Feed the Future: Innovation Lab for Integrated Pest Management Trip Report

Country(s) Visited: Nepal

Dates of Travel: October 22 – November 5, 2021

Travelers' Names and Affiliations: Sara Hendery, R. Muniappan, Daniel Sumner, Tim McCoy

Purpose of Trip: To review activities of the core IPM Innovation Lab vegetable project and the Feed the Future Nepal Integrated Pest Management project in Nepal. Provide pesticide safety training to Nepali stakeholders.

Sites Visited: Kathmandu, Rampur, Chitwan, Bharatpur, Nepalgunj, Surkhet, Banke

Description of Activities/Observations:

Oct. 24: Arrival. Brief check-in with iDE team on the upcoming events.

Oct. 25: Meeting with iDE team, pause and reflect workshop.

Oct. 26: Meeting with Chief of PQPMC and FAO consultant Dili Ram Sharma. Discussed pesticide use to control the spread of fall armyworm and collaboration with provincial labs to set up parasitoid rearing activities. Discussed pesticide regulations, registration of pheromone traps, etc.

Meeting with National Entomology Research Center (NERC) members. Visit to the Khumaltar station to review parasitoid production activities. Limited progress has been made at the lab. Discussion of facilitating travel of a woman scientist to be trained on biocontrol. Discussed issues related to finance in the project.

Visit with the Praramva BioTech Pvt. Ltd., a private company production tricho-compost, vermi-compost, and bio-pesticides in Nepal. Discussed collaboration, possible youth involvement in Tricho-composting.

Oct. 27: Participated in the review meeting of the "Climate Change, Biodiversity, and Assessment of Invasive Plant Species Using Satellite Images in Chitwan Annapurna Landscape" project. Meeting attended by Tribhuvan University administration and faculty as well as Lynn Schneider, USAID AOR.

In the afternoon, Muni met with Ophthalmologists at Tribhuvan University to discuss the possibility of insect setae contamination causing blindness in children in Nepal.

Oct. 28: Field Visits.

Muni and Sara: Traveled to Bharatpur to visit the NMRP station at Rampur. Reviewed parasitoid activities and visited the field to search for fall armyworm and parasitoids. Found several fall armyworm larvae killed by a bacterium or virus; identified occurrence of *Metarhizium rileyi* on larvae, larval parasitoid *Charops* sp, and pupal parasitoid *Brachymeria* sp. on fall armyworm; the lab will look into specifics. IPM IL planned to send lab technician Peter Malusi to Rampur to help the lab improve rearing skills; however, his trip was delayed/halted due to COVID restrictions.

Met with Agriculture and Forestry University to discuss possible collaboration and parasitoid rearing.

Tim and Daniel: Travel to Nepalgunj. Training on pesticide handling and safety at Hotel Marutinandan.

Oct. 29:

Muni and Sara: Visit to the Chitwan National Park to assess invasive weed spread. Met with Director of the park to discuss invasive weed management and control.

Tim and Daniel: Travel to Surkhet.

Oct. 30: Travel to Nepalgunj.

Tim and Daniel: Training on pesticide handling and safety at Hotel Namaste, Surkhet.

Oct. 31: Travel to Surkhet.

Muni and Sara: Visit Directorate of Agriculture Development (DOAD) and Integrated Agriculture Laboratory, Karnali Province. Met with director. Visit Madhaya Paschim Agrovet to discuss sales, storage, farmer perception of chemicals, biopesticides, interaction with CBFs, etc. Met with commercial farmer who is using zero pesticides for about 7 years. Uses net houses, staking, and tricho-compost to grow variety of crops. Met with Bimal Kama, Midwest University, to discuss possible collaboration in fall armyworm parasitoid rearing.

Tim : Traveled to Birendranagar, Karnali Province, Surkhet to conduct pesticide safety presentation for Agrovets.

Daniel: Returned to Kathmandu.

Major pesticide safety findings include:

- PPE is rarely used. While expense is always a factor, it does not appear to be the primary reason farmers are not wearing minimally protective equipment: gloves and foot coverage during mixing and applying. Agrovets, CBFs and Plant Doctors all cite farmers'

dismissal of the value of PPE as protective from pesticides. They express that farmers do recognize hazards associated with pesticides. Yet they simultaneously discount the value of PPE as a form of protection. Additionally, discomfort due to the heat is a reason cited for not wearing PPE.

- Pesticides are being applied to vegetables post-harvest to give them a "market-ready sheen," and to protect from insects. These are actually two separate problems. The fungicide Mancozeb was most frequently cited as the product used to provide a sheen to the produce (particularly eggplant and tomato). Other insecticides were mentioned as being used to protect vegetables, and fish when displayed at market. I could not get a citation of a type of insecticide, but Agrovets, CBFs, and PDs, all said it was going on.
- Pesticide labels are generally not read. Few labels are in a local language. The language problem is compounded by the small font size with which labels are printed. The font may be 4 point.
- Pre-Harvest Intervals (PHI) on pesticide labels are not being followed. This leads to higher pesticide residues at harvest. While this is related to the label problems above, the primary reason is that farmers must respond to market forces which dictate harvest time, and may not be able to wait the required PHI. One advantage of using many of the IPM-friendly pesticides is that the PHI is often zero.
- Adequate pesticide disposal remains a problem in much of the "emerging economy" countries. There simply is no place to dispose of pesticides, or no good method for disposal. The PQPMC is designating one collection site per province, though this is likely more a symbolic gesture. Fortunately, it appears that container reuse is not as great a problem. This is primarily because Nepali farmers use smaller volume containers that have little practical use once empty.
- The import duties and taxation scheme established for certain pest management products is hindering implementation of IPM in Nepal. Due to the vagaries of product designation, certain IPM-related items are more expensive to farmers as compared to more toxic alternatives. Changing some taxation code could help farmers afford safer pesticide solutions.
- Participants in both pesticide safety presentations actively discussed how gender and other social factors can (and do) shape risk to pesticide exposure. Both groups concurred that while men are viewed as principally responsible for decisions linked to pesticide purchase and application and are the ones responsible for applying pesticide, women and children are exposed indirectly through multiple ways (mixing, storage, and washing of clothes with pesticide residues.
- Larger commercial farmers and government extension staff recognized women's indirect roles linked to decisions regarding pesticides, but women CBFs in the presentations highlighted that women are now the principal farmers in Nepal and need information about safe pesticide use and handling.
- Both groups outlined the importance of having multiple forms of media to communicate information on safe pesticide use and handling – flyers, wall murals, practical trainings/demonstrations, SMS messages, and radio jingles. The group agreed that current communication channels could be adjusted so they could more directly reach women farmers.

Nov. 1, 2021: Visited Sunil Rice Mill (privately owned). Discussed collaboration selling or giving parasitoids to farmers associated with the rice mill. Met with NARC, director Amar Pun. Employs IPM IL-supported student Ram Khadka (Ohio State University), who is working on ASD trials. Return to Banke.

Nov. 2, 2021: Participate in the IPM IL achievements and GESI sharing workshop.

Nov. 3: Meet with the mission at the U.S. Embassy. Exit briefing. Discussed IPM IL achievements, management tactics for fall armyworm, scaling IPM packages for selected crops, pesticide safety findings, such as residues on crops, post-harvest pesticide sprays, high importing duties on bio-pesticides, etc.

Training Activities Conducted:

Program type (workshop, seminar, field day, short course, etc.)	Date	Audience	Number of Participants		Training Provider (US university, host country institution, etc.)	Training Objective
			Men	Women		
Seminar	10/28	21	14	7	Tim McCoy	Pesticide Safety
Seminar	10/30	23	15	8	Tim McCoy	Pesticide Safety
Seminar	10/31	22	15	7	Tim McCoy	Pesticide Safety

Suggestions, Recommendations, and/or Follow-up Items:

Communications: Articles on 1) rise of Tricho-composting in Nepal 2) Pramod K. Jha World Academy of Sciences nomination 3) GESI assessment findings 4) Pesticide safety findings 5) Decision-making tool assessment findings 6) Pest-net bulletin

GESI Analysis: 1) The final (detailed) GESI Analysis report will be published and shared with USAID/Nepal and FTFNIPM Implementing Partners. 2) FTFNIPM's GESI team will follow-up with KISAN II staff to discuss opportunities for collaboration on generating gender-responsive messaging on IPM and safe pesticide handling and how FTFNIPM can support KISAN II efforts to build the business case for gender and social inclusion with agro-vets.

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