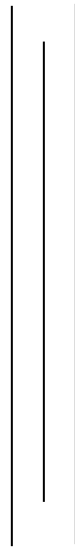


**Participatory Biodiversity and Climate Change  
Assessment for Integrated Pest Management in the  
Chitwan-Annapurna Landscape, Nepal**

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



**Report Submitted by**

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**Project PI**

**Associate Professor of Civil Engineering**

**City College,**

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

**Country(s) Visited:** Nepal

**Dates of Travel:** 5 to 15 January, 2017

## **Travelers' Names and Affiliations**

SN	Name of Travellers	Affiliations	Remarks
1	Dr. Nir Krakauer	The City College of New York, CUNY, Dept. of Civil Engineering	
2	Dr. Ajay Jha	Institute of Global Agriculture and Technology Transfer (IGATT), Fort Collins, CO, USA	
3	Dr. Tarendra Lakhankar	CUNY-CREST Institute, The City University of New York	
4	Dr. David Lohman	The City College of New York, CUNY Biology Department	
5	Dr. Jose Anadon	Queens College, CUNY Biology Department	
6	Tenzing Doleck	Graduate Center, CUNY Biology Department	

## **Purpose of Trip:**

- i. Review research progress and plans with entire project team and IPM IL ME team from Virginia Tech, and visit field sites and interact with farmer beneficiaries.
- ii. Convene the International Conference on Biodiversity, Climate Change Assessment and Impacts on Livelihood, Kathmandu, Nepal (<http://icbcl17.org>).
- iii. Train TU/AFU students on ecological niche modeling.

## **Sites Visited:**

- Kathmandu, including Central Department of Botany, Kirtipur
- Project field sites at Puranchaur, Kaski & Chyangchyangdi, Syagnja, via Pokhara

## **Description of Activities/Observations:**

The project team conducted a research workshop with PhD and MSc students of CDB, TU on January 7, 2017 at Central Department of Botany, Kirtipur (see detail in annex 1). Students presented their work progress and Dr. Nir Krakauer and Dr. Tarendra Lakhankar provided feedback on study design, forming and testing suitable hypotheses, and presentation and publication guidelines.

The team and IPM IL visitors participated in a workshop for TU and AFU students at Indreni Hotel, Kathmandu on 8 January (see detail in annex 2). Dr. Durga Devkota presented information from the



baseline survey conducted in 2016. The students presented their progress and got technical and programmatic feedback from the audience.

The team participated in the press meet for preparation of International conference on “Biodiversity, Climate Change Assessment and Impacts on Livelihood” on January 8 (see detail in annex 3). Journalists and photographers from different newspapers and television channels were invited to share the progress of the conference and its management. Questions and queries raised by journalists regarding the conference were answered. The main purpose of this was to share the conference themes and objectives and collect feedback to achieve success in raising awareness of biodiversity and climate issues and project focus areas in the government, among NGOs, and in the public eye.

The ICBC17 conference was held between 10-12 January at Crowne Plaza Soaltee Hotel, Kathmandu. The project team presented papers, chaired sessions, and put their views through inaugural and closing sessions and chaired panel discussion (see detail in annex 4). Thanks to strenuous and dedicated efforts by the project team, particularly Nepal project coordinator Dr. PK Jha and his team from Tribhuvan University, the conference was a major success as the biggest technical and policy event on integrated research and management of biodiversity and climate to be organized in Nepal. Among others, the President of Nepal, Hon. Bidhya Devi Bhandari, and the USAID Nepal Mission Director, Mr. Peter Malnak, delivered introductory remarks, and the conference was supported by an array of governmental, academic and international bodies and widely covered by the local and national media (examples:

- <http://kathmandupost.ekantipur.com/news/2017-01-10/nepal-will-play-proactive-role-to-repel-negative-impact-of-climate-change-president.html>
- <http://thehimalayantimes.com/kathmandu/president-bidya-devi-bhandari-inaugurates-biodiversity-conference/>.

The conference included special symposia on invasive plants and on coping with the emerging impact of the *Tuta absoluta* moth on tomatoes and related vegetables. The budgeted funding of \$10,000 (of which only \$2,000 was actually available by the conference date because of delays in release of FY 2017 funding) was augmented by about \$80,000 in leveraged support raised by the project team from a variety of cosponsors from Nepal and from international donors.

The project team, IPM IL visitors, and iDE representatives visited research field sites and interacted with farmers at Puranchaur, Kaski on 13<sup>th</sup> January and Chyangchyangdi, Syangja on 14<sup>th</sup> January (see detail in annexes 5 & 6). The team visited weather stations, experimental plots, sampling devices, and farmer fields. Farmer participants reported problems with pests (including beetles, Gandhi bug in cowpea, aphids, fruit flies, and caterpillars) and plant diseases (including wilt, blight, and root rot). Changes noticed in the past 10 years and thought to be attributable to climate change included irregular rainfall, increase in temperature, drying of water supply, and new types of insects, invasive plant species, and plant disease. Local Agro-Vet sales people were reported to be the main source of information on agricultural chemicals. The farmers were not familiar with *Trichoderma* biocontrol for fungal disease but did use other IPM methods such as neem biopesticide and pheromone traps.

vii. Dr. Jose Anadon led a practical ecological distribution modeling training on 15 January on the application of the maximum entropy (maxent) approach for finding climate envelopes of species using the computer language R (see detail in annex 7).



### 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		
1. Research team presentations and discussion	January 7	Students and researchers	12	7	CUNY, TU	Review research progress and provide feedback to students and faculty on research methods and plans
2. Research team presentations and discussion	January 8	Students and researchers	23	13	CUNY, IGATT, TU, AFU, IPM IL ME team	Review research progress and provide feedback to students and faculty on research methods and plans
3. Press meet for international conference	January 8	Media people	20	10	CUNY, TU AFU	Publicize conference and USAID and project work
4. International Conference	January 10-12	Students, researchers, policymakers	231	124	CUNY, IGATT, TU, AFU, IPM IL, Govt. of Nepal and other partners	Share research, build national capacity, raise awareness of biodiversity and climate issues
5. Interaction with farmers	January 13	Farmers & researchers	27	12	CUNY, IGATT, TU, AFU, IPM IL	Review fieldwork, share project progress and get feedback from team and local stakeholders
6. Interaction with farmers	January 14	Farmers & researchers	28	12	CUNY, IGATT, TU, AFU, IPM IL	Review fieldwork, share project progress and get feedback from team and local stakeholders
7. Ecological modeling	January 15	Students & researchers	7	11	CUNY	Introduce maxent methods for modeling climate impacts on biodiversity



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

Opportunities for cooperation with other institutions, such as the Hariyo Ban II project, ICIMOD, and the University of Kathmandu, were identified during the Conference for possible follow-up. A summary of the main points from the Conference presentations and discussions will be compiled and implementation steps suggested. Some of the conference presentations will be expanded into articles in journal special issues edited by the project team.

In the presentations and field visit, the visiting project and IPM IL teams identified specific technical shortcomings and made suggestions for better alignment with project goals in many of the research thrusts presented. These will be followed up by the student advisors and co-mentors to improve project quality and train students and young researchers in international research and publication standards.

Relocating, repairing and adding sensors, and maintaining the 3 weather stations existing at up to ~1000 m elevation took much longer under the project than expected and took most of the amount budgeted for weather observations, but is now complete, with collected data being transmitted via the cellphone network to a Web-accessible database. Data from about 50 Government of Nepal weather stations in the ChAL region for period of 40 years were acquired from the Department of Hydrology and Meteorology and is available for project researchers to analyze. The next step is to add 1-2 weather stations at higher elevations, which will require shifting funding from other project budget items. Dr. Muniappan Rangaswamy, IPM IL Director, recommended prioritizing, going forward, climate and biodiversity monitoring and modeling over other project components such as rural economic development capacity building and technology transfer.

Ecologist Dr. Anadon introduced project participants and other Nepal young researchers to state-of-the-art computational methods for estimating climate sensitivity of species, which will be used to carry out some of the proposed climate change and biodiversity research. More trainings on biodiversity assessment, modeling and statistical packages are needed to build the necessary research capacity in these areas.





## Annexes

### Annex 1: Participants' list for interaction workshop on 7th January 2017

S.N.	Participants' name	Affiliation
1.	Dr. Nir Krakauer	City College—CUNY, New York, NY, USA Dept. of Civil Engineering
2.	Dr. Tarendra Lakhankar	CUNY-CREST Institute, The City University of New York
3.	Prof Dr. P. K. Jha	Central Department of Botany
4.	Prof. Dr. Mohan Siwakoti	Central Department of Botany
5.	Dr. Sanjay Kumar Jha	Central Department of Botany
6.	Dr. Bharat Babu Shrestha	Central Department of Botany
7.	Dr. Anjana Devkota	Central Department of Botany
8.	Dr. Ram Asheshwar Mandal	Central Department of Botany
9.	Ms Seerjana Maharjan	Central Department of Botany
10.	Ms Anju Sharma	Central Department of Botany
11.	Ms Pristi Dangol	Central Department of Botany
12.	Ms Bidhya Maya Shrestha	Central Department of Botany
13.	Mr Sanjeeb Bhandari	Central Department of Botany
14.	Mr Ganga Shah	Central Department of zoology
15.	Mr Sagar Khadka	Central Department of Botany
16.	Ms Vishubha Thapa	Central Department of Zoology
17.	Prof. Dr Mohan Sharma	Agriculture Forestry University
18.	Dr. Durga Devkota	Agriculture Forestry University
19.	Mr Praseed Thapa	Agriculture Forestry University

### Annex 2: List of participants in workshop, 8 Jan 2017

S.N.	Participants' name	Affiliation
1.	Prof. Dr. Rangaswamy (Muni) Muniappan	IPM Innovation Lab - OIRED - Virginia Tech
2.	Ms Stephanie Parker	IPM Innovation Lab - OIRED - Virginia Tech
3.	Ms Jaspreet Sidhu	IPM Innovation Lab - OIRED - Virginia Tech
4.	Dr. Nir Krakauer	City College—CUNY, New York, NY, USA Dept. of Civil Engineering
5.	Dr. Ajay Jha	Institute of Global Agriculture and Technology Transfer, (IGATT), Fort Collins, CO, USA
6.	Dr. Tarendra Lakhankar	CUNY-CREST Institute, The City University of New York
7.	Prof Dr. P. K. Jha	Central Department of Botany
8.	Prof. Dr. Mohan Siwakoti	Head, Central Department of Botany
9.	Dr. Sanjay Kumar Jha	Central Department of Botany
10.	Dr. Bharat Babu Shrestha	Central Department of Botany
11.	Dr. Anjana Devkota	Central Department of Botany
12.	Dr. Ram Asheshwar Mandal	Central Department of Botany
13.	Ms. Seerjana Maharjan	Central Department of Botany
14.	Ms. Anju Sharma	Central Department of Botany
15.	Ms. Pristi Dangol	Central Department of Botany
16.	Ms. Bidhya Maya Shrestha	Central Department of Botany
17.	Mr. Sanjeeb Bhandari	Central Department of Botany







### Annex 5a: Schedule of the field visit on 13 January, 2017

S.N.	Time	Activity
1.	9:45 am	Travel to Pokhara via Simrik Airlines
2.	10:30 – 12:00	Travel to Syangja
3.	12:00-12:45	Lunch at Bayerghari of Syangja
4.	13:00-13:30	Weather station observation of Syangja
5.	13:30-15:00	Interaction with project beneficiaries
6.	15:00-16:00	Field visit of iDE team headed by Mr. Lalit (IPM Coordinator)
7.	16:00-18:00	Travel back to Pokhara and individual time

### Annex 6b: Schedule of the field visit on 14 January, 2017

S.N.	Time	Activity
1.	7-8 am	Breakfast
2.	8-8:30 am	Travel to Puranchaur, Kaski
3.	8:30-10:00	Observation of weather station, research trail (Light Trap and Cauliflower field trial) of two PhD students of AFU
4.	10:00-11.30	Interaction with beneficiaries of Puranchaur, Kaski
5.	11:30-12:00	Visit of commercial tomato production of beneficiary
6.	12:00-12:30	Travel back to Pokhara
7.	12:30-13:30	Lunch
8.	13:30 onward	Towards airport for check-in for flight at 15:00

### Annex 7: List of participants at species distribution modeling training, 15 Jan 2017

SN	Name	Email address
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18	Prathikshya Chalise	pratikshya71@gmail.com



# Workshop on Species Distribution Modeling

- 15 Jan 2017

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Some photographs





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