant clinics get introduced in Nepal and taking up its momentum with technical guidance and help from Global Plant Clinic. Started with training on field diagnosis and operation of clinics under training course How to become a Plant Doctor? Module 1 in Lamjung, SECARD Nepal replicated the experience in its project areas in Dhading and Kathmandu in technical support from District Agriculture development Office, the government body for agriculture development in Nepal. The concept is, by word, very appealing and is of great importance in surface observation but very little is known in its operation particularly in contextualizing the principle of plant clinics into practice.

Plant clinics are successful in having the farmers' reception and stakeholders' support. Being relatively new concept, numerous aspects are still not properly understood mainly integration with existing government services, sustainable operation of plant clinics and development of community based plant doctors.

Development of trained manpower through exposure and trainings, establishment of laboratories with minimum facilities to diagnose fungal and other simple diseases and publication of relevant color charts and materials like fact sheets, posters, pamphlets and initial support for clinic establishment is highly felt. Collaboration through resource sharing in abovementioned issues through national, district and village level consultation meeting among actors and with Global Plant Clinic can boost up the initiative in Nepal.

1. Getting Started: Concept and Initiative

Nepal is a developing country which ranks in 142 positions in human development index (UNDP, 2008). Its economy is mainly dependent on agriculture which contributes about 38% of the GDP (CBS, 2008). Livelihood of around two third of the population is dependent on agriculture but it is still in subsistence level in most parts of the country. Lack of quality inputs and effective technology transfer are the major problems associated with low production and productivity of different agriculture commodities. Though Ministry of Agriculture and Cooperatives of Government of Nepal (GON) has a good organizational framework from grassroots level to national level but due to limited agriculture technicians, government is not in a position to support to farmers to solve their farm problems especially in addressing different plant health problems. On the other hand, these agriculture technicians need to further update with latest information and technologies. Most of the plant health problems were overlooked by the subsistence level farmers but commercial farmers are found to make some queries and seek information about their problems.

As we have numerous hospitals and trained doctors and nurses to provide human health facilities, many veterinary hospitals to treat our sick farm animals but what for plants? In contrast to human and animal health problems and their respective treatment procedures, providing plant health services is quite more complex and difficult because plant seems to be unhealthy due to numerous biotic and abiotic factors. Most of those farmers seek the effective treatment against their problems only as per their verbal description of the problems. Farmers mostly visit their neighbors who are more experienced in commercial farming or at the agrochemical retailers (Agro vets) and agriculture input shops to get solution against their problems. Bringing diseased or problematic plant or plant parts with specialists or other service providers is very rare that makes the suggestion mostly on 'guess' based



Figure 1: An oil seed crop (*Brassica juncea var rapa*) being affected by aphids.

on verbal description of the farmers. On the other hand, some of the agrochemical retailers are taking benefit of the situation and sells number of agro chemicals which are not required to solve the problem. This hazardous and haphazard plant health service system is increasing the cost of production on one hand and increasing the soil, environment and human health hazards on other.

In December 2008, a successful attempt was made in the field of plant health system in Nepal. Global Plant Clinic (GPC) provided the first module of how to become a plant doctor and facilitated the ever first (pilot) plant clinics in Lamjung district of Nepal in support of World Vision International Nepal. Total of 23 participants attended the training and played role of plant doctor to provide technical service to the farmers visiting the pilot plant clinic. Mr. Raj Kumar Adhikari of is one of the participants of the training who replicate the concept into action in SECARD Nepal's project area.



Figure 2: Learning by Training. Raj Kumar Adhikari from SECARD Nepal participated in Training on how to become a plant doctor held at Lamjung on December 2008. December 2008 became the historic month in the field of plant health system of Nepal. Global Plant Clinic organized a training on how to become a plant doctor-module 1 and facilitated two pilot plant clinics in Lamjung district of Nepal in support of World Vision International Nepal. Total of 23 people were attended the training and served the pilot clinic as plant doctors.

Plant health clinic is a new concept and procedure to provide technical assistance to farmers regarding the plant health problems due to various causes. Similar with the human hospitals or veterinary hospitals, plant clinic is the hospitals for the ill plants where farmers brought their diseased or problem facing plant or plant parts. In each plant clinic, well trained plant doctor examines the diseased plant thoroughly and suggest available preventive and curative measures. Farmers are suggested to follow the recommendation

provided orally while discussed at the clinics and the notes written on prescription paper.

Plant clinic is an effective tool to provide appropriate plant health service to the needy farmers. Each farmer who will visit the clinic is expected to get proper diagnosis of their problems and satisfy his/her thirst of effective and appropriate solution upon their respective problems after a thorough discussion and interaction with the plant doctors.

2. Plant Clinic in Operation: Detailed Methodology

After participating in the first module of the training on how to become a plant doctor, Mr. Adhikari brought this innovative concept in publicity and action. Before planning the plant clinic in project area of SECARD Nepal, series of in-house discussion and planning meetings.

Before getting a rigid conclusion about plant clinic operation, a wider level stakeholder identification and discussion was made. Mainly, District Agriculture Development Office (DADO), farmer's groups/cooperatives and community based organizations as well as other locally acting CBOs were selected as the major stakeholders for the plant clinic operation. Different level of discussion and meetings were held with those



Figure 3: Handbills prepared to disseminate the organization of plant clinics mentioning date, venue and time.

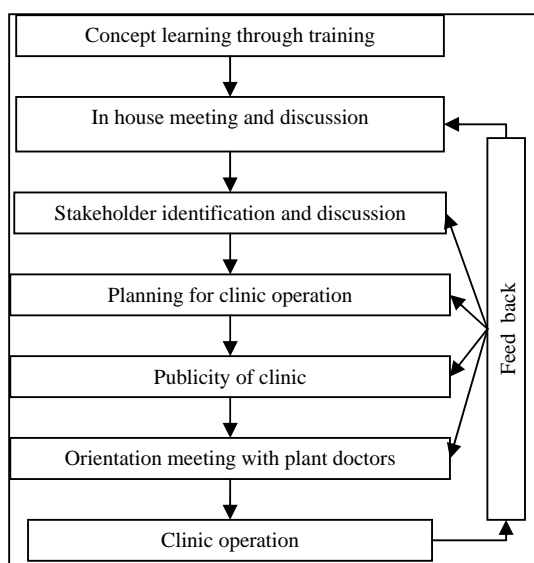


Figure 4: Operation procedures of plant clinic.

Stakeholders regarding the concept, effectiveness and prospects of the approach. Most of all appreciated the concept and encouraged for its operation. At the end, DADO Kathmandu agreed to go together with SECARD Nepal to implement this concept with fullest moral support. SECARD Nepal tried to operate few clinics in its command area.

After deciding the of plant clinic conduction, a consultative planning was made in active participation of all stakeholders. A meeting of group/cooperative leaders of the potential clinic coverage area was held in which a brief introduction of the concept on plant health clinic was given. That meeting realized the need of such initiative as soon as possible and decided the date, time and venue of the first clinic. Those group leaders were very enthusiastic about initiative and communicate with their group members about this concept and visit the clinic with problems. On the other hand, publicity of the planned clinic was done through distribution of handbills in and around the command area. Furthermore, field staffs of SECARD Nepal were mobilized to disseminate the concept to as much of the farm households as possible. Furthermore, local government bodies (Village Development Committee, health posts, police posts) community organizations, clubs, were also informed about the clinic operation and their presence is requested. Before starting the operation of clinics, plant doctors made a strategic plan to deal with the problems and recommendation. That meeting decided to advocate for both preventive and curative measures on each problem and recommend the use of locally available, eco-friendly curative or treatment procedures as far as possible. That is in background that, SECARD Nepal is promoting sustainable agriculture in those project areas.

Our first plant clinic was operated in Bhimdhunga VDC of Kathmandu district in which 64 farmers visited with different queries. Soon after the first clinic, another one was operated in Jeevanpur VDC of Dhading district where 76 farmers put their queries in the clinic. Different photo sheets were displayed at and around the clinic on which farmers became familiar with the disease symptoms as they have experienced on their farm land.



Fig 5: Plant Clinic operation in Kathmandu

Venue: Yard of Public School in roadside
 Duration: 11 am to 3 pm
 Date: January 31, 2009
 Organization: SECARD Nepal and DADO, Kathmandu
 Operation Model: Mobile
 Major Crops dealt: Fababean, potato, maize, litchi, cauliflower, cucumber, citrus



Figure 6: Operation of plant health clinic in Dhading

Venue: Roadside, (Near Cross Road)
 Duration: 11 am to 3 pm
 Date: March 18, 2009
 Organization: SECARD Nepal
 Operation Model: Mobile
 Major Crops dealt: Pear, peach, orange, maize, litchi, banana, jackfruit

3. Statistics of Registered Queries

All together 107 female and 33 male farmers visited the clinic with their problems. Figure 5. gives the detail of farmers visited the clinic.

Going through the statistics of the crops, total of 32 crop species were brought to the clinic. Table 1 describes the frequency of the crop species that were brought for the diagnosis and curative information.

Clinic at Kathmandu encountered the highest number farmers facing problem with wheat (10) followed by faba bean (9) and potato (5) while clinic at Dhading registered the higher number of farmers having problem with pear (11) litchi (10) and maize (6).

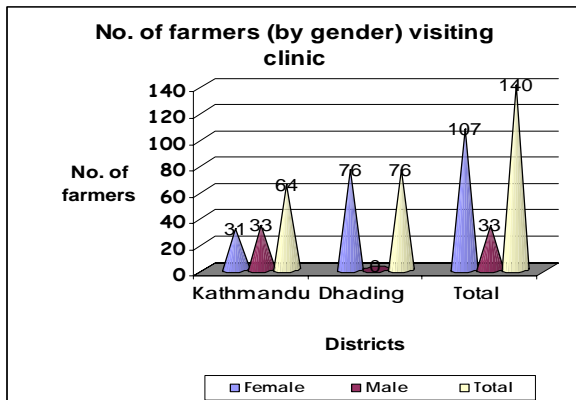


Figure 5: No. of farmers (by gender) visiting plant clinic



Figure 6 : Finding the problem: Men, women and children themselves look upon the color chart of the plant diseases from where they can compare the symptoms with figures.

Use of photo sheets in clinic operation is another effective tool for identifying the problem. Even a small child can compare the photo with the problem he has seen in his farm and interact with plant doctor for possible solutions.

Comparing the type of crops, most of the farmers brought the problems on vegetables and while in Dhading clinic, majority of the cases were of fruits. It may be due to difference in season and physio-geographical difference between the two clinic places. The command area of Kathmandu clinic is the working area of SECARD Nepal while that of Dhading clinic is the new project site. Farmers of Dhading clinic have less access to agriculture services from government as well as from non governmental organizations. Therefore, management related problem were more encountered in Dhading clinic.

Table 1: Different crop species brought in clinic

Crops	Frequency		
	Kathmandu	Dhading	Total
Apricot	0	3	3
Banana	0	2	2
Bitter Gourd	0	1	1
Broad leaf mustard	3	0	3
Cauliflower	3	0	3
Chilly	0	4	4
Citrus	0	3	3
Cucumber	3	4	7
Egg plant	1	0	1
Faba bean	9	0	9
Garlic	3	0	3
Ginger	1	0	1
Jackfruit	0	4	4
Lemon	0	1	1
Lime	0	2	2

Litchi	3	10	13
Maize	4	6	10
Mango	1	4	5
Onion	1	0	1
Orange	3	1	4
Peach	0	4	4
Pear	1	11	12
Pomegranate	1	1	2
Potato	6	0	6
Pumilo	0	1	1
Rape Seed Mustard	2	0	2
Rice	2	3	5
Sour orange	3	5	8
Sponge Gourd	0	1	1
Tomato	3	3	6
Tree Tomato	1	2	3
Wheat	10	0	10
Total	64	76	140

During the clinic operation, different types of problem on above mentioned crops were found. While classifying them according to the causal organism or agent, fungus was primary causal agent at Kathmandu clinic followed by fungus, abiotic and complex of two or more of different causal agents. But, at the Dhading clinic, abiotic factor was found to be the major cause of plant health problem. Poor crop management and faulty agronomy practices were the major causes for illness of plant. Insect related problem was second to abiotic followed by fungus related problem. Intensity of different problem causing agent is presented in table 3. All the cases were identified at least for their causal agent at Kathmandu clinic but three cases couldn't be identified at Dhading clinic.

While classifying those causal agents in broad categories, Kathmandu clinic registered 50 cases due to biotic factor while Dhading clinic registered 35 cases due to abiotic factor and 34 cases due to biotic factors. Kathmandu clinic encountered 5 complex cases while Dhading clinic registered 4 complex cases and 3 unknown cases. Those 3 unknown cases (in table 2) were taken into discussion furthermore among the agriculture technicians.

Table 2: Causal agents of the problems registered in plant clinic.

Agent	Frequency		
	Kathmandu	Dhading	Total
Abiotic	9	35	44
Bacteria	1	0	1
Complex	5	4	9
Fungus	15	8	23
Insect	29	24	53
Parasite	1	0	1
Virus	4	2	6
Unknown	0	3	3
Total	64	76	140

4. Who Were the Plant Doctors ?

 A photograph of Mr. Raj Kumar Adhikari, a man with glasses and a brown jacket, looking down at a document he is holding. In the background, there is a poster with Nepali text and illustrations of people.	<p>Mr. Raj Kumar Adhikari is one of the participants of the training 'how to become a plant doctor: module 1' organized by GPC in Lamjung, Nepal. He is a graduate in Agriculture and working as program officer in SECARD Nepal. Now, his effort is concentrated to disseminate the concept of mobile plant clinic, getting attention by different stakeholders and operating plant clinic in collaboration with different organizations.</p>
 A photograph of Mr. Bashu Dev Bhandari, a man with a mustache wearing a dark jacket, holding a thin branch. Behind him is a poster with various agricultural images and Nepali text.	<p>Mr. Bashu Dev Bhandari, Plant Protection Officer of DADO, Kathmandu, is a graduate in Agriculture. He is an experienced agriculture extension worker especially in the field of plant protection, mushroom production and bee keeping. He is partly contributing to mobile plant clinic on behalf of DADO Kathmandu, by being one of plant doctors.</p>
 A photograph of Mr. Bed Prasad Khatiwada, a man in a dark jacket over a plaid shirt, looking at a poster on the wall. The poster features various plant-related images.	<p>Mr. Bed Prasad Khatiwada is one of the participants of the training 'how to become a plant doctor: Module 1' organized by GPC in Lamjung, Nepal. He is a graduate in Agriculture (Horticulture) and is vice chief of SECARD Nepal. During his tenure, at World Vision International Nepal, he played a connecting role in introducing the concept of plant clinic in Nepal in coordination with Global Plant Clinic, UK after he read an article named 'plant clinic for healthy crops' on LEISA magazine.</p>
 A photograph of Mr. Bishnu Prasad Pokhrel, a man in a yellow jacket, examining a plant branch. A poster is visible in the background.	<p>Mr. Bishnu Prasad Pokhrel is an experienced person in the field of sustainable agriculture. He is working as program supervisor in SECARD Nepal, a NGO dedicated to sustainable agriculture development in Nepal. And, he has played the role of clinic manager for plant clinics operated by SECARD Nepal.</p>

5. Clinic Operation Methodology

5.1 Preparation for clinic operation

- Sharing among staffs including executive committees
- Planning meeting and consultative sharing with group leaders at field
- Development of handbills to disseminate information among clients and stakeholders
- Necessary background information collection, preparation of fact sheet, photo sheets.
- Selection of plant doctors
- Orientation to plant doctors

5.2 Operation of Clinics

- Listening to the farmers queries.
- Asking to the farmers on crop management, history of land.
- Recommending the eco friendly and local resource based technologies and management options.

5.3 Post clinic follow up

- Supervision by field staffs and technical staffs in project areas.
- Evaluate the farmer's perception on the initiative and efficacy of the recommendation.
- Use of recommendation into practice.

During the orientation and planning meeting of plant doctor, a common strategy was made for problem identification and recommendation. All plant doctors were asked to follow the procedure. Before telling the consequence of problem, plant doctors interact adequately with the farmers about the problem that he is experienced. While observing and listening the farmer's queries, detail



Figure 8: Information is knowledge : One of women farmer reading prescription after attending in the clinic.

As in human clinic or hospitals, prescription notes are given to the farmer who visited the clinic with plant health problem mentioning the detail diagnosis and necessary preventive as well as curative measures. Those prescriptions written in simple words of local language are good and easy to understand even by poorly literate farmer or by their children and were found to be very useful to memorize the information provided by the doctors.

of information like age of plant, past crop at that land, availability and use of irrigation, other agro-inputs, first incidence and current severity of such problem was known from the respective problems. Furthermore, use of any preventive or curative measures if applied were also asked to the farmers. Fully utilizing the knowledge and experience of plant doctors, problems were identified and all suitable recommendations were made considering the information obtained from farmers. Besides writing on prescription note, farmers are provided information on nature of problem, causal agent characteristics and necessary approaches to follow.

6. Lesson Learnt and Future Perspective

As stated above, plant doctor and plant clinic is a new concept and procedure for plant health system in Nepal, though we tried to apply it with our limited resources. Running two plant clinics experienced in many aspects of plant health. More especially, we were able to identify and rank the major plant health problems of the clinic site which will assist to plan and implement the future programs on agriculture development. These two clinics helped us to identify the critical points and the basic elements to plant clinic operation to benefit farmers sustainably and effectively.

Though, these two clinics are supposed to be successful in terms of queries encountered and farmer's positive response, plant doctor's knowledge and exposure is still inadequate which should be widened especially on some technical aspects and more on clinic management skill are essential. Therefore, more training and exposure visits to the established plant clinic will be beneficial. On the other hand, more plant doctors are to be trained who can handle rural plant clinics independently. More importantly, there is a need of greater publicity of these concepts and getting wider attention and cooperation of different stakeholders especially from District Agriculture Development Offices, local government bodies and community organizations is essential.

Request for more plant clinic in those sites and from other parts of the country has encouraged us to conduct more clinics. Realizing the need and effectiveness of such mobile plant health clinics, SECARD Nepal is planning to

conduct further more plant clinics in different parts of the country on regular basis. For this, it is interacting with different stakeholders and seeking resources to initiate them effectively.

7. SWOT Analysis of the Initiative

Strengths

- Wider acceptance by farming communities.
- Proper diagnosis can reduce productivity loss that may otherwise occur.
- Complement the government extension service which is narrowed down in recent years due to limited resources
- Can increase food security by solving epidemics, endemics and pandemics through timely mobilization of the mobile plant clinic in action.
- Can be a convincing way of disseminating technologies of crop management.

Weakness

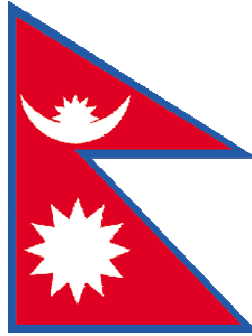
- Being relatively advanced science of plant protection, trained plant doctor may not be available and may be costly if suitable approach is not taken

Opportunities

- Establishment of agriculture information center cum plant clinic for dissemination of appropriate technologies and solving the plant health problems
- Establish commercial plant clinics at commercial crop production areas
- Integrate the concept to national agriculture policy and national crop protection policy to have wider impact through government service system.
- Development of local plant doctors getting trained in plant disease, insect pest and nutrient management to have sustainable impact.

Threats

- Lack of proper coordination and tie up with government may lead to creation of parallel extension service
- Haphazard recommendation by plant doctors may lead to indiscriminate use of agrochemicals further worsening the plant protection system.



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