



International Training Workshop  
on

***“Integrating Geospatial Technologies in Climate-Smart Agriculture  
Planning and Management in South Asia”***

September 22-25, 2023

Kathmandu, Nepal

## TRAINING WORKSHOP REPORT

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### **Four-Days International Training Workshop on “Integrating Geospatial Technologies in Climate-Smart Agriculture Planning and Management in South Asia” from September 22 - 25, 2023 at Kathmandu, Nepal**

#### **Organizers:**

- Mid-West University, Graduate School of Science and Technology (MU-GSST)

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 (September 22 - 25, 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. In the inaugural address, Prof. Dr Chhatra Mani Sharma, Head of Department of CDES and the Chairperson of the program, highlighted exploring innovative ways to integrate geospatial technologies for climate-smart agriculture planning and management in the South Asian context. Throughout the training session, GIS expert Bishnu Maharjan, working in tandem with Raju Chauhan, 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 Raju Chauhan 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.

Concluding the training, Dr. Rabindra Dhakal from the Secretariat of the Nepal Institute of Science and Technology (NAST) and Senior Scientist Deepa Singh Shrestha from the National

Agricultural Research Council (Gene Bank) expressed gratitude to both the organizers and participants for recognizing the imperative of incorporating cutting-edge technologies in contemporary practices. A total of 34 individuals, including agricultural officers from Bagmati 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 Holiday Regency Hotel in Kathmandu. 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

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*Picture 1. Participants in the Training Workshop*



Picture 2. Inauguration session of the program



Picture 3. Inauguration address from the Chairperson – Prof. Dr. Chhatra Mani Sharma , HoD, CDES – TU



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



*Picture 5. Training participants engaged in the group exercise*



*Picture 6. Group with Dr. Uttam Babu Shrestha*

## 2. List of Training Participants

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## 3. Programme Schedule

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### Day 1: Inaugural Session (September 22, 2023)

Time	Activity	Resource Person
16:00-16:30	Registration and arrival of guests/participants	
<b>Inaugural Session</b>		
16:30-16:35	<i>Guests on the dais</i> <i>Chairperson:</i> (MU) <i>Chief Guest:</i> <i>Guests:</i>  <i>Principal Investigator:</i> Dr. Sudeep Thakuri, Dean, Graduate School of Science and Technology, MU <i>Project Collaborator:</i> Dr. Madan Lall Shrestha, Nepal Academy of Science and Technology (NAST) <i>Project Collaborator:</i> Dr. Pushpa Raj Acharya	
16:35-16:45	Welcome note; Workshop Highlight and Project overview	
16:45-16:55	Brief remarks	Dr. Madan Lall Shrestha, Project Collaborator, NAST, Nepal
17:55-18:05	Brief remarks	
18:05-18:15	Remarks	
18:15-18:25	Vote of thanks and closing	
18:25-18:30	Group Photo	
18:30 onwards	Welcome Dinner	

### Day 2: Introductory Session (September 23, 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 – 10:00	Introduction to Climate smart agriculture: Theory and practice	

10:00 – 11:00	Application of Geospatial Technologies for Climate Smart Agriculture: Global trend and Nepalese Perspective	Dr. Uttam Babu Shrestha, GIS, Nepal (Yet to confirm)
11:00- 12:30	Digital Crop Mapping and Monitoring	AK (Arun) Pratihast, PhD, Sr. Data scientist in Earth Observation and Environmental Informatics group, Wageningen Environmental Research, Wageningen, The Netherland (Yet to confirm)
12:30- 1:30	Lunch	
1:30 -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 (September 24, 2023)

Time	Activity	Resource Person
8:00 - 9:30	An introduction to Geokrishi App for smart agriculture	Roshan Bajracharya
9:30 – 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/ Raju Chauhan
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 (September 25, 2023)

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