Glaciers and Water Resource Management

(Under GIAN, Global Initiative on Academic Network, Ministry of Human Resources, Govt. of India)

Organized by the Jawaharlal Nehru University, New Delhi
25^{th} -30^{th} , July 2016

Background

Mountain glaciers are widely recognized as excellent indicators of climate change over last centuries. Progress has been made in characterizing glaciers statistically and quantitatively, in quantifying Equilibrium Line Altitude/mass balance relationships, in determining glacier response times, and in modeling glacier sensitivity to climatic variables. However, assessments of the state of health of Hindu-Kush–Karakoram–Himalaya glaciers and their contribution to regional hydrology and global sea-level rise suffer from a severe lack of observations. So, there is an urgent need of information and study of some bench-mark glaciers over these regions on long-term. Glaciers in this region have strong impact on environmental and socio-economic, not only at local but also at regional and even global scales. Understanding the physical relationship between the glaciers and climate is one of the key to know the crisis and feedback against the recent atmospheric warming. Keeping in view the above points, there is an urgent need to have a platform where manpower can be trained and motivated to take up monitoring and scientific research on multidisciplinary aspects of Cryosphere/Glaciology. The studies so far have concentrated mostly on monitoring of snout (terminus of the glacier) and mass balance of glaciers. Much remains to be done regarding the important aspects of dynamics and physics of Cryosphere, interplay of weather parameters on health of glaciers, bedrock topography of glaciated regions and the biodiversity of Cryosphere. There is an urgent need of integrating modelling techniques with data generated by ground monitoring and that from satellite observations to understand future behaviour of glaciers under changing climatic regime.

Since the glaciology, as a subject, is not taught in Indian Universities there are limited opportunities available for students to take up studies of glaciers as a theme for research. The proposed course "**Glaciers and Water Resource Management**" would strive to fill up this need by generating ample opportunities for Post graduate level students to take up research projects leading to doctorate degrees to solve dual purpose of collecting state of art remote sensing and field observational data on glaciers related to their mass balance, determining the causes of changes, assess their ecological and hydrological effects, and develop models to predict future changes and effects. Students will also be introduced to the disciplines of ecology, hydropower generation, glacial hazards, hydro-meteorological hazards, water management, socioeconomics, water disputes and water sharing etc. which all play a great role in management of water resources for multi-purpose projects and to develop conservation strategies. They will be exposed to global water-food security link and public-

private participation issues and legal and regulatory settings in the context of IWRM. The course will develop necessary facilities for monitoring the glaciers and mountain river systems and their conservation and harvesting strategies towards supporting research and development on a long-term basis. The course will have input from various background experts such as earth scientist, hydrologist, civil engineers, environmental scientists, environmental engineers, climate modellers, social scientists, environmental lawyers, activists/ journalists, economists and policy makers etc. These experts will deliver lectures and discuss various case studies in the course.
The course will be organized as per the rules and regulations set-up by Jawaharlal Nehru University, New Delhi.

Modules	A. Course Name : **Glaciers and Water Resource Management** B. Course Code : **154027C05** C. Duration : **25-30 July , 2016** D. Venue : **Jawaharlal Nehru University, New Delhi** Number of participants for the course will be limited to fifty. **Module1: Glacier, Glacier hydrology, Glacier Energy and Mass Balance and modelling** **Module II: Paleoglciation -Paleoclimate Module III: Glacier and water harvesting, Water resource management in high mountain and Himalayan regions** .
Who can attend the course	This course is for students ((BTech/MSc/MTech/MA(Geo)/PhD), researchers, teachers, managers, technicians, remediation experts, hydrologists, ecologists, limnologists, water experts, environmental engineers, disaster management personals, state/central pollution control boards personals, hydropower industry people, Horticulture industries, aquaculture, project managers, activist/ journalist, policy makers, social scientist, and environmental scientists who need to understand the principles, practices and processes involved in glacier and water resource management on regional and local scale.
Fee	The participation fees for taking the course is as follows: JNU PhD/MTech/MPhil Students and Faculty**: INR 1000** Students from other recognized educational institutions**: INR 1000** Faculty from other recognized educational institutions: **INR 2000** Members of Government Research Organizations: **INR 5000** Members of Industry/Private Research Institution: **INR 10,000** Participants from abroad: **US $500** *The above fee includes all instructional materials for tutorials and assignments, laboratory equipment usage charges.*

The Faculty

Foreign Faculty

Prof. Dr. Matthias Braun is the Head of Department Geography and Geosciences at Institute of Geography, Friedrich-Alexander Universität Erlangen-Nürnberg (FAU)-Germany. His research interests include Remote Sensing, GIS, glaciers, ice shelf, climate change, Polar Regions, high mountains.

Host Faculty

Prof. AL. Ramanathan is a professor at School of Environmental Sciences, JNU, New Delhi. His research interests include Climate-Glacier interaction, Glacier mass balance (in-situ), energy balance, geodetic measurements Glacier meltwater hydrogeochemistry, glacier hydrology, and Biogeochemistry of Coastal Environment-Man groves.

Co-Host Faculty

Prof. A. P. Dimri is a professor at School of Environmental Sciences, JNU, New Delhi. His research interests include Regional climate modeling over western Himalayan region, Climate Dynamics and variability, Climate Change, glacier change etc.

Course Co-ordinator

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