



*experience the world of difference*



**DOON**  
UNIVERSITY

**SCHOOL OF  
ENVIRONMENT  
AND NATURAL  
RESOURCES (SENAR)**



## Vision and Mission

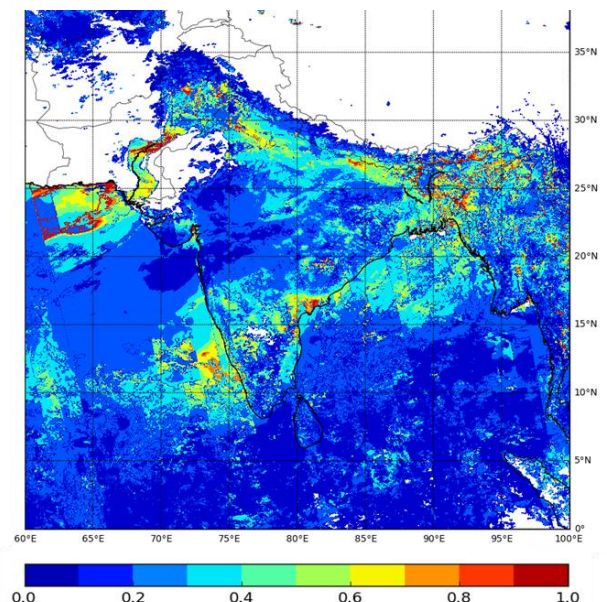
*“SENR is committed to excellence in cutting edge scientific research and building capacities of trained professionals who can meet the emerging environmental challenges of the 21st century.”*

The School of Environment and Natural Resources (SENR), established in the year 2009, is mandated to become a Centre of Excellence in the field of Environmental Science and Technology. The SENR is striving hard towards achieving its goal of excellence. The School aims to be benchmarked with the best institutions in the country and the world.

The mission of the school is :

- To build capacities in the field of Environmental Science through degree, diploma and research programs.
- To undertake cutting edge scientific research in the emerging areas of Environmental Science.
- To undertake research on environmental issues with policy implications for the state and the country.
- To forge academic and research collaborations with well recognized institutions of national and international prominence.
- To create awareness and sensitize the stakeholders about environmental issues.

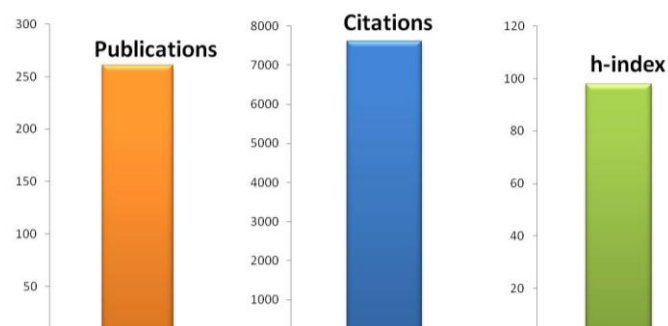
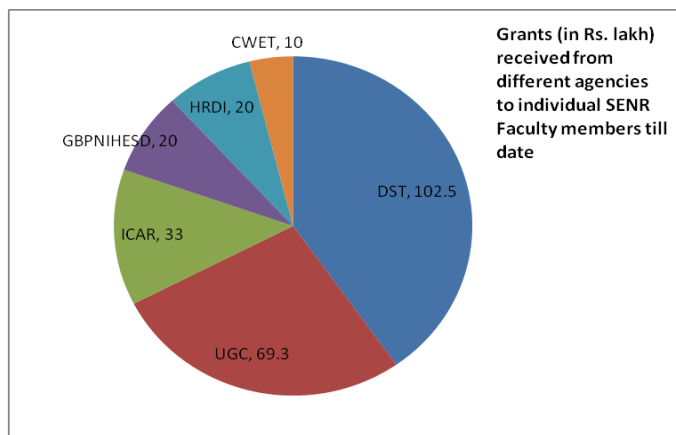
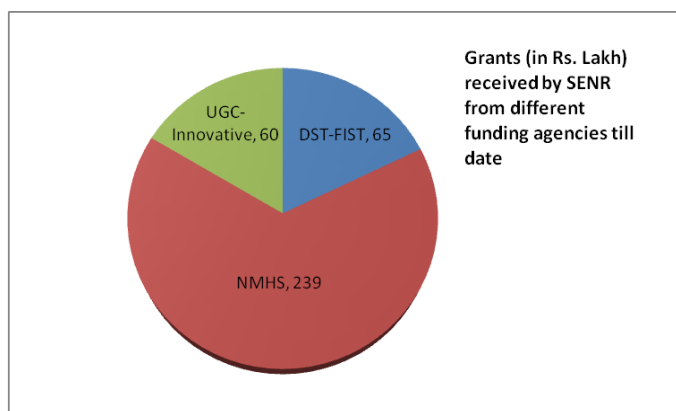
Pic : Aerosol Optical Depth (AOD) over India during 17 Mar to 3 April 2015



# Strengths

*“State of the art laboratories, highly skilled faculty with multidisciplinary backgrounds, strong academic collaborations with renowned national academic/research institutions”*

## Research Grants:



Cumulative Research output of SENR Faculty members (Source : Google scholar)

## About the School

The school offers 2 years Masters program in Environmental Science and Natural Resource Management, and an M. Tech. program in Environmental Technology. In addition, the school is running a PhD degree program with focus of research in the thrust areas of Forest Ecology & Biodiversity Conservation, Solid waste Management, Wastewater Treatment, Nanomaterials, Green technology, Bioprocess Design, Air quality monitoring and Modeling, Climate Modelling, Disaster Management, Remote sensing. The school has well equipped classrooms and teaching laboratories and a state of the art central research facility. SENR has a team of highly qualified, experienced and dynamic faculty with multidisciplinary background. In addition, four eminent academicians as adjunct faculty and a considerable number of visiting scientists/faculty support and enrich the academic programs and research activities of the school. The school has active collaboration with several academic and research organizations of the country. The school has several extramural research projects to its credit.

## Infrastructure

Within a few years of its inception, the school has developed a world class infrastructure with state of the art laboratory facilities. Some of the high end analytical instruments include ICP-OES, GCMS, GC-FID, HPLC, Ion Chromatograph, AAS, LICOR, CHNS analyzer, PCR, GELDOC system. Besides this, the laboratory has an array of analytical devices used for air, water and soil characterization. The school has its own ambient air quality monitoring system (continuous analyzers for O<sub>3</sub>, CO, NO<sub>2</sub>, SO<sub>x</sub> etc), athelometer, weather stations, high volume sampler. The school also has a dedicated RS-GIS lab equipped with 20 systems installed with ArcInfo and ERDAS

## Recognitions

The Doon University has been awarded in the year 2016 Himalayan Fellowships worth Rs. 2.39 crore under National Mission on Himalayan Studies (NMHS) by Ministry of Environment, Forest & Climate Change, Govt. of India for which SENR has been nodal school in planning, preparation and execution of the project. The School has been awarded grant Rs. 65 lakhs under the FIST Scheme by the Department of Science and Technology, Government of India in 2014. The school has been awarded M. Tech. program by UGC under its scheme of innovative programs in the year 2012. The faculty members of the school have been receiving research grants from University Grant Commission (UGC), Dept of Science & Tech., Govt of India (DST), Indian Council of Agriculture Research (ICAR), Herbal Research Development Institute (HRDI) and Govind Ballabh Pant National Institute for Himalayan Environment & Sustainable Development (GBPNIHESD).

## Alliance

The SENR has established links with prominent research institutions such as FRI, Survey of India, IIRS, National Atmospheric Research Laboratory (NARL), Indian Institute of Petroleum (IIP), Instruments Research & Development Establishment (IRDE), Wadia Institute of Himalayan Geology and Wild life Institute of India (WII). The School also draws academic support from various institutions, viz. NEERI, IISc, IIT, JNU, IITM, ARIES, NIDM, ICAR, etc.

In view of current Environmental scenario in the context of Uttarakhand as well as our country, several thrust areas have been identified by the school.

### **Ecosystem Management and Biodiversity Conservation**

Uttarakhand is one of the hyper-diversity states of the country and harbors a large number of endemic plants of high medicinal value. This valuable bio-resource of the state needs to be documented, conserved and sustainably utilized for the socio economic upliftment of the people. Keeping this in view the faculty of SENR is engaged in research on documentation of traditional knowledge associated with the cultural groups with regard to medicinal plants. In addition, the research also focuses on the niche modeling and eco-physiological studies of important medicinal plants and their phyto-chemical analysis for active constituents. Further, the SENR research scholars are also studying the microbial biodiversity under different ecosystems predominantly forest, agricultural and aquatic systems. The impact of pollution from industries on soil microbial diversity and activity is also being undertaken by the School, which needs to be studied on long term basis. SENR is also engaged in vegetation mapping, habitat characterization and analysis of landforms using RS and GIS.



*Researchers working with LICOR-IR gas analyzer in an agro-ecosystem*

### **Water resources Management:**



*Ganga water sample collection at Tapovan*

Himalaya is considered as the water tower of Asia, hence it becomes essential to manage these resources scientifically for

## **Thrust Areas of Research**

*"Ecosystem Management & Biodiversity Conservation"*

*"Water Resource Management"*

*"Sustainable Waste management"*

*"Air Quality monitoring/modeling"*

*"Regional Climate Modeling"*

*"Nanomaterials & Green Chemistry"*

*"Renewable Energy"*

environmental sustainability. Keeping this in view, the SENR is currently engaged in conducting research on water quality analysis of river Ganga and Yamuna from its site of origin to Haridwar. Further, the study on impact of hydropower (Tehri dam) on microclimate and biodiversity is being undertaken. Groundwater pollution in and around industrial areas of the state are also being studied.

### **Sustainable Waste Management**

One of the main focuses of SENR is to develop sustainable and economical technologies to deal with wastewater pollution. The conventional wastewater treatment method is a major energy sink as it requires high energy input in various unit operations (activated sludge system and conventional nitrification-denitrification system). Thus the focus of SENR is to switch from conventional energy intensive wastewater treatment method to advanced anaerobic treatment method, which can provide a sustainable energy management system for wastewater treatment, energy production and water recycling.

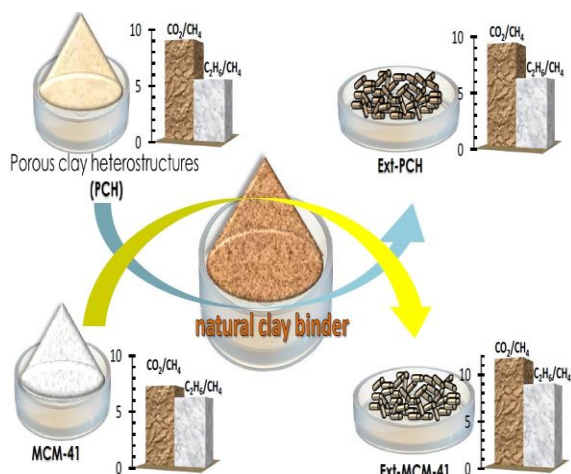


*Biochar production from agro-waste*

With continuous migration of rural population to urban areas and gradual change in lifestyle, the generation of solid waste is increasing continuously. The proper management of this increasing waste is essential for the sake of environment. The traditional way of dealing with solid waste, i.e. dumping and land filling are no



Air quality monitoring station at SENR



Nanoporous clay as value added binder



Cultivation of biofuel producing algae on an Algaltron

longer safe method due to their multiple affects on environment. Several new ways can be developed to solve this problem of solid waste management, which are segregation of waste in different categories, their possible reuse, valorization of waste and by products, anaerobic digestion using engineered systems, etc. In this line, a route of valorization of e-waste has been developed in a dissertation work. In it mesoporous material was prepared using non-metallic portion (NMP) of e-waste, obtained from Attero® Pvt Ltd. Similarly, research related to use of egg-shells, plant leaves, and barks, is also conducted by the school. The waste generated in university hostels and canteens are managed by the facility developed by school, where solid waste is disposed and converted into compost for further use in University lawns.

### Air quality Monitoring/Modelling

Several national/International agencies have considered Himalayan region as white spot for not having measured environmental data. SENR is working on various aspects of pollution monitoring and assessment in Himalayan mountains and foothills. These data will be primary input for future scenarios or climate change studies. The students have been working for black carbon assessment in Garhwal Himalaya, chemical characterization and source apportionment study. Other related aspects like impact of tourism activities on environment is undertaken by research scholars. SENR is also working on chemical transport models (CTM) simulation over Indian subcontinent to create air quality scenarios and its validation with satellite data. The suitable data assimilation scheme is being developed in order to assimilate surface and satellite data into CTM.

### Regional Climate Modelling:

In view of increasing impact of climate change on various aspect of human life, SENR is working on climate modeling and to develop a resource centre which can predict the effect of climate change on agriculture, biodiversity, water resources, and tourism.

### Nanomaterials and Green Chemsitry :

Nanomaterials research takes a materials science-based approach to solve environmental problems through nanotechnology where three different areas are being explored at SENR. In first approach, Generation of Nano porosity in the simple layered clay structure with help of nanoscale pillaring and surface template approach. The developed porous clay materials are then characterized for their physicochemical and surface properties. Thereafter, these materials are being studied along two different lines of research. In one line, which involves an aqueous phase adsorption, the surface properties prepared materials is observed in terms of adsorption selectivity towards selected emerging water contaminants. In another line of study, which involves the gas phase adsorption, the adsorption selectivity of prepared materials towards different indoor VOCs and gasses is investigated, for possible applications in separation and purification process. In the second approach, Valorisation of different type of wastes and by-products in terms of porous materials. After characterization, the adsorption selectivity of these materials is optimized for various separation and purification applications. The third approach involves photo catalysis which is modified by doping on a nanoscale. This modification is achieved under in-situ conditions, and its effects are observed in terms of photocatalytic activity. The developed photo catalysts are then optimized and investigated for photochemical degradation of selected emerging water contaminants.

### Renewable Energy:

Development of technologies for renewable energy generation is critical due to ever increasing worldwide demand for energy along with crucial economic and environmental issues. The research in SENR is focused on development of different techniques for renewable energy generation. Presently, some projects are in progress relating to development of algae based biofuels, wetland biomass based biofuels and light harvesting. The school already has an ongoing CWET (Center for Wind Energy Technology now known as National Institute of Wind Energy (NIWE)) funded project on local wind resource assessment and evaluation. Under National Mission on Himalayan Studies(NMHS) project, the energy efficiency study in 13 district of Uttarakhand is being undertaken.

# Academic Programs



*SENR Research scholars working with LICOR soil respirometer*

Presently, SENR offers following academic programs:

- M.Sc. Environmental Science (EVS) – 20 seats
- M.Sc. Environmental Science (with specialization in Natural Resource Management (NRM)) – 20 seats
- M. Tech. Environmental Technology – 20 seats
- Ph.D. Environmental Science

Offered programs have rigorous theoretical as well as practical content. The students undertake six months dissertation in fourth semester and two months summer internship in third semester with industries, institutions and NGOs of repute. Each student is assigned an advisor to guide and help students in academic and personal front.

The Ph.D. program includes extensive Course Work, Seminars and Theme papers of 14 credits of two semesters. This is followed by thesis work for Ph.D. on an approved topic for a minimum of two years (Four semesters). Evaluation of thesis by external examiners followed by successful defence of the research work by the student is required for the award of PhD degree.

The SENR students strength as on Aug 1<sup>st</sup> 2016 :  
M. Sc. : 59, M. Tech. : 30, Ph.D. : 41



*Students on Field-visit to high altitude Himalayan region.*



*Students from Franklin University, Switzerland on visit to Doon University*

The needy and economically backward students of SENR are availing fellowships from following sources such as

- Mahanand Danwal Fellowship
- Doon University students aid fund
- Assistance from Hans Cultural foundation

The SENR research scholars are availing fellowship from following funding agencies :

- DST-INSPIRE
- UGC-JRF
- OBC fellowship from UGC
- Maulana Azad Fellowship from UGC
- Overseas fellowship from DST

# COURSE CURRICULUM

## Ph. D. SEMESTER WISE CREDIT REQUIREMENT

First Semester					Total Credits: 9
S.No	Course Type	Course code	Course Title	Credit	L-T-P
1	Core	EES-710	Research Methodology	3	3-0-0
2	Core	EES-554	Statistics & Computer Application	3	2-0-1
3	Elective	EES-618	Analytical Techniques and Instrumentation	3	2-0-1
4	Elective	EES-514	Geomatics	3	2-0-1

Note: Only one elective has to be selected

Second Semester					Total Credits: 8
S.No	Course Type	Course code	Course Title	Credit	L-T-P
1	Core	EES-760	Course on area of specialization	3	2-1-0
2	Core	EES-681	Review Writing (related to research topic)	2	1-1-0
3	Elective	ENR-556	Traditional Knowledge & IPR Issues	2	2-0-0
4	General	EES-780	Seminar	1	

## MASTER'S PROGRAMME M. Sc. Environmental Science

First Semester					Total Credits: 20
S.No	Course Type	Course code	Course Title	Credit	L-T-P
1	Core	EES-511	Ecology and Environment	3	2-0-1
2	Core	EES – 515	Environmental Pollution	3	2-0-1
3	Elective	ENR – 556	Traditional Knowledge IPR Issue	2	2-0-0
4	Core	EES- 521	Earth Surface and its Processes	3	3-0-0
5	Elective	EES – 517	Environmental Chemistry	3	2-0-1
6	Elective	EES – 516	Environmental Impact Assessment	2	2-0-0
7	General	EGC – 571	Environmental Issues, Laws and Policies	2	2-0-0
8	Core		Computational Methods in Environmental Science	2	1-0-1

Second Semester					Total Credits: 23
S.No	Course Type	Course code	Course Title	Credit	L-T-P
1	Core	EES-513	Aquatic Environment	3	2-0-1
2	Core	EES – 627	Environmental Microbiology & Biotechnology	3	2-0-1
3	Core	EES – 514	Geomatics	3	2-0-1
4	Core	EES – 618	Analytical Techniques and Instrumentation	3	2-0-1
5	Core	EES – 520	Atmosphere, Weather and Climate	3	3-0-0
6	Elective	EES – 551:	Environment Waste Management	3	2-0-1
7	Elective	EES – 555:	Hazards, Risk Analysis and Management	2	1-1-0
8	General	EES 556	Society and Environmental Economics	3	3-0-0

## COURSE CURRICULUM

### Third Semester

**Total Credits: 16**

S.No	Course Type	Course code	Course Title	Credit	L-T-P
1	Core	EES-554	Statistics & Computer Applications	3	2-0-1
2	Core	EES – 518	Environmental Toxicology	3	2-0-1
3	Core	EES – 619	Green Technology	2	2-0-0
4	Elective		Optional From List of electives	3	
5		EES –635	Field Study/Internship	1+3	
6		EES-680	Seminar	1	

### Fourth Semester

**Total Credits: 10**

S.No	Course Type	Course code	Course Title	Credit
1	Core	EES-690	THESIS/DISSERTATION	10

## M. Sc. Environmental Science (Natural Resource Management)

### First Semester

**Total Credits: 19**

S. No	Course Type	Course code	Course Title	Credit	L-T-P
1	Core	ENR – 512:	Energy Resources and Their Management	3	3-0-0
2	Core	ENR – 514	Forest Ecosystem and Management	3	2-0-1
3	Core	EES –521	Earth Surface and its Processes	3	3-0-0
4	Elective	ENR-556	Traditional Knowledge and IPR Issue	2	2-0-0
5	Elective	ENR – 557:	Himalayan Ecosystem and People	2	2-0-0
6	Elective	EES – 516:	Environmental Impact Assessment	2	2-0-0
7	General	EGC – 571	Environmental Issues, Laws, and Policies	2	2-0-0
8	Core		Computational Methods in Environmental Science	2	1-0-1

### Second Semester

**Total Credits: 23**

S. No	Course Type	Course code	Course Title	Credit	L-T-P
1	Core	ENR-511	Water Resources and their Management	3	2-0-1
2	Core	ENR- 516	Biodiversity Assessment and Conservation	3	3-0-0
3	Core	EES- 618	Analytical Techniques and Instrumentation	3	2-0-1
4	Core	EES-514	Geomatics	3	2-0-1
5	Elective	EES-515	Hazards, Risks Analysis and Management	2	1-1-0
6	Core	EES – 520:	Atmosphere, Weather and Climate	3	3-0-0
7	Elective	ENR- 558	Wildlife Management and Ecotourism	3	3-0-0
8	General	EES -556	Society and Environmental Economics	3	3-0-0

### Third Semester

**Total Credits: 17**

S.No	Course Type	Course code	Course Title	Credit	L-T-P
1	Core	EES- 554	Statistics & Computer Applications	3	2-0-1
2	Core	ENR-555	Biological Resources Management	2	2-0-0
3	Core	ENR – 553	Restoration Ecology	2	2-0-0
4	Core	EES – 619	Green Technology	2	2-0-0
5	Elective		Optional From List of electives	3	
6		EES –635	Field Study/ Internship	1+3	
7		EES –680	Seminar	1	

### Fourth Semester

**Total Credits: 10**

S.No	Course Type	Course code	Course Title	Credit
1	Core	EES-690	DISSERTATION	10



# COURSE CURRICULUM

## M. Tech. Environmental Technology

### First Semester

**Total Credits: 18**

S.No	Course code	Course Title	Credit	L-T-P
1	ETC-550	Basic Instrumentation in Environmental Science & Engineering	2	1-1-0
2	ETC-510	Principles and Design of Wastewater Treatment and Disposal Systems	2	2-0-0
3	ETC-590	Remote Sensing & GIS Application in Environmental Management	2	2-0-0
4	ETC-530	Solid and Hazardous Waste Management	2	2-0-0
5	ETC-500	Fundamental of Biological Processes & Environmental Engineering	2	2-0-1
6	ETC-540	Air Pollution and its Control	2	2-0-0
7	ETC-541	Lab 1 (Air pollution)	2	0-0-2
8	ETC-511	Lab 2 (Wastewater Treatment)	2	0-0-2
9	ETC-596	Computer Application in Environmental Engineering	2	0-0-2

### Second Semester

**Total Credits: 18**

S.No	Course code	Course Title	Credit	L-T-P
1	ETC-570	Environmental Management System, Impact Assessment & Environmental Audit	3	2-0-1
2	ETC-552	Environmental Quality and Pollution Monitoring Techniques	3	2-0-1
3	ETC-520	Applied Environmental Chemistry & Microbiology	3	3-0-0
4	ETC-560	Sustainable Urban Habitats and Green City	2	2-0-0
5	ETC-575	Industrial Safety & Health Management	2	2-0-1
6	ETC-597	Environmental System & Modeling	2	2-0-0
7	ETC-554	Lab 1 (Advance Environmental Instrumentations & Analysis Techniques)	3	0-0-3

### Third Semester

**Total Credits: 22**

S.No	Course code	Course Title	Credit	L-T-P
1	ETC-592	Life cycle Assessment and Design of Environment	3	2-0-1
2	ETC-562	Renewable Energy Technology	3	2-0-1
3	Elective		3	3-0-0
4	ETC-580	Industrial Training/attachment (8 week) & Report Presentation	4	3-0-0
5	ETC-582	Technical and Scientific Writing	2	2-0-1
6	ETC-593	Project - I	4	2-0-0
7	ETC-591	Statistical Application	3	2-0-1

### Fourth Semester

**Total Credits: 12**

S.No	Course code	Course Title	Credit	L-T-P
1	ETC-594	Project - II	12	2-0-1

# SENR Faculty Profile

## Dr. Kusum Arunachalam, Professor

M.Sc. & Ph.D. (NEHU: North Eastern Hill University, Shillong)

Dr. Kusum, a soil microbial ecologist, has 16 years of research and teaching experience. She has published more than 80 research papers and 10 book chapters in edited volumes. She has been nominated as Fellow of Tropical Ecology by International Society of Tropical Ecology in 2011 and Fellow of National Academy of Environmental Sciences in 2015, a recipient of young scientist fellowship from DST in 1998, and prestigious BOYSCAST fellowship to work at University of Freiberg, Germany in 2003. For her contribution in the characterization of role of microbes in ecosystem dynamics of forest, agriculture and wetlands, she has been awarded Young Women Scientist Award by DBT, Govt. of India in 2005.



**Areas of Specialization/Interest:** Forest Ecology and Biodiversity Conservation, Microbiology, Soil Plant Microbe interactions, Climate resilient ecosystems, Traditional knowledge

### Best three publications in last five years:

1. Balasubramanian D., Arunachalam K., Arunachalam A., and A.K. Das, 2013, "Water hyacinth (*Eichhornia crassipes* (Mart.) Solms.) Engineered soil nutrient availability in a low-land rain-fed rice farming system of north-east India", *Ecological Engineering*, Vol 58, pp 3-12
2. Balasubramanian D., Arunachalam K., and A. Arunachalam, 2013, "Occurrence of critically endangered pteridophyte *Helminthostachys zelanica*. Hook. In Burachapori Wildlife Sanctuary, North East India", *American Fern Journal*, Vol. 103, pp 13-59
3. Tangjang S., Arunachalam A., Arunachalam K., and Balasubramanian D, 2012, Earth worm coudung and leaf residue alter soil physio-chemical and microbial properties in traditional agro-ecosystem of Arunachal Pradesh, *Journal of Tropical Agriculture* Vol 50, pp 76-79

### Ongoing Projects:

1. Study on ecosystem services in Agro-forestry systems in Garhwal Himalya (GBPIHED, Almora); Duration 3 years (2016-19); Total Funds : 20 lakhs
2. Development of Medicinal Plant Garden in Doon University, Funding agency: HRDI, Duration 2 years (2015-17), Total Funds: 20 Lakhs.
3. Documentation of Traditional Knowledge in Central Himalayas for Sustainable Development. DST, Duration 5 years (2015-20), Total Funds: 49.33 Lakhs.

## Dr. Surendra Singh Suthar, Associate Professor

M.Sc. & Ph.D. (J.N.V. University, Jodhpur)

Dr. Suthar's career spans over 14 years of research producing 94 research articles/ book chapters. In the area of vermitechnology, groundwater pollution and ecotoxicological research, he has been enlisted in the list of SCOPUS, as one of the highest quality paper publishing author. He is trained at UNESCO-IHE Institute of Water education, Delft, Netherlands on solid waste management in 2011. For that, he was also awarded Nuffic Fellowship by Govt of Netherlands during 2011. He has also been awarded Medal for Excellence in Science, Technology & Education, 2013, Szent Istvan University, Hungary. He is also a recipient of Young scientist award by DST in 2011.



**Areas of Specialization/Interest:** Ecotoxicology and Industrial Pollution, Solid Waste Management, Vermitechnology/Compost Technology, Wastewater Treatment, Algal Technology, Phytoremediation, Groundwater Contamination Hydrology, Ecological Engineering, Soil Biology, Organic Farming

### Best three publications in last five years:

1. Verma, R., Suthar, S., 2015. Utility of duckweeds as source of biomass energy: a review, *BioEnergy Research*, DOI 10.1007/s12155-015-9639-5. (IF : 3.54)
2. Verma, R., Suthar, S. 2015. Impact of density loads on performance of duckweed bioreactor: A potential system for synchronized wastewater treatment and energy biomass production, *Environmental Progress & Sustainable Energy*, DOI: 10.1002/ep.12157 (IF : 1.27)
3. Suthar, S, Sajwan, P., Sharma, K. 2014. Vermiremediation of heavy metals in wastewater sludge from paper and pulp industry using earthworm *Eisenia fetida*, *Ecotoxicology & Environmental Safety*, 109, pp 177-184 (IF : 2.76)

# SENR Faculty Profile

## Dr. Suneet Naithani, Assistant Professor

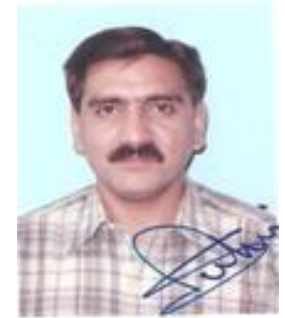
M.Sc. & PhD (HNB Garhwal University, Srinagar, Garhwal)

More than 27 years of experiential learning in Environment and Natural Resources including 6 years of administrative experience. National and state level trainer in TNA and Disaster management. 56 publications, 8 book chapters, 4 books, research projects. 6 countries visited for paper presentation and trainer's development programs. Designated as chairman & academic coordinator at state level crises management draft committee and children science congress respectively, Govt. of Uttarakhand along with important responsibilities at organizational level.

**Areas of Specialization/Interest:** Geo-botany using remote sensing and GIS, Disaster Management, Role of Earth Science in Natural Resource Management, Database Creation for Decentralized Planning and e- Governance using RS and GIS

### Best three publications in last five years:

1. Naithani, S., and V.B. Mathur, 2014, Specialized Mapping using Climatic Zones for Habitat Conservation, *International Journal of Advanced Remote Sensing and GIS, Cloud Publications, Vol 3*, pp 660-668 (IF : 1.75)
2. Naithani, S., V.B. Mathur and Piyoosh Rotella, 2014, Ground Water Prospect Mapping of Pench Tiger Reserve (PTR), Madhya Pradesh, India, *Ecology, Environment and Conservation, Vol. 20*, pp 51-58
3. Naithani, S., M.M. Doval and N. Juyal, 2008, Turbulent Terrain and Threatened Livelihood, *2nd Australasian Natural Hazards Management Conference, July, Te Papa, Wellington, New Zealand, Stewart, C. (editor), GNS Science Miscellaneous Series, 15*, ISSN 1177-2441, ISBN, 978-0-478-19635-1, Poster Paper, e- proceedings, p. 45..



## Dr. Archana Sharma, Assistant Professor

MSc. & Ph.D. (HNB Garhwal University, Srinagar, Garhwal)

Dr. Archana has excellent academic record having received gold medal at Master level. She has more than 14 years of teaching & research experience. Currently she is working on Environmental Impact analysis of Reservoirs on river systems after post impoundment. She is also focusing on emission of greenhouse gases from reservoirs. She has a research project on groundwater contamination in few industrial areas of Uttarakhand to work out a model for treatment.

**Areas of Specialization/Interest:** Aquatic Biodiversity, Freshwater Biodiversity; Water Quality Assessment & Monitoring, EIA, Wetland research

### Best three publications in last five years:

1. Archana Sharma, Ramesh C. Sharma and Ashish Anthwal, 2008, Surveying of aquatic insect diversity of Chandrabhaga river, Garhwal Himalayas, *Environmentalist, 28*, pp 395-404
2. Smriti Kukshal, B.P. Nautiyal, Ashish Anthwal, Archana Sharma and A.B. Bhatt, 2009, Phytosociological investigation and lifeform pattern of grazingland under pine canopy in temperate zone, North West Himalaya, India, *Research Journal of Botany, 4*, pp 55-69
3. Ashish Anthwal, Nutan Gupta, Archana Sharma, Smriti Anthwal and KI-Hyun Kim, 2010, Conserving biodiversity through traditional beliefs in Sacred Groves in Uttarakhand Himalaya, India, *Resources, Conservation and Recycling, 54*, pp 962-971

### Ongoing Projects:

1. UGC Major Project on "Environmental impact assessment of ground water quality in industrial area of Hardwar district with respect to physicochemical and microbiological parameters", Duration – 3 years (2014-17), Total Funds : Rs. 11 lakhs



# SENR Faculty Profile

## Dr. Vijay Shridhar, Assistant Professor

M.Sc. (Delhi University), M.Phil. & Ph.D. ( JNU, New Delhi)

Dr. Vijay has more than 9 years of experience in the field of Environmental pollution from microbial contamination to air, water & soil pollution assessment and their modelling. Presently his lab is engaged in studies encompass the assessment of anthropogenic activities in pollutants emission and their role on air quality, microbial community and agriculture crops. He is working on two sponsored research projects for assessment of black carbon and wind energy resources in Doon valley by UGC & C -WET.

**Areas of Specialization/Interest:** Air Pollution (Ambient air quality monitoring, Chemical Characterization and source receptor modelling of Pollutants (PAHs, VOCs, Trace metals, carbonaceous matter) in air, water and oil. Aerosol-Cloud interactions and micro physical processes

### Best three publications in last five years:

1. 2008, Spatial and Temporal variation of BTEX in the urban atmosphere of Delhi, India, *Science of the Total Environ*, 392, pp 30-40
2. 2008, Visibility impairing aerosols in the Urban atmosphere of Delhi, *Environ Monit Assess*, 141, pp 1-3
3. 2008, Temporal variability of benzene concentration in the ambient air of Delhi: A comparative assessment of Pre and Post CNG periods, *J of Hazar Mats*, 154, pp 1013-1018

### Ongoing Projects:

1. UGC funded project, " Black Carbon assessment in Dehradun and Mussorie region", Duration – 3 years (2014-17), Total Fund : 12.0 lakhs



## Dr. Vipin Kumar Saini, Assistant Professor

M.Sc. (HNB Garhwal University, Srinagar, Garhwal), PhD (IIT Roorkee)

Dr. Saini has more than 9 years of research experience. He obtained his PhD degree in Chemistry (Environmental Chemistry) from IIT Roorkee, 2007. During doctoral and post-doctoral period he has worked with several distinguished research groups from Germany, Belgium, Portugal, and Spain. His expertise involved development of Nano-scale properties in bulk material using innovative techniques, like Nanocasting, Self-assembly, Sol-gel, Hydrothermal, Impregnation and so on; to study their effects on environment quality improvement or energy generation".

**Areas of Specialization/Interest:** Material Environmental Chemistry, Advance Nanoporous materials for adsorptive separation and purification, Valorization of wastes and by-products through Green Chemistry, Light-harvesting for environmental applications

### Best three publications in last five years:

1. Moisés L. Pinto, Vipin K. Saini, José M. Guil, João Pires, 2014, Introduction of aluminum to porous clay heterostructures to modify the adsorption properties *Applied Clay Science*, 101, pp 497-502 (IF : 2.467)
2. João Pires, Moisés Pinto and Vipin K. Saini, 2014, Ethane Selective IRMOF-8 and Its Significance in Ethane–Ethylene Separation by Adsorption *Applied Materials and Interface (ACS)*, 6 pp 12093–12099 (IF 6.723)
3. Vipin K. Saini, João Pires, and Moisés Pinto, 2014, Synthesis and adsorption properties of micro/mesoporous carbon-foams prepared from foam-shaped sacrificial templates, *Materials Chemistry and Physics*, 138, pp 877 (IF 2.259)

### Ongoing Projects:

1. Improvement in indoor air quality (IAQ) using natural clay based nanoporous materials; UGC sponsored Major Research Project. Duration-3 years (2015-18). Total Funds-Rs. 15.65 lakhs



# SENR Faculty Profile

## Dr. Ujjwal Kumar, Assistant Professor

M.Sc., M.Phil. & PhD (JNU, New Delhi)

Dr. Ujjwal Kumar has more than 9 years of research experience in the field of atmospheric science/meteorology/environment at world's renowned institutes such as KNMI –Royal Netherlands Meteorological Institute, Netherlands, VITO-Flemish Institute for Technological Research, Belgium. At Doon University, his areas of focus are climate modeling, near real time air quality modeling, Statistical modeling applications in Environmental Science.



**Areas of Specialization/Interest:** Statistical/Time Series Modelling and Forecasting, Data Assimilation of surface & satellite data, Global & Regional Chemical Transport Models (CTMs), Air Quality Modelling/Forecasting, tropospheric O<sub>3</sub> and its precursors, Nonlinear Dynamics and Chaos Theory

### Best three publications in last five years:

1. M. Sofiev, U. Berger, M. Prank, J. Vira, J. Arteta, J. Belmonte, K.-C. Bergmann, F. Chéroux, H. Elbern, E. Friese, C. Galan, R. Gehrig, D. Khvorostyanov, R. Kranenburg, **U. Kumar**, V. Marécal, F. Meleux, L. Menut, A.-M. Pessi, L. Robertson, O. Ritenberga, V. Rodinkova, A. Saarto, A. Segers, E. Severova, I. Sauliene, P. Siljamo, B. M. Steensen, E. Teinmaa, M. Thibaudon, and V.-H. Peuch, 2015, MACC regional multi-model ensemble simulations of birch pollen dispersion in Europe, *Atmos. Chem. Phys* 15, pp 8115-8130 (IF : 5.053)
2. V. Marécal, V.-H. Peuch, C. Andersson, S. Andersson, J. Arteta, M. Beekmann, A. Benedictow, R. Bergström, B. Bessagnet, A. Cansado, F. Chéroux, A. Colette, A. Coman, R. L. Curier, H. A. C. Denier van der Gon, A. Drouin, H. Elbern, E. Emili, R. J. Engelen, H. J. Eskes, G. Foret, E. Friese, M. Gauss, C. Giannaros, J. Guth, M. Joly, E. Jaumouillé, B. Josse, N. Kadyrov, J. W. Kaiser, K. Krajsek, J. Kuenen, **U. Kumar**, N. Liora, E. Lopez, L. Malherbe, I. Martinez, D. Melas, F. Meleux, L. Menut, P. Moinat, T. Morales, J. Parmentier, A. Piacentini, M. Plu, A. Poupkou, S. Queguiner, L. Robertson, L. Rouil, M. Schaap, A. Segers, M. Sofiev, M. Thomas, R. Timmermans, Á. Valdebenito, P. van Velthoven, R. van Versendaal, J. Vira, and A. Ung, 2015, A regional air quality forecasting system over Europe: the MACC-II daily ensemble production, *Geoscientific Model Development*, 8, pp 2777-2813 (IF : 3.654)
3. Ujjwal Kumar, Koen De Ridder, Wouter Lefebvre, Stijn Janssen, 2012, Data assimilation of surface air pollutants (O<sub>3</sub> and NO<sub>2</sub>) in the regional-scale air quality model AURORA, *Atmospheric Environment*, 60, pp 99-108 (IF : 3.281)

### Ongoing Projects:

The Chemical Transport Models (CTMs) simulation of O<sub>3</sub>, NO<sub>2</sub> and aerosols at regional scale over Indian subcontinent and its comparison with the surface and satellite derived data (OMI and MODIS). UGC Start-up grant, Duration: 2 years (2016-18). Total Funds: Rs. 10.0 lakhs

## Dr. Achlesh Daverey, Assistant Professor

M.Tech. (ICT-Institute of Chemical Technology, Mumbai), PhD (IIT Guwahati)

Dr. Daverey has more than 5 years of research experience. He has worked in the field of biological wastewater treatment at National Chiao Tung University, Taiwan. He has developed advanced anammox based processes (CANON and SNAD) for the treatment of various industrial wastewaters such as optoelectronic, semiconductor, and anaerobic digester effluent during his postdoctoral work. He has published more than 20 research papers and 5 book chapters.



**Areas of Specialization/Interest:** Biological Wastewater Treatment; Biological Nitrogen Removal (Anammox Process); Biosurfactants; Bioprocess Design, Optimization and Kinetics; Biomass to Energy

### Best three publications in last five years:

1. A. Daverey, Y.C. Chen, K. Dutta, Y.T. Huang, J.G. Lin (2015). Start-up of simultaneous partial nitrification, anammox and denitrification (SNAD) process in sequencing batch biofilm reactor using novel biomass carriers, *Bioresource Technology*, **190**, pp 480-486 (IF : 4.494)
2. A., Daverey, S.H., Su, Y.T., Huang, S.S. Chen, S. Sung, J.G., Lin (2013). Partial nitrification and anammox process: A method for high strength optoelectronic industrial wastewater treatment, *Water Research* **47**, pp 2929-2937 (IF: 5.528)
3. A., Daverey, S.H., Su, Y.T., Huang, J.G. Lin (2012). Nitrogen removal from opto-electronic wastewater using the simultaneous partial nitrification, anaerobic ammonium oxidation and denitrification (SNAD) in sequencing batch reactor, *Bioresource Technology*, **113**, pp 225-231 (IF : 4.494)

### Ongoing Projects:

1. Enrichment of Anammox bacteria and start up of simultaneous partial nitrification Anammox and denitrification (SNAD) process from non-acclimated sludge. UGC Start-Up grant. Duration-2 years (2016-18). Total Funds - Rs. 10.0 lakh

## Adjunct Faculty

1. **Prof. A. N. Purohit**, Former Vice-Chancellor, H. N. B. Garhwal University
2. **Prof. Mukesh Khare**, Dept. of Civil Engineering, IIT Delhi
3. **Dr. M. G. Porwal**, Retired Scientist, IIRS, Dehradun
4. **Dr. A. Arunachalam**, Principal Scientist, ICAR, New Delhi



**Contact :**

**School of Environment and Natural Resources (SENR),**

**110, Faculty Offices Building,**

**Doon University**

**Dehradun – 248001**

**Uttarakhand, India**

**Email: [senr@doonuniversity.ac.in](mailto:senr@doonuniversity.ac.in)**

**Phone: + 91 135 2533103**

**Fax: + 91 135 2533115**

**Website: <http://www.doonuniversity.org/en/schools-centres-a-courses/school-of-environment-and-natural-resource>**