A BRIEF REPORT ON

Compiled by:

Dr Manish K Nema, Scientist-D
Dr Vishal Singh, Scientist-C

WATER RESOURCES SYSTEMS DIVISION
NATIONAL INSTITUTE OF HYDROLOGY
ROORKEE- 247667 (UTTARAKHAND)
MARCH-2022

Training Course Organizers

Director	Dr J V Tyagi
Head, WRS Division	Dr Sanjay Kumar Jain, Scientist-G
Course Coordinators	Dr Manish K Nema, Scientist-D Dr Vishal Singh, Scientist-C
Division	Water Resources Systems Division
Organization	National Institute of Hydrology (NIH) Roorkee - 247667 (Uttarakhand)

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1.0 INTRODUCTION

Water is a vital natural resource. Hydrological modelling is an essential aspect of any development project for planning, designing, executing, and managing water resources efficiently. A hydrologic model simplifies a real-world system (e.g., surface water, soil water, wetland, groundwater, estuary) that aids in understanding, predicting, and managing water resources. Both the flow and quality of water are commonly studied using hydrologic models. SWAT is widely used in assessing soil erosion prevention and control, non-point source pollution control and regional management in watersheds. This training course was designed to impart and transfer the working knowledge of a popular semi-distributed hydrological model called the Soil & Water Assessment Tool (SWAT). This model is a small watershed to river basin-scale model used to simulate surface and ground water quality and quantity and predict the environmental impact of land use, land management practices, and climate change.

SWAT, a river basin or watershed scale model, is a physically-based, spatially distributed, continuous model that operates on a daily time step. It is a product of four decades of modelling efforts by USDA-ARS, USDA-NRCS and Texas A&M University. It was developed to predict the impact of land management practices on water, sediment and agricultural chemical yields in large complex watersheds with varying soils, land use and management conditions over long periods. It can incorporate the effects of tanks and the reservoirs/check dams off-stream as well as on-stream. The significant advantage of SWAT is that it does not require much calibration. Therefore, it can be used on ungauged watersheds and predict relative impacts of alternative scenarios such as changes in management practices, climate and vegetation on water quality and quantity. Model output includes all water balance components at the level of each watershed and is available at daily, monthly or annual time steps. SWAT model has been extensively used to address water resources and nonpoint-source pollution problems for various scales and environmental conditions across the globe.

SWAT allows several different physical processes to be simulated in a watershed. A watershed may be partitioned into many sub-watersheds or sub-basins for modelling purposes. Thus, a user can reference different areas of the watershed to one another spatially. The input information for each sub-basin is grouped or organized into the following categories: climate; hydrologic response units or HRUs; ponds/reservoirs/ wetlands; groundwater and main channel, or reach, draining the sub-basins. HRUs have lumped land areas within the sub-basin that are comprised of unique land cover, soil and management combinations.

SWAT typically uses the ArcSWAT interface to create inputs that work in the licensed ArcGIS environment. The Quantum GIS (QGIS) is a free and open-source GIS that performs most of the functions of commercial GIS. Given its robustness and wide use in academic and professional environments, the present training course was conducted using QSWAT, a QGIS interface for the SWAT model.

2.0 OBJECTIVES

An email request has been received from the Indian Council of Forestry Research and Education (ICFRE), Dehradun, regarding imparting SWAT training for scientists working in different research institutions under its umbrella in November 2021. Due to Covid restrictions, the training was confirmed to be imparted in online mode through virtual platforms. A detailed proposal has been sent from NIH to ICFRE for the same. Finally, five days of online training was conducted for 20 numbers of ICFRE scientists from various institutions across India.

The training course was aimed to introduce participants to Remote Sensing, QGIS, Open Data resources, SWAT model and SWAT-Calibration and Uncertainty Program (SWAT-CUP). The mandatory and optional inputs to the model, database preparation, and SWAT setting up using the QSWAT interface were also included in the training objectives. The course covered many advanced topics, including sensitivity analysis, model calibration, validation and uncertainty analysis using SWAT-CUP.

The course contents were planned for five days' duration devoted to the preparation of spatial and non-spatial data, other model data inputs, SWAT model set up, model execution, and visualization and interpretation of results using the QGIS interface. The model calibration and validation using SWAT-CUP were also incorporated in the training course. By the end of the training course, the participants were capable of using the model on their own.

3.0 ABOUT NIH AND ICFRE

National Institute of Hydrology (NIH):

NIH is a premier Research and Development organization under the Dept. of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti, Government of India. It was established as an autonomous society in 1978 with its headquarters at Roorkee. The main objectives of NIH are to undertake, aid, promote and coordinate systematic and scientific work in all aspects of hydrology. The Institute was declared as an S&T organization in 1987.

The Institute is an ISO 9001:2008 Certificated organization. Over the years, the Institute has grown as a centre of excellence for pursuing research activities in hydrology and water resources, emphasising technology transfer and demand-driven, user-defined, strategic research. The research in the Institute have been carried out under six scientific divisions at the headquarters at Roorkee, four Regional Centres located at Belgaum, Jammu, Kakinada and Bhopal and two Centres for Flood Management Studies at Guwahati and Patna.

Indian Council of Forestry Research and Education (ICFRE)

The Indian Council of Forestry Research and Education (ICFRE) is an autonomous organization under the Ministry of Environment and Forests and Climate Change (MoEF & CC), Government of India. Its headquarter is located in Dehradun. Its functions are to conduct forestry research; transfer the technologies developed to the states of India and other user agencies, and impart forestry education. The council has 09 research institutes and 04 advanced centres to cater to the research needs of different bio-geographical regions. These are located

at Dehradun, Shimla, Ranchi, Jorhat, Jabalpur, Jodhpur, Bengaluru, Coimbatore, Prayagraj, Chhindwara, Aizawl, Hyderabad and Agartala.

4.0 INAUGURATION

The five-day online training course was organized from February 28 to March 04, 2022. The couse was inaugurated by Dr Sanjay K Jain, Sci-G, Head-WRS division & Nodal-Officer-NHP on February 28 at 10:15 am in a virtual mode in the gracious presence of Dr Anil K Lohani, Sci-G, Head-SWH division & Training-Coordinator of NHP. The function was presided over by Dr Manish K Nema, Sci.-D & Course Coordinator, WRS Division, formally welcomed all the participating scientists and briefly informed them about the training course and its objectives. In the procession, each participant introduced themselves and told about their research domains and expectations from the course. Dr Lohani informed the various research activities and purpose-driven studies of NIH to the course participants. He has also mentioned the different training activities of NIH Roorkee. Dr Jain briefed about the training modules, importance of remote sensing and GIS and Hydrologic modeling and the SWAT model. Dr Vishal Singh, Sci-C, offered a vote of thanks to all the attendees of the session.

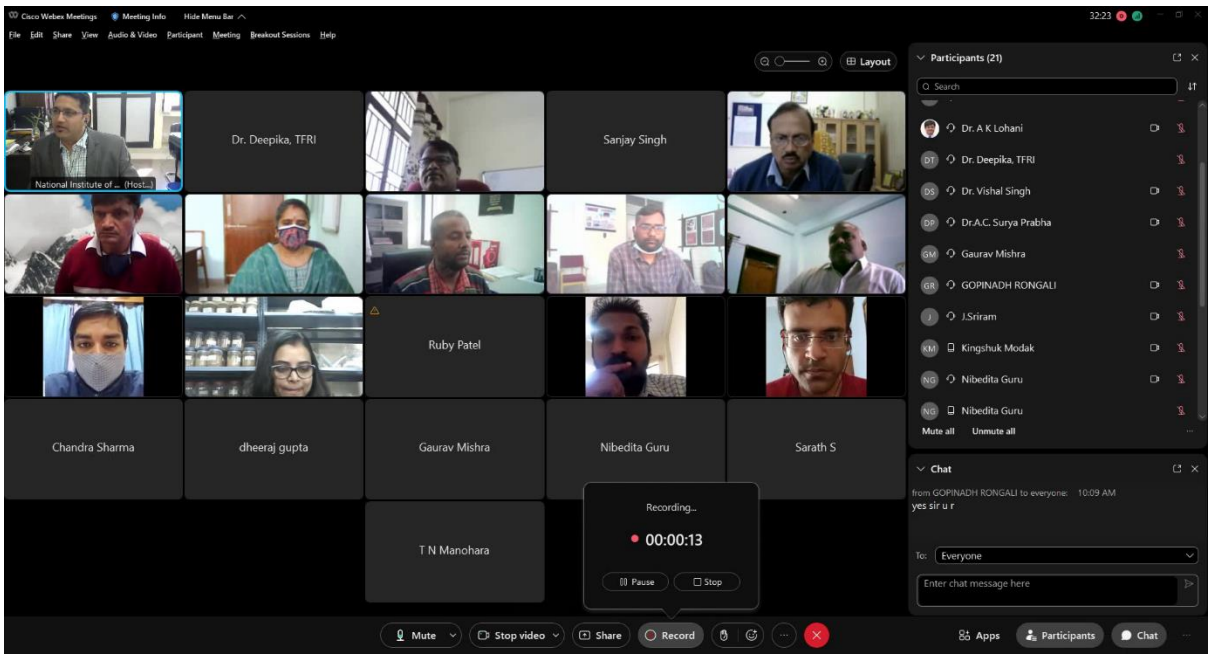

Fig. 1. The screen-shot during the Inauguration Session of the training

5.0 PARTICIPATION

This training course was sponsored by the Indian Council of Forestry Research and Education (ICFRE) for the scientific and technical participants from various research institutions across the country. The Director-General, ICFRE, Dehradun, nominated a total of 17 participants for the said training. These participants were from 08 different institutions located in different parts of the country. A list with various detail of all the participants who have completed the course is provided in **Annexure-I** and can also be seen at this QR code.

6.0 COURSE CONTENT AND FACULTY

The course consists of online lectures supported by hands-on sessions on computers to cover both theory and practice in the right proportion. The training lectures were provided by the subject experts and faculty of the National Institute of Hydrology, Roorkee. The course was conducted as a two-way interaction with the participants so that the problems and experiences of participants from the forestry research domain and field issues were also shared and discussed. The theoretical and practical sessions were designed in a 70:30 ratio to understand the modeling approach to the participants in a better way. Broadly, the following topics were covered in the course:

- Basics of Hydrological modelling
- Calibration and Validation
- Introduction to GIS, Hydrological Application of GIS and overview of QGIS;
- Various input data requirements of SWAT model;
- Hands-on sessions for preparing spatial datasets for SWAT using RS and QGIS
- SWAT model theory and applications;
- Preparation of spatial and non-spatial datasets
- Introduction to QSWAT interface; model set up;
- Sensitivity, calibration/validation and uncertainty analysis using SWAT-CUP-SUFI2;
- Visualization and interpretation of SWAT model outputs.
- A Case Study of Snowmelt Runoff Modeling using SWAT

7.0 SCHEDULE

The duration of the training course was five days. The training was started on February 28 to March 04, 2022, at 10:15 am, with the inaugural session followed by the technical sessions. The training courses included 06 lectures, 12 online tutorials and hands-on sessions, and one Multiple Choice Question (MCQ) based Online Test quiz session. The training was concluded on March 04, 2022, at 3:45 pm. The detailed schedule of the training course is given in **Annexure-II**.

8.0 FEEDBACK FROM PARTICIPANTS

The participants highly appreciated the smooth organization and sound management of the training course. During the valedictory session, a few of the participants had expressed their verbal feedback about the training course and suggested some points for further improvement. Online feedback was collected via filling Google-Form survey by the participants. Participants were agreed that the course content supported and delivered the training objectives, and the course provided opportunities to them for practising and reinforcing what was taught. The feedback suggests that the participants were happy that the course information provided was appropriate to understand the learning objectives. In the online test, more than 65% of participants scored 21 or more marks out of a total of 35, which indicates the understanding of participants towards the SWAT hydrological Model has enhanced during the training course. The overall verdict on the training course for the satisfaction level was also asked in a Google

feedback form, based on the feedback provided by the participants is shown in the Figure below.

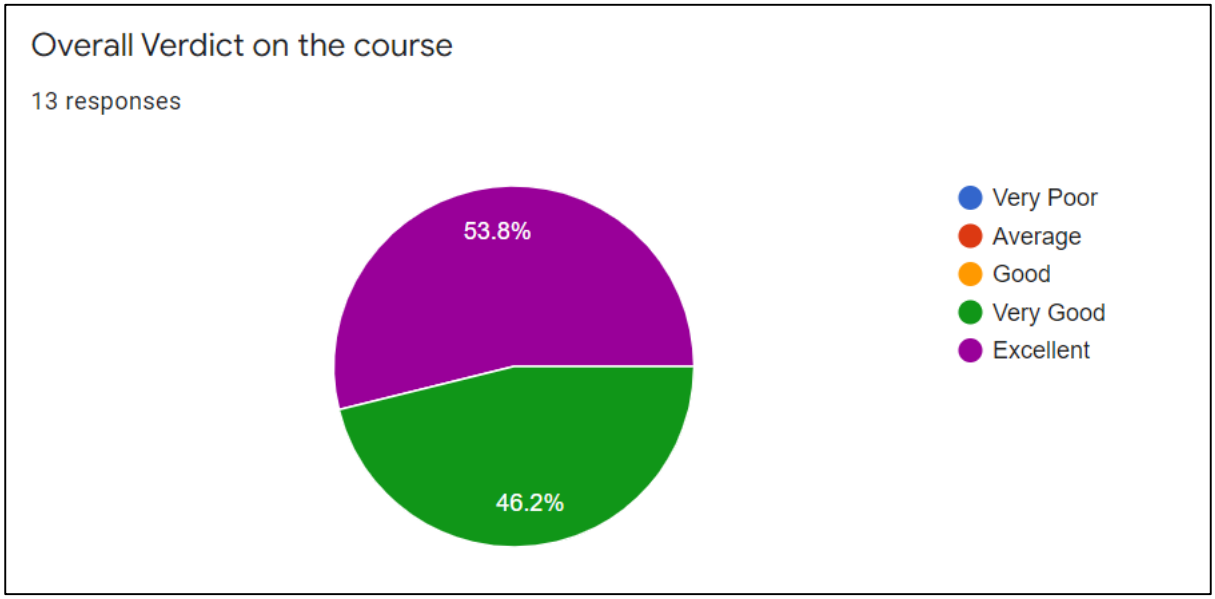

Fig. 2. The overall feedback of the training course

In their views, the instructors were knowledgeable about the course content and were responsive to questions and other needs. However, most of the participants suggested that if this training had been offline or physically, it could have been more advantageous for them. Some of the participants expressed the need for more practical sessions, longer course duration, and to include more modelling content, etc. A testimonial of one of the trainees is given below:

> "*Though it is a new topic to us and online mode, it is very interesting, learned SWAT modelling well and useful. All resource persons are taught with highly professional manner. However, offline training would give more opportunities to learn practical aspects and interaction with face to face. Overall the course is very useful.*"

9.0 VALEDICTORY FUNCTION & CERTIFICATE DISTRIBUTION

The valedictory function of the training course was held on March 04, 2022, at 3:15 pm. National Training Coordinator of NHP Dr AK Lohani, Sci.-G, was the chief guest of the session, and the session was graced by faculty and participants. The Course Coordinator, Dr Manish K Nema, Sci.-D, WRSD, presented a brief report of the five days training course. A few participants have also shared their learning experiences during the training programme during the valedictory function. In general, the training got excellent responses from the participants, and they suggested enhancing the training time for such specialized models. With the valedictory remarks, Dr AK Lohani announced the formal closure of the course. In the last, Dr Vishal Singh, Sci-C, offered a vote of thanks to all the dignitaries and all the participants for their since participation. The training certificates to the participants were sent by email on March 05, 2022. A sample of the training certificate, distributed to the participants, is enclosed in **Annexure-III**.

10.0 FINANCIAL ASPECTS

The total budgetary of Rs. 1,15,345/- (Rs. One Lakh Fifteen Thoundas Three Hundred Forty-Five only) including GST had been sanctioned and approved by the competent authority of ICFRE for the training course(Sanction Order at **Annexure-IV**). The same budget has been utilized for the purpose. A brief break-up of the expenditure is presented in the following Table 1:

Table 1. Total Budget of Training

Sl. No.	Items	Expenditure (₹)
1.	Honorarium for Faculty	75,000/-
2.	Memento for Faculty	10,000/-
3.	Institute overhead charges @ 15% of (1+2)	12,750/-
	Sub-Total	**97,750**/-
	GST @ 18%	**17,595/-**
	Grand Total	**1,15,345/-**

ANNEXURE-I: LIST OF PARTICIPANTS

SN	Name	Designation	institute	STATE	Mob. Number	Email-IDs	Certificate Id
1	Shri Sanjeev Kumar	Scientist – E	IFP. Ranchi	Jharkhand	7547874750	san.forester@gmail.com	NIH/STC/2021-22/T-2/01
2	Dr. S.N. Mishra	CTO	IFP. Ranchi	Jharkhand	7717727714	shambhu5365@gmail.com	NIH/STC/2021-22/T-2/02
3	Dr. T.N. Manohara	Scientist – E	IWST, Bengaluru	Karnataka	9435351304	tnmanohara@icfre.org	NIH/STC/2021-22/T-2/03
4	Dr. M.V. Durai	Scientist – C	IWST, Bengaluru	Karnataka	9445944288	vediappand@icfrie.org	NIH/STC/2021-22/T-2/04
5	Shri Sarath. S.	Scientist – B	IWST, Bengaluru	Karnataka	8281165394	sarath@icfre.org	NIH/STC/2021-22/T-2/05
6	Dr. Gaurav Mishra	Scientist – D	RFRI, Jorhat	Asam	8471938089	mishrag@icfre.org	NIH/STC/2021-22/T-2/06
7	Dr. Nibedita Guru	Scientist – B	RFRI, Jorhat	Asam	7008026255	gurun@icfre.org	NIH/STC/2021-22/T-2/07
8	Shri Chandra Sharma	Scientist – B	ICFRE (HQ), Dehradun	Uttrakhand	7900710785	sharma.chandra1@gmail.com	NIH/STC/2021-22/T-2/08
9	Dr. Sanjay Singh	Scientist – D	ICFRE (HQ), Dehradun	Uttrakhand	9926409009	sanjaysingh83@gmail.com	NIH/STC/2021-22/T-2/09
10	Dr. A.C. Surya Prabha	Scientist – D	IFGTB, Coimbatore	Tamil Nadu	8220368371	acsuryaprabha@icfre.org	NIH/STC/2021-22/T-2/10
11	Shri J. Sriram	IFS	IFGTB, Coimbatore	Tamil Nadu	9080989049	isriram@icfre.org	NIH/STC/2021-22/T-2/11
12	Ms. Ruby Patel	Scientist – B	IFB, Hydrabad	Telangana	7705912805	patelr@icfre.org	NIH/STC/2021-22/T-2/12
13	Shri Kingshuk Modak	Scientist – B	AFRI, Jodhpur	Rajasthan	7678480262	kmodak@icfre.org	NIH/STC/2021-22/T-2/13
14	Shri Sumantra Basu	Scientist – B	AFRI, Jodhpur	Rajasthan	8597505740	sbasu@icfre.org	NIH/STC/2021-22/T-2/14
15	Shri Deepak Kumar	Scientist – B	AFRI, Jodhpur	Rajasthan	8269799571	deepk@icfre.org	NIH/STC/2021-22/T-2/15
16	Shri Deepak Gupta	Scientist – D	TFRI, Jabalpur	Madhaya Pradesh	7587525086	dkg@icfre.gov.in	NIH/STC/2021-22/T-2/16
17	Ms. J. Deepika	Scientist – B	TFRI, Jabalpur	Madhaya Pradesh	8106633962	Jangamdeepika24@gmail.com	NIH/STC/2021-22/T-2/17

ANNEXURE-II: TRAINING SCHEDULE

TIME	TOPIC	FACULTY
DAY 1: 28.02.2022: MONDAY		
1000 - 1030	Inauguration of Course and Brief about the Training Course	
1030 - 1130	Hydrological Modeling and Calibration & Validation	AKL
1130 - 1300	Introduction of SWAT Modeling and Data Requirements	JVT
1300 - 1430	Break	
1430 - 1530	Role of Remote Sensing and GIS in Hydrological Modeling	SKJ
1530 - 1630	Introduction of QGIS, and Basic GIS Operations	MKN
DAY 2: 01.03.2022: TUESDAY		
1030 - 1130	Open Data Sources for Hydrological Modeling	VS
1145 - 1300	Demonstration of the SWAT Model	VS
1300 - 1430	Break	
1430 - 1530	Tutorial and Hands-on Practice – SWAT Setup and Watershed Properties	VS/MKN
1530 - 1700	Tutorial and Hands-on Practice – SWAT HRU Analysis, Weather Generator & Run	VS
DAY 3 : 02.03.2022: WEDNESDAY		
1030 - 1130	Snowmelt Runoff Modeling using SWAT	VS
1145 - 1300	Tutorial – SWAT Snow Hydrology Module	VS/ MKN
1300 - 1430	Break	
1430 - 1530	Tutorial and Hands-on Practice – SWAT Run, SWAT Check & Visualization of Results	MKN/VS
1530 - 1700	Tutorial and Hands-on Practice – SWAT Data Editing and Re-run	MKN/VS
DAY 4 : 03.03.2022: THURSDAY		
1030 - 1130	Introduction of SWAT CUP, Model Parameterization and Sensitivity Analysis using SUFI2	MKN

1145 - 1300	Tutorial and Hands-on Practice – SWAT CUP Database Preparation	MKN/VS/GR
1300 - 1430	Break	
1430 - 1530	Tutorial and Hands-on Practice – SWAT CUP Calibration and Uncertainty Analysis– SUFI2-I (Single-site)	MKN/VS/GR
1530 - 1700	Tutorial and Hands-on Practice – SWAT CUP Calibration and Uncertainty Analysis – SUFI2-II (Single-site)	MKN/GR
DAY 5 : 04.03.2022: FRIDAY		
1030 - 1130	Tutorial and Hands-on Practice – SWAT CUP Calibration and Uncertainty Analysis – SUFI2-III (Multi-site)	VS/MKN
1145 - 1300	Tutorial and Hands-on Practice – SWAT CUP Calibration and Uncertainty Analysis – SUFI2-IV (Multi-site)	VS/MKN
1300 - 1430	Break	
1430 - 1515	Multiple Choice Question-based Online Test for the Participants	MKN
1515 - 1545	Valedictory Function	

FACULTY OF THE COURSE:

JVT : Dr J V Tyagi, Director, NIH and Course Director
SKJ : Dr Sanjay K Jain, Sci.-'G', NIH and Head, WRSD
AKL : Dr Anil K. Lohani, Sci.-'G', NIH and Head, SWD
MKN : Dr Manish K Nema, Sci-'D', NIH and Course Coordinator
VS : Dr Vishal Singh, Sci.-'C', NIH and Course Co-coordinator
GR : Dr Gopinadh Rongali, RA, WRS, Division, NIH

ANNEXURE-III: FORMAT OF CERTIFICATE

CERTIFICATE NUMBER
NIH/STC/2021-22/T-2/01

सत्यमेव जयते
Goverment Of India

NATIONAL INSTITUTE OF HYDROLOGY
ROORKEE

Department of Water Resources, RD & GR
Ministry of Jal Shakti, Govt. of India

आपो हि ष्ठा मयोभुवः

CERTIFICATE

This is to certify that

Sanjeev Kumar

has participated in the on-line training course on

"Soil and Water Assessment Tool (SWAT)"
held from February 28 – March 04, 2022

Organised by
National Institute of Hydrology (NIH), Roorkee

Sponsored by
Indian Council of Forestry Research and Education (ICFRE), Dehradun,

Sanjay K. Jain
Sci.-G & Head, WRS Division
National Institute of Hydrology, Roorkee

J.V. Tyagi
Director
National Institute of Hydrology, Roorkee

ANNEXURE-IV: SANCTION ORDER

सत्यमेव जयते

भारतीय वानिकी अनुसंधान एवं शिक्षा परिषद
(पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय भारत सरकार की एक स्वायत्त संस्था)
पो0 ऑ0 – न्यू फॉरेस्ट, देहरादून -- 248 006 (उत्तराखण्ड)
Indian Council of Forestry Research and Education
(An autonomous Body of Ministry of Environment, Forest & Climate Change, Govt. of India)
P.O. New Forest, Dehra Dun – 248006

सं.३-२२/शिक्षा/२०२१-२२/भा.वा.अ.शि.प./१५। दिनांक: 22 फरवरी, २०२२

स्वीकृति आदेश

महानिदेशक, भा.वा.अ.शि.प., देहरादून ने वैज्ञानिकों के लिए "Soil Water Assessment Tool (SWAT)" विषय पर 5 दिवसीय प्रशिक्षण कराने हेतु रू. 1,15,345/-- (रूपये एक लाख पन्द्रह हजार तीन सौ पैतालीस मात्र) की राशि की स्वीकृति National Institute of Hydrology, Roorkee को प्रदान कर दी है। उक्त प्रशिक्षण दिनांक 28 फरवरी से 04 मार्च, 2022 को ऑनलाइन माध्यम से National Institute of Hydrology, Roorkee द्वारा आयोजित होना प्रस्तावित है।

इस संबन्ध में आपसे अनुरोध है कि रू. 1,15,345/-- (रूपये एक लाख पन्द्रह हजार तीन सौ पैतालीस मात्र) की स्वीकृत राशि निदेशक, National Institute of Hydrology, Roorkee को प्रशिक्षण के आयोजन हेतु आबंटित कर दी जाए।

उपरोक्त राशि का व्यय बजट शीर्ष: CAMPA-HRD (Reccuring) के अन्तर्गत किया जाए।

भवदीय

(दीपक मिश्रा)
सहायक महानिदेशक (शिक्षा एवं भर्ती बोर्ड),
भा०वा०अ०एवं शि०प०, देहरादून।

प्रतिलिपि:-

1. लेखा अधिकारी, भा.वा.अ.शि.प. को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित। आपसे अनुरोध है कि रू. 1,15,345/-- (रूपये एक लाख पन्द्रह हजार तीन सौ पैतालीस मात्र) की स्वीकृत राशि निदेशक, National Institute of Hydrology, Roorkee को हस्तातंरित करने का कष्ट करें।
2. Director, National Institute of Hydrology, Roorkee को सूचनार्थ प्रेषित।

Telephone: 0135-2758348, 2224850(O), Fax: 0135-2758571, 2750297, 2750298 E-mail:adg_edu@icfre.org
(An ISO 9001:2000 Certified Organisation)
(आईएसओ 9001:2000 प्रमाणित संस्था)

Scanned with CamScanner

सत्यमेव जयते

भारतीय वानिकी अनुसंधान एवं शिक्षा परिषद
(पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय भारत सरकार की एक स्वायत्त संस्था)
पो0 ऑ0 – न्यू फॉरेस्ट, देहरादून – 248 006 (उत्तराखण्ड)
Indian Council of Forestry Research and Education
(An autonomous Body of Ministry of Environment, Forest & Climate Change, Govt. of India)
P.O. New Forest, Dehra Dun – 248006

सं.३-२२/शिक्षा/२०२१-२२/भा.वा.अ.शि.प./142 दिनांकः 22 फरवरी, २०२२

सेवा में,

भा.वा.अ.शि.प. के संस्थानों के निदेशक (सूची के अनुसार)

विषयः Training on "Soil Water Assessment Tool (SWAT)" for Scientists of ICFRE, Dehradun.

महोदय,

उपरोक्त संदर्भित विषय के अनुसरण में सूचित किया जाता है कि महानिदेशक, भा.वा.अ.शि.प., देहरादून ने **"Soil Water Assessment Tool (SWAT)"** विषय पर होने वाले पाँच दिवसीय प्रशिक्षण कार्यक्रम जो कि दिनांक **28 फरवरी से 04 मार्च, 2022** को राष्ट्रीय जलविज्ञान संस्थान, रूडकी में ऑनलाइन माध्यम द्वारा आयोजित होना प्रस्तावित है, में भाग लेने हेतु 17 वैज्ञानिकों को नामित किया है (सूची संलग्न)।

The Director General, ICFRE, Dehradun is pleased to nominate 17 Scientists (list enclosed) for the 05 days training programme on **"Soil Water Assessment Tool (SWAT)"** to be held at National Institute of Hydrology, Roorkee through Online mode from **28 Feb to 04 March, 2022**.

उपरोक्त प्रशिक्षण भा.वा.अ.शि.प. के वैज्ञानिकों के लिए मानव संसाधन विकास योजना के तहत आयोजित किया जा रहा है। उपरोक्त प्रशिक्षण में भागीदारी अनिवार्य है तथा नामांकनों में कोई भी बदलाव नही किया जाएगा। इस संबन्ध में सभी संस्थानों के निदेशकों से अनुरोध है कि उक्त प्रशिक्षण हेतु नामित वैज्ञानिकों को प्रशिक्षण में भाग लेने के लिए आई.टी. सुविधाए उपलब्ध कराने की कृपा करें।

This training is being sponsored by ICFRE as a part of HRD training program for ICFRE Scientists. The participation is mandatory and no change will be entertained without prior approval of the Competent Authority. In this regard all the Directors of the Institutes are requested to kindly provide IT facilities to the nominated Scientists for the said training programme.

प्रशिक्षण संबन्धी किसी भी जानकारी के लिए डॉ. संजय जैन, वैज्ञानिक-जी एवं प्रमुख, वाटर रिसोर्स सिस्टम डिवीजन, राष्ट्रीय जलविज्ञान संस्थान, रूडकी (ई-मेलः sjain.nihr@gov.in & Contact No. 9897035156) से सम्पर्क किया जाए।

For any information regarding the training programme, kindly contact to Dr. Sanjay Jain, Scientist-G & Head, Water Resources System Div., National Institute of Hydrology, Roorkee (E-Mail: sjain.nihr@gov.in & Contact No. 9897035156).

भवदीय

संलग्नः यथोक्त।

(दीपक मिश्रा)
सहायक महानिदेशक (शिक्षा एवं भर्ती बोर्ड),
भा०वा०अ०एवं शि०प०, देहरादून।

प्रतिलिपिः- नामित वैज्ञानिकों को उनके निदेशकों द्वारा सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

Telephone: 0135-2758348, 2224850(O), Fax: 0135-2758571, 2750297, 2750298 E-mail:adg_edu@icfre.org
(An ISO 9001:2000 Certified Organisation)
(आईएसओ 9001:2000 प्रमाणित संस्था)

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Annexure-I

Trainings Name : Soil Water Assessment Tool (SWAT)
Dates : 28 Feb to 04 March, 2022
Conducted by : National Institute of Hydrology, Roorkee
Mode : Online Mode
Nominated Scientists :

S.N	Name & Designation	Mob. Number	Email-IDs	Institute
01	Sh. Sanjeev Kumar, Sci-E	7547874750	san.forester@gmail.com	IFP, Ranchi
02	Dr. S.N. Mishra, CTO	7717727714	shambhu5365@gmail.com	
03	Dr. T.N. Manohara, Sci-E	9435351304	tnmanohara@icfre.org	IWST, Bengaluru
04	Dr. M.V. Durai, Sci-C	9445944288	vediappand@icfre.org	
05	Mr. Sarath. S., Sci-B	8281165394	sarath@icfre.org	
06	Dr. Gaurav Mishra, Sci-D	8471938089	mishrag@icfre.org	RFRI, Jorhat
07	Dr. Nivedita Guru, Sci-B	7008026255	gurun@icfre.org	
08	Shri Chandra Sharma, Sci-B	7900710785	sharma.chandra1@gmail.com	ICFRE (HQr)
09	Dr. Sanjay Singh, Sci-D	9926409009	sanjaysingh83@gmail.com	
10	Dr. A.C. Surya Prabha, Sci-D	8220368371	acsuryaprabha@icfre.org	IFGTB, Coimbatore
11	Sh. J. Sriram, IFS	9080989049	jsriram@icfre.org	
12	Ms. Ruby Patel, Sci-B	7705912805	patelr@icfre.org	IFB, Hyderabad
13	Sh. Kingshuk Modak, Sci-B	7678480262	kmodak@icfre.org	AFRI, Jodhpur
14	Sh. Sumantra Basu, Sci-B	8597505740	sbasu@icfre.org	
15	Sh. Deepak Kumar, Sci-B	8269799571	deepk@icfre.org	
16	Sh. Deepak Gupta, Sci-D	7587525086	dkg@icfre.gov.in	TFRI, Jabalpur
17	Ms. J. Dipika, Sci-B	8106633962	Jangamdeepika24@gmail.com	

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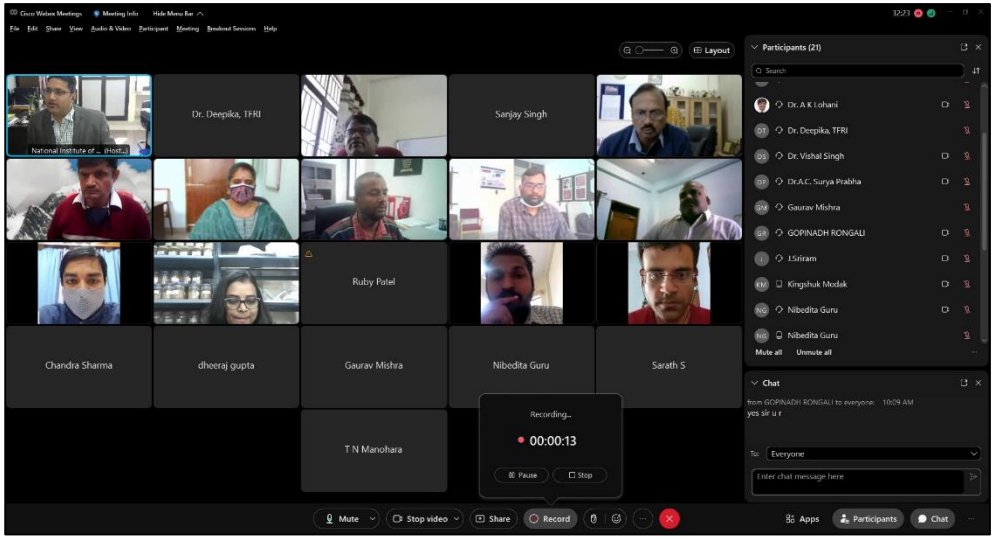
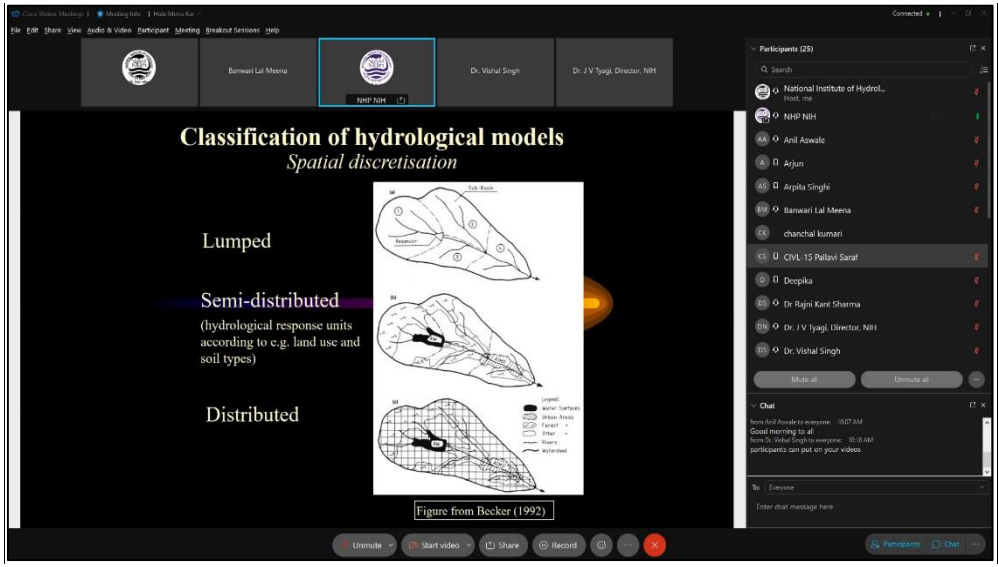
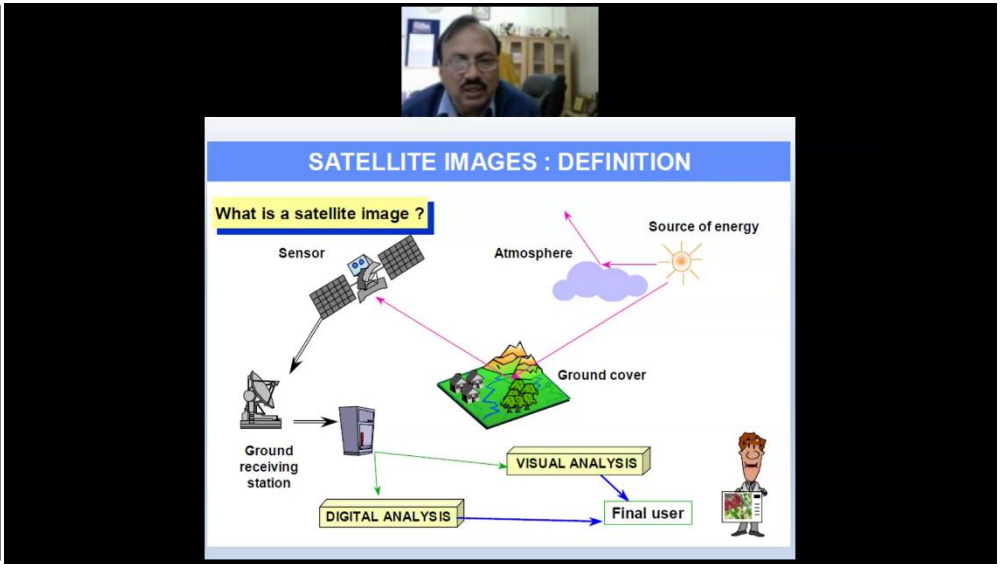
FEW GLIMPSES OF THE TRAINING COURSE







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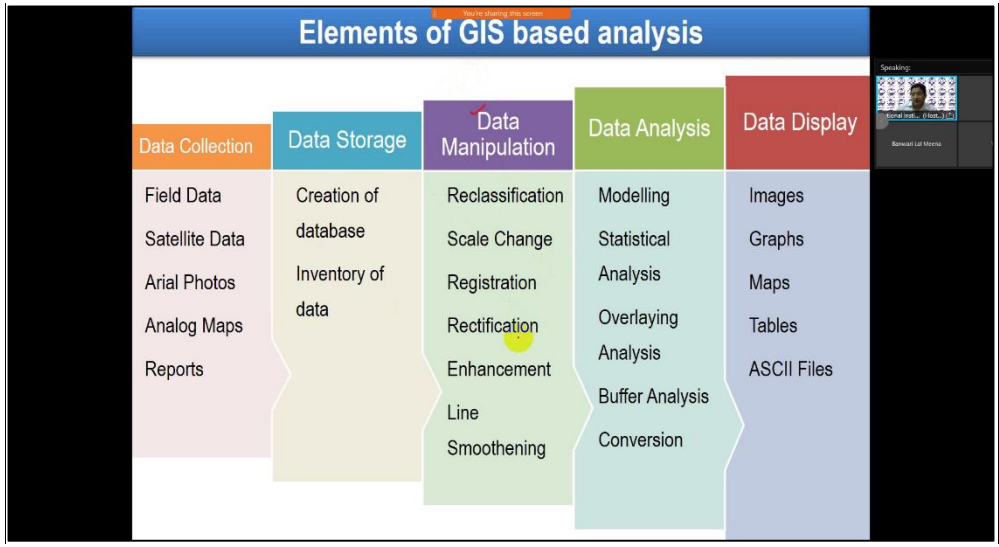

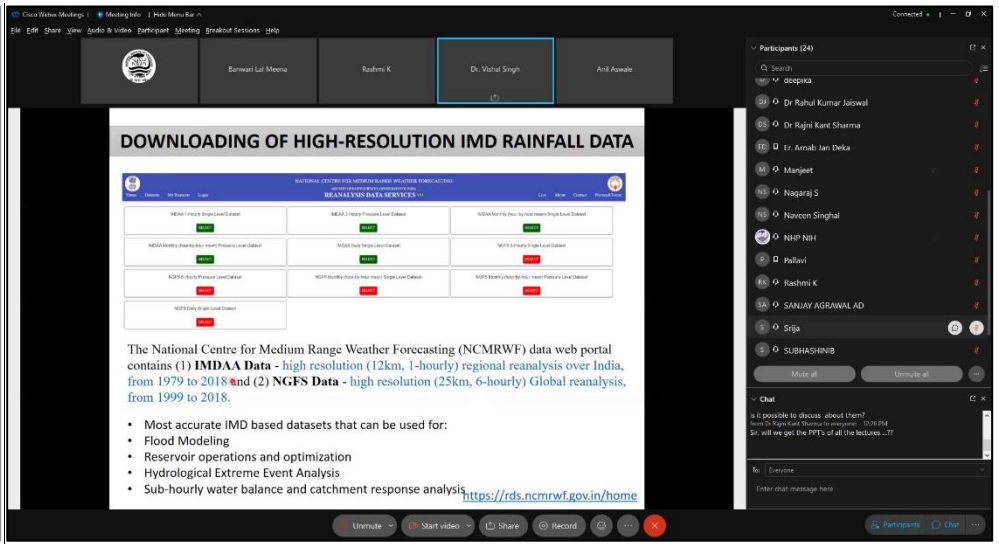

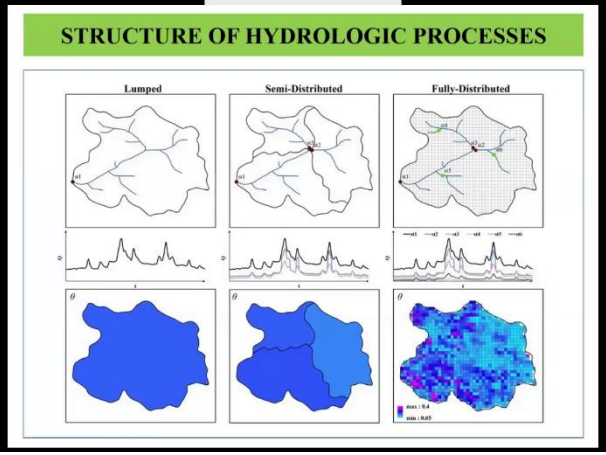

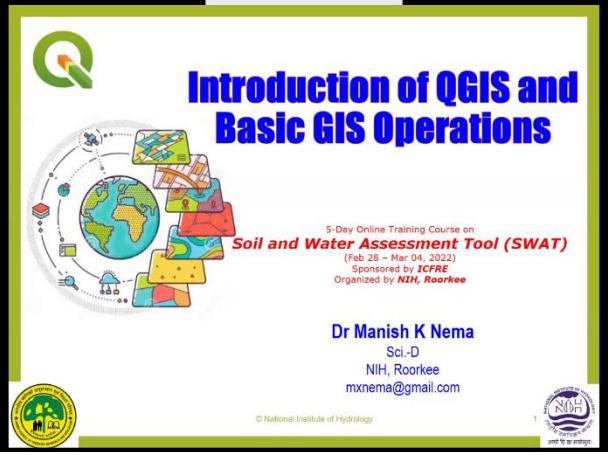

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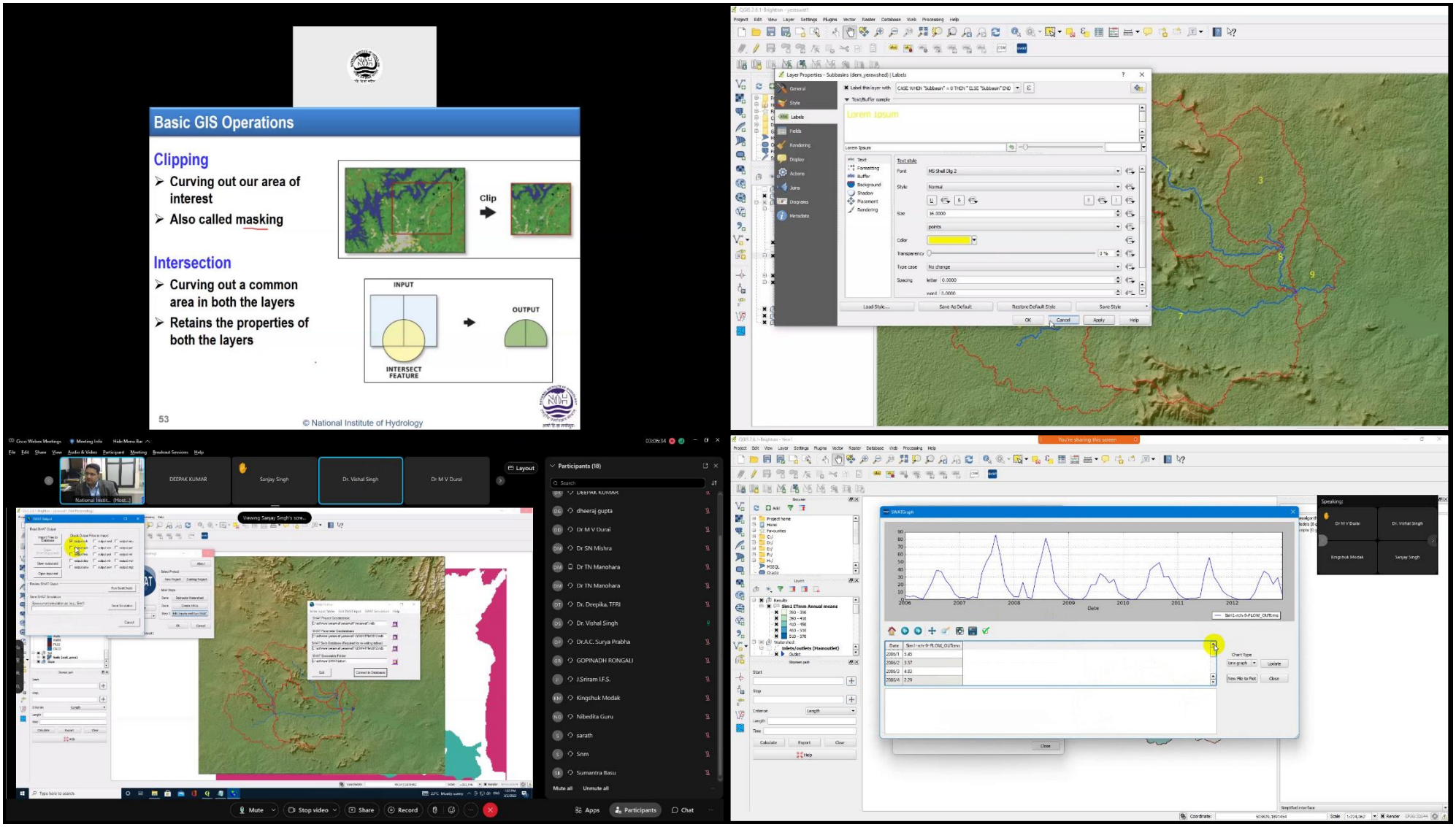
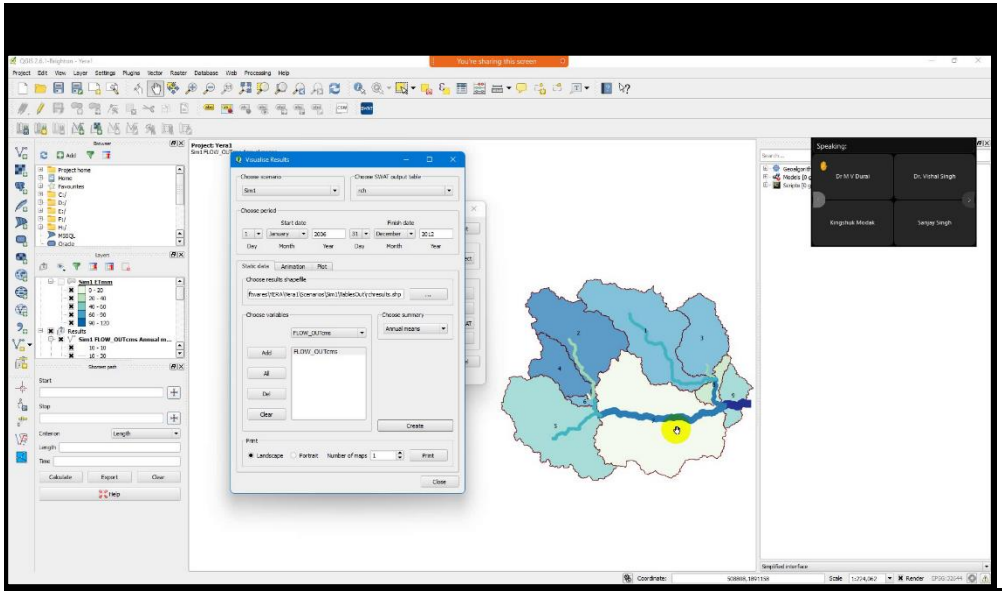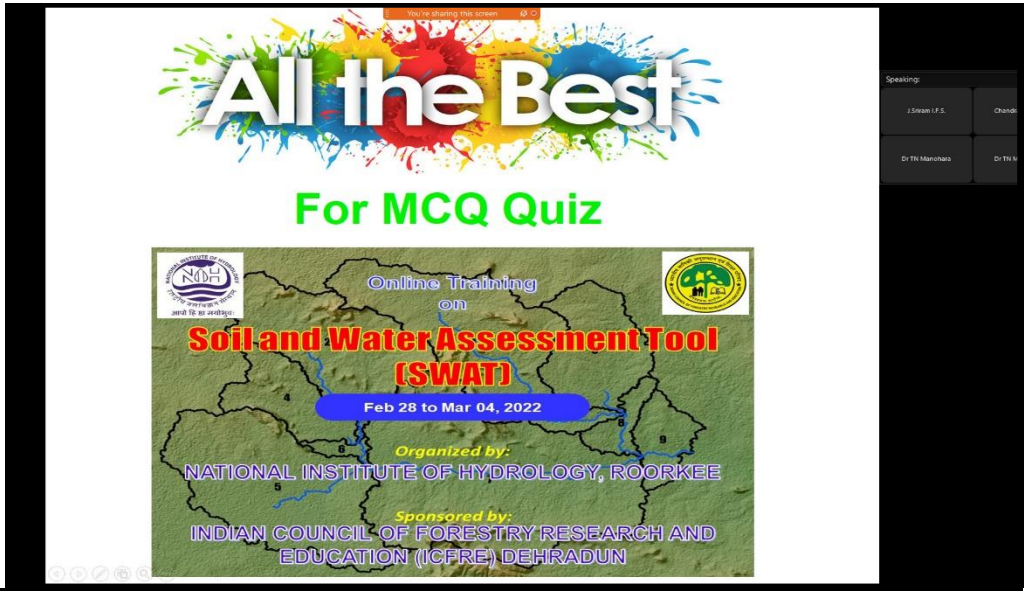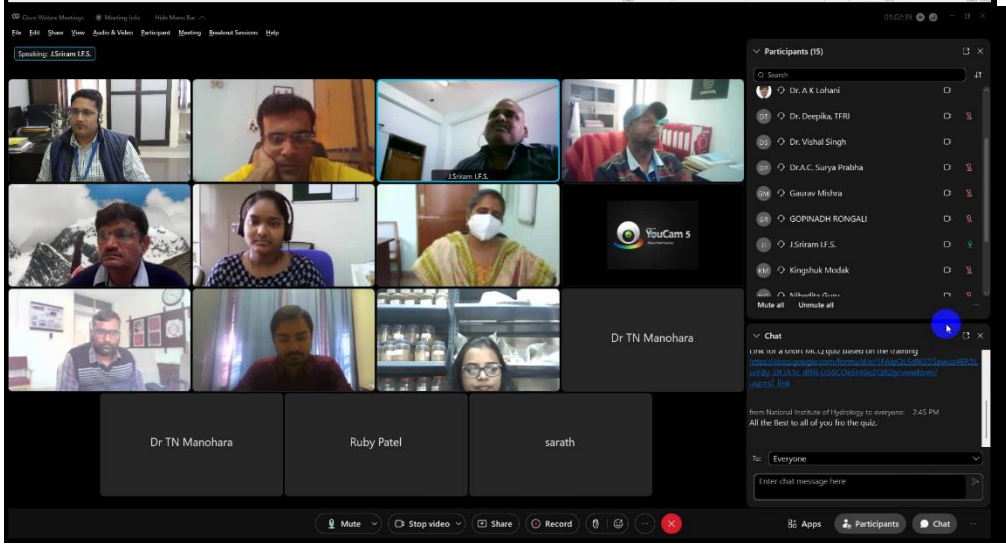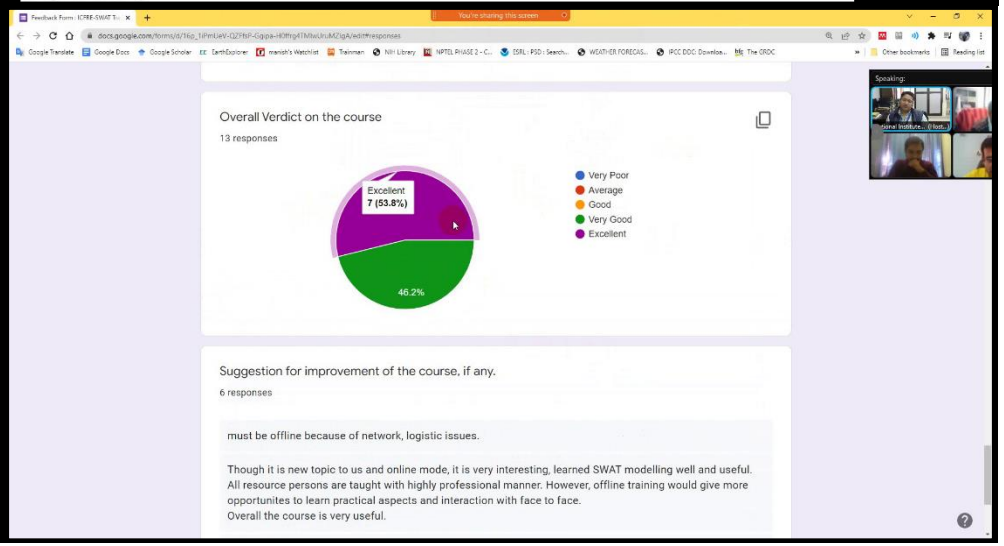
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