

FTFNIPM Trip Report

Country and Places Visited:

Bangladesh, Bangladesh Agriculture Research Institute (BARI), Gazipur

Name of the traveler and her designation:

Ms. Kalpana Dhital

Field Coordinator/FTFNIPM Program

Period of Travel:

20 July 2022-28 July 2022

Purpose of Travel:

To participate in the International Training Program on “Mass rearing of different parasitoids and their field application as a component of IPM”

Description of Activities:

Women scientists from Nepal participated in Training on” Mass rearing of different parasitoids and their field application as a component of IPM “at the Bangladesh Agricultural Research Institute (BARI): The FTFNIPM Coordinator along with three women scientists from the Government of Nepal has been nominated and participated in the parasitoids rearing training organized by Entomology Division, BARI and Feed the Future Bangladesh Integrated Pest Management Activity supported by USAID mission, Bangladesh. We attended the training that started from July 23-27, 2022 (Saturday- Wednesday) at the Bangladesh Agricultural Research Institute (BARI). The team returned safely to Kathmandu on July 28, 2022 (Thursday). The learning from the training will be shared within the team during the meeting. The four nominated scientists and their affiliations include the followings:

1. Ms. Binu Bhat, Technical Officer, NERC, Khumaltar, NARC
2. Dr. Saraswati Neupane, Sr. Scientist, NMRP, Rampur, NARC;
3. Ms. Sushma Marahatta, Plant Protection Officer, PPL, Gandaki Province, Nepal
4. Ms. Kalpana Dhital, Field Coordinator, FTFNIPM/iDE Nepal

In the training altogether 10 participants from different sectors like four participants from Khulna University and Patuakhali science and Technology University (Two Professors and two students), two participants from BRAC Agriculture R & D Center and Bio pesticide and Fertilizer and four female scientists from Nepal (NARC, Provincial Laboratory from Gandaki Province and the Project) were participated in the training.

23 July 2022 (1st day)

The training was started on 23rd July 2022 at the conference hall of BARI. The program started with registration of all the participants along with warm welcome to the participants and guests from the head of Entomology division, BARI Dr. Nirmal Kumar Dutta. Then the technical session started with Dr. Syed Alam, Ex. Director, BARI and senior consultant CIMMYT on the topic of Bio-rational based Integrated Pest Management - An overview and biological control of insect pests, mass rearing protocol development and field release techniques. The sessions covered the scenario of biopesticide use in Bangladesh, use of chemical pesticides to control



insect pest and diseases, biological control and its approaches, type of biological control agents, different type of predators, egg, larval, and pupal parasitoids and microbial organisms and mass rearing. Dr. Rangaswamy Muniappan, chief investigator of IPMA program, Virginia Tech presented strengthening of bio control by transboundary exchange of tools, techniques and expertise amongst South Asian countries. He covered the brief introduction of biological control agents, types of bio-control agents, different types of predators, parasitoids and microbial organism. Mass rearing of parasitoids and its supply chain system, botanical pesticides and regional collaboration for the promotion of bio control agents within SAARC countries. Dr. Kohinoor Begun, Principal Scientific Officer, Entomology Division, BARI covered preparation of artificial diet for the mass production of wax moth in the Entomology Laboratory of BARI.

24 July 2022 (2nd day)

Due to the busy schedule of Dr Debasish Sarker, Director General, BARI, Inaugural session organized on the second day of the training. The Inaugural session chaired by Dr. Debasish Sarker, chief guest Dr. Shaikh Mohammad Bokhtiar, Executive Chairperson of BARC and others invited guests. Dr. Nirmal Kumar Dutta, Head of Entomology Division, BARI, gave the welcome remarks and thanked the Dr Rangaswamy Muniappan, FTF Bangladesh IPM program for financial and technical support for organization of the international training at BARI. The special guest said that such type of training will be useful for sharing the knowledge, transfer of knowledge and need to scale up. The guests from training center and VT gave their speech for collaboration in the technology dissemination within countries. The chairperson gave closing speech by welcoming all the participants and wished for the success of the training. The Director General explained on the role of BARI in agricultural development of Bangladesh especially emphasizing on pest management. Dr. Kohinoor Begun, Principal scientific Officer, Entomology Division of BARI, presented a practical session on mass rearing of larval parasitoids, *Bracon hebetor*, Wax moth rearing on artificial diet in the laboratory.

25 July 2022 (3rd day)

As following the principle of learning by doing, all the participants participated in the preparation of artificial diet for wax moth larvae, parent stock of wax moth development with honeycomb in a glass jar, first to second instars larvae of wax moth rearing in artificial diet, and 200 full fed larvae transferring in to a plastic bottle with a corrugated paper sheet. Later, *B. hebetor* adults were released in a plastic bottle with the wax moth larvae. Honey soaked cotton pieces was provided as food for the parasitoids. The mouth of the container was covered with a black cloth and kept on rack for parasitoid egg laying, larval development, pupation and adult emergence of *B. hebetor*. In about 8-10 days later, adults of *B. hebetor* emerged from the parasitized larvae and were ready for field release.



The mass rearing of egg parasitoids, *Trichogramma* spp on the host *Sitotroga cerealella* and *Corycera cephalonica* has been practiced by the participants in the laboratory.

26 July 2022 (4th day)

Dr Nirmal Kumar Dutta presented bio-rational based integrated management of different crops in Bangladesh and Ms. Binu Bhat from Nepal shared the practical experience about *Trichogramma* production in the laboratory of NERP/NARC, Khumaltar, Nepal. The practical session on the field released of egg parasitoids *Trichogramma* and larval parasitoid *Bracon hebetor* was carried out in bean and guava fields.

27 July 2022 (5th day)

Visited Ispahani Agro Limited, Konabari, Gazipur and observed different products like pheromones, bio pesticides and parasitoids produced by it. There was a very productive interaction and discussion with participants and company's staffs. We learned about various bio-pesticides, lures, and mass production biocontrol agents for pest management produced by Ispahani Agro Limited. Ispahani Biotech works in a variety of sectors, including vegetables, rice, maize, tea, cotton, sugarcane, tobacco, and mango crops, and crop-specific pest and disease management packages have been developed. The products available at the Ispahani Agro Limited are:

S. N	Category	Number of products
1	Sex pheromone lures	11
2	Bio-Insecticides/itocides	12
3	Bio-fungicides	5
4	Bio-bactericide	1
5	Bio-virucide	2
6	Bio-Nematicide	1
7	Bio-Control Agent	2

8	Fruit Bag	2
9	Color sticky trap	3
10	Pheromone trap	2
11	Public Health Product	1
	Total	42

Afterwards we returned to BARI for the closing ceremony of the training program. A vote of thanks was given by Dr Nirmal Kumar Dutta, Head of Entomology Division, BARI, Certificates were distributed by the Director General, BARI.

Participation in meetings/lectures/visits:

S. N	Topic	Presenter	Number of Participants
1	Bio-rational based Integrated Pest Management-An overview	Dr. Syed Nurul Alam, Ex. Director, BARI and senior consultant CIMMYT	15
2	Biological control of insect pests and mass rearing protocol development and field release techniques	Dr. Syed Nurul Alam, Ex. Director, BARI and senior consultant CIMMYT	15
3	Strengthening bio-control by transboundary exchange of tools, techniques and expertise amongst South Asian countries	Dr. Rangaswamy Muniappan, Chief investigator, IPMA, Virginia Tech	15
4	Orientation of IPM laboratory and briefing on the training program	Dr. Nirmal Kumar Dutta, CSO and Head, Entomology Division, BARI	15
5	Role of BARI in Agricultural development of Bangladesh especial emphasis on pest management	Dr. Debasish Sarkar, DG, BARI	15
6	Mass production protocols of different egg and larval parasitoids in Bangladesh: an overview (Lecture)	Dr. Kohinoor Begum, Principal Scientific Officer, Entomology Division BARI	10
7	Mass production of fictitious host (<i>Corcyra cephalonica</i> , <i>Sitotroga cerealella</i>) for egg parasitoid mass production (Lecture +Practical)	Dr. Kohinoor Begum, Principal Scientific Officer, Entomology Division BARI	10

8	Storage of host eggs, preparation of tricho cards and different methods of <i>Trichogramma</i> mass rearing and their field release (Lecture+Practical)	Dr. Kohinoor Begum, Principal Scientific Officer, Entomology Division BARI	10
9	Field release of egg parasitoid <i>Trichogramma</i> (Lecture+Practical)	Dr. Nirmal Kumar Dutta, CSO and Head Entomology Division, BARI	10
10	Preparation of artificial diet for mass production of wax moth (Lecture+Practical)	Dr. Kohinoor Begum, Principal Scientific Officer, Entomology Division BARI	10
11	Mass production protocols of Larval Parasitoid <i>Bracon hebetor</i> on wax moth larvae (Lecture +Practical)	Dr. Nirmal Kumar Dutta, CSO and Head, Entomology Division, BARI	10
12	Field release techniques and efficacy study of larval parasitoid <i>Bracon hebetor</i> (Lecture+Practical)	Dr. AKM Ziaur Rahman, PSO, Entomology Division, BARI	10
13	Practice of trichocard preparation, wax moth rearing by artificial diet preparation and mass production of <i>Trichogramma</i> and <i>Bracon hebetor</i>	Dr. Kohinoor Begum, and Akhtaruzzaman Sarkar, Entomology Division, BARI	10
14	Review of Mass rearing and field release of egg parasitoids by participants (Group wise)	Dr. Md. Akhtaruzzaman Sarkar, PSO, Entomology Division, BARI	10
15	Review of Mass rearing and field release of larval parasitoids by participants (Group wise)	Dr. Md. Akhtaruzzaman Sarkar, PSO, Entomology Division, BARI	10
16	Visiting Ispahani Agro limited Konabari, Gazipur	Dr. Nirmal Kumar Dutta, Dr Md. Kafil Uddin, AKM Rakibul Hassan Ferdouse Entomology Division, BARI,	15

Recommendations/comments:

The training emphasis for the importance of biological control of insect pest and disease management in the cereal and vegetable crops, It is one of the most environmentally safe pest management method of IPM approach. Biological control is one of the most important components

of integrated pest management through promoting natural enemies of key pests of crops. The egg, larval and pupal parasitoids used for pest management is a sustainable, viable and ecological solution. The training was very fruitful and sharing the knowledge about parasitoids production and its field release and there is possibility of its replication in Nepal. Practical sessions-built confidence and increased interaction with the presenter and participants. For the sustainability, private sector needs to take initiation for the production and supply of parasitoids with the continued technical support of the government and some subsidy for the promotion of the biological control approach. The Ispahani Agro Limited has very impressive collaboration with BARI and others in IPM related tools and technologies introduction. Continued collaboration, communication, and interaction will help to transfer knowledge within SAARC countries. Over use and misuse of chemical pesticides to control insect pest and diseases impacts human health and the environment. Biological control is one of the most appropriate method that needs to be promoted and requires support and collaboration of governments, private sector and farmers.

List of people met: (prepare a table with names of people, their designation, and email addresses)

S. N	Name of People	Designation	Email address
1	Dr. Debasish Sarkar,	Director General, BARI	
2	Dr. Syed Nurul Alam	Ex. Director, BARI and senior consultant CIMMYT	
3	Dr. Rangaswamy Muniappaan	Chief investigator, IPMA, Virginia Tech	
4	Dr. Nirmal Kumar Dutta	CSO and Head Entomology Division, BARI	
5	Dr. Kohinoor Begum	Principal Scientific Officer, Entomology Division, BARI	
6	Dr. AKM Ziaur Rahman	PSO, Entomology division, BARI	
7	Dr. Md. Akhtaruzzaman	PSO, Entomology Division, BARI	
8	Madhab Chandra Das	Country Program Manager Feed the Future Bangladesh integrated Pest Management Activity	
9	Mrs. Saraswati Neupane	Sr. Scientist	

10	Mrs. Sushma Marahatta	Plant protection officer	
11	Mrs. Binu Bhat	Technical Officer	
12	Mrs. Kalpana Dhital	Field Coordinator	