



THE FOURTH INTERNATIONAL CONFERENCE

IOUNTAINS IN THE CHANGING WORLD

UNDERSTANDING HYDROCLIMATIC SYSTEMS FOR SUSTAINABLE LIVELIHOODS 18-19 October, 2019 | Kathmandu, Nepal



Host & Organizer



Co-organizer













Kathmandu Institute of Applied Sciences PO Box 23002, Kathmandu, Nepal

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INTRODUCTION

The 4th international conference on "Mountains in the Changing World (MoChWo19) was held on 18-19 October, 2019 at Radisson Hotel, Kathmandu, Nepal. The major theme of MoChWo19 was "Understanding hydroclimatic systems for sustainable livelihoods".

The conference is a flagship annual program of Kathmandu Institute of Applied Sciences (KIAS). The conference aims to provide a regular forum for scholarly interactions on various facets of mountain among international/national scholars, researchers, policy makers and students. KIAS believes that conference is an important avenue to boast international collaboration, share research findings and knowledge related to various aspects of mountains

WHY MOCHWO?

Mountains are a part of global biodiversity repository and play vital role in maintaining global ecosystem and supporting millions of people. Mountains possess a large variation in landscape features and also act as global water towers. Similarly, mountains offer a 'niche or comparative advantage' at operational levels such as medicinal herbs, tourism and hydropower. In the meantime, they are the most vulnerable to the effect of global change. Data suggest that mountain communities are among the poorest and most affected by development programs that are not tailor-made for mountain conditions.

Furthermore, the cascading effects of climate change on water resources and biodiversity have severe consequences on local livelihoods, and consequently result in a downward spiral of poverty. The mountains, as a whole, require tailor-made solutions based on mountain-specific research and knowledge. Therefore, Kathmandu Institute of Applied Sciences (KIAS) is organizing a series of international conferences on Mountains in the Changing World (MoChWo) to create a forum for exchanging scientific knowledge on mountain-specific research among scientists, decision makers (bureaucrats and politicians) and development practitioners.



MoChWo 2016

01-02 October, 2016 Kathmandu, Nepal

The conference was attended by more than 150 participants from 10 different countries where 110 scientific works were presented. The main theme of the MoChWo 16 was "Living through disasters: mitigation, adaptation and resilience". To know more about first MoChWo, please visit at http://mochwo16.kias.org.np/

MoChWo 2017

27-28 October, 2017 Kathmandu, Nepal

Th major theme of the conference was "Air pollution: mechanisms and consequence". The conference was attended 200 participants and had 108 presentations from 10 different countries. To know more about second MoChWo, please visit at http://mochwo17.kias.org. np/.

MoChWo 2018

09-10 October, 2018 Kathmandu, Nepal

The conference was attended by more than 220 participants from 15 different countries where over 110 scientific works were presented. The main theme the conference was "Conserving Biodiversity: Challenges for the mountains in the anthropocene". To know more about third MoChWo, please visit at http://mochwo18.kias.org.n p/..

OBJECTIVES OF MOCHWO



The main objective of the MoChWo conference is to bring scientists, experts and researchers from government agencies, development practitioners and academia to share research frontiers on sustainable mountain development.

TO SHARE MOUNTAIN SPECIFIC RESEARCH FINDINGS;

TO IDENTIFY CRITICAL ISSUES AFFECTING LIVELIHOODS AND WELL-BEINGS OF MOUNTAIN PEOPLE;

TO FOSTER COLLABORATION AND NETWORKING AMONG ACADEMIA, NGOs AND GOVERNMENTAL AGENCIES;

TO PROMOTE KNOWLEDGE BASED POLICY INTERVENTIONS BY CREATING A DISCUSSION FORUM AMONG THREE KEY PLAYERS: (A) ACADEMIC INSTITUTIONS, (B) GOVERNMENT AGENCIES, AND (C) INTERNATIONAL DEVELOPMENT AGENCIES THROUGH A POLICY DIALOGUE.



ABOUT ORGANIZER



Kathmandu Institute of Applied Sciences (KIAS) is a non-profit multidisciplinary research organization founded by a group of scientists with proven excellence in research that ranges from biodiversity, climate change to development of new technology for biological and chemical analyses. Currently, KIAS has three centers for excellences. Major aim of KIAS is to serve our society and nation via scientific research. KIAS aims to foster knowledge based intervention to tackle with existing and emerging challenges faced by people.

STRATEGY

То realize this goal. KIAS conducts multidisciplinary research devoted to specific problems through its specified research centers. Apart from regular research, KIAS organizes trainings and workshops, and science outreach programs including short-term schools and conference targeting students, researchers and scientists. Furthermore, KIAS encourages dialogue among academia, practitioners and decision makers to share evidence-based solutions to real-world problems. The MoChWo is one of the initiatives that aim to serve as a major networking outlet for people working on sustainable mountain development.

If you are interested in becoming a part of the MoChWo conference in coming days, please contact us for more details.



KIAS RESEARCH CENTER

BUILDING KNOWLEDGE FOR NATION DEVELOPMENT



CENTER FOR
CONSERVATION BIOLOGY



CENTER FOR
ANALYTICAL SCIENCES



CENTER FOR WATER & ATM. RESEARCH

MoChWO 2019

Photo Gallery







LINK TO GALLERY

HTTPS://WWW.FLICKR.COM/PHOTOS/185095925@N03/S FTS/72157711447212427/



4TH MOCHWO CONFERENCE OVERVIEW

The fourth MoChWo conference was organized and hosted by Kathmandu Institute of Applied Sciences (KIAS). The conference brought together over 250 people across the globe to share and exchange their research experiences on different cross-cutting issues on mountains such as disaster risk reduction, climate change, biodiversity conservation, environmental pollution, forest management, agro-economy, sustainable agriculture development, citizen science and invasive species. The conference was a huge success in bringing together experts from different backgrounds to discuss and deliberate on challenges of mountains, opportunities for future and strategies for sustainable development. The conference secretariat received more than 270 submissions, which were reviewed by scientific committee. Altogether 128 submissions (101 - oral presentations and 27 - poster presentations) were selected for presentation. The papers were categorized on the basis of their themes and scheduled accordingly.



CONFERENCE STRUCTURE



INAUGURAL SESSION

KEYNOTE SESSION

Walter W. Immerzeel, Department of Physical Geography, Utrecht University The Netherlands

Arun Bhakta Shrestha, International Centre for Integrated Mountain Development, Kathmandu, Nepal

SYMPOSIA

Mountain Climate, Cryosphere, Hazard and Livelihoods

Climate Change and Biodiversity: What Conservation Biologists Should Worry About in Nepal?

Pollinators for Sustainable Livelihoods

Towards Sustainable Water Resource Management: Citizen Science and Beyond

ORAL SESSION

Conservation Ecology and Management

Mountain Disasters and Livelihoods

Sustainable Management of Water and Waste

Plant Ecology in Changing Environment

POSTER SESSION



OVERVIEW

The MoChWo 2019 conference kicked off with a busy registration desk. The conference was started with a welcome speech from the convener of the conference, Dr. Prakash K. Paudel. Dr. Paudel welcomed participants, and highlighted on the importance of MoChWo Conference in bringing together the international professionals for discussing on the issues of mountain environment under the changing climate.

The conference was attended by 250 participants around the world including Nepal, the Netherlands, France, China, USA, Cyprus, India, Singapore and Poland. A total of 128 research papers were presented on various issues of mountains, ranging from hydroclimatic systems, disasters, climate change, biodiversity, environmental pollution and water resource management." A major motivation of organizing MoChWo Conference is bringing together experts, policy makers and practitioners under a roof to discuss on emerging issues on a regular basis", said Dr. Prakash K Paudel, Convener and Executive Director, KIAS. "We're hopeful that MoChWo will contribute in linking science with policy in mountain regions".

A MAJOR MOTIVATION OF ORGANIZING MOCHWO CONFERENCE IS BRINGING TOGETHER EXPERTS, POLICY MAKERS AND PRACTITIONERS UNDER A ROOF TO DISCUSS ON EMERGING ISSUES ON A REGULAR BASIS

DR. PRAKASH K. PAUDEL, CONVENER AND EXECUTIVE DIRECTOR, KIAS

KEYNOTE SESSION

The keynote session included two presentations from imminent experts in the field: Prof. Dr. Walter W. Immerzeel and Dr. Arun Bhakta Shrestha. Prof. Immerzeel, gave keynote talk on Recent advances in understanding climate, glacier and river dynamics in highmountain Asia. Dr. Arun Bhakta Shrestha delivered keynote talk on "State and fate of the Hindu Kush Himalaya water resources"

High mountain Asia has been impacted seriously by climate change, far more than global average and our projections.

Prof. Dr. Walter W. Immerzeel



Hindu Kush Himalaya water resources, critical for billions of people, are at risk due to climate change and there are environmental, sociocultural, and economic consequences, impacting sustainability of entire region.

Dr. Arun Bhakta Shrestha



Prof. Dr. Walter W. Immerzeel

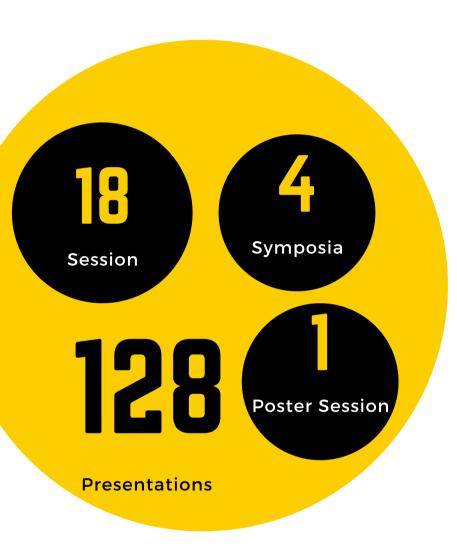
Walter W. Immerzeel has 20 years of experience in geo-informatics, water resource management and climate change and has been doing research on Himalayan hydrology since 2002. He is currently working as a professor of Mountain Hydrology at Utrecht University where he is leading a number of projects on the cutting edge of climate change, glaciology and hydrology. Immerzeel has large international network and has worked in Netherlands, many developing countries and at International Centre for Integrated Mountain Development (ICIMOD) in Nepal for two years. He has also received several prestigious awards for his pioneering Himalayan research.

Dr. Arun Bhakta Shrestha

Dr Arun Bhakta Shrestha is a Senior Climate Change Specialist and Programme Manager for Regional River Basins and Cryosphere programme of International Centre for Integrated Mountain Development (ICIMOD) based in Kathmandu. He has a PhD in Earth Sciences from the University of New Hampshire, the USA, and a Master's degree in Hydraulic Engineering from Minsk, former USSR. Before joining ICIMOD, Dr Shrestha worked for the Department of Hydrology and Meteorology, Nepal. His main areas of expertise include climate change, glaciers and glacial hazards, glacial lake risk mitigation, atmospheric environment, and hydrological modelling. Dr Shrestha has had several publications in peer-reviewed international journals, national journals, and magazines on subjects related to climate change, water resources, waterinduced hazards and regional water cooperation. Dr Shrestha is on the editorial panel for Advances in Climate Change Research (Elsevier). Dr Shrestha was one of the four editors of the Hindu Kush Himalaya Assessment and one of three coordinating lead author of the climate change chapter of the assessment.

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TECHNICAL Session





TOWARDS SUSTAINABLE WATER RESOURCE MANAGEMENT: CITIZEN SCIENCE AND BEYOND



6 PRESENTATIONS

HIGHLIGHTS

Uneven distribution of water in space and time is an ongoing challenge, which is intensified by anthropogenic activities at local, regional and international levels. This requires wise management of water resources. Water availability data is of paramount importance to make a well-founded plan. "You can't manage a resource you don't measure", Lord Kelvin, a famous Mathematician, once said". This is true for water resources. Citizen science is the process of involving citizens (or "non-professional scientists") in data collection that is both inexpensive and fast.

This symposium brought together some of the citizen science based pioneering works done on water resource management in Nepal. The symposium was coconvened by Dr. Bhesh Raj Thapa and supported by Smartphone4Water-Nepal.

CLIMATE CHANGE AND BIODIVERSITY: WHAT CONSERVATION BIOLOGISTS SHOULD WORRY ABOUT IN NEPAL?

4 PANNEL PRESENTATIONS

Hosted by Nepal Chapter of Society for Conservation Biology





HIGHLIGHTS

Nepal has a strikingly diverse heterogeneity due to sharp variations in physiography, altitude and precipitation within a relatively small territory. Nepal's mountains are fragile and highly sensitive to global environmental change and human-induced modifications. Most people live under poverty, and the capacity of people and the country to cope with climate change impact is low. Given to highly sensitive to climate change, Nepal is likely to be among the first few countries facing an inescapable downward spiral of poverty and disasters. Early indication suggests that climate change has already impacted agriculture, tourism and hydropower. There are limited discussions on linkages of biodiversity and climate change, although it is urgently needed.

This symposium was structured as an panel discussion and interactions. The symposium provided important opportunity to have interactions among policy makers, practitioners and researchers. The symposium organized by Nepal Chapter of Society for Conservation Biology.

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MOUNTAIN CLIMATE, CRYOSPHERE, HAZARD AND LIVELIHOODS

6 SESSIONS, 28 PRESENTATIONS, 1 PANEL DISCUSSION





HIGHLIGHTS

High mountain constitutes Earth's one of the most complex and sensitive ecosystems that provides life-supporting goods and services, such as water, food and energy, for millions of people. Cryosphere, in particular holds a pivotal role in mountain ecosystem because it perpetuates clean water to downstream by holding it in the form of snow, glacier and permafrost in the high altitudes. There is a growing consensus among broad spectrum of society, particularly among scientists, decision makers and development practitioners that rising temperatures including extreme fluctuations of climate would diminish perpetual source of water, trigger disasters (e.g., flash flood, drought etc.) and put mountain people disproportionately at high risk of disasters. However, there is little scientific data to substantiate the extent and the processes of change and its potential impacts. Such information is very important for developing well-founded mitigation and adaptation strategies.

The symposium focussed on the discussion of current status of Himalayan glaciers and their potential responses to future climate change, hazards associated with it and, future other challenges. The symposium was co-convened by Prof. Dr. Dipak Aryal and Dr. Dibas Shrestha and supported by the Central Department of Hydrology and Meteorology, Tribhuvan University (CDHM-TU) in collaboration with Central Department of Geography, Tribhuvan University (CDG-TU), Institute of Research for Development, France and International Center for Integrated Mountain Development (ICIMOD).

POLLINATORS FOR SUSTAINABLE LIVELIHOODS 3 PRESENTATIONS





HIGHLIGHTS

Pollinators are intricately linked to human well-being through food security, social and cultural values and maintenance of ecosystem health and functions. Whereas wind and water can also serve as pollinating agents, majority of the globally cultivated and wild crops rely on pollination by animals. Beyond provisioning of food, pollinator-dependent plants also contribute directly to recreation activities, medicines, construction materials and biofuels, among others. As such, pollinators contribute to the sustainable livelihoods not only by providing economic and other unquantifiable benefits to the human, but also indirectly by sustaining the ecological functions. However, declines in pollinator diversity and populations in the last century has indicated that our knowledge and response actions have been unable to keep in pace with the threats to pollinators and pollination services.

As it is said, "we can't conserve what we don't understand". This symposium, therefore, brought together some researches on the status and uses of pollinators of Nepal. The symposium was co-convened by Dr. Susma Giri, an associate scientist at KIAS and also the organizing committee member of the conference.

REGULAR SESSION



SUSTAINABLE MANAGEMENT OF WATER AND WASTE

7 Presentations



MOUNTAIN DISASTERS AND LIVELIHOODS

11 Presentations



PLANT ECOLOGY IN CHANGING ENVIRONMENT

6 Presentations



CONSERVATION ECOLOGY AND MANAGEMENT

7 Presentations





The MoChWo conference was formally concluded by the convener of the conference, Dr. Prakash K. Paudel, on the evening of October 19, 2019. Dr. Paudel appreciated people and institutions involved in making the conference successful. During closing ceremony, best oral and poster presentation award was conferred to two students, each representing undergraduate and graduate student category. Similarly, two participants, Dr. Henry Huntington, USA, and Dr. Anjana Shakya shared their experiences of attending the conference. The conference was concluded with announcement of the 2020 episode of MoChWo Conference. The participants welcomed this announcement by a huge round of applause.



ORGANIZING COMMITTEE

Together we can do so much



Dr. Prakash K. Paudel, Convener



Dr. Hemu Kafle, Member



Dr. Basant Giri, Member



Dr. Dibas Shrestha, Member



Dr. Madhu Sudan Kayastha, Member



Dr. Susma Giri, Member

A dedicated team to support conference logistics

- 1. Varsha Rai, Research Outreach Coordinator, KIAS
- 2. Nischal Karki, Research Assistant, KIAS
- 3. Jasmita Khadgi, Research Assistant, KIAS
- 4. Sushila Kandel, Graduate Student, CDHM-TU
- 5. Arreena Maharjan, Research Assistant, KIAS
- 6. Sachin Sejuwal, Research Intern, KIAS
- 7. Bhoj Raj Thapa, Research Assistant, KIAS
- 8. Pravesh Dhungana, Graduate Student, CDHM-TU
- 9. Krisha Pokharel, Research Intern, KIAS
- 10. Saughat Bolakhe, Research Intern, KIAS
- 11. Deepa Pradhan, Graduate Student, CDHM-TU
- 12. Retina Shrestha, Research Associate, KIAS
- 13. Bikram Karki, Research Intern, KIAS
- 14. Shishir Pandey, Research Intern, KIAS
- 15. Jhalak Paudel, Research Intern, KIAS
- 16. Megh Danial Lama, Research Intern, KIAS
- 17. Arjun Limbu, Research Intern, KIAS



SCIENTIFIC COMMITTEE

- Prof. Dr. Raju Sarkar, College of Science and Technology Royal University of Bhutan, Bhutan
- 2. Prof. Dr. Rajib Shaw, Graduate School of Media and Governance Keio University, Japan
- Prof. Dr. Mohan Dangi, California State
 University, USA
- 4. Prof. Dr. Megha N. Parajulee, Texas A&M University, USA
- 5. Prof. Dr. Md. Anwarul Abedin, Department of Soil Science, Bangladesh Agricultural University, Bangladesh
- 6. Dr. Vasileios Bontzorlos, Technology of Thessaly, Greece
- 7. Dr. Shalik Ram Sigdel, Institute of Tibetan Plateau Research, Chinese Academy of Sciences, Beijing, China
- 8. Dr. Ranit Chatterjee, Graduate School of Informatics Kyoto University, Japan
- 9. Dr. Rajan Ghimire, New Mexico State University, USA
- 10. Dr. Olga Ameixa, University of Aveiro, Portugal
- 11. Dr. Nabin Malakar, Worcester State University
- 12.Dr. Khamarrul Azahari Razak, RAZAK Faculty of Technology and Informatics Kuala Lumpur, Malaysia



SCIENTIFIC COMMITTEE (CONTD.)

- 13. Dr. Keshav Basnet, Pashchimanchal Campus, Institute of Engineering, Tribhuvan University, Nepal
- 14. Dr. Indrajit Pal, Disaster Preparedness, Mitigation and Management, Asian Institute of Technology, Thailand
- 15. Dr. Ifte Ahmed, Faculty of Engineering and Built Environment, University of Newcastle Australia
- 16. Dr. Bipin Kumar Acharya, School of Public Health, Sun Yat-sen University, Guangzhou, China
- 17. Dr. Basanta Raj Adhikari, Institute of Engineering, Tribhuvan University, Kathmandu, Nepal
- 18. Dr. Atta-ur-Rahman, Department of Geography, University of Peshawar-Pakistan
- 19. Achyut Aryal, The University of Sydney, Sydney, Australia

EVALUATION COMMITTEE

- 1. Dr. Binod Pokharel, Chair
- 2. Dr. Yves Arnaud, Member



SESSION CHAIRS

- 1. Prof. Dr. Dipak Aryal
- 2.Mr. Saraju Kumar Baidya
- 3. Dr. Rishi Ram Sharma
- 4. Dr. Prabhu Budhathoki
- 5. Prof. Dr. Rejina Maskey
- 6. Prof. Dr. Rijan Bhakta Kaystha
- 7. Dr. Susma Giri
- 8. Dr. Shreedhar Masky
- 9. Dr. Bharat Babu Shrestha
- 10.Mr. Ram G. Kharbuja
- 11. Dr. Rashila Deshar
- 12. Dr. Gangalal Tuladhar
- 13. Dr. Bhesh Raj Thapa
- 14. Dr. Jiban Mani Paudel
- 15. Prof. Dr. Narendra Raj Khanal
- 16. Dr. Tirtha Bahadur Shrestha

INVITED SPEAKER



- 1. Dr. Patrick Wagnon, Grenoble University, France
- 2. Prof. Dr. Rijan Bhakta Kayastha, Kathmandu University, Dhulikhel, Nepal
- 3. Dr. Qing Bao, Chinese Academy of Sciences, Beijing, China
- 4. Prof. Dr. Deepak Aryal, Central Department of Hydrology and Meteorolgy, Tribhuvan University, Nepal
- 5. Dr. Maxime Litt, Department of Physical Geography, Utrecht University, The Netherlands
- 6. Dr. Ashok Kumar Pokharel, Atmospheric Scientist/Forensic Meteorologist
- 7. Dr. Henry Huntington, Huntington Consulting, Eagle River, Alaska, USA
- 8. Dr. Shreedhar Maskey, IHE Delft Institute for Water Education, The Netherlands
- 9. Dr. Binod Pokharel, Utah State University, Logan, Utah, USA
- 10. Dr. Bhogendra Mishra, Earth Surface Intelligence, Kathmandu, Nepal
- 11. Prof. Dr. Sudeep Thakuri, 1Central Department of Environmental Science, Tribhuvan University, Kirtipur, Nepal;
- 12.Mr. Deepak K.C., United Nations Development Programme, Nepal
- Dr. Bikram Shrestha Zoowa, Department of Hydrology and Meteorology, Nepal
- 14. Prof. Dr. Basanta Raj Adhikari, Institute for Disaster Management and Reconstruction, Sichuan University, China
- 15. Dr. Arun Bhakta Shrestha, Ministry of Forest and Environment, Nepal
- 16. Dr. Krishna Prasad Acharya, State Ministry of Forest, Tourism and Environment, Karnali Paradesh
- 17. Mr. Haribhadra Acharya, Department of National Parks and Wildlife Conservation, Nepal



BEST PRESENTATION AWARD

Following students were awarded with best student presentation awards:

Best poster presentation

Nisa Pokharel (Graduate category), Department of Civil and Geomatis Engineering, Pashchimanchal Campus, Institute of Engineering Tribhuvan University, Pokhara, Nepal

Priya Silwal (Undergraduate category), Naya Aayam Multi-disciplinary Institute, Jorpati; Smartphones For Water Nepal (S4W-Nepal), Lalitpur, Nepal

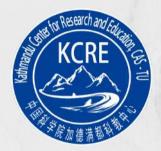
Best oral presentation

Jasmita Khadgi (Graduate category), Kathmandu Institute of Applied Sciences, Kathmandu, Nepal

Prajwol Bickram Rana, Rakshya Khanal (Undergraduate category), Kathmandu School of Law, Kathmandu, Nepal

COLLABORATORS

CO-ORGANIZER



Kathmandu Center for Research and Education, CAS-TU

PARTNERS



Nepal Chapter of Society for Conservation Biology



Central Department of Hydrology and Meteorology, TU, Nepal



Tribhuvan University
Institute of Science and Technology
Central Department of Environmental Science

Central Department of Environmental Science, TU, Nepal





