Progress Report: SDG 6 Clean water and Sanitation

Sustainable Approach: Shoolini University is highly focused on following the Sustainable Development Goals. Our University is working on the clean water and sanitation indicators and progressively following the different parameters. We continuously calculate the total inflow from various resources (290 m³D) and usage of the water in the university and also water consumption per person (400 KLD or 66.6 Lts/person). We are measuring the supply of total water from various resources. The total peak

residential population including students and staff on campus is 5000 persons and floating population of the campus is about 1000 persons. We also have a water treatment plant for the reuse of the water and utilizing the treated water for various purposes. We have a Sewage Treatment Plant (STP) with the capacity of 400 KLD in which we have adopted biological treatment and tertiary treatment technology. University also has a process to prevent the polluted water entering water



Sewage Treatment Plant at Shoolini University Campus

system and waste water is properly going to the STP by a suitable scientific mechanism.



Buildings Supporting Rain Water Harvesting

Our University is providing purified and quality approved free drinking water for students, staff and visitors. To minimize the water use we have constructed our buildings in a way to harvest the rain water and paneled with the facility for rain water supply to the building for specific purposes. Our buildings also support the draining of rain water to the underground after filtration and treatment which helps in increasing and maintaining the ground water level. We also have very successful model for the landscape plantations. We have plantation of drought tolerant plants as well to minimize the usage of water and also support the water conservation. Apart from the working on clean water

and sanitation
inside the
university
campus, we
also have
explored our
activities to



Landscape Plantation at Shoolini University

the off campus for the water conservation and reuse and also awareness generation. Rainwater harvesting is also adopted in the vicinity of university campus.

Harvested rainwater is used for landscaping and recharging of the bore well pits. Water is collected in

rainwater harvesting tanks from the roof tops and roadside drain. From collection points, it is being used for the various purposes. We also have camps off the campus for the cleaning and conservation of water resources. We have our SES REC action plan recognized by Ministry of Education, Govt of India where we are providing educational awareness to the local communities for good water management.

Water research:

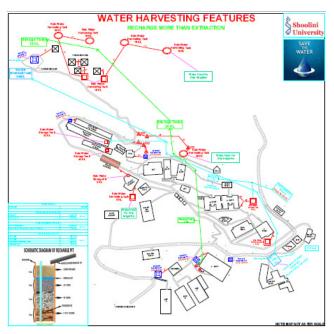
Our university is a research-oriented organization and our research is also focusing on

sustainability. We followed a sustainable approach for the development of research technologies. We have a three-year PhD programme on Water Management at Shoolini University that covers topics such as hydrogeology, marine hydrology, drainage basin management, water quality, irrigation, water conservation and water treatment. Scholars get every opportunity to conduct valuable and high-impact research while working closely environmental with engineers, geologists, and civil engineers. Water management professions explore and



Rain Water Harvesting System at Shoolini University

study the ways and means to tackle global warming and climate change, protecting and preserving our water resources. Our ever-growing demand for freshwater has caused its sources to diminish rapidly



Water Harvesting Features at Shoolini University

and scientists have been attempting to find strategies to purify wastewater for reuse to meet future demands. At present, the most common wastewater treatment techniques involve the use of chemicals or ultraviolet radiation to kill microorganisms or remove pollutants. But these conventional techniques have several drawbacks, such as the toxic effects of chemical substances on our health or the high energy requirements to run treatment facilities. To create a sustainable system of wastewater treatment, the focus has shifted to eco-friendly and cost-effective technologies. Photocatalysis is one such technology that employs abundantly available solar light and semiconducting materials as catalyst for its course of action to treat various ranges of organic, inorganic pollutants, and microorganisms. **Various**

researchers in Shoolini University are putting their efforts to shift the potential of this technology from

lab scale to pilot scale and constantly producing high end research publications during this time. Some of the details of excelling in the field of water research and sustainable management are summarized as follows:

- As per Scopus Data, the university has done considerably well in terms of publishing under the domains of water treatment and corresponded water management and has 833 publications in total using the keyword "water treatment".
- Keeping up with the today's demand of inventing fascinating technologies for water and wastewater treatment, Shoolini University has successfully filled 33 patents in the domain of water purification out of which one utility patent has also been granted for photocatalytic water purification technology.
- Considering the importance of water and sustainable approaches to treat wastewater, Shoolini University has also started doctorate programme water management (https://shooliniuniversity.com/phd-water-management)
- With the aim of developing high end research environments for sustainable development goals, Shoolini University has establishes an International Research Centre of Nanotechnology for Himalayan Sustainability (IIRCNHS) and is dedicated to the multi-disciplinary and dynamic research for environmental detoxification, clean energy production, and waste water treatment.
- In continuation with achieving global rankings, two scientists from Shoolini University namely Dr. Gaurav Sharma and Dr. S.S. Chandel who worked for environmental restoration technologies have been featured in Stanford University's list of top 2% Scientists.

Collaborations with Government and NGO's

Our university has strong research collaboration with other reputed Govt. organizations/NGOs to address the issue of water pollution. As a result, scientists from Shoolini University have received funding from various government agencies to work on water-related issues. University has many successful partnerships with different government Research bodies. Our scientists have received funds of 3 crore INR from Vardhman Textiles Limited, India to find a sustainable solution for polluted Industrial water. Our developed system shows promise for practical applications in wastewater purification. In order to achieve

MoU for research in nanotechnology

TRIBUNE NEWS SERVICE

SOLAN, OCTOBER 29

In a bid to encourage industry-academia partnership, Shoolini University has signed a memorandum of understanding (MoU) with Vardhman Textiles Limited (VTL) who will contribute Rs 3 crore for research in nanotechnology.

By putting nano-materials and techniques to use in the state-of-the-art lab, Shoolini University aims to work for environmental detoxification, clean energy production and waste utilisation.

The MoU was signed by Shoolini University Chancellor Prof PK Khosla and Vardhman Textiles director and chairman of CSR, Prafull Anubhai Patel, in the presence of SP Oswal, chairman and Managing Director of Vardhman Group.

"Industry-academia partnership is the right step for application of research for societal benefits. The support that Vardhman is giving for establishing this lab in

₹3-CRORE GRANT

- Vardhman Textiles Ltd will contribute ₹3 crore for research in nanotechnology at Shoolini University
- The university aims to work for environmenwaste utilisation

Shoolini University will go a long way in promoting this. The lab is named after SP Oswal's father - Ratan Chand Oswal Himalayan Center of Excellence in Nantoechnology - will help to sprout the seeds of this joint partnership," said Prof Khosla.

Praful Anubhai Patel from Vardhman said that the group was committed to holistic development and considered education and quality healthcare facilities as essentials. "With sustainable development as our goal, we find it a privilege to be able to give back. As a responsible corporate citizen, we willingly contribute to social cause and participate in the development of communities that host us."

MoU with Vardhman Textile Ltd.

the goal of sustainable development and environmental protection various government and non-government agencies have funded Shoolini University to carry out the high end research. The list of various funding agencies is as follows:

- 1. Vardhman textile Limited, Ludhiana Punjab, India.
- 2. Department of Science and Technology, MHR, New Delhi.
- 3. Himachal Pradesh Council for Science, Technology & Environment.
- 4. Indian Council of Agricultural Research, Government of India
- 5. Indian Council of Medical Research, Department of Health Research, Ministry of Health and Family Welfare, Government of India
- Central Council for Research in Ayurvedic Sciences, Ministry of Ayush, Government of India.
- Defence Research and Development Organization, Government of India
- 8. MOU with iHUB Divyasampark from IIT Roorkee for the development of smart technologies.



with the local persons for the social cause. Water shortage is one of the local problems as we are

Certificate



This is to certify that Shoolini University of Biotechnology& Management Science, Solan is now a Recognized Social Entrepreneurship, Swachhta & Rural Engagement Cell (SES REC) Institution. The Institution has successfully framed the SES REC Action Plan and constituted ten working groups for improving facilities in the Campus and the Community/Adopted Villages in the areas of Sanitation & Hygiene, Waste Management, Water Management, Energy Conservation and Greenery post COVID-19, along with the observation of three environment, entrepreneurship and community engagement related days to inculcate in faculty, students and community, the practices of Mentoring, Social Responsibility, Swachhta and Care for Environment and Resources.



SES REC Institution Certificate from Government of India

Awareness Generation:

Shoolini University has strong bonding with the local community and involve

Latitude - 30.93702
Longitude - 77.1514
Date - 2019-06-28

Awareness Generation Through Off-Campus Cleanliness Derive

situated at the hills and generally our water needs depends on the supply water. So, conscious usage and reuse of water is the essential requirement for the local community. We also support water conservation off campus. Rainwater harvesting facility is established with the help of University management in the vicinity of the campus and collected rain water is treated inside the University for Reuse for various purposes such as irrigation of landscape, irrigation to our

agricultural farms, construction works, and recharging of the bore well pits. Water is collected in rainwater harvesting tanks from the roof tops and roadside drain. We also promote local community by the training and demonstration camps, off the campus for the cleaning and conservation of water resources. We have workshops with the local community off campus for the demonstrations towards water conservation steps and events. Our students regularly visited "Ashwini Khadd" and local water bodies in the nearby villages for cleaning the natural water resources, regularly. We also educate the local communities for the plantation of drought-tolerant plants to preserve water consumption and increase the ground water level.