Experience of community IPM in Nepal

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Abstract

Integrated Pest Management (IPM), is a combination of management strategies that farmers use to minimize the impact of pest and diseases on their crop. The emphasis of an IPM farmer field school approach is a sustainable production through the conservation of natural biodiversity in the field. Nepal started this approach in 1997 and its success with farmers was so immense, that community IPM was introduced in 2000. Farmers developed personal and organizational capacities so they became trainers, planners and researchers to carry out different IPM activities for their communities. Nepalese farmers have become better managers, they have increased their yields, safeguard their health and protect the environment 14000 farmers have gone through farmer field school (40 % are women and 10 % are illiterate).

Introduction

Nepal is an agricultural country and about 81 % of the country’s 22 million people depend on the agriculture for subsistence. The share of agriculture in the national GDP is 40 %. Major crops of Nepal are rice, wheat, maize, vegetables, potatoes and fruits. One of the main constraints to increase agricultural production is yield losses due to diseases, insects, pathogens, weeds, nematodes, mites, rodents and birds. An estimate annual yield loss is about 35 % of the total production. To reduce this loss farmers use synthetic pesticides, which are expensive, cause negative environmental consequences and are health hazardous to the growers and consumers. Integrated pest management (IPM) is a priority activity in line with the government’s policy for reducing pesticides and increasing food production, food security and sustainable agriculture.
To minimize these economic losses, the farmers themselves are empowered to make their own decisions in applying crop management strategies. These are based on their own analysis of the agro-ecosystem and their knowledge generated by conducting studies in their own field. The farmer’s field school (FFS) is a model of a non-formal education process of learning by experiments and discovery and has proven to be very effective. This approach emphasized the need for farmers participating in the farmer field school to understand the rice eco system. The curriculum includes crop physiology, agronomy, identification of natural enemies, pests and diseases, health risks to pesticides and group dynamics. The principle of IPM emphasized in the FFS are; 1. Grow healthy crop, 2. Visit field regularly, 3. Identify and conserve natural enemies and 4. During this process farmers become experts in their field management. Facilitating farmers to understand biological control through field investigation are the key to successful implementation of Integrated Pest Management.

IPM helps farmers to raise their crops yield and increases their income by improve returns on investment. In Nepal program carried out by FAO for Community IPM in Asia, the GCP/RAS/172/NOR has shown that IPM trained farmers increase their rice yield by about 15 to 25 % and reduce the use of pesticides by about 40 %.

**Pest management practices and their problems in Nepal**

In Nepal, chemical control has been the primary method of pest control in the past since its introduction in 1950s. Pesticides are commonly used to control various economically relevant pests and diseases. The consumption of pesticides per unit area is estimated to be 142 g/ha. Some of the reasons for the increase of consumption of pesticides over the years are:

a. an increase in area and intensity of various vegetables (especially off season)

b. an increase in area under high yielding varieties of rice, for which farmers use high inputs

c. sales promotion activities of pesticide dealers have motivated a large number of farmers to use pesticide indiscriminately without caring for the bad effects on the non-target species and the environment

d. excessive use of pesticides by farmers out of ignorance

At present 255 trade names have been registered in Nepal. In 2000, 108 mt active ingredients
pesticides were used. All these are imported. Although pesticide use in Nepal is very low compared to neighbouring countries (India use annually 320 g /ha) the misuse of pesticides has been a problem.

**Need for Integrated Pest Management in Nepal**

Considering the fact that:

a. Nepal needs to increase its crop productivity in a sustainable way.
b. Pests continue to cause serious crop losses.
c. Use of pesticides is the main method of pest control. Such continued heavy use of chemicals leads to serious environmental and human health problem, pest resurgence, new pest problems, development of resistance.
d. Farmers are often ignorant of pesticide use and need to be educated.

There is a real need for an alternative strategy, IPM therefore is considered to be the alternative strategy.

**National IPM Programme**

The National IPM Program aims to make integrated pest management in major rice-vegetable growing areas in Nepal and is based on field works and total participation of the farmers and farming communities. The practice of IPM among farmers is achieved through direct training in Season-long Farmers Field Schools (FFSs). Farmers are empowered to make their own decisions in applying crop management strategies based on their own analysis of agro-ecosystem and their knowledge generated by conducting studies in their own field. FFS models of non-formal education process of learning by experiments and discovery has been very effective. As the National IPM Program enters its 4th year of implementation, it now aims at institutionalizing IPM support and activities at the field, district, regional and national levels.

Major thrust are focused on:

**A. Core Training Activities**
1. **Training of IPM Trainers (ToT)**

An IPM training of trainers course is a season-long (16–18 weeks) training on IPM for Assistant Plant Protection Officer and Assistant Extension Officers who are responsible for conducting Farmer Field School at the district level.

2. **IPM Farmer Field School (FFS)**

IPM Farmer Field School is a season-long training on IPM for farmers, facilitated by trained IPM trainers (Assistant Plant Protection Officer APPO). Each FFS comprise of twenty five to thirty farmers.

**B. Follow-up Program Activities**

1. This activity comprises refresher training to IPM trainers to strengthen technical, management and facilitation skill.

2. Activities aimed to establish IPM communities through farmers' societies, farmers to farmers training, farmers' participatory planning, implementation and farmers' science.

**C. Horizontal and Vertical Linkages**

Coordinated efforts are made to share the experiences and jointly plan and implement the program. Linkages are made with government institutions (National Agricultural Research Council NARC; Institute of Animal and Agriculture Science IAAS, Commodity Divisions) and NGOs.

**D. Focus on Development of IPM in Other Crops**

Focus on development of IPM in other crops like potato, vegetable, fruits, tea and cotton is felt.
IPM Activities

Initial activities

- Before Nepal's participation in the Technical Cooperation Project (TCP) 1997 the program interventions were made with a concept of promoting the integrated use of different pest control methods to avoid or minimize pesticide use.
- Program coverage included the use of diseases or pest tolerant varieties, use of biological control of certain economic pests such as fruit flies in citrus and cucurbits, lepidopterous pests in cotton and tomato and woolly aphid in apple and botanical pesticides extracted from plant species such as *Azadiracta indica*, *Acurus calamus*, *Zanthoxylum alatum*.
- These interventions made before 1997 makes it clear that pesticide reduction strategy, guided basically the Nepalese IPM Program rather than application of ecological principles.
- It was the implementation of TCP project in rice in 1997 which brought Nepal into new paradigm of the discovery based, participatory and farmer – based educational process founded on the sound principles of agro-ecosystem analysis by farmers for decision making on pest management strategy promoted through season long Farmer's Field School.

Table 1 Different IPM Activities 1998-1999

<table>
<thead>
<tr>
<th>Year</th>
<th>Training of trainers for Officers</th>
<th>Number of Field Schools</th>
<th>Number of Farmers Trained</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>1 / 35</td>
<td>35</td>
<td>875</td>
</tr>
<tr>
<td>1999</td>
<td>1 / 35</td>
<td>68</td>
<td>1700</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 / 70</td>
<td>2575</td>
</tr>
</tbody>
</table>

Current IPM Activities

The current phase of Regional Community IPM Program began in January 2000. The beginning of new millennium is also the start of Community IPM in Nepal. Two year's experience showed that the Rice IPM Farmers Field School is only the beginning, the entry point, for a longer term process while farmers develop the personal and organizational capacities necessary for sustaining agricultural and community development. Activities have started which give focus on:
• **Farmer as IPM Trainers (Farmer ToT, Farmer FFS)**

Farmers have proven to be able and responsible trainers as these farmer trainers gain skill and experience; they become an important resource for their community.

• **Farmers as Planners**

Alumni farmers develop local plan for deepening and disseminating IPM in their communities.

• **Farmers as Researchers**

Farmers master basic scientific principles and learn to design studies and organize local research geared to adverse their specific local problems and conditions.

• **Farmers as Organizers**

Graduates from FFS create forums and local organization for the exchange of information, and for the discussion of study results work plans. Arrange for publication of leaflets, radio program etc.

Three new programs as follow-up activities are introduced:

1. **Participatory Planning and Implementation**

   This is a five session planning activity where FFS graduate farmers participate to do bottom-up planning to solve the agriculture related location-specific problems encountered during conducting FFS. After they have prioritized the activities they plan to implement most in the following season by themselves.

2. **Farmer to Farmer FFS**

   The FFS graduate farmers receive 10 days Training of Trainers so that they themselves can organize and conduct season long FFS for their neighbors and communities with the financial assistance from various sources at the local level.

3. **Farmer Studies**

   Farmers master basic scientific principles and learn to design studies and organize local research geared to address their specific local problem. Farmers develop their scientific attitude and master basic scientific methods. They learn to design, conduct, analyze and interpret their own field research.
All these activities justify the goal of community IPM to institutionalize IPM at the local level by putting farmers in control of the process of planning and implementation of their own IPM Program.

### Table 2 Different IPM Activities 2000-2001

<table>
<thead>
<tr>
<th>Year</th>
<th>ToT / Officers</th>
<th>ToT / Junior Technicians</th>
<th>ToT / Farmers</th>
<th>Number of Field Schools</th>
<th>Number of Farmers Trained</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td></td>
<td>6 / 156</td>
<td></td>
<td>89</td>
<td>2225</td>
</tr>
<tr>
<td>2001</td>
<td>1 / 35</td>
<td>1 / 35</td>
<td></td>
<td>206</td>
<td>5150</td>
</tr>
<tr>
<td></td>
<td>1 / 35</td>
<td>1 / 35</td>
<td>6 / 156</td>
<td>103</td>
<td>7375</td>
</tr>
</tbody>
</table>

### Future Plans and Priorities

Based on the review of the present status of IPM in the country, efforts are be made to sustain IPM in Nepal through governments and NGOs. In the nearby future emphasis will be given to the following activities:

1. improved monitoring of field activities
2. expand the number of farmer trainers
3. strengthening of farmers trainers associations
4. improve and broaden skills of farmer trainers (training, facilitation skills, farmer studies, participatory planning)
5. develop a vegetable IPM Program in the districts
6. strengthen NGO/GO collaboration
7. improve publicity of project activities, raise farmer and consumer awareness
8. increase gender sensitivity among IPM trainers and farmers
9. expand the IPM curriculum with post-harvest exercises
10. strengthening linkages with national scientists and other the institutions involved in research and development of sustainable agriculture,
11. search for ways to secure further funding for the National IPM Program.

### 2002 and beyond

Although the IPM Program in Nepal has made tremendous progress since its launch in 1997, it is still vulnerable and needs further support in order to sustain the activities. HMG/N will increasingly take over the responsibilities to organise and fund district IPM activities but financial and technical support will be needed for another 4-5 years to come, to:
1. improve the monitoring system
2. strengthen collaboration with NGOs
3. develop farmer trainers skills
4. build up farmers IPM organisations
5. strengthen links with research institutions

Broaden and sustain the IPM approach (different crops, related sectors, institutional development).

Lesson learned

By December 2001, the National IPM Program in Nepal has trained over 121 trainers-of-trainers, and more than 14000 farmers in the main rice growing districts. But so far, high quality replication still remains a challenge. Main point that emerged out of the experience includes:

- Introducing IPM cannot be compared to transfer of technology by experts to non-experts. It requires facilitation of a learning process, and not adoption of a single innovation. This means a paradigm change with respect to extension approach.
- The IPM Farmer Field School is a process, not a body of knowledge. The critical issue in training is discovery learning focused on the ecology of the rice field, which can be learned by observation, if the process is good. This makes the Farmer Field School easy to be replicated.
- Training of IPM trainers requires the same learning process as farmers (season-long, discovery-learning, field based). Learning IPM is directly related to daily farming experiences and problems. It takes time and practice IPM trainers to acquire sufficient knowledge and skills.
- Through their intensive IPM training, assistant plant protection officers became committed to IPM and to the facilitation approach of training. This commitment could sustain because of their position within the structure of the Department of Agriculture. For farmers, season-long IPM training in Field Schools and ten-day training-of-trainers appears to be enough to become good IPM trainers, since commitment and communication skills usually exist among farmer trainers.
• Farmers are considered the best candidates to be the primary IPM trainers for farmers in the future. The IPM Program is then to support farmer-conducted Field Schools with funds and in the future APPOs will no longer able to do the field work which is expanding, but they will be capable to do planning and monitoring of IPM activities at a higher level.

• Several issues of primary concern include maintenance of training quality, institutionalization, and task distribution of government officials or NGO staff who are inevitably involved.

Conclusion

IPM is a program that is particularly suited to poor farmers because it does not require the use of external resources and is compatible with the integrated farming systems associated with poor subsistence farmers. It can increase agricultural productivity, reduce production risks, increase farmer's income, improve their health, protect their environment and over all empower the farmers, therefore it has become a successful and popular program in Nepal.