IPM FFS Training To Farmers

FHEN FFS report in Chitwan, Nepal: concepts, practical examples and feedback

Nepal Public Health Foundation Nepal (NPHF)
Farming, Health and Environment Nepal Project

FHEN FFS Report in Chitwan, Nepal: Concepts, Practical Examples and Feedback

Report prepared by

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Date: May, 2020

Acknowledgments

It is my pleasure to express my deepest acknowledgement, profound gratitude and sincere appreciation to all my concerned people, farmers and different organization for their contribution and support to go success for long duration IPM FFS training on the issue of pesticide and health. Although many IPM FFS training were conducted in Chitwan District, this training is believed to one of the multiple collaborative effort in the sector of agriculture and public health for reducing the use of pesticides for better health and environment of farmer and community.

I would like to begin acknowledge by thanking Prof. Dr. Abhinav Vaidya, Project Coordinator of FHEN, NPHF for his continuous guidance to this work. I am extremely fortunate having team members, Ms. Simrin Kafle, Dr. Amrit Pokharel, Mr. Shirjan Kumar Yadav and Ms. Usha Neupane who are strong pillars to this work.

I would like to cordially acknowledge and express my deepest gratitude to all the ward chairperson for their continuous support on selection of appropriate farmer with the principle of GESI for the training and providing hall for the different times of FFS program. Also, their Regular visit on the FFS field with motivational speech really gives encouragement and hope for the participants. I also want to acknowledge to all the farmers who provided their land/space for conduction of FFS training.

Heartfelt thanks to work with the District Coordination Committee, Chitwan, and with all the municipalities of Chitwan District. Our approach of joint planning, implementation and monitoring has made this training program a success one.

I extend my humble appreciation to all IPM facilitators (Mr. Krishna Murari Ghimere, Mr. Lekhanath Pokharel, Mr. Raju Poudel, Mrs, Rama Dhungana) for informative and interactive sessions. My sincere thanks to all specialist (Dr. Sundar Tiwari, Ghanshyam Bhandari, Shiva Raj Poudel, Meghnath Timilsina, Sudhir Shrestha) who have given their special classes during the long duration training. I would like to extend my gratitude to all farmers who were very enthusiastic and motivated to learn about the issue throughout the training course and expressed their commitment to implement their action plan.

-Sunil Dulal

Contents

1. Introduction

Farming Health Environment and Nepal 2017-2020 (FHEN Phase II) is a project which overall objective is to improve the health of farmers and consumers by promoting a healthy and sustainable food production in Nepal with a focus on integrated Pest Management. Regarding on this objective the one of the major activities of this project is to conduct the Integrated Pest Management Farmer Field School. (IPM-FFS).

A Farmer Field School is also called a school without walls, which teaches basic agroecology and crop management skills to the participants. A group of farmers gets together in one of their own field where real field problems are observed, recorded and analyzed from planting to harvest of the crop. Participants set up numbers of comparative studies and other supportive trials in the field. Participatory discussions, group decisions and agro-ecosystem analysis (AESA) are the fundamentals of IPM-FFS. The FFS was developed to help farmers adopt their IPM practices to diverse and dynamic ecological conditions.

Farmer field schools not only provide specific technical skills but also organizational skills and practice, analytical skills and practice, and basic group assets such as trust and confidence required for joint enterprises. IPM Field School was for running training to the farmers who were engaged on vegetable and crop production on five different areas (Shivanagar, Geetanagar, Padampur, Jutpani and Kumroj of Chitwan district. Through FFS farmers are able up to the point of being good agriculturist in close interaction with experienced farmer field school facilitators and the agriculture technician of government bodies.

1.1. Objectives of the training

- To enable the farmer to diagnose the real pest and diseases problems
- To develop the skill among the farmers identification on nature of damages

- To provide the skill and knowledge on IPM including their basic methods, principles and using techniques IPM tools
- To motivate the farmers to use the PPE and prevent other hazards of pesticides

2. Selection and number of the participants

In FHEN project, five FFS were run in five different areas of Chitwan district. Overall these areas cover both the eastern and western part of the Chitwan district. All together there were 148 farmer participated on the training. Meetings were conducted in the selected site/ field in order to inform, introduce and collect information for successful implementation and completion of Farmers Field School. The meetings were useful to take the commitment and assign the role and responsibilities of the different agencies as well as from the participants. Participants were selected by the ward chairperson with some certain following specific criteria. The criteria for the participants to be participated on IPM FFS were:

- Area of land size holding
- Number of years on farming especially vegetable production
- Number of participation on trainings

Those participants who do not participated on IPM training, with more experience on farming and have more area of land under crop production were preferred as participants.

In general there were three meetings before start up the farmer's field school.

- First preparatory meeting
- Second preparatory meeting
- Third preparatory meeting

The main objectives of first two meetings were identify and explain their need, select crops based on problems, profitability and market demand, select proper site and appropriate venue, make cropping calendar based on their own existing practices, analyze their problems that are useful for selecting experiments, trials, treatments, plot size etc. Whereas the objective of third meetings were soil sampling for testing, socio-economic analysis, sub-group division and selection of leader, norms Setting, day and time setting, expectation matching.

2.1. List of the FFS with number of participants

S.N.	Name of FFS	Location	Total number of participants
1	Shivanagar IPM FFS	Bharatpur Metropolitan city, Ward no: 14	30
2	Shrijansil IPM FFS	Kalika Municipality Ward No: 2,3,6&7	30
3	Kalika IPM FFS	Kalika Municipality Ward No: 1,4 &5	29
4	Janajagriti IPM FFS	Bharatpur Metropolitan Municipality Ward No: 6 & 13	31
5	Kumroj IPM FFS	Kharahani Municipality Ward No: 12 & 13	28
Total			**148**

Major Crops Selected for the IPM FFS

For the selection of crops matrix ranking method was done. There were two main trail plots in each FFS, in which generally, IPM Plot is of 250 m^2 and farmers Plot was 250 m^2. But on accordance on the availability of land and crop we have different

area of IPM plot and farmers plot in 5 different IPM FFS. The main crops selected for the IPM FFS on five different places was shown in the table below:

S.N.	Name of FFS	Main Crop	Trails		
			Varietal	Mulching	Fertilizer
1	Shrijansil IPM FFS	Bitter gourd (Pali)	Pali, Pari, Archana & local	Plastic, Straw, Mustard, control	This trail was not done
2	Kalika IPM FFS	Cowpea (Surya)	Surya, Chinese, Akash, Prakash	Plastic, Straw, Mustard, Control	Two bucket FYM, One bucket FYM, Chemical fertilizer and Control
3	Janajagriti IPM FFS	Bitter gourd (Pali)	Pali, pari, Archana & local	Plastic, Mustard, Straw, Control	This trail was not done
4	Kumroj IPM FFS	Rice (Hardinath, 1442)	Hardinath, CH5, Radha 4, PR	No any mulching trail	Ash, GMT, Chemical, Mixed
5	Shivanagar IPM FFS	Bittergourd (Pali)	Pali, pari, Archana & local	Plastic, straw, Mustard, control	This trail was not done

3. Spatial Design for all FFS

In Each weekly session following usual activities were conducted:

1. Agro-Ecosystem Analysis (AESA): It is the main activity of the field school. The AESA includes:

Field observation and data collection: Observations are made on the soil conditions, plant health status (leaf color, withering etc.), plant growth and development, pest and disease attack symptoms, number and types of pests and

their natural enemies, weather conditions, weed incidence and environmental conditions around the field.

Recording of the observations and graphical representation of insects, weather and the growth & development of the crop on a newsprint paper or brown paper: In a shaded area close to the field, farmers report all their field information in a chart paper. The plant is represented in its present state of growth.

Discussion, analysis, and interpretation of field information: Comparisons are made between the number and type of pests, the number of natural enemies and the growing stage of the plant. Thus, conclusions are drawn and the field status was built up.

Decision-making: The outcome of the agro-ecosystem analysis process is the decision-making. The group decides if any pest control measures or other crop management operations are necessary.

2. Presentation of results and the decisions taken to the entire group: The results of the field observations and the decision are presented on a plenary session for comment and improvement.

3. Implementation of previous AESA decisions: Just after field observations and data collection, participants carry out the decisions made a week ago.

4. Group dynamics exercise: Group dynamics exercises are to develop group cohesiveness and problem-solving skills, and encourage collaboration, creativity and self-discovery.

5. Special topics: Special topics based on local agricultural problems and conditions help supporting the agro-ecosystem analysis by delving more deeply

into specific issues relating to agro-ecology, crop development, IPM principles etc.

6. Evaluation of the day and planning for the following week.

7. Evaluation and Certification were parts of FFS sessions: Pre and post-training tests were organized for the participants. Farmers with high attendance rates, their participation on the field, presentation and who mastered the field skill tests were awarded graduation certificates.

4. Disseminated technologies

The technologies disseminated through the IPM field school were almost same in each FFS. The major technologies disseminated were:

- Germination test in farmers filed
- Improved Farm yard Manure
- Jhol Mol bio-pesticides
- Waste decomposer
- Planting distance
- Application method of different fertilizers
- Different lure and traps

All of these models were also performed with a great interest by the facilitators and participants for the learning purpose.

5. Special theoretical class covered in FFS

- **General Concept of Farmers field school:** General background information, history, principles and methods were discussed.

- **IPM concept and Methods:** The meaning of IPM, its
- principles, various types of IPM methods such as cultural, mechanical, physical, biological, innovative approaches and finally use of chemical pesticides as a last resort were delivered in training. In addition, various IPM tools were demonstrated from time to time based on necessity.
- **Soil exercise:** The acidity and basicity of soil were practically demonstrated with using PH meter. The participants were demonstrated first the soil sampling methods. The acid soil and basic soil are not suitable to grow crop but neutral soil is best to grow crop.
- **Soil sterilization techniques:** Soil sterilization helps to sterilize the soil and protect the crop from soil born diseases. That course covers about the general principle of soil sterilization and process. A white plastic was used in a seed bed and kept in field for 15 days. Intense light kills the harmful germs in the soil covered by plastic mulch.
- **Seed exercise**: Seed was tested in salt water solution. Salt water helps to float the diseased seed. This is most popular method of seed testing in local level which reduces at least 70% seed born diseases.

- **Botanical pesticide preparation:** Plants having bitter, acidic, pungent and hot taste were collected, useful for preparation of botanical pesticide.

Process:

Ingredients such as bulb of onion, clove of garlic, rhizome of ginger and cattle urine were mixed thoroughly.

Finely grind the leaves and all ingredients and mixed with the cattle urine.

Keep above ingredients in closed vessel for 15-20 days.

Filter the liquid from the mixture. Muslin cloth are used for filtration and

Spray the mixture with mixing water at the ratio of 1:10 or 1:6 or 1:5 depending on the plant stage and pest population.

6. Field technology and practices disseminated on five different IPM FFS.

S.N	Practices	IPM FFS	
1	**Varieties**	Shrijansil	Pali- F1
		Kalika	Surya
		Janajagriti	Pali-F1
		Kumroj	Hardinath-1
		Shivanagar	Pali- F1
2	**Germination test**	Shrijansil	Seeds in line and number of germinated seeds in 1 week were conducted in all four FFS.
		Kalika	
		Janajagriti	
		Kumroj	
		Shivanagar	
3	**Land preparation**	Shrijansil	Disc Ploughing twice and gentle hand hoe twice (except in Kumroj FFS).
		Kalika	
		Janajagriti	
		Kumroj	
		Shivanagar	
4	**Planting Plot**	Shrijansil	Flat
		Kalika	Flat
		Janajagriti	Flat
		Kumroj	Puddled well levelled land
		Shivanagar	Flat
5	**Number of plants per pit or in hill**	Shrijansil	2 seedlings per pit
		Kalika	2 seedlings per pit

		Janajagriti	2 seed per hoe
		Kumroj	3 rice seedling per hill
		Shivanagar	2 seedlings per pit
6	**Planting spacing**	Shrijansil	150 X 100 (R-R X P-P)
		Kalika	50 X 30 (R-R X P-P)
		Janajagriti	150 X 100 (R-R X P-P)
		Kumroj	20 X 15 (R-R X P-P)
		Shivanagar	150 X 100 (R-R X P-P)
7	**Application of fertilizers**	Shrijansil	FYM 6 k.g per pit, Micronutrient Bhumi care and Bhumi Gold, Vermicompost 500 gm per pit.
		Kalika	FYM 1500 kg, Micronutrient Bhumi care and Bhumi gold, Vermicompost 50 kg.
		Janajagriti	FYM 6 k.g per pit, Micronutrient Bhumi care and Bhumi gold, vermicompost
		Kumroj	FYM 1500 k.g, Micronutrient Bhumi care and Bhumi gold, vermicompost
		Shivanagar	FYM 1500 kg, Micronutrient Bhumi care and Bhumi gold, Vermicompost 50 kg.
8	**Refilling/ re-transplanting**	Shrijansil	No need of refilling or re-transplanting
		Kalika	Refilling was done on 4th week after sowing
		Janajagriti	No need of refilling and re-transplanting
		Kumroj	No need of refilling and re-transplanting
		Shivanagr	No need of refilling or re-transplanting
9	**Jholmol Botanical bio-pesticides**	Shrijansil	In all FFS botanical bio-pesticide was applied on the field. The bio-pesticide were applied 25 DAP/DAS, and it was sprayed on weekly basis.
		Kalika	
		Janajagriti	
		Kumroj	
10	**Treatment and use of traps**	Shrijansil	Yellow sticky trap and Cue lure trap was used
		Kalika	Yellow sticky trap was used.
		Janajagriti	Yellow sticky trap and Cue lure was used.
		Kumroj	Yellow sticky trap, B.T, Metarharzium anisoplae was used to control rice borer.
		Shivanagar	Yellow sticky trap and Cue lure trap was used

7. Total expenditure and income from the crops in different FFS

S.N	FFS	Expenditure on FFS field	Income on FFS field
1	**Shrijansil IPM FFS**	Rs. 8285	In IPM Plot 220 Kg = 6200 In Farmers Plot 149 Kg = 3900

2	**Kalika IPM FFS**	Rs. 7000	As the performance of cowpea was not satisfactory. The production of cowpea was not satisfactory so that we cannot harvest cowpea. Although 4 k.g cowpea was harvested in the IPM filed while 2.5 k.g cowpea was harvested in the farmers field
3	**Janajagriti IPM FFS**	Rs.11000	In IPM field 250 Kg = Rs. 7500 In Farmers field 150 Kg = Rs. 4500
4	**Kumroj IPM FFS**	Rs. 5500	In IPM field 140.5 K.g = Rs. 2810 In FFS field 144.5 Kg = Rs. 2890
5	**Shivanagar FFS**	Rs. 8500	In IPM field 187 Kg = Rs. 9350 In FFS field 320 Kg = Rs. 16000

From the table we can see that there was not much more profit on agriculture crop production. This was because the materials were used for the small field area. So, the cost of production looks high. And also, our main aim was that to grow healthy crops and vegetable without use of chemical pesticides or minimal use of the pesticides.

8. Major findings

- For the better growth of the crop we should need to investigate the past scenario of the land.
- The crop attained better growth and production on plastic mulch.
- Among the bitter gourd Pali was the most productive and popular variety among the farmers. It had better production than other crops. Similarly, in the case of rice, CH-5 had better growth and production than rest of the other varieties. In case of cowpea, Kalika-4 was not suitable for the cowpea

production as in this area it has more clayey type of soil. If the farmer will to grow cowpea in this area, S/he need to raise the cow pea on the raised bed system too.

- ❖ Waste decomposer had good performance on crop growth.
- ❖ Use of micronutrients was most essential during the active growth stage of the crops.
- ❖ B.T was most effective bio-pesticides to manage the rice stem borer.
- ❖ Training was most essential practice for the bitter gourd or cucurbits crops.

9. Major Outcome

- ❖ Government bodies (Agriculture branch office, ward office and municipalities) had committed to brought programme related to pesticide minimization.
- ❖ Each ward FFS participants had developed their action plan and presented it on closing ceremony in front of concerned stakeholders.
- ❖ Majority of the participants committed for the formation of IPM farmers group.