

## 21 Days Hands-on-training on RS & GIS using QGIS

(14th Feb 2022 to 16 Mar 2022)

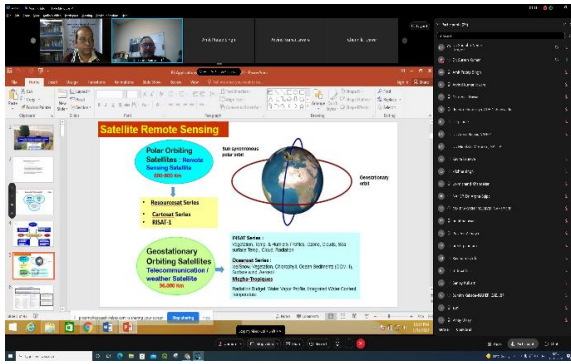
The NAHEP CAAST JNKVV Jabalpur conducted a 21-day hands-on training in RS & GIS using QGIS from 14th February to 16th March 2022 for university teachers/scientists and project personnel from JNKVV and many other agriculture universities across India. The training was intended to cover the fundamentals of remote sensing and geographic information systems (RS & GIS) and to enable participants to perform hands-on practices on RS & GIS by processing satellite imageries for various natural resource management planning purposes using the open-source software QGIS.

The training covered the following topics:- a) Introduction to Remote Sensing and its applications in Agriculture. b) Satellites, Sensors & Resolution, Visual Interpretation of Satellite Imagery, Different Geoportals. c) Introduction, acquiring, and installation of QGIS software, Georeferencing of the map, and generation of vector features. d) Acquiring satellite data, basics of the image, bands information, band combination, FCC formation, and clipping of Area of Interest (AOI) in the QGIS environment. e) Pre-Processing of Landsat 8 using SCP plugin, Creating training dataset, Satellite image classification, LULC area calculation, map layout creation, and DEM data processing for watershed delineation and other thematic maps preparation (Table 1). The training was attended by 26 participants from different agriculture universities.

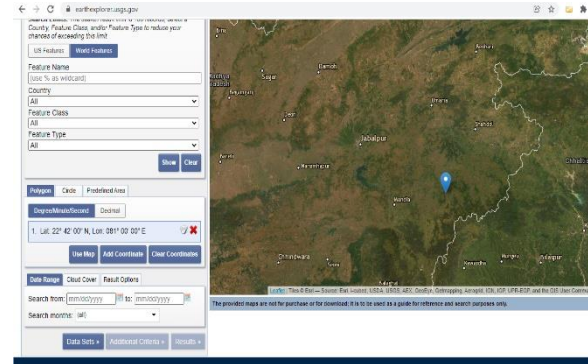
Along with the scheduled lectures, five special lectures have been planned and delivered by eminent scientists with extensive experience in remote sensing and geographic information systems from the Indian Institute of Remote Sensing, Dehradun as well as the Indian Agriculture Research Institute, New Delhi. The special lectures covered a range of topics such as the concept of remote sensing, Basics of Digital image processing, Remote sensing in vegetation and crop yield estimation, Remote sensing in crop resource management, and microwave remote sensing in agriculture which have been delivered by Dr. Suresh Kumar (Scientist G, IIRS), Dr PS Tiwari (Scientist F, IIRS), Dr. V Sahgal (Professor, IARI), Dr. N R Patel (Scientist G, IIRS) and Dr. D. Halder (Scientist F, IIRS) respectively.

**Table 1: Detailed Training schedule (14th Feb 2022 to 16 Mar 2022)**

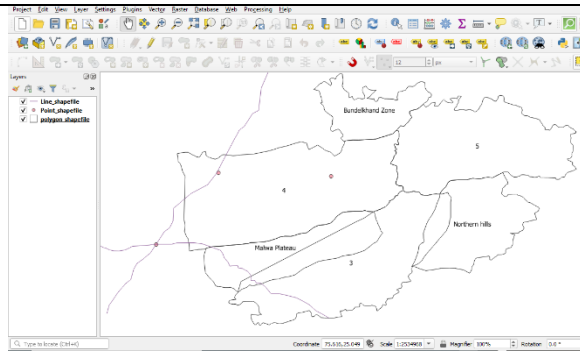
Date	Topic
14/02/2022	Inauguration, Basics of Remote Sensing and its application in agriculture (Special lecture), Pre-Training Test, Interaction with participants
15/02/2022	Satellites, Sensors, and Resolution & Visual Interpretation of Satellite Imagery
17/02/2022	Different Geoportals (Earth explorer, Bhuvan, Copernicus ESA, etc.). Introduction to GIS, Special lecture
18/02/2022	Introduction of QGIS, Downloading & Installation of QGIS Software, Special lecture
21/02/2022	Introduction of QGIS open-source software & its overview, Special lecture
22/02/2022	Georeferencing of Map
23/02/2022	Generation of vector features such as Point, Line, and Polygon, filling data in the attribute table and area calculation.
24/02/2022	Downloading of Landsat-8 satellite dataset and about bands information.
25/02/2022	Layer stacking of different bands and clipping of Area of Interest (AOI) Continue.....
28/02/2022	Band combinations for agriculture applications using False Colour Composite (FCC).
02/03/2022	Pre- Processing of Landsat 8 using SCP
03/03/2022	Region of Interest (ROI) and Creating Training Dataset
04/03/2022	Introduction of Classification, Supervised classification using Minimum distance algorithm
07/03/2022	Introduction of Classification, Supervised classification using Minimum distance algorithm
08/03/2022	Supervised classification using Minimum distance algorithm
09/03/2022	Area Calculation of LU/LC classified data
10/03/2022	Map Layout Creation, Special Lecture
11/03/2022	Installation of QuickOSM plugin and downloading of OSM data
14/03/2022	DEM data processing (Drainage/ Watershed Delineation), Special lecture
15/03/2022	DEM data processing (Elevation, Slope, Aspect, contour map preparation) & external thematic maps using WMS layers
16/03/2022	Presentation by Participants on LU/LC & Thematic maps (as prepared during exercise), Post Training Assessment & Valedictory Function



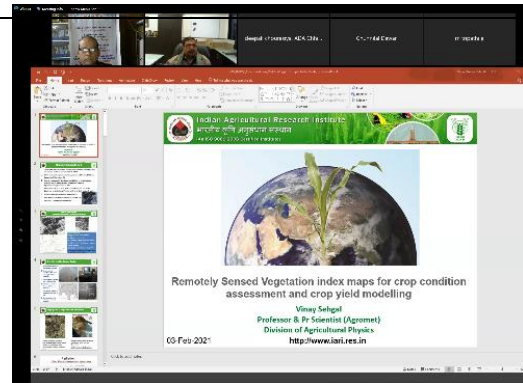
Basics of Remote sensing



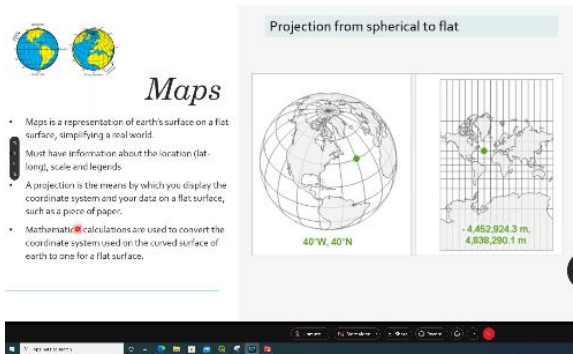
Downloading of Landsat-8 satellite dataset



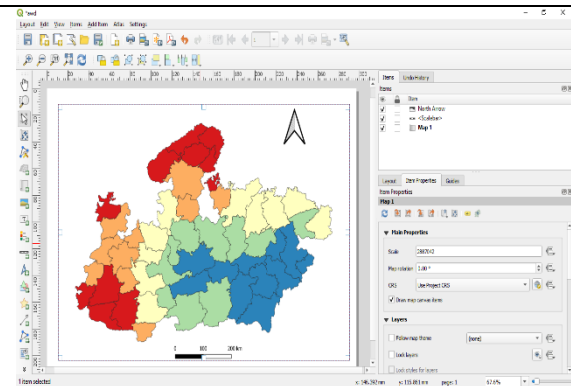
Creation of Vector Data



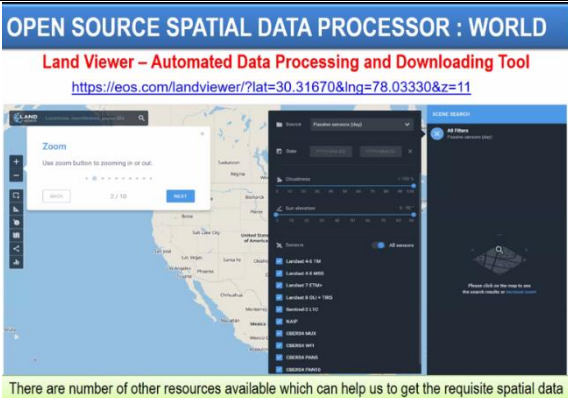
RS & GIS in crop condition assessment



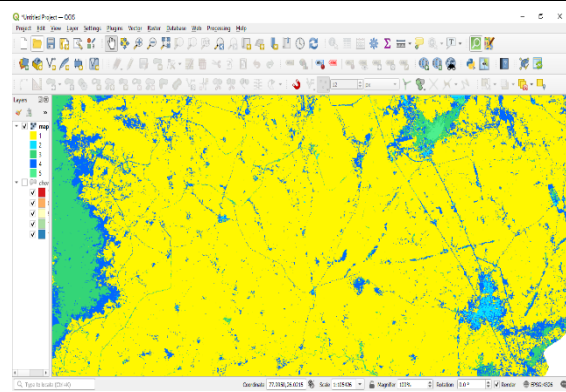
Map information



Map Layout Creation



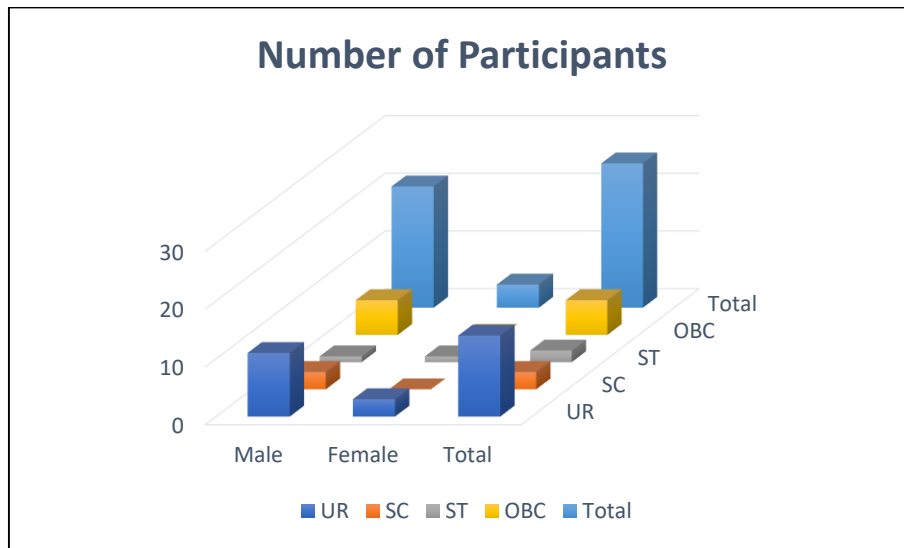
Open Data portals



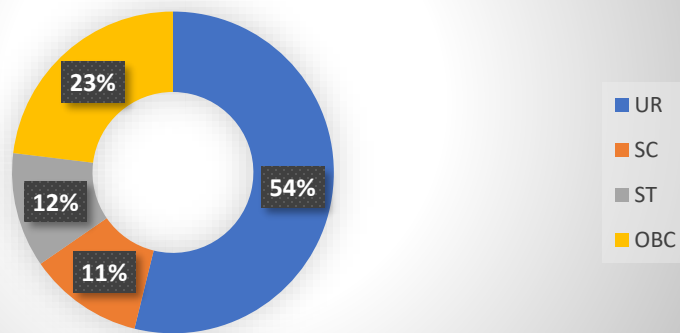
LULC Map

### Educative Learning Program for Agriculture Executives

Number of Participation						% of participation of diff. Category			
Gender	UR	SC	ST	OBC	Total	UR	SC	ST	OBC
Male	11	3	1	6	21	50.0	13.6	9.1	27.3
Female	3	0	1	0	4	75.0	0.0	25.0	0.0
<b>Total</b>	<b>14</b>	<b>3</b>	<b>2</b>	<b>6</b>	<b>25</b>	<b>53.8</b>	<b>11.5</b>	<b>11.5</b>	<b>23.1</b>



### Percentage wise participation of category



**Performance Evaluation:**

The daily attendance of 26 registered participants was varying from a minimum of 16 to a maximum of 26. To assess the awareness level of participants as well as to evaluate the effectiveness of the 21-day RS & GIS training using QGIS, performance was evaluated prior to training and post-training. In the pre-training test, average marks obtained by participants were about 72 percent, varying in the range of 12 to 18 marks. The post-assessment indicated an improvement i.e., on average 84 percent of marks were obtained by the participants varying in the range of 14-20 marks.

**Feedback from participants:**

All participants were asked to respond online related to training, learning experience, knowledge before and after the training and application of RS & GIS. There were feedbacks of participants indicates the following:

- Training provides very interesting elements for those participants who are willing to learn everything related to GIS.
- The quality of material and presentation was good.
- Great experience, interactions with scientist having expertise in Remote sensing & GIS
- Quality and patience of instructors who were very willing to repeat the content and clear doubts as per the requirements of trainees.

**They learned:**

- How to access the remote sensing data and used for Agricultural application.
- Downloading, installation and working with QGIS software, digitization, attribute filling and satellite image processing.
- Processing and analysis of geographic information using QGIS.
- Processing and analysis of satellite images using QGIS.
- A good exposure to the latest technology GIS and Remote sensing.

## Final Participant List

SN	Name	Designation / Position	Name of the Department	Name of the University with Address
1	Vishnu K Solanki	Assistant Professor	Forestry	JNKVV, JABALPUR, M.P.
2	Dr. Niharika Shukla	Scientist	Krishi Vigyan Kendra Jabalpur JNKVV Jabalpur	Jawaharlal Nehru Krishi Vishwa Vidyalaya Jabalpur
3	Dr. Surabhi Jain	Scientist	Department of Mathematics and Statistics	JNKVV, Jabalpur
4	Dr. Yogendra Singh	Assistant Professor	Department of Plant Breeding and Genetics	Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur
5	Dr. Mahesh Prasad Tripathi	Assistant Professor	Agricultural Engineering	Eternal University, Baru Sahib, Himachal Pradesh-173101
6	Somanath Sarvade	Assistant Professor	Agroforestry	Jawaharlal Nehru Agriculture University Jabalpur Madhya Pradesh
7	Sanjeev Kumar	Assistant Professor	Department of Plant Pathology	Jawaharlal Nehru Krishi Vishwavidyalaya- Jabalpur
8	Roshni Tiwari	Other	Dept. Agricultural Economics and Farm Management, Jnkvv, Jabalpur	JNKVV Jabalpur, Madhya Pradesh
9	Dr. Vinay Kumar Gautam	Project Staff	Department of Soil and Water Engineering	MPUAT, Udaipur, Rajasthan-313001
10	Dr. Umakant Rawat	Project Staff	Engineering	Jnkvv jabalpur
11	Dr Vinod Kumar	Project Staff	Plant Breeding and Genetics	JNKVV Jabalpur (MP)
12	Dr. Anand Kumar Panday	Scientist	PC Unit Sesame and Niger	JNKVV, Jabalpur (M.P.)
13	Dr. Yati Raj Khare	Scientist	JNKVV , KVK JABALPUR	JNKVV, ADHARTAL JABALPUR
14	Gourav Kumar Vani	Assistant Professor	Department of Agricultural Economics and Farm Management	Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur
15	Dr. G Thiyagarajan	Assistant Professor	Water Technology Centre,	Tamil Nadu Agricultural University, Coimbatore - 641 003
16	Dr. Devendra Vasht	Project Staff	Soil and water engineering	Jawahar Lal Nehru Krishi Vishwa Vidyalay, Jabalpur
17	Dr. Akshay Kumar	Project Staff	Centre for Advanced Agricultural Science and Technology (CAAST) for Climate Smart. Agriculture and Water Management (CSAWM)	MPKV, Rahuri, Ahmednagar-413722, Maharashtra
18	Dr Sudhir Singh Dhakad	Scientist	RVSKVV Krishi Vigyan Kendra Shajapur Madhya t	Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya Gwalior
19	Venkteshwar Jallaph	Project Staff	Agricultural Extension	ICAR- ATARI, Zone-IX, Jabalpur
20	Dr. H. K. Niranjana	Project Staff	Agro Economic Research Centre	JNKVV, Adhartal, Jabalpur
21	Dr Vijay Keru Balsane	Assistant Professor	Soil and Water Conservation Engineering	Mahatma Phule Krishi Vidyapeeth Rahuri
22	ANILKUMAR MAROTIRAO KAMBLE	Assistant Professor	Soil and Water Conservation Engineering	Vasantrao Naik Marathwaada Krishi Vidhyapeeth
23	Dr. Kailash Chaukikar	Other	Guest Teacher	JNKVV, Jabalpur MP
24	Vinita parte	Assistant Professor	Agronomy	JNKVV JABALPUR
25	Dr. Rakesh Singh Marabi	Assistant Professor	Department of Entomology	Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur