

Proceedings of the 2nd Meeting on “Development of the Unified National Soil Information System (UNSIG)” under National Geospatial Policy held March 4-5, 2025, held at ICAR-NBSS&LUP, Nagpur

As part of the National Geospatial Policy (NGP)-2022, the 2nd meeting on the ‘soil’ theme on with a focus on “Development of the Unified National Soil Information System (UNSIG)” was conducted at ICAR-National Bureau of Soil Survey and Land Use Planning (ICAR-NBSS&LUP), Nagpur, on March 4-5, 2025. Approximately 27 participants from ICAR, SAUs, and geospatial industry attended the two-day event (Annexure-1).

The meeting commenced with a welcome address by Dr. G.P. Obi Reddy, Principal Scientist & Head, Division of Remote Sensing Applications, ICAR-NBSS&LUP, who provided an overview of the meeting's objectives. Dr. N.G. Patil, Director, ICAR-NBSS&LUP, emphasized the significance of UNSIG in policymaking and planning, highlighted the necessity of consolidating soil data into a unified platform. He urged all nodal officers from SAU's for their cooperation and stressed the importance of a standardized data-sharing format to enhance accessibility and national collaboration.

The Chief Guest, Dr. A. Velmurugan, ADG (S&WM), NRM Division, ICAR, New Delhi, underscored the importance of data liberalization and integrating soil data onto a single platform. He also emphasized the abundance of available soil information within ICAR and state universities, and stressed the importance of consolidating this wealth of data on a unified platform. He also provided guidelines on data sharing, land degradation assessment, and water quality data collection while recommending the use of student theses and published reports for data compilation to develop UNSIG.

The Guest of Honour, Dr. Rajeev Srivastava, Former Head, Division of Remote Sensing Applications, ICAR-NBSS&LUP, Nagpur, stressed the importance of UNSIG for stakeholders, policymakers, and farmers. He suggested harmonizing datasets, addressing scale-related challenges, and updating chemical property databases every 3-5 years.

Dr. G.P. Obi Reddy delivered a detailed presentation on the development of the Unified National Soil Information System (UNSIG), highlighting its importance under the National Geospatial Policy (NGP). He discussed various key aspects of data acquisition, data processing, database management, and the roadmap for building UNSIG in collaboration with ICAR, NRSC, SLUSI, SAUs, and state agricultural departments. He also outlined the scope, characteristics, and challenges of assembling soil datasets while emphasizing the need for coordination among national organizations. On BHOOMI Geo-portal, he showcased data accessibility, metadata formats, and functionalities related to soil data. His presentation underscored the significance of integrating diverse soil resources into a unified platform to enhance data-driven decision-making for policymakers, planners, and farmers.

Dr. P.P. Adhikary highlighted the role of soil information systems in assessing soil loss and their integration into UNSIG, while Dr. U. Surendran emphasized the importance of soil datasets in sustainable agriculture, nutrient management, and crop suitability. Dr. Nirmal Kumar discussed digital soil mapping, focusing on dataset harmonization and optimizing soil sample collection for accurate and efficient analysis.

Dr. D.V. Singh, Principal Scientist & Head (I/c) at ICAR-IISWC, Dehradun, discussed soil erosion assessment, soil erodibility, and Detailed Project Report (DPR) preparation. He assured that the institute's datasets on soil erodibility could be made available for building the UNSIG, contributing to comprehensive soil data integration (Action: ICAR-IISWC).

Dr. Priyabatra Santra, Principal Scientist & Head at ICAR-CAZRI, Jodhpur, presented soil datasets from hot arid ecosystems compiled at the institute. He highlighted the availability of soil profile and land degradation data, emphasizing their contribution to UNSIS for better soil resource management in western India (Action: ICAR-CAZRI).

Dr. Sailaja (ANGRAU, Guntur) reported on geo-referenced soil profile datasets of Andhra Pradesh, stating that their availability for UNSIS would be subject to university approval for sharing (Action: ANGRAU, Guntur).

Dr. Satish Ayyappan, Professor at UAS, Bengaluru, shared that soil data from the Sujala-III and REWARD projects, including 94,000 surface samples and 4,000 soil profiles, could be made available for UNSIS, contributing valuable datasets for soil resource management (Action: UAS, Bangalore).

Dr. B.R. Jagdeesh (UAS, Dharwad) shared insights on soil data generated under the REWARD, PDWD, and Sujala-III projects, highlighting their potential contribution to UNSIS (Action: UAS, Dharwad).

Dr. R.N. Katkar (PDKV, Nagpur) provided soil fertility analysis data and agreed to share the soil fertility datasets of Maharashtra. He also discussed various challenges in data compilation for UNSIS integration (Action: PDKV, Nagpur).

Dr. Rakesh Banwasi (IGKV, Raipur) presented a geospatial dataset of 4,510 samples and shared soil fertility assessment data collected under various projects, confirming its availability for UNSIS integration (Action: IGKV, Raipur).

Mr. Satyendra Gupta, Co-founder & CEO of Neoperk Technologies, Mumbai, emphasized the role of soil spectroscopy in soil fertility assessment and collaborative efforts with ICAR-NBSS&LUP. He reported 10,000 tested soil samples across Maharashtra, highlighting their potential contribution to UNSIS.

Sh. Dinesh Pal Singh, Tech Lead at Cisco Systems India, emphasized the need for data convergence, avoiding duplication in data assimilation, and ensuring robust IT infrastructure and cybersecurity for effective visualization of UNSIS.

Actionable Outcomes

- The participants of the meeting decided to ensure GPS accuracy soil sample location and dataset validation is essential for maintaining the quality, reliability and precision of soil data processed for UNSIS.
- Besides, the use of existing research data, urged all Nodal Officers to compile soil datasets available from MSc and Ph.D. theses of their respective University to contribute to UNSIS.
- Integrating profile photos into the database will enhance dataset authenticity and provide a visual reference for soil profiles, improving data usability.
- Defining SLUSI's role in integrating soil datasets will help in consolidating efforts and ensuring seamless collaboration among different institutions.
- Addressing security concerns in UNSIS is crucial to ensure data integrity, prevent unauthorized access, and safeguard sensitive soil information.
- Establishing an information-sharing mechanism for universities will promote collaboration, enable easy data exchange, and enhance the overall effectiveness of UNSIS.

- Manpower and funding challenges are the concerns to ensure the smooth implementation, maintenance, and scalability of UNSIS.
- Region-specific approach was suggested for effective management and conducting quarterly review meetings for effective coordination, enhance data collection efforts, and facilitate regular progress assessments.
- Urged the other SAU's to identify the nodal officers to streamline data collection and coordination, ensuring efficient management and integration of soil datasets into UNSIS.
- Encouraging SAUs to collaborate with Nodal Organization of ICAR-NBSS&LUP will promote data harmonization, ensuring consistency and accuracy in soil datasets across different institutions.
- Nodal Organization will provide standardized soil data formats to facilitate data entry and sharing for seamless integration into UNSIS and interoperability across various platforms.
- Developing a national soil database with proper metadata will enhance usability, allowing policymakers, researchers, and farmers to access and utilize soil information effectively.

The two-day meeting ended with a formal vote of thanks.

List of participants in the meeting

Annexure-1

S.No.	Name of Participant	Affiliation
1.	Dr. A. Velmurugan	ADG (S&WM), ICAR, New Delhi
2.	Dr. N. G. Patil	Director, ICAR-NBSS&LUP, Nagpur
3.	Dr. Rajeev Srivastava	Former Pr. Scientist and Head, RSA Division, ICAR-NBSS&LUP, Nagpur
4.	Dr. G. P. Obi Reddy	Pr. Scientist & Head, RSA, ICAR-NBSS&LUP, Nagpur
5.	Dr. P. Tiwary	Pr. Scientist & Head, SRS, ICAR-NBSS&LUP, Nagpur
6.	Dr. H. Biswas	Pr. Scientist & Head, LUP, ICAR-NBSS&LUP, Nagpur
7.	Dr. Partha P. Adhikary	Pr. Scientist, RSA, ICAR-NBSS&LUP, Nagpur
8.	Dr. U. Surendran	Pr. Scientist, RSA, ICAR-NBSS&LUP, Nagpur
9.	Dr. Nirmal Kumar	Sr. Scientist, RSA, ICAR-NBSS&LUP, Nagpur
10.	Dr. Sunil B.H	Scientist, RSA, ICAR-NBSS&LUP, Nagpur
11.	Dr. P. Santra	Head, Natural Resources, ICAR-CAZRI, Jodhpur
12.	Dr. Manish C. Kasture	Head, Department of SSAC, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli
13.	Dr. Hitendra Kumar Rai	Principal Scientist, Department of SSAC, JNKVV,
14.	Dr. Sailaja Vinnakota	Principal Scientist, Dept. SSAC, Acharya NG Ranga Agri. University, Guntur (AP)
15.	Dr. S. K. Yadav	Associate Professor, ANDUA&T, Kumarganj, Ayodhya
16.	Dr. B. R. Jagadeesh	Professor, Dept of Soil Science, UAS, Dharwad
17.	Dr. Satish Ayyappan	Professor, GKVK, UAS, Bangaluru
18.	Dr. Rakesh Banwasi	Associate Professor, SSAC, CoA, IGKV, Raipur
19.	Dr. R. N. Katkar	Professor & Head, CoA, Nagpur, Dr. PDKV, Akola
20.	Dr. Narender Sankhya	Head, Department of Soil Science, CSKHPKV, Palampur
21.	Sh. Dinesh Patel	SSO, SLUSI, Nagpur Centre
22.	Sh. B. S. Chafle	ASSO, SLUSI, Nagpur Centre
23.	Dr. D.S. Mohekar	ACTO, RSA, ICAR-NBSS&LUP, Nagpur
24.	Shri Vilas Parhad	CTO, RSA, ICAR-NBSS&LUP, Nagpur
25.	Sh. Dinesh Pal Singh	Tech. Lead - Digital Transformation Office, New Delhi Cisco Systems India Pvt Ltd., New Delhi
26.	Shri Devansh Shinde	Regional Head (Technical), ESRI, Mumbai
27.	Mr. Roshan Tarate	Ingenious Geo Technologies, Nagpur