7 days hands on training
on
WATER RESOURCE MANAGEMENT

In association with

ndian Institute of Technology,
Gandhinagar
(Project Management Unit)

Organized by

Department of Geology,
University of Lucknow

From 30th May to 5th June, 2023

Prof. Ajai Mishra
Co-Convener

Prof. Vibhuti Rai
Convener/Coordinator

Sponsored by

Department of Science and Technology (DST)
STUTI (Synergistic Training Program Utilizing the Scientific & Technological Infrastructure).

WORKSHOP ON WATER RESOURCE MANAGEMENT

Urbanization is a key component of development but it also causes deterioration of Environment. Growing Population density and changing land use patterns and lifestyles increase the burden on the Environment. ***Water*** is essential to everyone but rapid urbanization and industrialization may result in serious problem in accessing safe water. It is therefore essential to incorporate Water Quality training to professionals and researchers on state-of-the-art equipments.

Remote sensing has lately become a very essential tool for quickly analysing the macroscopic data especially in terms of planning and execution of developmental projects related to terrain analysis, natural disaster mitigation plans, space objects, Geological and geographical investigations, water resource management systems, Civil Engineering projects, Agricultural assessments and cadastral mapping.

All these studies and many more utilise satellite data which is in digital format, arial digital photography including drone-based data and different types of data such as cloud cover moisture content, pollution content, diseased crops, farms and forest, thermal data related to forest fire and distantly located natural and man-made disasters.

Many of the above applications generate huge amount of digital data that needs to be handled through utilization of specific softwares such as Geomatics, PCI Geomatics; SAGA GIS(Open Source); TNTmips, MicroImages; ERDAS IMAGINE; Google Earth; ENVI; GRASS GIS; OpenEV; Opticks; Orefeo Toolbox; Remote View; SOCET SET; IDRISI; ECognition ArcGIS; SNAP.

Lucknow, the capital of Uttar Pradesh is the part of central Gangetic plain which is located between North latitudes 26°30’ and 27°10’ and East longitudes 80°30’and 81°13’. The city has a humid subtropical climate with a cool dry winter from December to February and a hot summer from April to June. The temperature extremes vary from about 45°C in the summer to 3°C in the winter. The city receives about 100 cm of annual rainfall mostly from

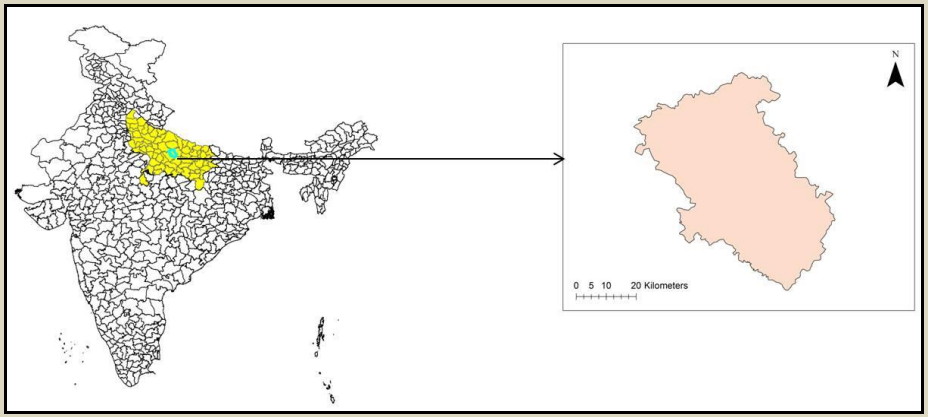
the southwest monsoon between July and September. The city lies at an average altitude of 128 meters above mean sea level and generally slopes to the east. Lateral slopes are towards the river **Gomati**, which flows from North-West to South-East through the heart of the city, dividing it into the Trans-Gomati and Cis-Gomati regions.

Since time immemorial, **Lucknow** is always known as a multicultural city and it continues to be an important center of governance, administration, education, commerce, aerospace, finance, pharmaceuticals, technology, design, culture, tourism, music and poetry. As **Lucknow** is one of the fastest growing cities of India and is going through a rapid change in environmental quality. Rapid urbanization has led to problems i.e., change in Land use/land cover, demand of water, housing, health, education, transport (including Metro) etc. The city has an alarming increase in population as it has increased from 0.497 million in 1951 to 2.267 million in 2001 and 2.714 million in 2006 to 3.306 in 2011 which has effectively increased by 4.56 times (456 per cent) during the last fifty years.

This rising population density has major impact on natural resources of the area especially on water quality and quantity. Fresh water is most important natural resource for the life but overexploitation and unjustified use of water has led to deterioration of quality of water.

River **Gomati** is one of the major sources of public water supply in the city along with groundwater. It has been estimated that the gross water demand of the city is 490 MLD out of which 250 MLD is supplied by the river water. Generation of sewage and proper treatment and disposal of this waste is the major problem of the city.

The river **Gomati** is polluted at several points and consistently shows high BOD readings. The sources of pollution in River **Gomati** originate from gray water coming from households, commercial buildings, together with discharges from industries, pesticide and fertilizer run-off from agricultural land adjoining the city. The flow of the river becomes almost negligible and dissolved oxygen diminishes and therefore scientific study for the urban water environment of **Lucknow** City has become essential.



Considering the significance of the **City of Lucknow,** the **Department of Geology at the University of Lucknow** through its number of research projects have been pursuing water resource management and planning for a long time. In developing future scenarios toward 2050, population and land use projection, and the effect of climate change have been considered out by our organization independently.

We propose to host a Workshop on **WORKSHOP ON WATER RESOURCE MANAGEMENT**. This is in continuation with an event held in October 2016, in which priorities and challenges with respect to waste-water and flood management were discussed. The simulation scenarios consider projected changes in climate, population and land use as well as the development of infrastructure for flood control and wastewater treatment based on city's master plans. In addition to that Remote Sensing based work on Water based Sustainability has been a priority programme of our department on Global/ National and Local level through several research programmes. In the same vain, our department utilized the DST-PURSE grant to procure instruments and Software's catering to the needs of faculty members and research scholars.

OBJECTIVES

To conduct a 7-day long program aimed to provide hands-on training to the participants on DST-PURSE funded instruments to promote the expansion of R&D Infrastructure at academic institutions by ensuring transparent access to S&T facilities. STUTI program is also intended to build human resources and its knowledge capacity through open access of S&T Infrastructure across the country.

The main focus will be on Scientists/ Professors/ PhDs and Post Doc Fellows and PG students who have to progressively move towards research under NEW EDUCATION POLICY.

OBJECTIVES

- Current Scenario of the Country for its Surface, Subsurface and budgeting of its Water Resources under distinct geographic domains. Also mapping of aquifers and Water audit Techniques using Softwares such as TNT MIPS V2021 Software, Aqua Flow (AqQA) under Rockworks Standard Software. Many other mapping Software's which are also included in Rockworks.

- Water quality assessment using several instruments such as UV-VISIBLE SPECTROPHOTOMETER: UV PLUS STAND Alone operation, Photometer-MD-610, Automatic Temperature Correction, Water Quality meters, with Analyzes and AAS, Analyst 700.

INSTRUMENTS

- UV-VISIBLE SPECTROPHOTOMETER: UV PLUS STAND Alone operation with Bult in PC, Colour Touch Screen 32 GB memory, windows with WIFI USB Port HSN: 9027.

- Photometer- MD- 610, Automatic Temperature Correction, Water Quality meters, with Analyzes

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TNT MIPS V2021: Software Three Floating Licence with Hardware Ten TNT MPIS – 10 Basic classroom Licence

- Rockworks Standards Software Classroom Licences- 10 User and Hardware Support.

In addition, a hands-on training workshop for water quality modelling in which the target participants are researchers whose research interests are on water quality and modelling and engineers and government officials and scientists who are in charge with implementing master-plan for Water management and Quality assessment..

Through this 7-day training workshop, participants will learn how to estimate quality of urban river water using simulation model. Scenario analysis using the model will clarify how to project future water quality affected by climate change, population increase, etc., and how related strategies and measures can improve the water quality. Basic knowledge of the software used in water quality modeling, "Water Evaluation and Planning will also be covered.

BACKGROUND

Megacities in developing countries are suffering from pollution of the urban water environment by domestic and industrial wastewater discharged into environmental water bodies without appropriate treatment. The anticipated rapid population increase, urbanization and the effect of climate change in such megacities would further exaggerate the situation. Despite a number of projects implemented in developing cities to tackle with the problem, we seldom see desirable improvement in water quality of urban water. One reason for this discrepancy is the lack of appropriate methods for evaluating the effectiveness of the strategies such as master plans and projects. In order to help stakeholders to develop master plans and projects which consider the anticipated risks (e.g. the effect of climate change and urbanization), scientific tools should be applied to estimate the future state of urban water environment - **AROUND 30 STAKEHOLDERS.**

ELIGIBILITY CRITERIA

● Eligibility criteria for participants for the Training Program:

a) Person of Indian origin;

b) Minimum qualification should be Graduation (Science) or B. Tech. (Technology);

c) Professors/Scientists/ Post-Doc Fellows/ PhD Fellows/ Industry persons / Students who are actively involved in research and development (R&D in the field of Water Resource management);

d) Not more than 3 people from one institute per training should be allowed from outside the host institute.

REGISTRATION FEE - There is no Registration Fees.
Interested participants can register through sending the filled resume template to:
Resume Link:
https://drive.google.com/drive/u/0/folders/1GeK_6Gx0wrfx_W-m1aXSqa1j8Oc0o-F3

Send to:
Email 1: vibhutirai@gmail.com
Email 2: stuti@iitgn.ac.in

While sending the e-mail mention the subject details as:
'DST-STUTI Workshop in Geology, University of Lucknow'

Note: Shortlisted candidates will be intimated by e-mail only.

VENUE ADDRESS:
DEPARTMENT OF GEOLOGY, UNIVERSITY OF LUCKNOW, LUCKNOW, LUCKNOW 226007. PHONE : 7007022700 & 9415752111

PROGRAMME SCHEDULE

Detailed Program – Day 1 (30th MAY 2023)
VENUE – DEPARTMENT OF GEOLOGY, UNIVERSITY OF LUCKNOW

TIME	INAUGURAL SESSION
10:00 – 11:30	REGISTRATION
11.30 - 13.30	INAUGURAL SESSION
13:30 – 14:30	LUNCH BREAK
14:30 – 17:30	INTRODUCTION FOCAL THEME/ PARTICIPANTS INTERACTION

Detailed Program – Day 2 (31st May 2023)
VENUE – DEPARTMENT OF GEOLOGY, UNIVERSITY OF LUCKNOW

TIME	TECHNICAL SESSION -1
09:30 – 11:30	Lecture 1: PHYSICS OF SPECTROPHOTOMETERS-UV VISIBLE
12:00 – 13:30	Lecture 2: UV-VVISIBLE SPECTROPHOTOMETER – AN OVERVIEW
13:30 – 14:30	LUNCH
	TECHNICAL SESSION -2
14:30 – 16:00	Lecture 3: REMOTE SENSING- THE FRONTIERS OF SPACE
16:00 – 17:30	Lecture 4: TNT MIPS V2021 SOFTWWARE- AN OVERVIEW

Detailed Program – Day 3 (1st June 2023)
VENUE – DEPARTMENT OF GEOLOGY, UNIVERSITY OF LUCKNOW

TIME	TECHNICAL SESSION - 3
09:30 – 11:30	Lecture 5: INTRODUCTION TO WATER QUALITY ANALYSIS
12:00 – 13:30	Lecture 6: ANALYTICAL TECHNIQUES EMPLOYE IN WATER QUALITY WITH EXAMPLE
13:30 – 14:30	LUNCH
14:30 – 17:30	TECHNICAL SESSION - 4

Detailed Program – Day 4 (2nd June 2023)

VENUE – DEPARTMENT OF GEOLOGY, UNIVERSITY OF LUCKNOW

TIME	FIELD WORK
08:00 – 18:30	VISIT TO NAMISHARANYA, AN ARTESIAN WELL, LOST DUE OVEREXPLOITATION, REVIVAL PLAN

Detailed Program – Day 5 (3rd June 2023)

VENUE – DEPARTMENT OF GEOLOGY, UNIVERSITY OF LUCKNOW

TIME	TECHNICAL SESSION – 5
09:30 – 11:30	Lecture 7. ROCKWORKS STANDARD SOFTWARES
12:00 – 13:30	Lecture 8. MAPPING WATER BODIES BY REMOTE SENSING & SATELLITE DATA
13:30 – 14:30	LUNCH
14:30 – 17:30	TECHNICAL SESSION – 6

Detailed Program – Day 6 (4th June 2023)

VENUE – DEPARTMENT OF GEOLOGY, UNIVERSITY OF LUCKNOW

TIME	TECHNICAL SESSION – 7
09:30 – 11:30	Lecture 9. WATER BASED SOFTWARE- AN INTRODUCTION
12:00 – 13:30	LUNCH
13:30 – 17:30	LOCAL LAB VISIT + FIELD VISIT (LUCKNOW CITY VISIT) CONVENTIONAL WATER RESOURCE MANANGEMENT

Detailed Program – Day 7 (5th June 2023)

VENUE – DEPARTMENT OF GEOLOGY, UNIVERSITY OF LUCKNOW

TIME	TECHNICAL SESSION – 8
9:30 – 13:30	EXERCISE/ TEST/ SELF SAMPLE ANALYSIS/ FORM FEEDBACK
13:30 – 14:30	LUNCH
14:30 – 17:30	VALEDICTORY

OUR KEY SPEAKERS (OUTSIDE THE ORGANIZING INSTITUTION)

PROF. CHARU C. PANT

Head of the Department (Formerly), Department of Geology, Kumaon University, Nainital, Uttarkhand.

PROF. MALLIKARJUN JOSHI

Head of the Department (Formerly), Department of Geology, Banaras Hindu University, Varanasi.

PROF. S. C. MATHUR

Head of the Department (Formerly), Department of Geology, Jodhpur University, Jodhpur.

PROF. K. S. MISRA

Professor of Geology, University of Petroleum & Energy Studies, Dehradun.

MR. RAVINDRA SINHA

Sr. Hydrogeologist, Ground Water Department, Govt. of Uttar Pradesh & Convener, GWAG.