

Five Days Training Course on
**CONSERVATION AND MANAGEMENT OF
LAKES, WETLANDS AND SPRINGS**

(24-28 June, 2019 at NIH, Roorkee)

A BRIEF REPORT



Compiled by:

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Sh. Rajeev Gupta, PRA



**NATIONAL INSTITUTE OF HYDROLOGY
ROORKEE- 247667 (UTTARAKHAND)**

Training Course Organisers

Director	Dr. S. K. Jain
Division	Hydrological Investigations Division
Divisional Head	Dr. Sudhir Kumar , Sc-G
Course Coordinator	Dr. Suhas D. Khobragade, Sc-F

INTRODUCTION

The increasing demand for fresh water for various purposes due to ever growing population, calls for proper conservation and management of all the available fresh water resources, including lakes, wetlands and springs. Lakes are quite often the catalysts in the development of the region by supplying water for variety of uses such as drinking and civil water supply, industrial supply, irrigation, aqua-culture, recreation and tourism etc. Springs are primary sources of drinking water in many areas, particularly in the Himalayas. Wetlands are also a critical part of our natural environment and are the vital link between land and water. They provide an important range of environmental, social and economic services. The wetland ecosystems provide habitat for animals and plants and many contain a wide diversity of life. Unfortunately many lakes, springs and wetlands are reported to have undergone quantitative or/and qualitative degradation in the last few decades. They are under increasing stress due to growing demands, urbanization and human interference in the catchments. Heavy sedimentation and siltation, organic pollution, eutrophication, reduced water availability, loss of habitat etc. are some of the major problems which are common to most of the lakes and wetlands. Similarly many springs are reported to be going dry. As such, conservation and proper management of lakes, springs and wetlands for the socio-economic benefits of the society, has assumed great significance in recent times.

OBJECTIVES

To impart knowledge to the field engineers, planners, managers bureaucrats, researchers and academicians about:

- latest approaches for monitoring and investigating the processes in lakes, springs and wetlands
- developing strategies and action plans for conservation and management lakes, wetlands and springs

Another important objective of the training course was to introduce the concept of Integrated Lake Basin Management (ILBM) which is becoming popular in recent times.

INAUGURATION

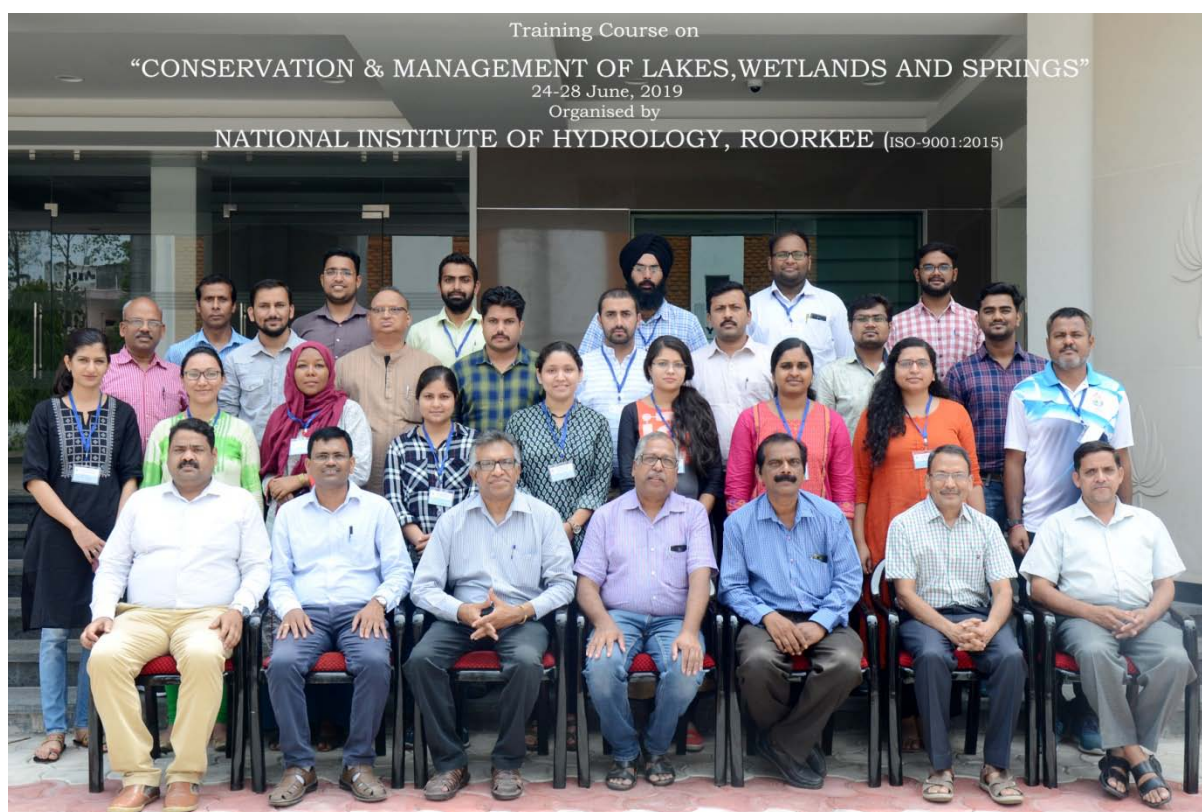
The five days training course was organised during 24-28 June, 2019 at NIH Roorkee. The Inauguration function of the training course was organised on 24th June, 2019 at 10.00 AM. Dr. Rakesh Kumar, Sc-G & Director-in-charge, NIH was the chief guest. The function was presided over by Dr. Sudhir Kumar, Scientist-G & Head, HI Division. Dr. Suhas Khobragade, Scientist F, HI Division and Course Coordinator, formally welcomed all the participants and briefly informed about the training course and its objectives.



PARTICIPATION

The Training Course was intended for field engineers, junior/middle level officers, managers, bureaucrats and policy makers of various organizations related to Water Resources, particularly lakes, wetlands and springs.

A total of 24 candidates attended the training course. It mostly included research scholars and academicians. The participants belonged to different organizations from India and from different scientific streams. Participants were from Jammu & Kashmir, Uttarakhand, Uttar Pradesh, Bihar, Rajasthan, Chhattisgarh, Kerala and Maharashtra. One participant was also from Sudan (who is currently studying in IIT, Roorkee). One participant from Rajasthan who deposited the fees on-line did not eventually join the course. A list participant is given in Annexure -I.



COURSE FEES

The Training course was mostly funded from the Plan Grant of NIH. However, to support the expenses, some nominal course fee was kept as:

Govt. Employee (Central/State)	= Rs. 3,000/-
NGO's and Industry	= Rs. 4,000/-
Local Bodies/Municipal Corporations	= Rs. 2,000/-
Students/Research Scholar/Project Staff	= Rs. 2,000/-

COURSE CONTENT AND FACULTY

The Training Course consisted of lectures by subject experts from the National Institute of Hydrology, Roorkee. Efforts were made to cover the various theoretical and some practical aspects. Case studies carried out by the Institute were included. A tutorial on evaporation estimation and GIS was included. Visit to Isotope Hydrology Laboratory and hands on in Water Quality Laboratory were organized. Most of the faculty of the training course were the senior scientist of the Institute who have carried out studies on lakes, ponds, springs and wetlands over last 20-30 years.

The various lecture topics covered in the training course and the corresponding faculty are given in Annexure-II.

SCHEDULE

The duration of the training course was five days. The training courses included 16 lectures, 2 laboratory hands on session, 1 laboratory visit, 4 tutorial sessions and one software demo session. A field visit to Hydraulic Structure on Gnaga Canal, Pashulok Barrage, Rishikesh and River Ganga, Haridwar was also arranged on day 4. The original proposed schedule of the training course had to be reorganised in view of the urgent programme of Ministry of Jal Shakti under the Jal Shakti Abhiyan. The detailed schedule of the training course is given at Annexure-II.

VIDEO SESSIONS

To make the training course interesting and informative, some video sessions related to water resources were added in between some lectures.

LECTURE MATERIAL

The lecture material/presentations were provided to the participants as PDF files in soft copies in pen drive.

FIELD VISIT

As mentioned above, a full day field visit to Pashulok Barrage, Rishikesh and River Ganga, Haridwar was organised on 27th June, 2019. During the field visit the participants were provided field training on water quality sampling, depth water sampling, measurement of spring discharge, sediment core sampling, measurement of water level in hand pumps etc. Visit was also made to the hydraulic structures on the way. Sh. Rajeev Gupta, PRA, Sh. Y. S. Rawat, Resource Person (J) and Sh. Satya Prakash, MTS (T) HID, provided the field training to the participants.



FEEDBACK FROM PARTICIPANTS

The organisation and management of the training course was highly appreciated by the participants. However, some of the participants expressed the need for more practical sessions, longer course duration, and to include more modelling contents, design aspects of artificial lakes and use of advanced version of GIS etc. A sample of the feedback received from the participant is enclosed in Annexure III.

VALEDICTORY FUNCTION & CERTIFICATE DISTRIBUTION

The valedictory function of the training course was held on 28th June, 2019 at 4.30 PM. In view of the Jal Sahakti Programme, the Director-in-charge and other scientists were on official tour to Delhi. So, function was presided by Dr. Sudhir Kumar, Sc- G & Head, HI Division. In the absence of the Course Coordinator, Sh. Rajeev Gupta, PRA, HID presented a brief report of the five days training course. During the valedictory function certificates were distributed to the participants by Dr. Sudhir Kumar, Sc-G & Head, HID. A sample of the certificate is enclosed in Annexure IV.



FINANCIAL ASPECTS

The total expenditure incurred on the training course was **Rs. 84098/- (Rs. Eighty Four Thousand Ninety Eight only)**. A brief break up of the expenditure is presented in the following Table.

SN	Item	Amount (Rs)
1	Registration kits including folders, pen and pads	9436
2.	Hospitality including inaugural tea, valedictory tea, working lunch on 4 days and , sessions teas for 4 days,	27260
3.	Mementos for faculty	4032
4.	Honorarium to faculty	19500
5.	Printing charges (banner, Group Photos, certificates and badges etc)	3244
6.	Field visit	5840
7.	Pen Drive for soft copies of lectures/presentations	9900
8.	Labour charges for operation of audio & electricity in society room)	2400
	Others & Miscellaneous expenses (stationary items, etc)	2486
	TOTAL	84098

Apart from the other expenses, Vehicle of NIH (bus) was used for field visit. No arrangement for picking up the participants on arrival and departure was made.

Funds Received

As per the approval obtained from the competent authority the Training Course was to be financed from Plan Budget of NIH with some financial support through registration fees. Accordingly an amount of Rs. 48,000/- (Rs. Forty Eight Thousand) was raised through registration fees of the training course.

Annexure-I

LIST OF PARTICIPANTS

SL.	NAME	DESIGNATION	ORGANIZATION	CONTACT NO.	E-MAIL ID
1	Mr. MANCHAND SINGH	Asstt. Prof.	Department of Civil Engineering, Model Institute of Engineering & Technology (MIET), Jammu - 181122	01912459222 7051143674	manchand.civ@miet.jammu.org singh.manchand26@gmail.com
2	Mr. KISHLAY KR. SINGH	M. Phil, Student	Interdisciplinary School of Life Science, Banaras Hindu University, Varanasi - 221005	8288979188 9450103595	kishlay.kumar.ingh@gmail.com
3	SYED ROUHULLAH ALI	Research Scholar	College of Agricultural Engineering & Technology, SKUAST-K, Shalimar, Srinagar-190025	7006341015 9419072868	agasyedrouhullah@gmail.com
4	Mr. ABHINAV SAHAY	Asstt. Prof.	Environmental Sciences, Amity University, Patna - 801105	7252949421 9334426360	asahay@ptn.amity.edu aabhinav.sahay@gmail.com
5	Mr. UMESH KUMAR	Asstt. Prof.	Environmental Sciences, Amity University, Patna - 801105	7990304147 7043012342	u.kumar@ptn.amity.edu umeshkumar2517@gmail.com
6	Ms. JEENU JOSE	Project Assistant	National Centre for Earth Science Studies, Akulam, Thiruvananthapuram - 695011	0471 2511502 9400735656	jeenujose5@gmail.com
7	Mr. SOURABH DAS	M. Tech. Student	Soil & Water Engineering, Indira Gandhi Krishi Vishwavidyalaya, IGKV, Raipur - 492012	7587133590 7974854683	sourabhdas15038@gmail.com
8	Mr. AVINASH KUMAR	Research Scholar	Zoology & Environmental Science, Gurukul Kangri Vishwavidyalaya,	9045728562	avinashkumar.rs@gkv.ac.in

			Haridwar		
9	Mr. JHALESH KUMAR	Ph.D. Scholar	SV College of Agril. Engg. & Technology, Indira Gandhi Krishi Vishwavidyalaya, IGKV, Raipur - 492012	9691660925	jhalesh.ku.sahu@gmail.com
10	Ms. ALKA YADAV	Research Scholar	Water Resources Development & Management, IIT Roorkee - 247667	9416402288	alkayadav2012@gmail.com
11	Mr. MAYANK RAJ PURBEY	Student	Amity Institute of Biotechnology, Amity University Rajasthan	9414115813 8619664685	mayankpurbey16@gmail.com
12	Ms. PIYANKA NEGI	Research Scholar	Department of Earth Sciences, Indian Institute of Technology, Roorkee - 247667	8958700086	negir6@gmail.com
13	Ms. RITAMBHRA THAKUR	Student	School of Habitat/Climate Change & Sustainability Studies, Tata Institute of Social Sciences, Mumbai - 400088	8291722917 7876170779	ritambhra1000@gmail.com
14	Ms. KALPANA SINGH VERMA	Research Scholar	Department of Earth Sciences, Indian Institute of Technology, Roorkee - 247667	8279362509	kalpanasinghdiary@gmail.com
15	Dr. PRAVIN RANGRAO PATIL	Asstt. Professor	Agricultural Engineering, ARSS Sumerpur, Agricultural University, Jodhpur - 306902	02933 258475 8791214120	prpatil.auj@gmail.com
16	Ms. RACHANA SINGH	Research Scholar	Deptt. Of Environmental Science, Central University of South Bihar, Fatehpur, Bihar - 824236	8210586783	rachna@cusb.ac.in
17	Ms. STUTI SHAH	Research Scholar	Department of Earth Sciences, Indian Institute of Technology, Roorkee - 247667	9456139272	stutishahntl@gmail.com
18	Mr. NEERAJ PANT	S.R.F.	Hydrological Investigation Div.	8896513770	pant.neeraj007@gmail.com

			National Institute of Hydrology, Roorkee		
19	Mr. SUJIT KUMAR SWAIN	J.R.F.	Hydrological Investigation Div. National Institute of Hydrology, Roorkee	8681977463	sujitkumargeo27@gmail.com
20	Ms. NIDHI KALYANI	Scientist 'B'	Hydrological Investigation Div. National Institute of Hydrology, Roorkee	8296912885	nidhikalyani15@gmail.com
21	Mr. RAHAT ALI	M.Sc. Student	Department of Geology, HNB Garhwal University, Srinagar Garhwal - Uttarakhand	9058888965	rahatali.geology@gmail.com
22	Ms. NAJWA ABDALLA	M.Tech. Scholar	Department of Hydro and Renewable Energy, Indian Institute of Technology, Roorkee	7253929048	najwa.i.hamed@gmail.com
23	Mr. VISHAL GUPTA	Research Assistant	Hydrological Investigation Div. National Institute of Hydrology, Roorkee	7830888869 9897071437	vishal.nihr@gov.in vishalnih@gmail.com
24	Ms. RAJASHREE NAIK	Ph.D. Scholar	Deptt. Of Environmental Science, Central University of Rajasthan, Bandasindri, Ajmer-305817	7073025299	rajashreehini06@gmail.com

(Note: Ms Rajashri Nayak at sr no. 24 paid the registration fees but did not eventually join the course)

REVISED TRAINING SCHEDULE
(Reorganised in view of the Jal Shakti Abhiyan Programme)

DAY 1: 24th June, 2019

S. NO.	TIME	ACTIVITY
1.	0930-1000 Hrs	REGISTRATION
2.	1000-1030 Hrs	INAUGURAL FUNCTION & INAUGURAL TEA
3.	1030-1130 Hrs	LECTURE on "Introduction to Springs, their hydrology and dynamics" by Dr. Sudhir Kumar
4.	1130-1230 Hrs	LECTURE on "Introduction to Lakes and Wetlands" by Dr. S. D. Khobragade
5.	1230-1330 Hrs	LECTURE on "Introduction to Isotopes and Isotope applications to Lake, Wetland and Spring studies" by Dr. Sudhir Kumar
6.	1330-1430 Hrs	LUNCH
7.	1430-1530 Hrs	LECTURE on "Water Quality of Lakes, Wetlands and Springs: Monitoring and Assessment" by Dr. M. K. Sharma
8.	1530-1600 Hrs	SESSION TEA
9.	1600-1700 Hrs	LAB SESSION (Water Quality Lab) - HANDS ON-1 (Dr. M. K. Sharma)
10.	1700-1800 Hrs	LAB SESSION (Water Quality Lab) - HANDS ON-2 (Dr. M. K. Sharma)

DAY 2: 25th June, 2019

S. NO.	TIME	ACTIVITY
1.	0930-1030 Hrs	LECTURE on "Introduction to Lake Processes and Water balance of Lakes" by Dr. S. D. Khobragade
2.	1030-1100 Hrs	VIDEO SESSION & SESSION TEA
3.	1100-1200 Hrs	LECTURE on "Spring flow characterization using hydro-meteorological data" by Dr. S. M. Pingale
4.	1200-1300 Hrs	Visit to Isotope Laboratory by Dr. M. S. Rao
5.	1300-1400 Hrs	LUNCH
6.	1400-1500 Hrs	LECTURE on "Applications of Remote Sensing & GIS for Lake, Wetland and Spring Studies" by Dr. Sudhir Kumar
7.	1500-1600 Hrs	DEMO of GIS Software by Dr. L. N. Thukral
8.	1600-1630 Hrs	SESSION TEA & GROUP PHOTO SESSION
9.	1630-1730 Hrs	LECTURE on "Sedimentation in Lakes and Wetlands" by Dr. S. D. Khobragade

DAY 3 : 26th June, 2019

S. NO.	TIME	ACTIVITY
1.	0930-1030 Hrs	GIS TUTORIAL SESSION -1 by Er. D. S. Rathore
2.	1030-1130 Hrs	GIS TUTORIAL SESSION -2 by Er. D. S. Rathore with Session Tea
3.	1130-1230 Hrs	LECTURE on "Conservation and Management of Lakes: A Case Study of Sukhna Lake" by Dr. S. D. Khobragade
4.	1230-1330 Hrs	LECTURE on "Management of Lakes: A Case Study of Nainital Lake, Uttarakhand" by Dr. S. D. Khobragade
5.	1330-1430 Hrs	LUNCH
6.	1430-1530 Hrs	Constructed Wetlands as a Technique for Conservation of water bodies: A case study of a village pond by Dr. V. C. Goyal
7.	1530-1600 Hrs	SESSION TEA
8.	1600-1700 Hrs	Hydrological Analysis of Wetlands under limited data availability conditions: A case Study of Khijadiya wetland, Gujrat by Dr. S. D. Khobragade
9.	1700-1800 Hrs	LECTURE on "ILBM Approach to Conservation and Management of Lakes" by Dr. S. D. Khobragade

DAY 4: 27th June, 2019

S. NO.	TIME	ACTIVITY
1.	0800-1800 Hrs	FIELD VISIT FIELD DEMONSTRATION (Rajeev Gupta, Y.S. Rawat & Satya Prakash)

DAY 5 : 28th June, 2019

1.	0930-1030 Hrs	LECTURE on "Groundwater Modelling for Spring and Lake studies" by Dr. Sudhir Kumar
2.	1030-1130 Hrs	Tutorial on Estimation of Evaporation- 1 by Dr. Prabhat Semwal
3.	1130-1230 Hrs	Tutorial on Estimation of Evaporation- 2 by Dr. Prabhat Semwal
4.	1230 -1330 Hrs	Instrumentation for Lake, Wetland and Spring studies by Dr. Sudhir Kumar
5.	1330-1430 Hrs	LUNCH
6.	1430-1530 Hrs	Rejuvenation of Springs: Theoretical Aspects and Success Stories by Dr. Sudhir Kumar
7.	1530-1600 Hrs	GROUP DISCUSSION & FEED BACK SESSION
8.	1600-1700 Hrs	VALEDICTORY FUNCTION AND VALEDICTORY TEA

SAMPLE OF FEED BACK RECEIVED

Five Days Training Course on
CONSERVATION AND MANAGEMENT OF
LAKES, WETLANDS & SPRINGS
(24-28 June, 2019 at NIH, Roorkee)

FEED BACK FORM

- PLEASE DO NOT WRITE YOUR NAME OR DO NOT PUT YOUR SIGNATURE ANYWHERE
- BE CANDID IN GIVING YOUR VIEWS. DO NOT HESITATE WHILE RECORDING NEGATIVE COMMENTS, IF ANY. THIS IS IMPORTANT FOR US TO IMPROVE THE STANDARD OF THE COURSE

Do you think that the course was useful to you? Did it help in improving your knowledge about lake conservation and management of Lakes, Wetlands & Springs?

Yes, it was very useful and knowledge enriching experience.

Do you think that the course duration (5 days) was adequate? Or do you think that the duration was short/too short/long?

For covering the basic parts of the topics, I think 5 days were enough to build a concept base.

Are you satisfied with the course content? Do you suggest any additions or deletion (of topics) to the course content?

Yes, I'm very much satisfied with the presented course content.

Do you think that the training schedule was properly framed? If not, what alterations/modifications do you suggest?

The training schedule was framed accordingly to the requirements of the course and I don't suggest any more alterations.

.....P.T.O.

Are you satisfied with the standard of the faculty and their presentations?

The faculty were outstanding and were best in their respective fields.

Are you unhappy with the standard of any particular faculty? Do you suggest deletion of any particular faculty or a particular lecture presentation?

No, the faculties provided were very experienced and were best in their respective fields.

How do you think was the overall organization and management of the course?

The staff helped a lot with schedule providing, and were well behaved.

Are you satisfied with the hospitality provided to you? Any observations or suggestions?.

Hospitality were perfect and everyone was kind & understanding

Did you feel inconvenience of any type during your stay at NIH or during the training course. If so, please write about it.

It was near perfect stay at NIH and all the facilities were provided to me.

Any comments/suggestion (not covered above) which you would like to give for further improvement of the training course?

The course could be better if it allowed us to handle equipments on our own with provided samples.

FORMAT OF CERTIFICATE

Certificate No.: NIH/19-20/T

**NATIONAL INSTITUTE OF HYDROLOGY
ROORKEE**



CERTIFICATE

This is to certify that

Mr./Ms./Dr. _____

has participated in the 5 days Training Course on

CONSERVATION AND MANAGEMENT OF LAKES, WETLANDS AND SPRINGS

**organised by the National Institute of Hydrology, Roorkee
during**

June 24-28, 2019 at NIH, Roorkee.

The participants have been imparted knowledge about the latest approaches for monitoring and investigating the processes in lakes, wetlands and springs for developing strategies and action plans for their conservation and management.

Dr. S. D. Khobragade
Scientist-F & Course Coordinator

Dr. Sudhir Kumar
Scientist-G & Head, H.I. Division

Dr. Rakesh Kumar
Scientist-G & Director In-charge

