

Feed the Future Nepal Integrated Pest Management (FTFNIPM) Project

Project Monthly Status Report No. 8 (Fiscal Year 4/2022-23)

Reporting Month: August 2023
Submitted to: Judith Almodovar, AOR, USAID Nepal Mission, Kathmandu
Reported by: Komal Pradhan, COP, FTFNIPM/ iDE Nepal, Lalitpur
Reporting Date: September 7, 2023 (Thursday)

July 2023 Monthly Report Preparation and Submission

Worked and coordinated with the FTFNIPM team for the July 2023 Monthly report and finalized the draft report accordingly. The final monthly report was submitted to Judith Almodovar, AOR, FTFNIPM/ Deputy Director of Economic Growth Office, USAID Nepal on August 7, 2023 (Monday).

We also submitted the work plan for October 1st to November 15, 2023 (a 1.5-month work plan) to the AOR through Dr. Muniappan, Virginia Tech, PI, FTFNIPM.

Coordination with government stakeholders

As part of preparation for the close-out workshop of the FTFNIPM project on September 27, 2023 (Wednesday) at Kathmandu, we have confirmed the workshop venue at the Himalaya Hotel, and prepared the draft workshop agenda and participants' list. We are inviting the Secretary of MoALD as chief guest and he has confirmed for his participation in the workshop. The Secretary has planned a trip to Senegal from 16 – 25 September and will be back in Nepal on the 25th evening.

GESI Specialist along with the local FTFNIPM team visited Gurvakot Municipality ward no. 12 to capture some video clips and photos for the FTFNIPM project. They met with Laxmi agro-vet proprietor Mr. Samir Regmi, Hari Maya Garti Magar, leader farmers, and Govinda Oli commercial technology adopter. They also interacted with Mr. Chandra Bahadur GC and Sita Shahi on the demonstration of vermicompost, and IPM packages for brinjal, tomato, and cucumber in the Lekbeshi Municipality, Sardikhola. The Radio Bheri FM team Mr. Madhuwan BC, station manager, and videographer Mr. Purna Bahadur Khadka also visited the fields for an interview and video documentary with the farmers and IPM suppliers. Mr. Chitra Rokaya, Director, DOAD, Karnali Province also participated in it. This was done as per the agreement with the Bheri FM to prepare a short video documentary on IPM tools and technology adopting farmers. The photos and videos will be displayed during the closing workshop of the FTFNIPM project as a background display.

Collaboration with FTF Implementing Partners (IPs)

USAID Fall armyworm taskforce committee meeting: USAID's FTF Implementing projects-Fall armyworm (FAW) taskforce committee meeting was held on 9th August 2023 at iDE Country office, Jhamsikhel, Lalitpur Nepal. The meeting convened from 3:00 PM to 4:30 PM. During the meeting, major discussions were on the following agenda:

- Field update on FAW status (damage percentage, yield loss) in the FTF ZOI.
- Plan for management activity and the possibility of collaboration in field implementation.

- Share the FTFNIPM project phaseout strategy, which is ending on November 14, 2023.

During the meeting, FTFNIPM also discussed the Phase-out Strategies and plans:

- I. Project sharing workshop at the central level event is going to be held on September 27, 2023, and provincial level closing workshops will be held on September 17, 20, and 22 in Surkhet, Nepalgunj, and Dhangadhi, respectively.
- II. Collaboration with PEAN: Collaboration with PEAN for agrovet capacity building on IPM tools and techniques along with supply chain development.
- III. Government stakeholders collaboration: The IPM capacity-building training for agriculture staff has been organized successfully at the central, provincial, and local levels.
- IV. University collaboration: FTFNIPM ongoing joint efforts with AFU and FWU on biocontrol control for FAW management, this partnership holds great potential for institutional and human resource development at the country level.
- V. NARC: NARC acts as a central hub for technical support, and the supply of Tricho-cards to provinces and different districts. Their continued involvement is a necessity.

Participated in the FTF Nepal Agriculture Input Activity Project YR1-Co-Design Workshop: The FTFNIPM Senior Technical Specialist participated in the FTF Nepal Agriculture Input Activity Project YR1 Co-design Workshop on August 24, 2023, held at Soaltee Kathmandu. The FTFN Agriculture Input Activity is a five-year project funded by USAID and implemented by Winrock International in partnership with CEAPRED, Pathway Digital Pvt. Ltd., Market Share Associates, and Vikara Institutes. The workshop aimed to engage various stakeholders, including representatives from the Government of Nepal (MoALD, DOA, NARC) and private sector actors. The primary objectives of the workshop were to introduce stakeholders to the project and gather their input for designing Year 1 project components and activities. Dr. Rick Ody began by welcoming participants and outlining the workshop's objectives, followed by an overview of the project by Alexis Ellicot, the Chief of Party (COP). Dr. Gobinda Prasad Sharma, Secretary of MoALD, and USAID Economic Growth Director Jason Seuk delivered opening remarks, expressing their wishes for the successful and impactful implementation of the project. Likewise, Rick Ody and Dr. Rudra K. Shrestha introduced the process for providing input, described group tasks, and announced the group assignments. There were a total of 8 groups, each led by a facilitator. Participants collaborated to generate solutions for specific implementation challenges, prioritized recommendations and then rotated to discuss new topics at different tables.

During the plenary session, facilitators presented the priority solutions, followed by a question-and-answer session and discussion on all topics. During the Q&A session, the FTNIPM Technical Specialist (Lalit Sah) suggested that the project team focus on safe crop production using IPM technologies for targeted agricultural commodities such as rice, maize, lentils, and vegetables. The discussions were divided into two co-design activities:

- A. Breakout Co-design Activity 1: Addressing Technical and Policy Questions for Implementation.
- B. Breakout Co-design Activity 2: Discussing Cross-Cutting Questions for Implementation.

During the conclusion of the workshop, Alexis Ellicot, COP of the Project, outlined how the workshop outputs would be utilized. Dr. Rajendra Mishra, Joint Secretary of MoALD,

delivered closing remarks, expressing confidence in successful project implementation, and extended gratitude to all the invited participants for their valuable contributions to the workshop.

Project Closing Workshop Preparation Meeting Organized: On Friday, August 25, 2023, the CoP of the FTFNIPM project called the meeting at the country office to discuss and allocate roles and responsibilities for the upcoming FTFNIP closing workshop preparations. These workshops had been planned, with events scheduled at the provincial level in Karnali, Lumbini, and Sudurpaschim on September 17, 20, 22, 2023, respectively. The COP updated Dr. Muniappan's Nepal visit from September 15-28, 2023. He will be participating in the provincial and Kathmandu closing workshops.

Dr. Muni will have a debriefing meeting with the AOR in USAID on Friday, September 15, 2023..

Details of the workshop events planned:

- a. Central-level Closing Workshop at Kathmandu: Scheduled for September 27, 2023 (Wednesday) from 8 am until 1 pm at the Himalaya Hotel in Lalitpur, Kathmandu.
- b. Surkhet Closing Workshop: September 17, 2023 (Sunday) at Namaste Hotel, Birendranagar, Karnali Pradesh.
- c. Nepalgunj Closing Workshop: September 20, 2023 (Wednesday) at Kalpataru Hotel, Nepalgunj, Lumbini Pradesh.
- d. Dhangadhi Closing Workshop: September 22, 2023 (Friday) at Rubas Hotel, Dhangadhi, Sudur Paschim Pradesh.

GESI Activity

GESI Specialist reviewed the FTFNIPM impact study checklist of the Key Informant Interview (KII), Focus Group Discussion (FGD), and interview questionnaires to ensure that the questionnaires and checklist had developed from the GESI lens.

GESI Specialist's interview was broadcast by Bheri FM radio. The interview covered the FTFNIPM project introduction, its working modality, and program focus toward GESI to reach the smallholders and marginalized farmers. The Bheri FM had a wider coverage of its program, this was supposed to disseminate IPM tools and technology and its impact on farmers and work forward to support organic initiatives of the Karnali government.

Field Work-plan Activity:

Campaign on "Importance and Uses of Trichoderma with Practical Demonstration"

The two events on the campaign "Importance and Uses of Trichoderma with Practical Demonstration" were conducted at Sano Gavar, Bhairnath 03 on 19 August 2023. This campaign was initiated in collaboration with Deurali Multipurpose Cooperatives Ltd. to inform general members of the cooperatives about the importance and uses of *Trichoderma* in the farming system and to demonstrate the utility of *Trichoderma* in real field scenarios. A total of 20 participants participated in both sessions. Introduction and overview of *Trichoderma*, importance and utilization of *Trichoderma*, and things to remember before and after using *Trichoderma* were highlighted in the theory session. Preparation and inoculations of *Trichoderma* in FYM was conducted in the practical session. Each participant was also provided with two packets (250 gm) of *Trichoderma* at the end of the event.

Promotion of IPM technology through Broadcasting of FM Jingle Messages on FAW Management and Others

Krishnasar FM, Banke, Dinesh FM, Kailali, Bheri FM, Surkhet, and Radio Sudur Awaz FM, Dadeldhura have been broadcasting jingle messages about the “IPM Package of Rice” from July 2023. The contract agreement with all the FMs, except Bheri FM, and Surkhet, has expired in August 2023. The contract agreement with Bheri FM also involves the preparation of a short documentary on the Farmer's adoption of IPM and Organic practices among farmers. Recording of the documentary in coordination with FTFNIPM has been completed. The documentary will serve as a documentation of the FTFNIPM project and it will be displayed in the closing workshops.

IPM Package Validation and Demonstration Trial on FTF Focus Crops Through Private Sectors

Coordinated with all the private sectors of Banke, Surkhet, Kailali, and Kapilvastu districts for the completion of IPM package demonstration cum validation programs. All the data from the trials have been received, compiled, and analyzed. The final report of the IPM package validation and demonstration trial on FTF focus crops (rice, maize, lentil, and vegetables) through private sectors has been prepared.

FTFNIPM technical team is preparing and finalizing the comprehensive folder of Integrated Pest Management (IPM) Packages for Rice, Maize, and Lentil. Also, the preparation and finalization of the research article on “*Validation of Integrated Pest Management (IPM) Strategies for Reducing Crop Losses Caused by Insect Pests and Diseases in Rice Production in Nepal.*” is in progress.

Updates From AFU and FWU Universities

a) Agriculture and Forestry University (AFU), Rampur

Identification, and isolation of entomopathogenic fungus: The fungus-infected 4 insect cadaver were provided to Intrepid Nepal Pvt. Ltd. Thapathali, Kathmandu for identification of *Metarhizium* sp. As per the report the fungus has been reported as *Metarhizium rileyi*. This fungus is giving 98% mortality of FAW larvae.

Corcyra rearing: *Corcyra* rearing is continued and eggs of *Corcyra* were collected regularly. The adult *Corcyra* is provided with the honey solution. Enough egg cards are made by radiating the egg in a UV chamber and pasting it on A4 paper. The data collection has been already completed.

Trichogramma production: *Trichogramma* is produced using the host *Corcyra* eggs. The parasitisation of *Trichogramma* has been checked on Maize stem borer and fall armyworm. The highest parasitisation rate has been found in maize stem borer as compared to fall armyworm.

Efficacy testing of commercial *Metarhizium* sp. for the FAW management in laboratory conditions.

- The efficacy of commercially available *Pseudomonas* sp., *Beauveria bassiana*, *Trichoderma* sp., *Verticillium* sp., and *Metarhizium anisopliae* has been checked on different (1st, 2nd, 3rd) instar larva of FAW.
- The commercially available biopesticide is not quite effective, and no mortality has been seen in FAW till now.
- The efficacy of *Metarhizium rileyi* is checked on the 5th instar larva of FAW.

Telenomus Rearing: The application of *Telenomus* in cage conditions has been conducted, and data collection is still ongoing. The parasitisation rate at temperatures 5°C, 10°C, 15°C and 20°C is being conducted.

b) Far Western University (FWU), Tikapur

Laboratory Mass Production of Parasitoids (*Corcyra* rearing): Daily collection of *Corcyra* eggs and transfer of *Corcyra* moths in breeding cages was carried out continuously up to 11 August 2023. After that, the *Corcyra* stopped laying eggs and thus the moths of both of the breeding cages were discarded on 12th August, 2023. On 18th August 2023, crushed maize and groundnut were sterilized in a hot air oven at 100°C for 30 minutes to initiate the next lot of *Corcyra* rearing. On 19th August 2023, 2.5kg sterilized crushed maize, 250g sterilized crushed groundnut, 0.5g yeast, and 0.3g streptomycin sulphate were mixed in a *Corcyra* rearing box. Then, 0.5cc of *Corcyra* eggs were added to it for mass rearing of *Corcyra*. This was carried out in three rearing boxes.

Trichogramma rearing

On 20th August 2023, *Trichogramma* emerged from the Tricho-card provided by Dr. Ghanashyam Bhandari during his last visit to FWU, and a trichocard was prepared on 23rd August 2023. For this, *Corcyra* eggs were pasted on a trichocard using natural gum. This card was then irradiated in a UV chamber for 10 min. Two such cards were prepared. The cards were kept in plastic containers containing emerging *Trichogramma* adults. Now, the blackening of eggs have been observed in those trichocards.

FAW (*Spodoptera frugiperda*)/ *S. litura* rearing

Both FAW and *S. litura* rearing are going on in the laboratory. At present, we have *S. litura* in the pupal stage, and FAW in both larval and pupal stage. On 26th August 2023, an artificial diet of maize leaf powder and chickpea powder was prepared for feeding FAW larvae. Similarly, maize has been sown in plastic containers to provide the newly emerged FAW and *litura* moths with the maize plants for oviposition.



Picture: Preparation of trichocard (left) and parasitized trichocard (Right)

Other Activities

Discussion meeting with the FTFNIPM team (FWU, NARC, and iDE) on the provincial-level symposium: On August 1, 2023, at 08:00 PM, we discussed details on organizing a provincial-level symposium. The participants included representatives from FWU, Dr. Ghanashyam Bhandari, and the iDE team. The discussion revolved around the agenda of the symposium, topics to be covered, potential speakers or presenters, logistical arrangements, and promotional strategies.

Technical support on FAW biological control to the FWU, Plant Protection Labs-Khajua, Birendra Nagar and Pokhara: We coordinated and arranged a field visit program with Dr. Gjhanashyam Bhandari from the National Maize Research Program, Rampur to the Far-Western University, Government's Provincial Plant Protection Labs in Khajura (Banke), Birendra nagar (Surkhet) and Pokhara (Kaski) for technical backstopping and support on rearing of FAW egg parasitoids in labs. During these visits, Dr. Bhandari provided technical training to the lab technical persons and also provided Tricho cards, and *Trichogramma* sp. to the labs.

Organized meeting with AFU and FWU team: We also organized coordination and monitoring meetings with AFU and FWU teams to review the field implementation status and plan the remaining activity for the rest of the project period.

Working on project vehicles disposition Plan: We have 4 USAID vehicles in the project and we are communicating with USAID's Agriculture Input Activity for their transfer.

Project Annual Field Survey: We have conducted an annual field survey and have prepared the draft report, which has been shared with Dr. Muniappan for his review and comments.

Dissemination of Weekly SMS on Crop IPM Recommendations in August 2023:

Date	SMS (Nepali Version)	SMS (English Version)
August 4.2023	धान बालीका किराहरु व्यवस्थापन गर्न कीटनाशक प्रयोग गर्न परेमा, जैविक विषादीहरु जस्तै लाही, थ्रिप्स, सेतो झिगा व्यवस्थापनका लागि बिउभेरिया बेसियाना र लार्भाहरुको व्यवस्थापनका लागि बि. टी र एन.पी.भी प्रयोग गर्न सकिन्छ ।	If insecticides are to be used to manage rice crop pests, biological insecticides such as <i>Beauveria bassiana</i> for the management of aphids, thrips, and whiteflies and <i>Bacillus thuringiensis</i> (B.T) and Nucleopolyhedrovirus (NPV) for the management of different larva to be used.
August 11.2023	गोलभेडा खेती गर्ने ठाउँ बिहान देखि बेलुकासम्म घाम लाग्ने वा पारिलो हुनुपर्छ। रुख, घर, वा कान्लाको छाया नपर्ने ठाउँ हुनुपर्छ।	Tomato cultivation areas should have exposure to sunlight from morning to late evening and not be shaded by the trees, and structures.
August 18.2023	हिजो आज देशका धेरै स्थानहरुमा भारी वर्षाको संभावना भएकोले कृषि कर्महरु गर्दा आवश्यक सावधानी अपनाउनुहोस्।	As there is a possibility of heavy rain in many parts of the country this week, take necessary precautions while doing agricultural work.
August 25.2023	मध्य पहाडी जिल्लाहरुमा खुमल ज्यापू काउलीको नर्सरी राख्नुहोस्। झरी पर्ने समय भएकोले बेर्नालाई जोगाउन प्लाष्टिकको छापो राख्नुहोस्।	Prepare a nursery bed of cauliflower using a variety "Khumal Jyapu" in mid-hill districts. Use plastic mulch to protect the seedlings during the rain.

Program Highlight Report

Fall Armyworm Management Initiatives at NMRP/NARC, Agriculture and Forestry University, Rampur and Far Western University, Tikapur

Challenge:

Fall Armyworm (FAW) is a devastating pest that has posed a significant threat to maize crops since its invasion in Nepal in 2019, resulting in substantial yield losses. Effective management of FAW is crucial for ensuring food security and agricultural sustainability. Traditional chemical control methods were proving ineffective and environmentally harmful. There was an urgent need to identify and implement sustainable, eco-friendly measures to manage FAW effectively.

Action:

A comprehensive survey and surveillance program was carried out to assess the presence and distribution of FAW populations in maize fields. Various natural enemies of FAW, including predators and parasitoids, were collected from the field. The collected specimens were identified and characterized to determine their potential for FAW management. State-of-the-art laboratory facilities were set up for the mass production of FAW egg parasitoids (*Trichogramma* and *Telenomus*) at the Department of Entomology within NMRP/NARC, Agriculture and Forestry University, and Far Western University. Optimal rearing protocols and methodologies were evaluated to ensure the efficient and large-scale production of *Trichogramma* and *Telenomus* parasitoids. Quality control measures were implemented to maintain the effectiveness of the parasitoids. Biological control agents (*Trichogramma* and *Telenomus*) for FAW management were released in the maize fields of Banke, Bardiya, and Kailali.

Result:

Several potential predators and parasitoids of FAW were identified, offering sustainable solutions for pest control. Optimal rearing protocols and methodologies were developed to ensure the efficient and large-scale production of *Trichogramma* and *Telenomus* parasitoids. The mass production of *Trichogramma* and *Telenomus* parasitoids in the laboratory successfully established ensuring a steady supply for field applications in the future. The release of *Trichogramma* and *Telenomus* reduced the population of FAW in the fields.

Impact:

The release of natural enemies of FAW provided farmers with sustainable, environmentally friendly alternatives to chemical pesticides. Effective FAW management would increase maize yields, contributing to food security and economic stability in the country. Reduced reliance on chemical pesticides would result in a decrease in harmful chemical residues in the environment and improve overall ecosystem health. In conclusion, these collaborative efforts have had a positive impact on agriculture, the environment, food security as well as academia. These actions represent a significant step toward sustainable pest management practices in maize farming.

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