



APN CAPaBLE Training Program on Integrating Geospatial Technologies in Climate-Smart Agriculture Planning and Management in South Asia

Collaborative Project Among
NEPAL, BHUTAN, & PAKISTAN
Funded by
Asia Pacific Network for Global Change Research, Japan

November 7 to 10, 2023
Birendranagar, NEPAL

Organized by
Mid-West University
Graduate School of Science and Technology

TRAINING WORKSHOP REPORT

Four-Days International Training on "Integrating Geospatial Technologies in Climate Smart Agriculture Planning and Management in South Asia" from November 7 to 10, 2023 at Birendranagar, Nepal

Organizers:

- Mid-West University, Graduate School of Science and Technology, Mid-West University

In collaboration with

- Nepal Academy of Science and Technology (NAST)
- Royal University of Bhutan (RUB)
- University of Haripur (UOH) Pakistan
- Global Change Impact Studies Centre (GCISC) Pakistan

Objective

The overall goal of the training is to strengthen the capacity of agriculture sector stakeholders on the application of geospatial technologies in CSA planning and management for promoting sustainable agriculture in Nepal.

The specific objectives of the training are as follows:

- Share and discuss the key concepts of the CSA
- Introduce different geospatial tools and techniques for CSA planning and management
- Train the stakeholders on some of the application of geospatial techniques for the best/innovative CSA planning and management through hands on exercises.

Date and Venue

Date: November 7 to 10 (Nepali Calendar: 21 – 24 Kartik, 2080)

Venue: Hotel Namaste, Pipal Chautara, Birendrachow, Birendranagar

Agriculture contributes one-third of the national GDP in Nepal (CBS, 2016), 23% in Pakistan (Plecher, 2019), and 17% in Bhutan (NSB, 2018). It employs 65%, 60%, and 44% of the population in Nepal (CBS, 2016), Bhutan, and Pakistan (FAO, 2019), respectively. Agriculture is immensely affected by climate change (CC) in these countries. Climate-smart agriculture (CSA) has been identified as a sustainable solution to CC challenges in agriculture; however current efforts in CSA limit to conventional planning, extension, and dissemination approaches. The effective adoption of CSA requires smart, informed decisions for which the application of geospatial and other information technologies is crucial. Changing land use, water resources, soil fertility, and increasing climate extremes pose a serious threat for sustainable agriculture of the rapidly populating and climatically changing south Asian region (Gupta & Deshpande, 2004; Christen et al., 2010). Notwithstanding, the present apparent symptoms of CC causing non-availability of water at the right time, the existing traditional practices, skills, and drought/flood risks mitigation practices on watersheds are not sufficient (Ahmad et al., 2004; Prabhakar & Shaw, 2008) to cope with the emerging issues and risks. Consequently, a significant impact of CC on livelihood has been reported in South Asia (Ashraf et al., 2011; Nelson et al., 2009; Rafiq & Blaschke, 2012). It is partly because concise future climate vulnerability and risks are not known. Geospatial technologies comprise a range of modern tools contributing to the geographic mapping and analysis of the earth and human societies (Albert, 2012). These technologies can be an important tool for agriculture planning and management (Rao et al., 2004; Sherrouse et al., 2011) and addressing CC issues (Sunderesan et al., 2013). Therefore, skilled human resources and improved knowledge on the application of geospatial technologies in climate-smart agriculture planning and management are urgently needed for sustaining food production, improving livelihood, and augmenting the economy. Therefore, this training workshop has been planned, under the framework of the APN Project (CBA2020-13MY-Thakuri), for the capacity building of the stakeholders on the application of geospatial technologies in CSA planning and management in Nepal.

A 4 days training workshop (**November 7 - 10, 2023**) was organized by Mid-West University, Graduate School of Science and Technology (MU-GSST) in collaboration with the Nepal Academy of Science and Technology (NAST) and through the financial support of Asia Pacific Network for Global Change Research (APN-GCR) in Japan, with Nepal taking the lead. Throughout the training session, training coordinator Dr. Pushpa Raj Acharya, resource

person Mr. Bishnu Maharjan, GIS expert working in tandem with other resource persons, played a pivotal role in instructing participants on the practical utilization of GIS software within the realm of agriculture. The guidance extended to navigating the software interface and delving into its application in agriculture-related contexts. In a comprehensive approach, they offered valuable insights into comprehending the intricacies of the software's data frame, emphasizing data analysis techniques and mapping functionalities. A key component of their instruction involved a hands-on exercise within the GIS software, wherein participants were actively engaged in assessing climatic data. Bishnu Maharjan and Dr Pushpa Raj Acharya facilitated a detailed exploration of how to determine the suitability of various crops for specific locations. This involved a nuanced understanding of climatic factors and their implications on agricultural practices. Through this interactive session, participants gained practical experience in employing GIS tools for informed decision-making in agriculture planning and management.

Dr. Uttam Babu Shrestha conducted a comprehensive training session, enlightening participants on the global utilization of cutting-edge technologies in agriculture and providing insights into the specific context of Nepal. The training covered crucial aspects such as land selection and mapping (drawing) in the agricultural domain. Additionally, Mr. Kiran Timilsina imparted knowledge on climate-smart agriculture, emphasizing strategies to mitigate the impact of climate-related challenges and the importance of cultivating appropriate crops in specific locations. Furthermore, participants received training on the Super-Krishak and Geo-Krishi mobile applications, enhancing their proficiency in utilizing these tools for agricultural purposes. The sessions aimed to equip attendees with a well-rounded understanding of contemporary agricultural practices, integrating technology and climate-smart strategies for optimal outcomes in the Nepalese context.

In the Conclusion Session of the training, Prof. Dr. Bimal Kumar Lal Karn, Dean of Graduate School of Agriculture and Forestry, Mid-West University was the Chief Guest and Dr. Sudeep Thakuri, Team Leader of the Project attended the program. A total of 28 individuals, including agricultural officers from Karnali province, professors specializing in agriculture, forestry, and environmental studies, as well as research-level students, actively participated in the training. The closing session, culminating with the distribution of certificates of participation, took place at the Hotel Namaste Nepal, Birendranagar, Surkhet. The event served as a platform for acknowledging the collective commitment to advancing agricultural methodologies through the integration of modern technologies. The expressions of appreciation underscored the significance of collaborative efforts in addressing the evolving needs of agriculture in today's dynamic landscape.

1. Glimpse of the Event in Pictures

Picture 1. Participants in the Training Workshop



Picture 2. Inauguration session of the program



Picture 3. Trainer Bishnu Maharjan Showing the Example of map for Practice.



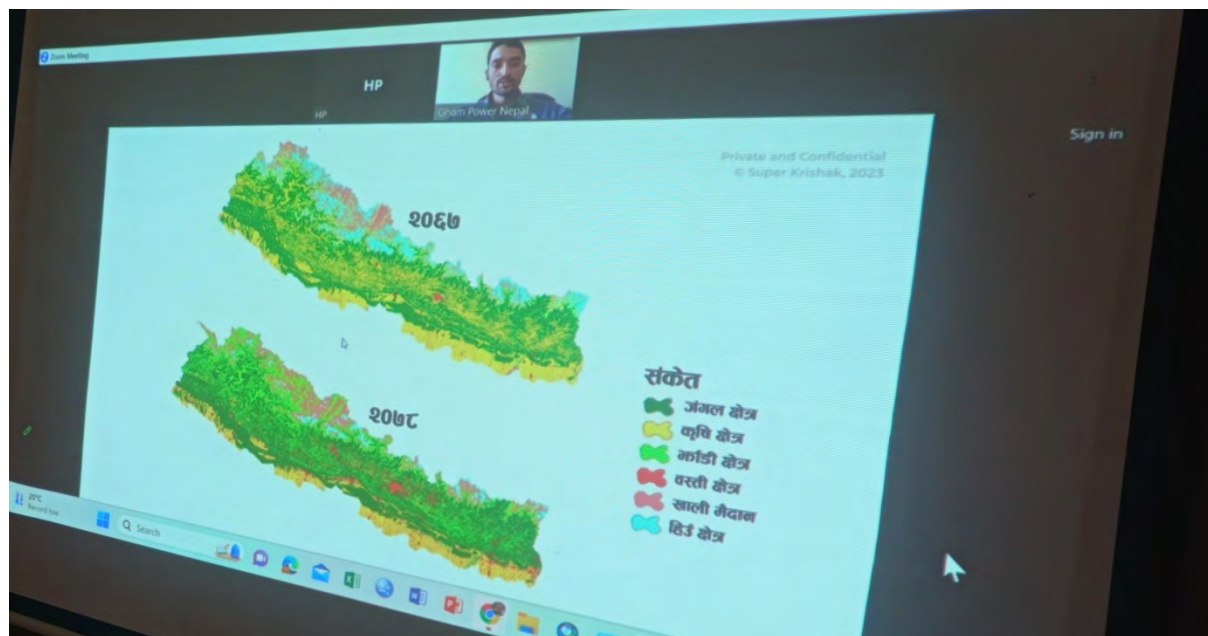
Picture 4. Sharing by the resource person during the technical session



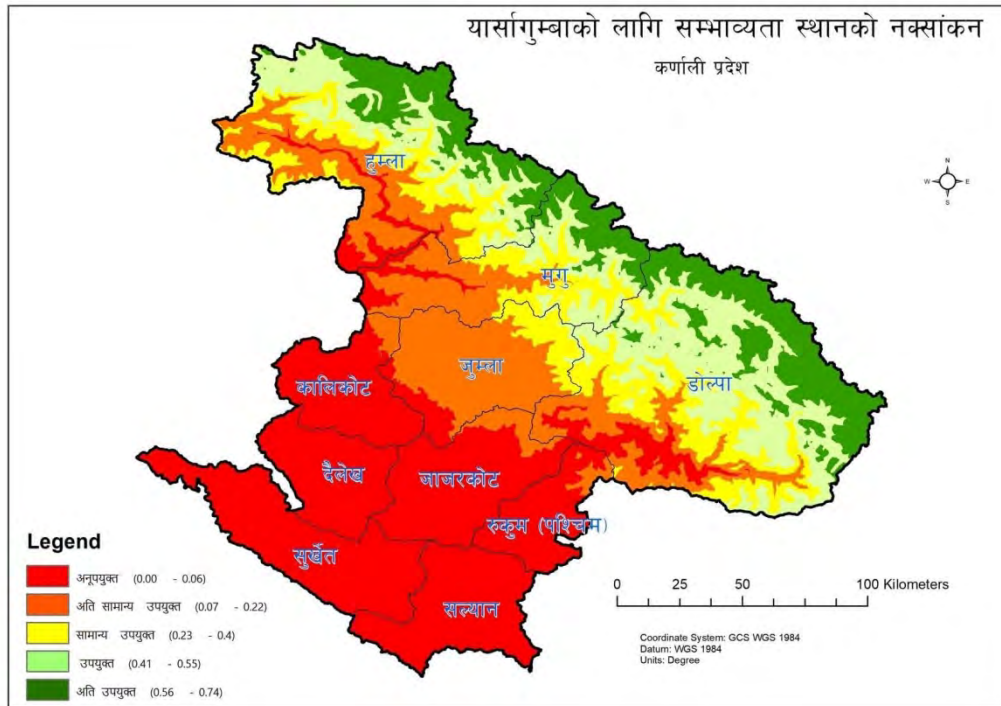
Picture 5. Participants are discussing among themselves.



Picture 6. Participants also learn from online



Picture 7. Participants are learning how to distinguish different areas in mapping.



Picture 8. Participants sharing their experiences on the last day.



Picture 9. certificate distribution function from Chair Person to trainer-Agriculture officer Nisha KC



Picture 10. Closing the program and handing over the token of love from Chair Person Dr.Sudeep Thakuri to- Trainer Bishnu Maharjan



3. Programme Schedule

Day 1: Inaugural Session (November 7, 2023)

Time	Activity	Resource Person
14:00-14:30	Registration and arrival of guests/participants (welcoming with snacks)	
Inaugural Session		
14:30-15:00	Guests: <ul style="list-style-type: none"> • Prof. Dr. Bimal Lal Karna, Dean, Graduate School of Agriculture and Forestry, MU • Assoc. Prof. Sudeep Thakuri, Dean, Graduate School of Science and Technology • Dr. Narahari Prasad Ghimire, Secretary, Ministry of Land Management, Agriculture Development and Co-operatives • Devnidhi Tiwari, Senior Scientist, Director National Agriculture Genetic Resources Center (Genbank) 	
15:35-15:45	Welcome note; Workshop Highlight and Project overview	Presentation by Project Coordinator, Dr. Pushpa Raj Acharya
16:45-16:55	Technical Highlights and Software Installation	Bishnu Maharjan, Resource Person
17:55-18:05	Brief remarks	Guests
18:05-18:15	Remarks from Chief Guest	Chief Guests
18:15-18:25	Vote of thanks and closing	
18:25-18:30	Group Photo	
18:30 onwards	Hi Tea with snacks	

Day 2: Introductory Session (November 8, 2023)

Time	Activity	Resource Person
8:00-8:30	Registration and arrival of guests/participants	
8:30-9:00	Introduction of the participant and training overview	
9:00 – 10:30	Introduction to Climate smart agriculture: Theory and practice	Kiran Timilsina - Head of Agri-Services - Gham Power
11:00 – 12:00	An introduction to Geokrishi App for smart agriculture	Rajan Bajracharya

12:00- 1:00	Lunch	
1:00 -3:00	Introduction to Arc Map: Getting to know software and data types	Bishnu Maharjan/ Raju Chauhan
3:00 – 4:30	Exploring with data and data frame in GIS	Bishnu Maharjan/ Raju Chauhan
4:30 – 5:30	Map layout	Bishnu Maharjan/ Raju Chauhan

Day 3: Applied Session (November 9, 2023)

Time	Activity	Resource Person
9:00-10:30	Application of Geospatial Technologies for Climate Smart Agriculture: Global trend and Nepalese Perspective	Dr. Uttam Babu Shrestha, GIS, Nepal
10:30 – 11:00	Hands on exercise on operating SMART agriculture NCFD Nepal application in android Mobile	Bishnu Maharjan
11:00- 12:30	Handling GPS and google earth applications for crop and agriculture mapping	Bishnu Maharjan
12:30- 1:30	Lunch	
1:30 -2:00	Crop Suitability Analysis using GIS and Climatic Data (Entropy Modelling)- An introduction	Bishnu Maharjan/ Raju Chauhan
2:00 – 3:30	Crop Suitability Analysis using GIS and Climatic Data: Hands on exercise	Bishnu Maharjan/ Raju Chauhan
3:30 – 5:00	Crop Suitability Analysis using GIS and Climatic Data: Hands on exercise, continued.	Bishnu Maharjan/ Raju Chauhan
5:00- 5:30	Group division for project work	

Day 4: Presentation and closing Session (November 10, 2023)

Time	Activity	Resource Person
8:00- 9:00	Group work continued	
9:00 – 11:00	Presentation of group work and Discussion	
Closing session		
11:00-11:30	Reflection from participants and trainers	

11:30- 12:00	Certificate distribution	
12:00 -12:10	Remarks	
12:10-12:20	Remarks	
12:20-12:30	Closing remarks	
12:30-1:30	Lunch	
1:30	Check out and departure	