Webinar Report

World Soil Day, 2020

'Keep Soil Alive, Protect Soil Biodiversity'

December 05, 2020

Organised by:

JNU ENVIS Resource Partner on Geodiversity & Impact on Environment
School of Environmental Sciences, Jawaharlal Nehru University
New Delhi – 110 067

WORLD SOIL DAY

Theme: 'Keep Soil Alive, Protect Soil Biodiversity'

The School of Environmental Sciences celebrated World Soil Day on December 05, 2020. On this occasion, a webinar was organized on the theme 'Keep Soil Alive, Protect Soil Biodiversity' in collaboration with the JNU ENVIS Resource Partner and the Young Holistic (YoHo) group, School of Environmental Sciences, Jawaharlal Nehru University, New Delhi.

The panel included very eminent national and International researchers such as **Prof. Himanshu Pathak** (Director, ICAR - NIASM Pune), **Dr. Sharath Pallerla** [Director, MoEF&CC (Policy) Gol], **Prof. Hiroshi Hara** (Tokyo Agriculture University, Japan), **Dr. Nemitz Eiko** (Center for Ecology & Hydrology, Edinburg, UK), **Prof. U.C. Kulshrestha** (Dean SES & JNU ENVIS Coordinator) and **Dr. Usha Mina,** (Associate Professor & ENVIS Co-coordinator, SES, JNU). The Young Holistic leader **Ms. Rashmi Dwivedi** represented the student YoHo group, while **Ms. Swati Singh,** Programme Officer, ENVIS, SES executed the programme.

Professor Umesh Kulshrestha, moderated the panel discussion. It was attended by more than 650 participants, through Google-Meet and Facebook Live platforms. The participants included university students, researchers, faculty members and other stakeholders both nationally and internationally.


WORLD SOIL DAY
Theme: 'Keep Soil Alive, Protect Soil Biodiversity'
Date: December 05, 2020
Time: 12:00 Noon - 01:30 pm
Panelist
Prof. Himanshu Pathak
Director, ICAR-NIASM
Pune
Dr. Sharath Pallerla
Director, MoEF&CC (Policy)
GoI, Delhi
Prof. Hiroshi Hara
Tokyo Agriculture
University, Japan
Dr. Nemitz Eiko
Center for Ecology &
Hydrology, Edinburg, UK
Prof. U.C. Kulshrestha
ENVIS Coordinator,
Dean, SES, JNU
Dr. Usha Mina
ENVIS Co-coordinator,
SES, JNU
Ms. Rashmi Dwivedi
YoHo Lead
M.Sc student, SES, JNU
Ms. Swati Singh
Programme Officer,
JNU-ENVIS RP
Registration link: https://forms.gle/Zn5nDWg1EJT2Vc6U7
E-Certificate will be provided to all participants
Organized by:
JNU ENVIS Resource Partner on Geodiversity & Impact on Environment
School of Environmental Sciences, Jawaharlal Nehru University, New Delhi
Ministry of Environment, Forest & Climate Change, Govt. of India, New Delhi

Fig.1: Poster and Schedule of the Webinar widely circulated on the social media platform.

Prof. U.C. Kulshrestha, **Dean SES & JNU ENVIS Coordinator –** Prof Kulshrestha welcomed all the speakers, participants, students and all the guests. He talked about the importance of World Soil Day. He said Soil takes millions of years to form but it takes a few years to destroy it in the name of bricks, buildings, run-off after deforestation etc. He also talked about JNU ENVIS RP, it's activities and thematic areas. Also mentioned about Young Holistic (YoHo) activities of SES. He also mentioned that Prof. Hara (panelist) is the Co-founder of the `Holistic Environment` programme. He then introduced first speaker Prof. Himanshu Pathak and asked him to deliver his talk.

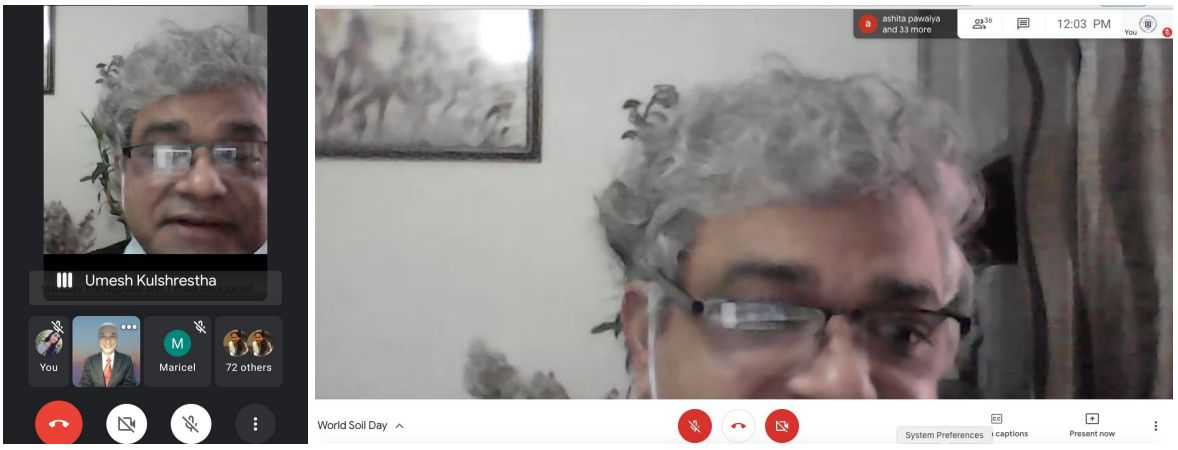


Fig.2: Prof. Umesh Kulshrestha, Dean & ENVIS Coordinator, SES, JNU

Prof. Himanshu Pathak, Director, ICAR - NIASM Pune – Prof Pathak mentioned about the cause and importance of celebration of World Soil Day. He briefly mentioned the genesis of Soil Day. In 2002, an International Union of Soil Science (IUSS) recommended an international day for Soil. Later in June 2013, FAQ supported the formal establishment of World Soil Day within the framework of the Global Soil Partnership. Then in December 2013, the 68th UN General Assembly designated 5 December 2014 as the first official World Soil Day. The day corresponds with the official birthday of H.M. King Bhumibol Adulyadej, the King of Thailand, who officially sanctioned the event.

He recognized soil as a vital contributor to the human commonwealth. He acknowledged its crucial role for food, water and energy security. He identified soil as a mitigator of biodiversity loss and climate change. Prof Pathak urged the global community to generate and communicate knowledge of soil for the common good. He further said why we worry about Soil, Agriculture is the only industry which produces food & soil is the base for producing food, fiber feed, fuel, fertilizer. Soil provides goods and services in the form of Biomass Production, for Human Health, Culture, Biodiversity, Ground Water, Surface Water & Air.

Prof Pathak mentioned relationships about Soil and Society - Food and health: Healthy soil produces healthy food. Economic: Healthy soil requires less external inputs, increases profits. Environmental: Healthy soil keeps environment healthy. Political: It reduces dependency on other countries for imports. Poverty: Poor soil, poor people. In relation to Sustainable Development Goals, all the 17 Sustainable Development Goals are directly or indirectly related to soil. SD Goals are equal to Soil Development Goals.

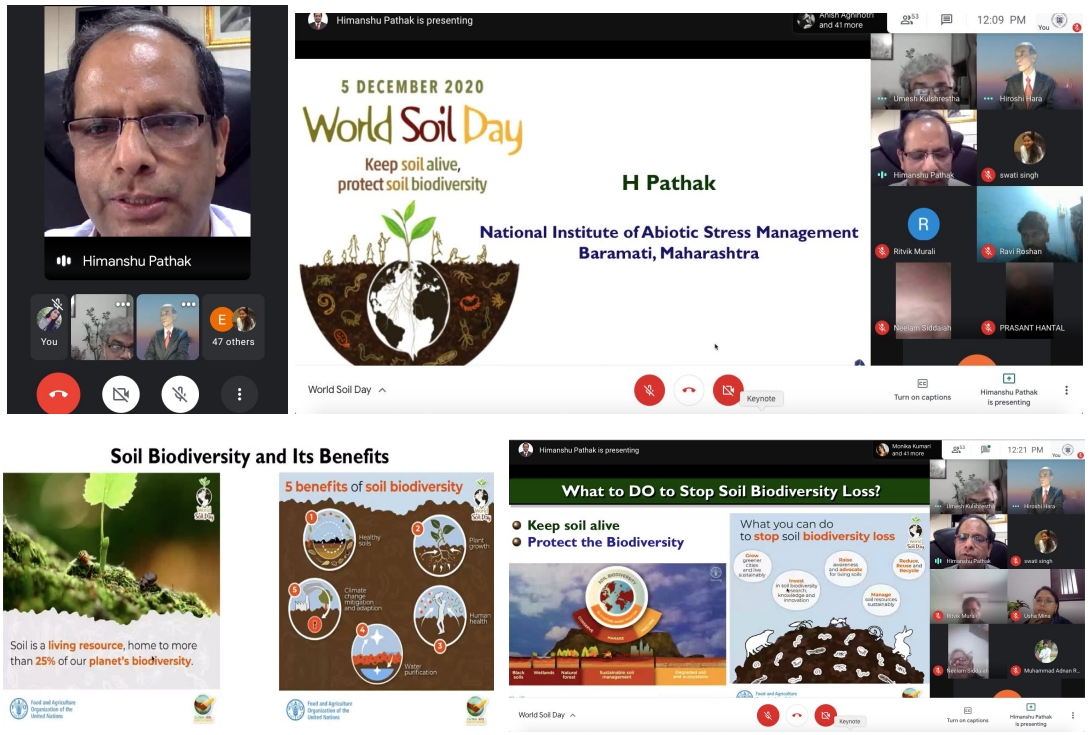


Fig.3: Prof. Himanshu Pathak, Director, ICAR - NIASM

Prof Pathak also talked about Soil Health, soil health depends on Physical, Chemical & Biological factors like Water retention & availability, Root growth, Erosion, Compaction Chemical Cation exchange capacity, Nutrient retention, Nutrient reserves, Buffering against acidification, Bioavailability of pollutants & Biological Biodiversity, Nutrient cycling, Degradation of pollutants.

Prof Pathak also highlighted why soil health is deteriorating and degrading- **1).** Inappropriate land use **2).** Deforestation **3).** Urbanization **4).** Water and wind erosion **5).** Faulty agri – management **6).** Dumping of wastes **7).** Discharge of pollutants **8).** Mining of nutrients **9).** Depletion of soil carbon **10).** Climate change. Around 24% of global soils are degraded to various degrees including 50% of agriculture soils. India has around 36% of the geographical area degraded with soil erosion, salinity, alkalinity, acidity, water logging and other edaphic stresses (NAAS, 2017). Around 1.2 billion USD is the economic loss in grain production due to soil degradation.

He mentioned that loss of soil carbon is very fast and especially in recent years. In India due to tropical location organic carbon content of our soil is very poor (1 – 0.5%). Due to current environmental changes and anthropogenic changes soil organic carbon will further decrease.

He mentioned about increased occurrence of soil deficiency:

- Nutrient deficiencies multiplying with every passing decade.
- Exclusive focus on NPK, nutrient mining, weak soil testing.
- Discuss of organic manure, tillage, removal/burning of crop residues.

He mentioned an imbalanced 'N' balance. Our planet has crossed 3 planetary boundaries (Climate change, Nitrogen cycle & Biodiversity loss) and going to cross boundaries (Phosphorus cycle and Ocean acidification). Soil Biodiversity and its benefits are: **i.** Healthy soils **ii.** Plant growth **iii.** Human health **iv.** Water Purification **v.** Climate change mitigation and adaptation. Still millions of species of soil biodiversity is not known, even those we know are being lost due to land use change, Invasive species, Unsustainable soil management practices, Pollution, Soil salinization and urbanization. We should stop soil Biodiversity loss; keep soil alive and protect the Biodiversity. He ended his talk by suggesting measures that should be adopted to stop soil biodiversity loss: **i.** Grow greener cities and live sustainably **Ii.** Invest in soil biodiversity research knowledge and innovation **iii.** Raise awareness and advocate for living soils **iv.** Reduce, Revise and Recycle **v.** Manage soil resources, sustainably.

Dr. Sharath Pallerla, Director, MoEF&CC (Policy) GoI, Delhi – He talked about Soil Biodiversity that is hidden world beneath our feet : **i.** More than 2 million species are reported to exist on earth **ii.** Soil is a living resource, home to more than 25% of our planet's biodiversity **iii.** Plants nature a whole world of creatures in the soil, that in return feed and protect the plants **iv.** This diverse community of living organisms keeps the soil healthy and fertile **v.** This vast world constitutes soil biodiversity and determines the main biogeochemical processes that make life possible on earth.

Types of fauna – Mega fauna: Toads, moles beavers, rabbits and badgers are the principal agents of soil turnover and distribution; **Macro fauna:** Earthworms, termites, ants, millipedes and woodlice help with soil drainage and aeration; **Meso fauna:** Microscopic invertebrates such as collembolans, diplura, proturans, nematodes, mites and tardigrades, diplura, proturans, nematodes, mites and tardigrades are biological regulators of decomposition; **Micro fauna & Micro Organism:** Bacteria, protozoans, fungi and nematodes are the smallest and most numerous organisms in the soil. That is responsible for biogeochemical processes. He also mentioned about 5 benefits of soil biodiversity.

Dr. Pallerla also talked about the Legal Instruments for Conservation and sustainable use :Environment protection is enshrined in the constitution of India [Article 48A and Article 51A

(G)]. Wide - ranging policies, programmes and projects are in place, which directly or indirectly serve to protect, conserve and sustainably use the country's biological resources.

- Forest (Conservation) Act,
- Wildlife (Protection) Act,
- Biological diversity Act,
- National Green Tribunal Act,
- National Biodiversity Action Plan,
- National Forest Policy,
- National Wildlife Action Plan,
- NationalForestry Action Programme,
- National Environment Policy and National Action Plan on Climate Change,
- Protection of Plant Varieties and Farmers Rights Act, 2001,
- The Scheduled Tribes & other Traditional Forest dwellers (Recognition of forest Rights) Act 2006.

Dr. Pallerla talked about various biogeographic zones of India. Four of 36 identified hot spots of the world (which are biologically rich but deeply threatened) are in India : North East India in Eastern Himalaya, Assam in India Burma, Western Ghats, part of Andman & Nicobar Islands, Over 40,000 species of plants and 1,00,000 species of animals recorded so far, India has ten biogeographic zones, based on which conservation planning has been token up thus management of soil depends on its geographic areas.

MoEF&CC Government of India has specific divisions to look into matter of Soil; Desertification cell, Biodiversity, Hazardous Substance management Division, Control of pollution, Mountain Division, Conservation & Survey, Impact Assessment i. River valley/ Mining/ infrastructure/ industry, forest wildlife. India has developed Atlas "Desertification and Land Degradation Atlas of India"

Important International Commitments were also mentioned e.g. implementation of Biological Diversity Act and International obligations like the Convention on Biological Diversity (CPB), the National Biodiversity Action Plan (NBAP) and National Biodiversity Targets (NBTs), Nagoya protocol on Access and benefit sharing (ABS), National reports to CBD and Nagoya protocol on ABS, Intergovernmental platform on Biodiversity and Ecosystem services (IPBES).

Projects on biodiversity implemented through the NBA. The Desertification cell in the Ministry is the nodal division coordinating activities allied to combating desertification and restoring degraded land. The Division is:

1. The national executing agency for the Sustainable land and Ecosystem Management (SLEM) programmatic approach.
2. The focal point addressing the issues pertaining to the implementation of the United Nations Convention to Combat Desertification, which was ratified by India on 17th December 1996. He ended his talk by highlighting desertification objectives.

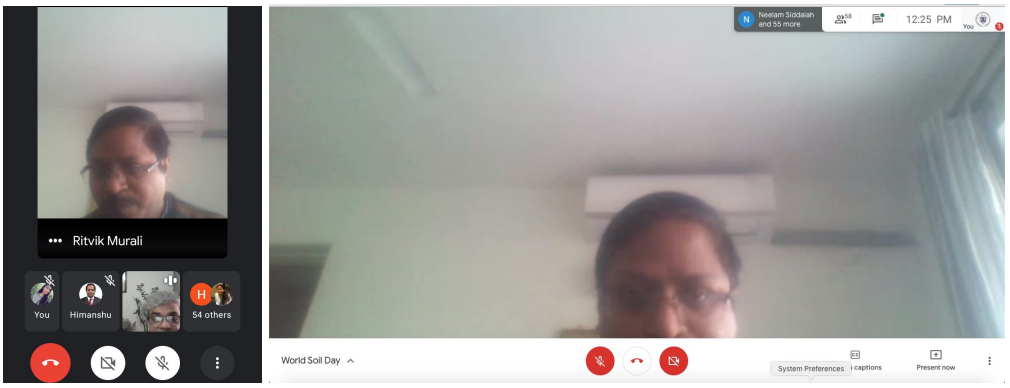


Fig.4: Dr. Sharath Pllerla, Director, MoEF&CC (Policy) GoI

Prof. Hiroshi Hara, **Tokyo Agriculture University, Japan –** Prof Hara showed his more interest in the Holistic approach, this has relation to Asian heritage. Prof Hara talked about pH change of precipitation in South–East Asia. He mentioned that now pH level is increasing, acid deposition is decreasing due to control measures. According to him, the Holistic approach is the best way to provide environmental solutions as it takes care of each component of the problem in an integrated manner.

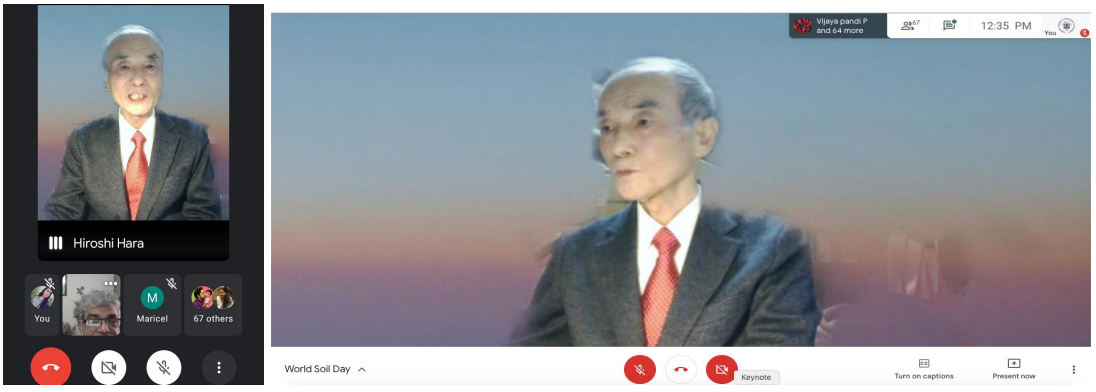


Fig.5 Prof. Hiroshi Hara, Tokyo Agriculture University, Japan

Dr. Nemitz Eiko, Center for Ecology & Hydrology, Edinburg, UK – Dr Eiko shared COVID impact on Noxin Italy. Use of fertilizers and release of ammonia has increased. He mentioned about the threats of excess nitrogen and greenhouse gases to air quality, water quality, soil quality, ecosystem.He shared the Nitrogen cycle. He talked about the studies which show loss of huge amounts of nitrogen in Europe. He showed images of hotspots of ammonia in the Indo–Gangetic plain. He discussed his study of Modelling of ammonia across South Asia. Also discussed $PM_{2.5}$ responses to ammonia emission changes. He showed temporal dynamics of pollutants, in early morning hours, pre – monsoon, monsoon & post – monsoon periods. He emphasized a sustainable nitrogen management system is a need to reduce nitrogen uses and suggested to use low emission measures.

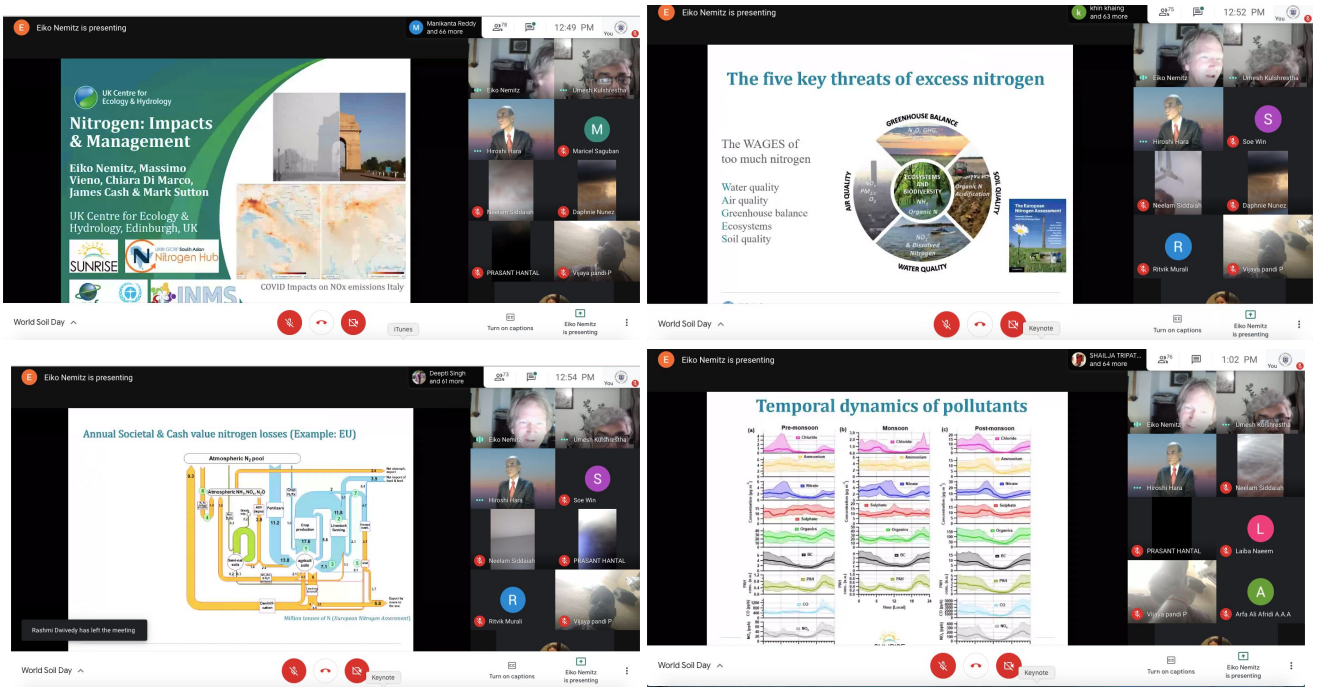


Fig.6: Dr. Nemitz Eiko, Center for Ecology & Hydrology, Edinburg, UK

Dr. Usha Mina, ENVIS Co - coordinator, SES, JNU - She started her talk by quoting Prof. Ratan Lal (Winner of World Food Prize 2020). "I believe Soil is a living thing and that's why soil helps me and soil has life, every living thing has right, therefore soil also has rights".

Everything we eat or drink is processed through soil biota over and again numerous times. Therefore we need healthy soil for healthy food and healthy lives. We all give voice to 2020 World Soil Day theme "Keep Soil Alive, Protect Soil Biodiversity". World Soil Day celebrations were started in 2015, same year 17 SDs were given to all the countries as

target, to achieve by 2030. 2015 – 2024 declared as the International decade for soil. 2020 King Bhumibol Award was conferred to ICAR.

Soil plays an important role in maintaining a fragile balance of life in natural as well as agro ecosystem. If this interaction is interrupted in any ways it can cause irreversible damage on earth including humans.

Soil biodiversity contains many unknown species and performs many unknown functions. eg) Importance of Bacillus Species in soil and their role in producing antibodies. Soil ecosystem is a giant web where everything is interconnected, plants are connected to soil microbes which helps plants to uptake minerals, soil microbes are connected to plants for habitat and shelter. They all are working in collaboration so that sustainability can be maintained and food security could be achieved.

24% of global soil is already degraded and in India 36% of our total geographical area has been categorized as degraded, Soil health is directly related to soil organic matter, which is important for ecosystem services. This will affect meeting target SD goals. Thus it is very critical to maintain soil health by stopping degradation and stop causes of degradation.

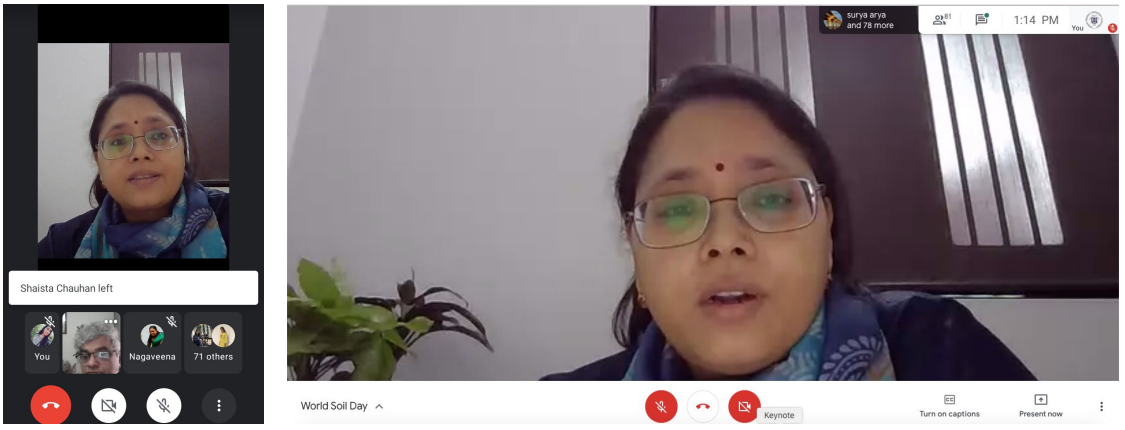


Fig.7: Dr. Usha Mina, Associate Professor & ENVIS Co-coordinator, SES,JNU

Rashmi Dwivedy, YoHo Gyan Lead & Student, SES, JNU – as a young holistic leader, Rashmi talked about YoHo activities and her ideas about Pollution Prevention and Control. She highlighted that Young Holistic (YoHo) like platforms are needed for the all-round development of the students.

She declared the results of the Painting Competition held on the occasion of World Soil Day jointly by YoHo and ENVIS. The help of Dr. Sangeeta Goyal, PO Envis CAZRI, Dr. Vrushali

Singh, KDMC Goa, Ms. Akansha, SES, JNU as jury members for evaluating the paintings was highly appreciated.

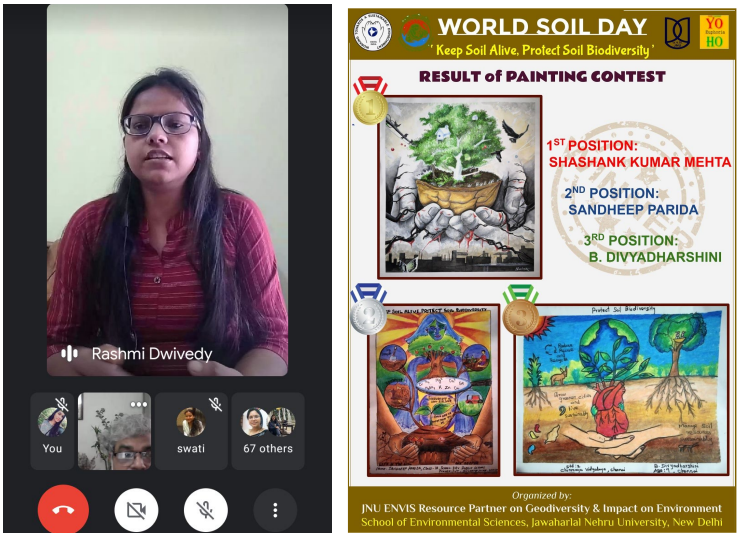


Fig.8: Ms. Rashmi Dwivedy, YoHo Gyan Lead, SES, JNU announced result online

Vote of Thanks was extended by **Ms. Swati Singh, Programme Officer, JNU ENVIS -** She thanked all the speakers, participants, students and the faculty for making the event successful.

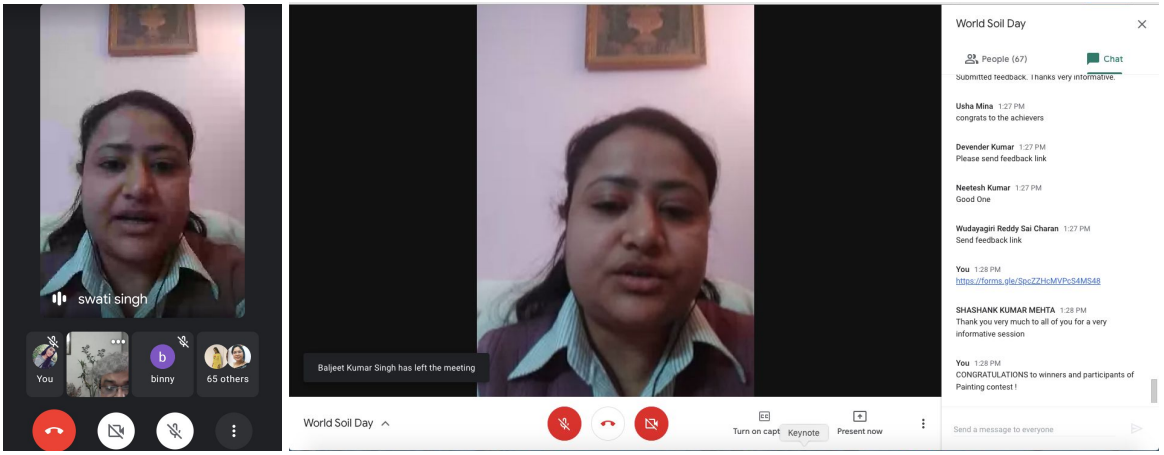


Fig.9: Ms. Swati Singh, Programme Officer, JNU ENVIS RP

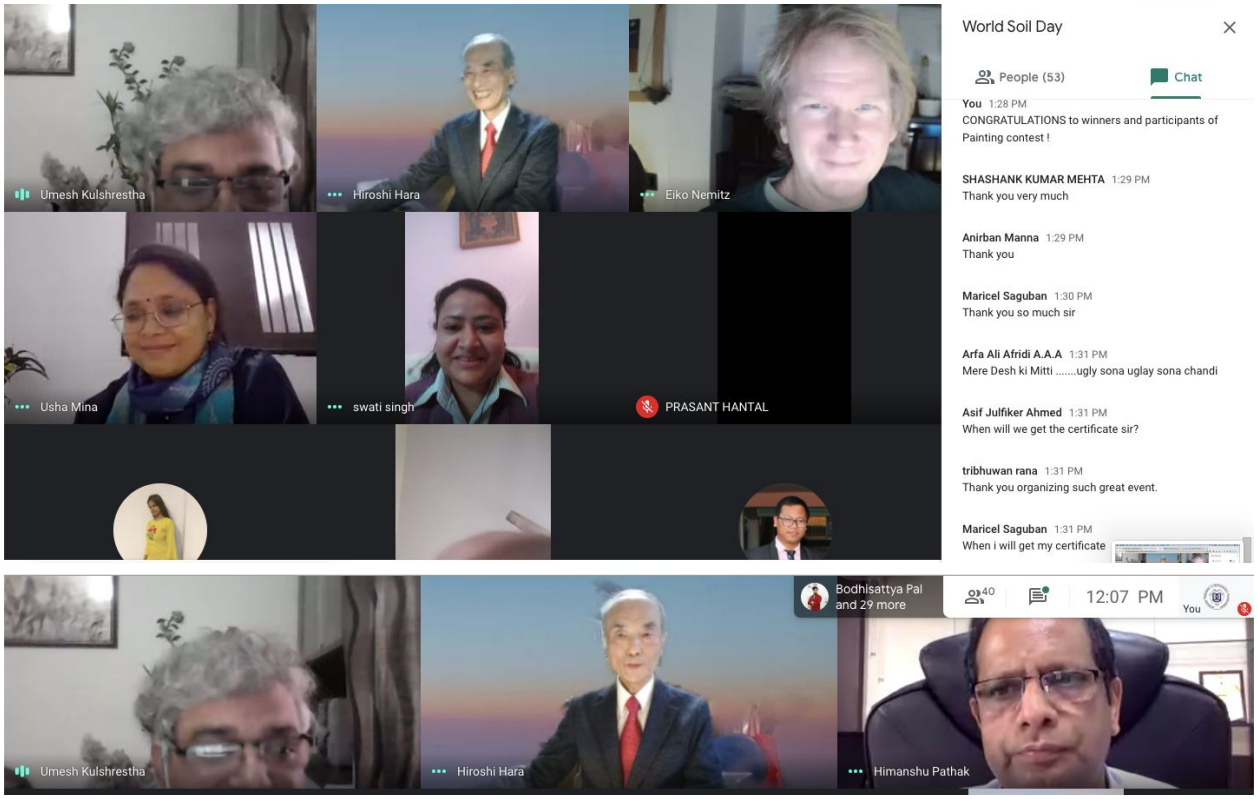


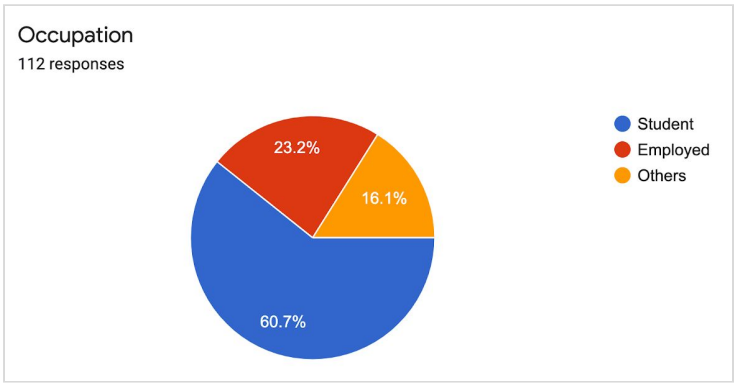
Fig.10: Panelists & Participants of the Panel Discussion

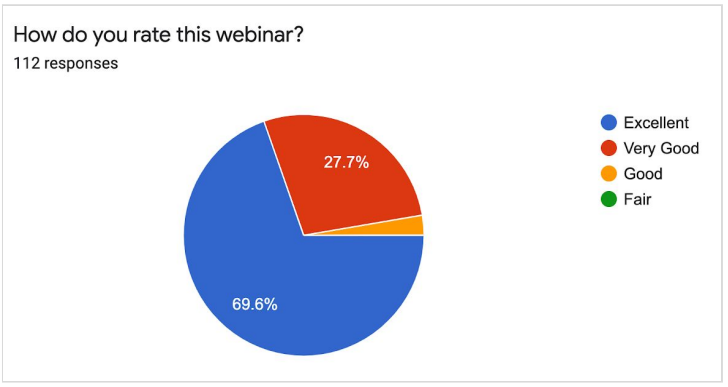
The session came to an end with the distribution of e-certificate to all the participants. This is to mention that a very positive feedback has been received from the participants about the event.

Recommendations:

1. Integrated efforts are required for healthy management of soil for healthy crop, healthy food, the planet and society.
2. Technical advancement in agriculture is needed for precision farming
3. Soil health needs attention globally as soil health is becoming very poor.
4. Soil biodiversity must be protected to fulfill Sustainable Development Goals.
5. Threats of degradation, pollution and climate change are alarming.
6. Sustainable soil management is crucial.
7. Need to have International negotiations for a Sustainable Nitrogen Management System.
8. Reduce Nitrogen losses through circular economy.

Feedback:





Short line feedback

96 responses

Thank you for organization. Many of our things have been restricted to talks or seminars, make effort with known organizations to reach all part of the world to educate, create awareness and bring maximum change. Governments will do to lower level, people from higher organization can only do better. Take it positively. Thank you if the effort is made from my feedback.

One platform, many speakers.really appreciate

Very informative, helps all the scientists and students

Highly informative.... Online project/internship should be started

Very nice..informative

Really an informative session and many things that we dont know and have never thought of make us to think upon it.

Overall webinar was excellent and very informative.Thank you.

Webinar Live Session on the official FB page:
https://www.facebook.com/jnuenvis/videos/214426873461832

Webinar on the official YouTube page:
https://www.youtube.com/watch?v=pFkI6fR_SW0&t=153s

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