JSS ACADEMY OF HIGHER EDUCATION & RESEARCH

(DEEMED TO BE UNIVERSITY) MYSURU

COMPENDIUM ON SDG 6

CLEAN WATER AND SANITATION

2020-2021

CONTENTS

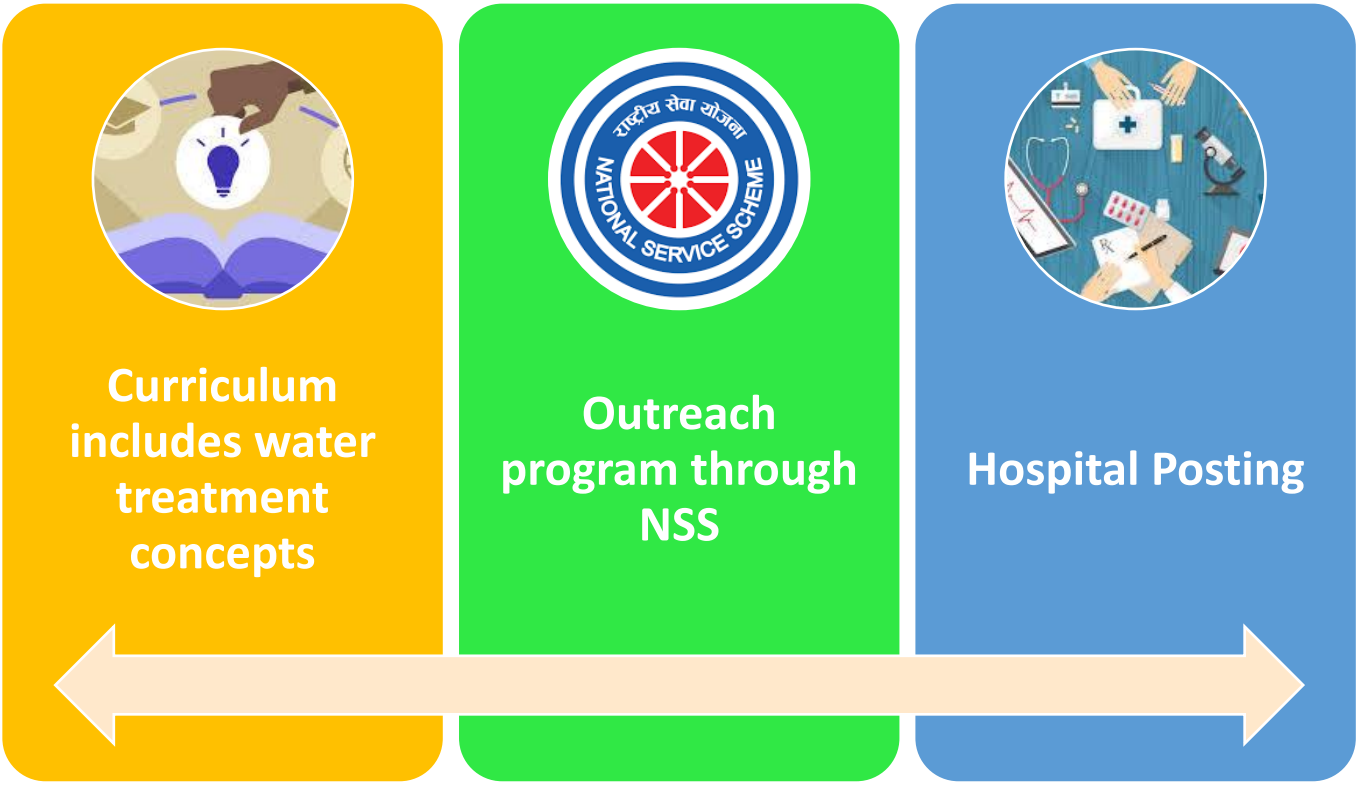
INTRODUCTION

The overall proportion of Indian households with access to improved water sources increased from 68% in 1992-93 to 89.9% in 2015-16. However, in 2015-16, 63.3% of rural households and 19.7% of urban households were not using improved sanitation facilities. According to the World Bank, more than 520 million in India were defecating in the open – the highest number in the world. This figure is expected to have reduced significantly given that improving sanitation is a key priority of the government which has introduced several flagship programmes including the Swachh Bharat Abhiyan to clean India, the National Rural Drinking Water Programme, and Namami Gange, which aims at the conservation of the River Ganga.

One in three people live without sanitation. This is causing unnecessary disease and death. Although huge strides have been made with access to clean drinking water, lack of sanitation is undermining these advances. If we provide affordable equipment and education in hygiene practices, we can stop such suffering and loss of life.

The UN's sustainable development goals aim to provide safe and clean water for humanity and prioritize the sustainable management of water resources. Institutional incapability and resource constraints induce complexities and uncertainties in the sustainable urban water supply system. The majority of the cities in the underdeveloped and developing countries including India are struggling to provide adequate and clean drinking water supply due to the failure in infrastructure, unavailability of resources, weak regulatory framework, expansion of the cities, water contamination, political uncertainty, and climate change. Regardless of sufficient freshwater resources available, many cities have failed to cater to the need for clean water across the globe. Integrated urban water resource management (IUWRM) is generally applied with respect to three vital components such as drinking water supply, storm water management, and wastewater collection at the urban level.

In line with the SDG, the department has taken all measures to provide safe and clean drinking water to all in the campus through installation of point-of-use as well as point-of-entry water treatment units. It has taken special attention to the needs of women and girls and those in vulnerable situations by providing adequate access to equitable sanitation and hygiene. The Department has hosted various awareness and education programs on water and hygiene including sensitizing events for women. It has initiated various innovation and technology developmental activities like development of drinking water quality management strategies, development of advanced and affordable water treatment techniques, designed low-cost and potential plant based cleaning agents, etc., to provide clean drinking water and hygiene to all.



ACTIVITIES ALIGNING TO SDG 6

Academic Activities	
Curriculum	The curriculum is designed with subjects where concepts of water conservation and treatment, safety and risk management, sewage treatment and bio medical waste management and treatment are introduced to students. Here students practically learn the various concepts of waste management and conservation. https://jssuni.edu.in/JSSWeb/UDData/Docs/FLS-PG-Regulations-and-Combined-Syllabus.pdf **Environmental Sciences** SEMESTER III PAPER 9: **WATER AND WASTE WATER TREATMENT TECHNIQUES 4 CREDITS** Unit I: Physico-chemical Treatment- Methods of water treatment, Optimized design, plant control and operational variables, Preliminary treatment process of Wastewater Treatments: Physical treatments: Principles, flow measurement, screening, grit removal – Chemical treatments: Principles of chemical treatment, coagulation, flocculation, and sedimentation. Unit II: Biological Treatment- Principle of biological treatment, microbial growth and their kinetics for substrate removal, technical considerations in biological treatment. Aerobic Process: Activated sludge, Oxidation ponds, Trickling filter, Towers, Rotating discs and Rotating drums, Oxidation ditch – Anaerobic Process: Anaerobic digestion, Anaerobic filters, Upflow anaerobic sludge blanket reactors (UASB), Bioreactors for waste water treatments: Reactor types and design.

Unit III: Advance Treatment- ultra filtration, Disinfections (UV, Ozonization), water softening, Demineralization, Reverse osmosis, Color & odor removal by activated carbon, Iron removal.

Unit IV: Application of Nanotechnology- Applications and emerging opportunities, Nanofibers and Nanobiocides, Nanozymes for Biofilm Removal, Nanofiltration and nanomembranes, Nanomaterials and nanocatalyst in water and waste water treatment applications, Potential Risks of using nanotechnology in water treatment.

Unit V: Industrial waste water treatment- Selection of appropriate unit operations for the treatment and flow chart of wastewater treatment plant for Dairy and food, Pulp & Paper, Electroplating, Textile, Distillery.

PAPER 10: WATER BORNE DISEASES AND CHEMICAL AGENTS 4 CREDITS

Unit I: Introduction, Waterborne diseases caused by pathogenic microorganisms, Epidemiology: Amoebiasis, Cryptosporidiosis, Giardiasis, Microsporidiosis, Schistosomiasis, Dracunculiasis, Fasciolopsiasis, Ascariasis, Botulism, Cholera, E. coli Infection, M. marinum infection, Salmonellosis, Typhoid fever, SARS, Hepatitis A, Poliomyelitis, Polyomavirus infection, Desmodesmus infection. 25

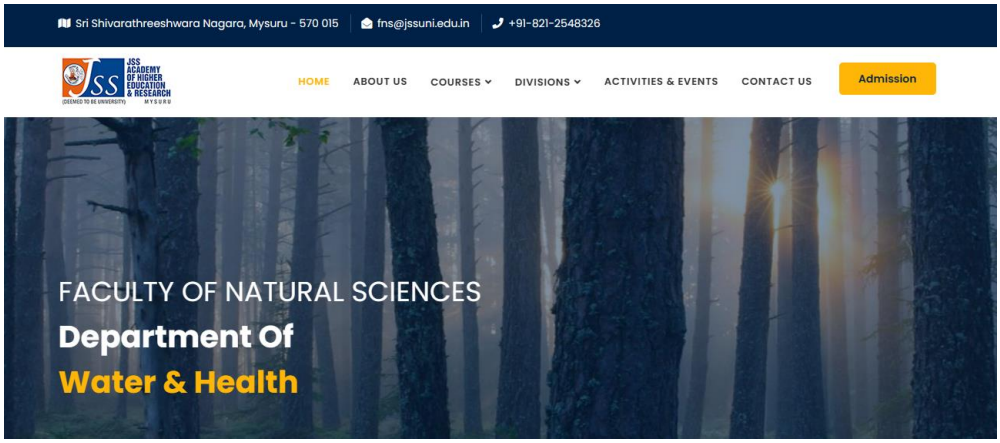
Unit II: Human health impact of chemical agents: trace metals (fluoride, lead, cadmium and mercury), Acrylamide, Benzene, dichloroethane, vinyl chloride, Pesticides (Organophosphates, Carbamates, Paraquat and Endosulfan) and disease Epidemiology.

Unit III: Water Safety in Distribution Systems: Types of Water Transmission or Distribution System, Components of Water Transmission or Distribution Systems, Identify hazards and hazardous events and assess the risks, Microbial hazards, Chemical hazards (Disinfection by-products, Chemicals from pipe materials and fittings, Water treatment chemicals), Physical hazards, Water quality integrity,.

Unit IV: Risk assessment in water distribution systems (Semi-quantitative risk assessment, Quantitative microbial risk assessment) Validate control measures, Drinking-water Quality standards and Guidelines, Standard operating and management procedures, surveillance, audits and inspections, Capacity building.

Unit V: Fate, Transport and effects of Contaminants: chemical concentration, mass balance approach, physical transport of chemical agents in surface and ground water, Air-water exchange, contaminants in sediments.

- Laws and regulations that are required for management of the above concepts are also inculcated to the students.
- Training of water conservation through NSS Program
- Research on sustainable use of water and water borne diseases
- Publication on conservation, sustainable use of water and water borne diseases
- Competition and activities related to SDGs
- Nature club activities related to curriculum

Teaching & Learning	The concept of hospital postings are based on work learning model where students are made to work in real time work environment to have hands on experience. Students visit the sewage treatment plant and understand the process that takes place in the facility.  https://www.jssuni.edu.in/jssaher/faculty-of-natural-sciences/ **Department Of Water & Health** The continuous rise in population and environmental problems are witnessing a drastic destruction of our living habitat which is not only resulting in climate change and drinking water problems due to pollution but also in outbreaks of several communicable and non-communicable diseases. Water contamination and climate change poses many threats to human health from severe weather and water linked infectious disease risks to disrupted food systems and population displacement.
Energy conservation program	https://jssuni.edu.in/JSSWeb/UDHP.aspx?PID=19 Light Bulb Replacement It is estimated that replacing traditional incandescent bulbs with CFLs/LED can cut lighting costs by up to 75%. The college has adopted a policy to exchange such traditional incandescent bulbs across campus with CFLs/LED in a phased manner. Thus, at least 25 % of the bulbs had been changed with CFLs/LEDs.Bold Sticker Reminders The college as part of their 'Energy Awareness Campaign' has placed adhesive stickers on switch boards to remind everyone to conserve energy by turning off the lights. Small pamphlets emphasising the importance of energy saving is prepared and circulated to all the staff and students of the college. Water conservation program Sensitizing the staff and students The students arriving on campus and to the hostels are sensitized about water conservation in their orientation meetings. Printed stickers / labels with the slogan 'Save Water' are fixed in strategic places of the college and hostels. Cutting back on car washing The vehicles on the campus are washed based on the real needs rather than regular washing to save water.

	Irrigation Techniques and Duel Flushing Systems The gardens are irrigated with sprinklers and drip irrigation systems to save the wastage of water in plantations. All the existing flushes in the toilets are being changed into duel flush system in a phased manner to conserve water. Recycle programs Green wastes, like tree and brush trimmings, are composted and reused for fertilizer and preparing composts. Food waste is also cut down by implementing self serving of food by the students, so they aren't tempted to waste food. Further, the food remains are collected systematically and used for preparing composts manure in the dig wells which is used for the gardening purposes. Hazardous solvent systems are recycled / disposed in a safe manner. The waste water from the utility areas of the hostels, and the college are subjected to treatment before being flushed to the public drainage system. Green Policy for the use of papers The college encourages the practices like double-sided printing, usage of one side papers for taking print outs. All the internal notifications and circulars are communicated in electronic formats (e-Tapaal). Transportation policy: The college has a transportation system that serves the staff and students 3 vehicles for official transits/travels. Further, sharing the transport among the staff / students residing in the same locality is also encouraged to conserve the fuel.

OUTREACH ACTIVITIES

Support and strengthen the participation of local communities in improving water and sanitation management.

The students volunteer along with the local municipal officials participate in awareness program on water reserve management and tree plantation to protect water source.

NSS Special Annual Camp at Majjigepura- March 2019		
Day 4 28/03/2019 Thursday	**Rally on Water usage and Environmental management- Dr. Raghu Ram Achar Cleaning activities near the convention hall and temple premises of Majjigepura**	**"Water Resources" Special lecture by Dr. Shivaraju HP, Assistant Professor, FLS, JSS AHER**

Rally on Water usage and Environmental management.

Special lecture by Dr. Shivaraju HP, Assistant Professor, FLS, JSS AHER on water resource management

SWACHATHA PAKWAD

SWACHATHA PAKWAD was organized at JSS Urban Health Centre, Medar's Block Mysuru on On this occasion following activities were conducted

- Health education given on sanitation and hygiene
- Sanitation pledge taken by all participants and audience
- Distribution of course completion certificates
- Participants actively involved in programme, and took sanitation pledge

https://jssonline.org/a-one-day-workshop-on-fuel-saving-and-water-conservation-measures/

A ONE-DAY WORKSHOP ON 'FUEL-SAVING AND WATER CONSERVATION MEASURES'

The JSS ICAR Krishi Vignana Kendra, Suttur, in association with the Karnataka Renewable Energy Development Corporation, Government of Karnataka, had organized a one-day workshop on the topic, "Fuel Saving and Water Conservation Measures,' at the Allama Prabhu auditorium in the JSS Educational Institution complex in Suttur on October 30, 2021.Sri G.H. Yogeesh, Deputy Director, Agriculture Department, Naganahalli District Agriculture Training Center, participated as the resource person. In his talk, he explained that the rivers, tube wells, tanks, and groundwater are major sources of water for agriculture. "The rivers in South India will be full and flow only during rainy seasons. There will be water scarcity for the remaining months of the year. Hence, the farmers should undertake cultivation across the slopes in their agricultural fields and construct pits. It will increase the groundwater level and reduce water scarcity," he said. He asked the farmers not to burn field waste, and instead convert it as compost and use it to increase soil health. It also helps erosion of soil and absorbs rainwater, he added.Sri N.M. Dinesh Kumar, Officer, Karnataka Renewable Energy Development Corporation, Bengaluru, in his address, informed that the Department has implemented several programs to enable fuel efficiency measures, keeping in mind the increasing demand for power and energy in the agricultural sector, and its proper management. "Along with agricultural pump sets, farmers are given solar panels. The solar panels are given at subsidized rates for farmers who install the solar panels on the rooftop of their houses, produce electricity, and supply it to KPTCL. Solar lamps are also being installed at public places," he added. He also informed that more farmers should install solar pump sets in the fields.Sri N.M. Shivashankarappa, Director, Horticulture Department, JSS Mahavidyapeetha, Mysuru, presided over the program. In his address, he informed that in India, the agricultural sector is using 50% water and 30% power, leading to scarcity of both. "As a large portion of cultivable land is rain-based, rains play an important role, and the groundwater is an alternative source for it. As more farmers are marginal and poor, the government is providing power supply at subsidized rates or free of cost. Also, it is noticed that not many farmers know or are using alternative sources of energy, like solar energy. Hence, more farmers should try to know about it and give preference to install solar agricultural pump sets," he added.

More than 100 farmers, including both men and women, members of the Farmer Producers' Organization of Esha Foundation, farmers of the Dharmastala Rural Development Institute and Outreach organization, and B.Ed. students of JSS College took part in the workshop.Smt. H.V. Divya welcomed the guests and the gathering. Smt. Netravathi Ettinamani gave a vote thanks, and Sri Shamraj mastered the program.Guests inaugurating the one-day workshop on 'Fuel Saving and Water Conservation Measures.' Sri G.H. Yogeesh, Deputy Director, Naganahalli District Agriculture Training Center, Sri N.M. Shivshankarappa, Director, Horticulture Department, JSS MVP, Sri N.M. Dinesh Kumar, Technical Officer, Karnataka Renewable Energy Development Corporation, Bengaluru, Smt. H.V. Divya, Senior Scientist and In-charge Head, JSS KVK and staff members of the JSS KVK are seen in the picture.

https://jssstuniv.in/event/water-conclave-for-a-better-future/

DEPARTMENT OF WATER & HEALTH

The continuous rise in population and environmental problems are witnessing a drastic destruction of our living habitat which is not only resulting in climate change and drinking water problems due to pollution but also in outbreaks of several communicable and non-communicable diseases. Water contamination and climate change poses many threats to human health from severe weather and water linked infectious disease risks to disrupted food systems and population displacement.

To manage these water associated health threats and other environmental problems, we must switchover to sustainable management approaches including technological frameworks to mitigate the water contamination, drinking water treatment options, climate change in many areas, alternative energy sources, including green infrastructure, governance and technology.

Human exposure to water associated infections occurs by unsafe drinking water, contact with contaminated water, recreational water, or food. The Department of Water & Health (DW&H), as the name indicates is dedicated to carryout extensive research on analysis, assessment and mitigation of human diseases through water treatment and sustainable environmental management approaches including geo-spacial techniques and nanotechnology. The DW&H has recognized as one of the pioneer research centre in the field of Water Research and Technology.

The major research activities mainly concentrating on advanced water treatment (PC/PEC, Hybrid-membrane technology, bio-remediation, etc) methods for safe and clean drinking water, integrated water resources management at catchment and rurban level, water quality improvement and feasible treatment techniques at rural region, water-energy-environment nexus, advanced materials for clean and alternative energy, geo-spacial techniques for water resource management and sustainable township, nano-technological approaches for human health and environment, pollution mitigation techniques and ecosystem conversation.

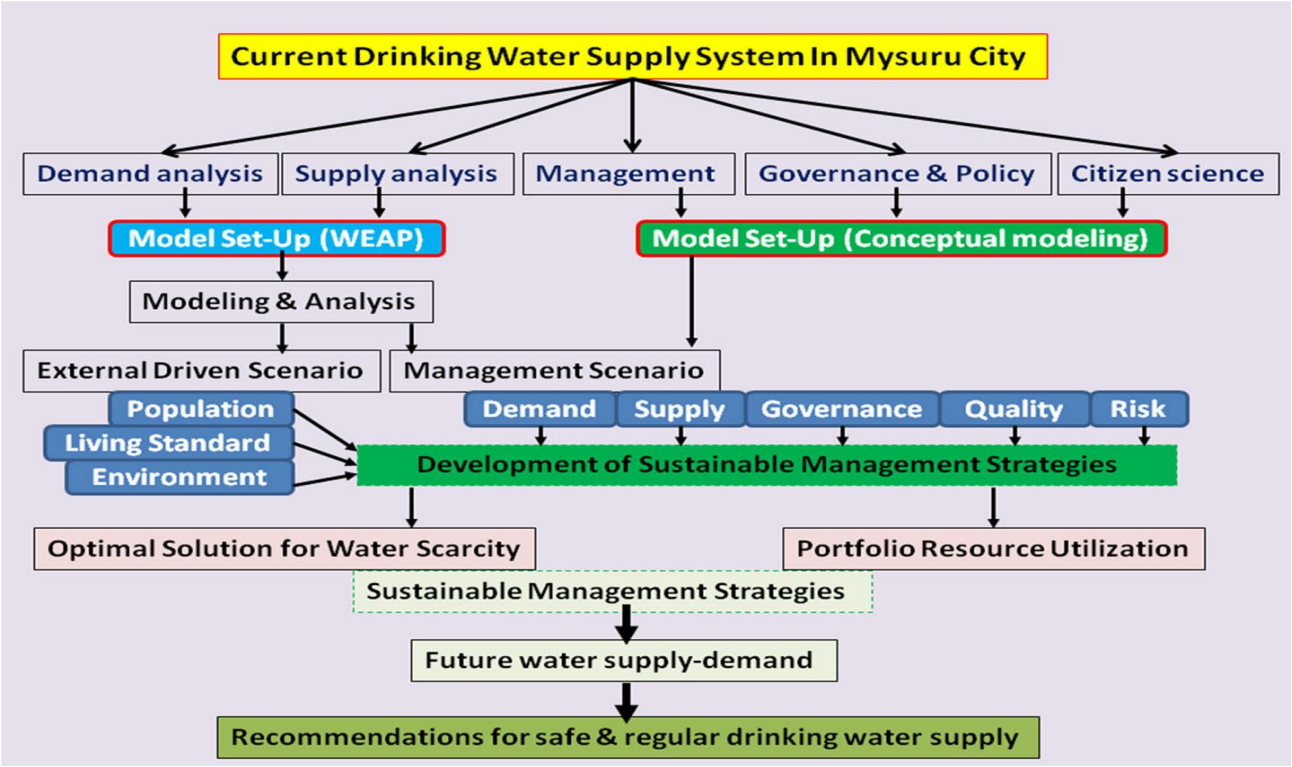
All faculty members are well qualified and have good interdisciplinary research experience from pioneer research institutes that enable to mentoring the students to achieve their research goal of their interest. Moreover, the faculty members have a unique diversity of research interests and actively encourage cross-disciplinary research problems. The research activities in the DW&H is associated and supported by world class hospital with more than 300 health professionals from medical, dental and pharmacy fields to enhance the skills which provides better understanding of dynamic interaction of water-health-energy-environment nexus mechanisms and mitigation stratergies.

The faculty members in DW&H has research collaborations with reputed institutions at national and international level and proving excellent platforms under research exchange program to the students and research scholars to carryout cutting edge research in the field of Water Research and Advanced Technology.

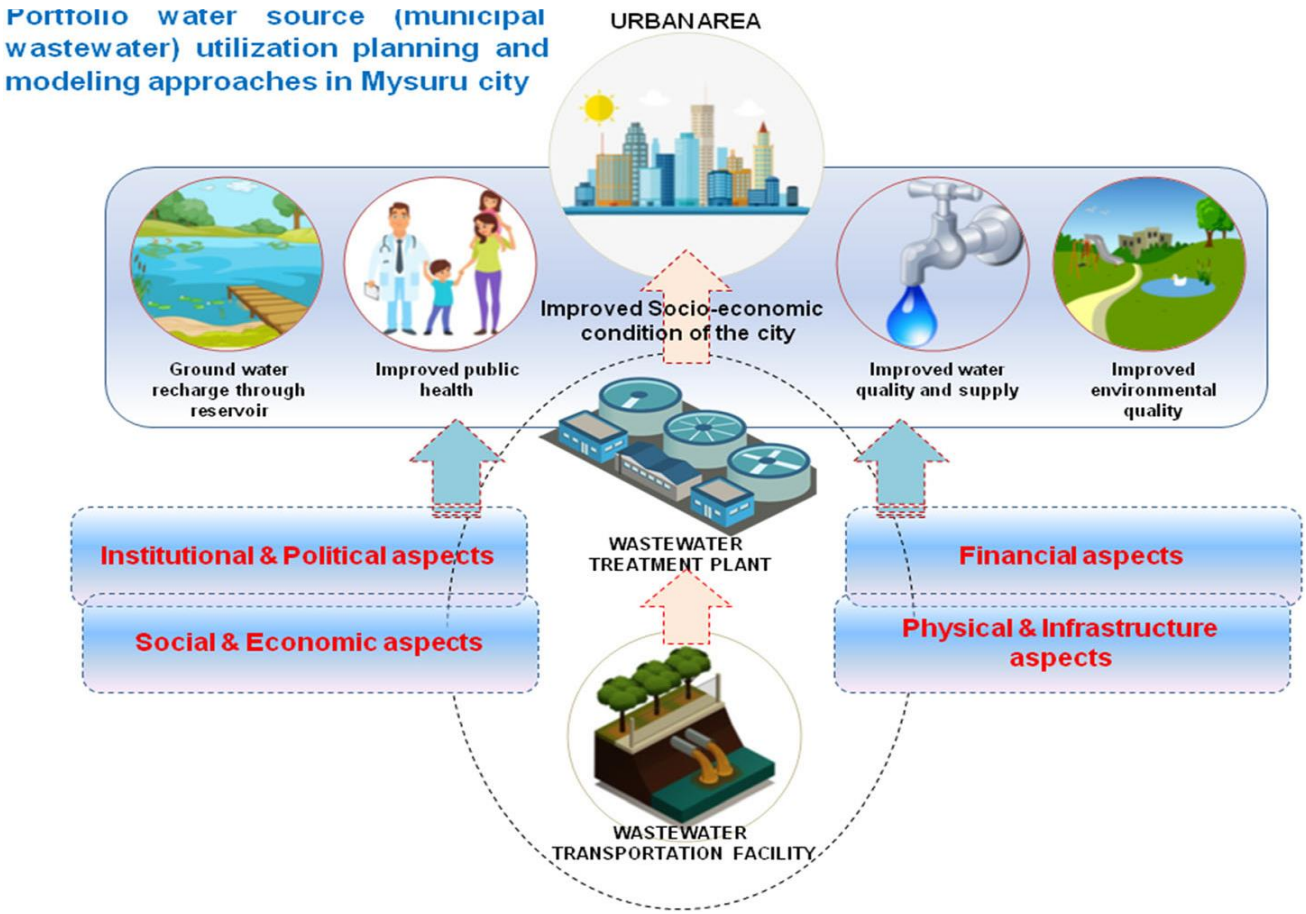
The DW&H has received financial support from national and international funding agencies to conduct the state-of-art research in the field of Water and Health Research.

The department has been involved in various activities towards the improvement in clean water and sanitation by introducing relevant courses in the UG and PG programmes in Environmental Sciences. The department is one of the pioneer research centers in the region where water research is the primary concern that contribute a lot towards the SDGs of clean water and sanitation.

The majority of the cities across the developing countries have saddled water supply and quality management issues. Unfortunately, even cities with adequate water resources and infrastructures foresee safe drinking water supply as a challenge. The present study discusses the potential hazardous events associated with a drinking water supply and management strategies in the case of Mysuru city, India to realize water security through integrated modeling approaches. Here, the water demand and supply of the city is simulated by the WEAP decision-making tool using current and reference data in the perspective of water supply trends concerning social-economic and environmental parameters.



Dr. Shivaraju HP and his group developed a conceptual model for the sustainable utilization of water resources for safe and clean drinking water supply including improved sanitation by proper treatment and reuse of municipal sewage. The concept was published in the journal Water Resources Management under the title “Comprehensive understanding of urban water supply management: Towards sustainable water-socio-economic-health-environment nexus.



The above figure illustrate the portfolio water source (recycled sewage water) utilization planning and modelling approaches especially for municipal wastewater recycling to meet the expected demand for domestic usage in Mysore city. Advanced approaches such as water governance, development of green technologies for water supply monitoring, alternative sustainable treatment and recycling techniques, water pricing, private and public partnership, education, and attitude change could be adopted while developing sustainable water supply and management frameworks.

WORLD WATER DAY

Division of Environmental Sciences, Department of Water & Health, JSS Academy of Higher Education & Research, Mysore has organised an awareness program and walkathon at Bannimantap, Mysuru to commemorate the World Water Day to bring awareness and drive home the importance of water, water conservation & hygiene.

The Division organised e-poster presentations on the theme “Leaving No One Behind”, Environmental Captioning and Photography on the theme “Life in landscape “ among the students to create awareness of environment and water conservation. Sri. U N Ravikumar, Former Director, CART, Mysuru delivered a special lecture on “Water for Life” during the World Water Day celebrations and educated the participants on water conservation and sustainable development through rainwater harvesting. He also spoke about the existing problems and alternative routes for overcoming those water-related problems.Dr. Kushalappa PA, Director Academics, JSS AHER, Dr. Balsubramaian S, Director Research, JSS AHER, Dr. Raveesha KA, Head, Department of Water & Health, Faculty members participated in the event.

STUDENTS AWARNESS PROGRAM ON SDG6

https://www.youtube.com/watch?v=7LMlRALV0mk

E-Poster Competition on Sustainable Development Goals

Posters Presented by Biomedical Science Interns Stidents for SDG 6 for the Competion on "SDGs- Where We are"

CLEAN WATER AND SANITATION

By- Divya Sahadevan,Adhithya Sajeean,Abin C Benny,Sojiya Babu,Justin Biju

B.Sc RDT, JSS AHER

Water sanitation is defined as the process of cleaning and purifying water so it is safe for use. Example of water sanitation is a filter that removes impurities from water.

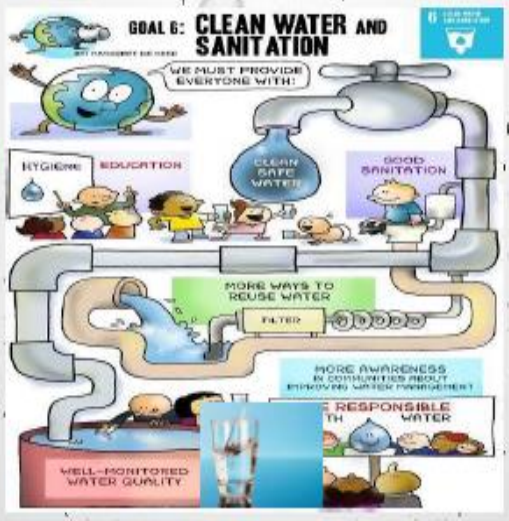
CLEAN WATER ACT(CWA)

*Establishes the basic structure for regulating quality standard for surface water *Originally published : 18 oct 1972*Act amended federal water pollution control act.

IMPORTANCE OF CLEAN WATER

*Having clean water and sanitation means being able to avoid exposure to countless to countless diseases.

*Every year millions of people die from diseases caused by inadequate water supply sanitation and hygiene.



FUTURE GOALS TO IMPROVE CLEAN WATER AND SANITATION

1)Achieve universal and equitable access for all, to be safe and affordable drinking water.
2)Achieve access to adequate and equitable sanitation and hygiene for all.
3)Improve water quality by reducing pollution and substantially increasing recycling and safe reuse globally.
4)Substantially increase water use efficiency across all sector, ensure sustainable withdrawals and supply of fresh water.
5)Implement water resources management at all levels.
6)Protect and restore water related ecosystem.

DISEASES CAUSED BY UNSAFE WATER AND POOR SANITATION

*Cholera
*Typhoid
*Polio
*Diarrhea
*Dysentery

BENIFITS OF WATER SANITATION

* Access to clean drinking water and sanitation reduces health risks and free-up time for education and other productive activities as well as increases the productivity of the labour force.

WAYS TO IMPROVE WATER QUALITY

- Implement rainwater harvesting systems to collects and store rainwater for drinking.
- Promote good hygiene habits through education.

Clean water sanitation techniques and strategies

Ms. Neharika Rai, Dr. Sowmya H V, Ms. Swathi Madhavan.

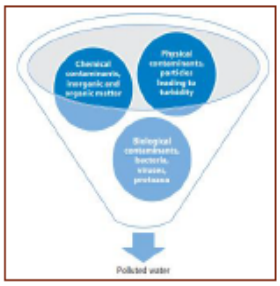
Department of Ophthalmology, JSS Medical College, JSS Institute of Higher Education and Research

Introduction:

"Clean water essentially means water that is appropriately free from physical, chemical, and biological pollutants and may be employed for purposes such as drinking, bathing, and cooking." In simpler words, clean water means the one that is suitable for drinking.

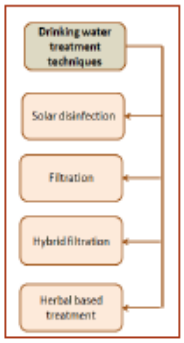
Particularly in recent events of widespread pandemic – COVID 19, handwashing with clean water has become extremely important. Lack of it compromises the efforts for hygiene (Corburn et al. 2020), which in turn impacts prevention and control of COVID-19 spread in communities. In regard to this. WASH (water, sanitation and hygienic) interventions are implemented to control the spread and transmission of disease in treatment facilities (Yates et al. 2017).

Water contamination is one of the major environmental and natural resource concerns in the twenty-first century. In the following presentation, the different strategies of water sanitation and its techniques would be discussed along with the recent innovations and advancements to prevent water contamination.



Current strategies

Disinfection of harvested rainwater are achieved by chlorination after its removal from the tank to minimize side reactions with inorganic matter settled at the tank bottom.



- **Solar Disinfection:**

The technique is simply based on the ability of microorganisms present in contaminated water to directly absorb solar rays (near UV A) which further leads to its inactivation.

- **Filtration:**

It simply means passing contaminated water through a bed of sand and gravel. **Slow** sand filtration is one of the oldest and most effective methods that has been used for decades. Studies reveal that the a thin biological layer of a specific deposited material on the filter takes approximately 30 days to form, after which better filtration effect is achieved.

- **Hybrid Filtration:**

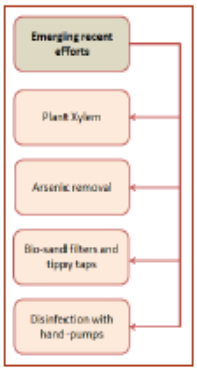
Slow sand filtration followed by storage of the filtered water in a clean copper container to bring about disinfection is the technique of hybrid filtration. Naturally available materials, such as coconut shell, resins, and activated rice husks, along with activated carbon, adsorb chlorine and iodine, which acts as disinfectants when contacted with contaminated water.

- **Herbal-Based Treatment**

Aluminum sulphate or alum [Al2(SO4)3] and ferric sulphate [Fe2(SO4)3 are used for anticoagulation and removal of suspended solids, bacteria, and viruses.

Natural alternatives for these two chemicals are *Moringa oleifera* (drumstick), *Ocimum sanctum* (Tulsi) and *Azadirachta indica* (Neem).

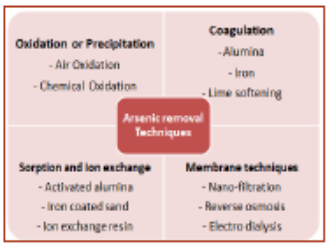
Emerging Innovations



- **Plant Xylem for Water Filtration**

Plant xylem is a porous material that is known to conduct fluids in plants and is used as a filter medium to provide clean water. Point-of-use filtration devices are prepared from xylem as per the pioneering work by Boutilier et al.

- **Arsenic Removal Technologies**



- **Innovative Biosand Filters and Tippy Taps**

A simple biosand filter is constructed using cheap and easily available resources that consists of a 20L plastic barrel, into which previously washed and dried gravel and sand is added in layers, followed by a topmost layer of activated charcoal. This gives excellent filtration efficiency (500 mL/min).

- **Disinfection of Potable Water Using Hand Pump**

The hand pump essentially is a positive displacement pump, using negative pressure to lift water from the well to the surface level. Hydrodynamic cavitation at the suction valve in hand pumps creates a high collapse pressure to rupture the biological constituents of water, including the microbial cells causing its destruction. This disinfected water from the hand-pump can be used for drinking purposes.

References

1. Pandit AB, Kumar JK. Clean water for developing countries. Annual review of chemical and biomolecular engineering. 2015 Jul 24;6:217-46.
2. Islam SD, Mondal PK, Ojong N, Bodrud-Doza M, Siddique MA, Hossain M, Mamun MA. Water, sanitation, hygiene and waste disposal practices as COVID-19 response strategy: Insights from Bangladesh. Environment, development and sustainability. 2021 Jan 2:1-22.
3. Corburn J, Vlahov D, Mberu B, Riley L, Caiaffa WT, Rashid SF, Ko A, Patel S, Jukur S, Martínez-Herrera E, Jayasinghe S. Slum health: arresting COVID-19 and improving well-being in urban informal settlements. Journal of urban health. 2020 Jun;97(3):348-57.
4. Yates T, Allen J, Leandre Joseph M, Lantagne D. WASH interventions in disease outbreak response. Oxfam; 2017 Feb 28.
5. Boutilier MS, Lee J, Chambers V, Venkatesh V, Karnik R. Water filtration using plant xylem. PLoS One. 2014 Feb 26;9(2):e89934.

WATER CONSERVATION -RAINWATER HARVESTING AND RETENTION FACILITY IN THE CAMPUS IN SUPPORTING SDG 6

RAIN WATER HARVESTING / RO PLANT / WATER MANAGEMENT

- Rain water harvesting collection tank of 30,000 ltrs storage capacity.
- 10 no's of Ground water & bore well recharge pits and infiltration tank of about 15,000 ltrs capacity.
- STP of 25 KLD capacity by using SWR technology has been installed for treating of sewage & kitchen waste water of PG Guest Hostel & the treated water is using for the purpose gardening area developed surrounding the building.
- One tank of 10,000 ltrs capacity is made for re-use of RO rejected water for gardening purpose
- Water sprinklers are in place

Small scale sewage treatment plant

Facility for Reverse Osmosis (RO)

Rainwater harvesting

Rainwater purify photos

UTILISE SUSTAINABLE WATER EXTRACTION TECHNOLOGY

In JSS AHER campus, we have installed Ultra Filtration plant of capacity 3000 LPH , at Girl's hostel building (G+7 floors), where all the rooms are provided with attached bathrooms. This plant is to avoid residual scale formation in pipelines & bathroom fittings due to more hardness in borewell water. Which in turn maintenance cost will be more as well often & often CP fittings will goes spoil due to this scale formation.

Reject water (wastewater coming after treatment) is about 75% of the treated water. This reject water will be made use for watering the greenery of the campus. As a result of this, easy flow of water in pipelines will be there without any clogging. Another thing is, life of bathroom fittings also will be more when we compared to the use of direct borewell water without any treatment for bathrooms.

We are having Reverse Osmosis plant of capacity 3000 LPH for supplying water for drinking purposes, Kitchens, Dental chairs, Laboratories etc., where we need little soft water. Here reject water will be more when we compared to UF plant. So, quantity of treated water & reject water is of same. This wastewater also will be channelised to feed greenery areas.

We have installed 25KLD STP plant of Bio-digester Vortex system exclusively for Guest house wastewater treatment (Pilot plant). In this system no chemicals are used to treat, no sludge formation, odourless treated water, low carbon footprint etc., Treated water is connected to the sprinklers of the garden area.

In guest house, we are having rainwater collecting tank of capacity 10K Ltrs to collect all terrace & courtyard rainwater, this water will be pumping for nearby garden sprinklers & for watering surrounding plants.

In JSSCPM campus also, we have installed individual RO units for Girl's hostel, Boy's hostel & Admin blocks to get treated water for cooking & for drinking purposes. Reject water will be used for watering lawns/garden etc.,

The JSSAHER has adopted many rainwater harvesting systems like pits done by inserting concrete rings by following all procedures for ground re-charging, 2 to 3 nos. of huge rainwater harvesting pits etc.,

WATER MANAGEMENT AND CONSERVATION

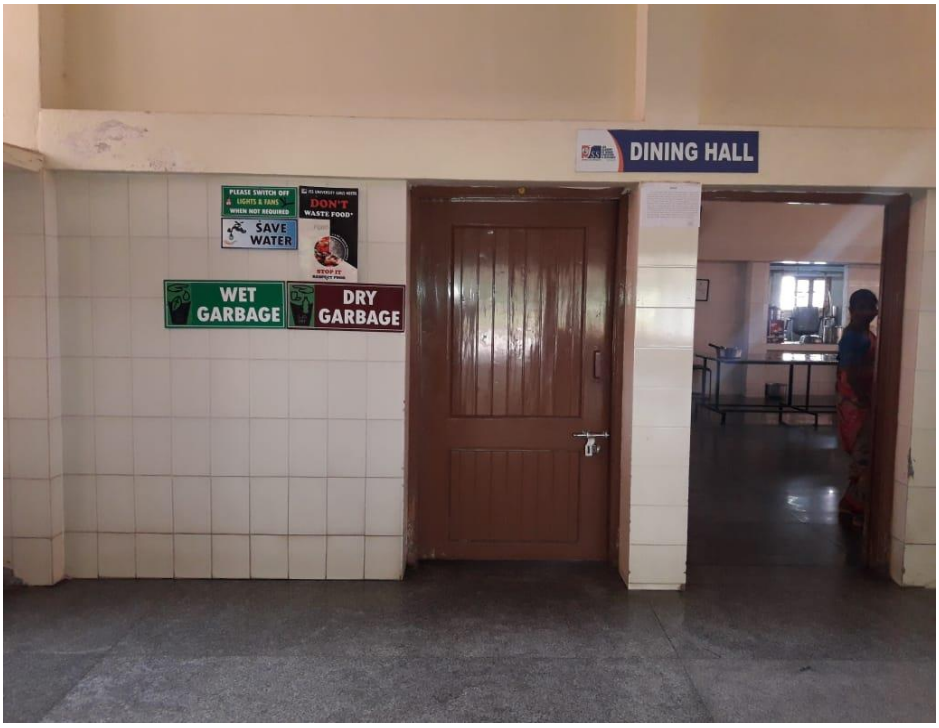
To meet the needs and sustainable management of fresh water, the rainwater harvesting, and utilization systems have been established in all the campuses of the university to aid towards the greater objectives of water management and conservation and increasing recharge of groundwater by capturing and storing rainwater, rainwater harvesting from rooftop run-offs and natural water bodies and the community development. The below mentioned models are established in the various buildings based on the size of the building and the extent and topography of the land.

- Simple roof water collection systems - Most of the rooftop rainwater harvesting has been completed by constructing five water storage structures with a storage capacity of 1000 m3.
- Land surface catchments – a simple way of collecting rainwater by retaining the flows (including flood flows) of small creeks and streams in small storage reservoirs (on surface or underground) created by low-cost dams
- Collection of storm water – The surface runoff collected in storm water ponds/reservoirs is subject to a wide variety of contaminants and every effort is made to keep these catchments clean.
- The University supports green practices in all its initiatives. It has well-defined policies for its sustainable green practices which include its energy conservation policy, water conservation policy, transport policy, the SMART and Green campus policy and many such policies and practices that inculcate the importance of conserving the present for the future generations.
- Biomedical waste management in Hospital
- JSS Dental College and Hospital gives utmost importance to controlling and prevention of infection in patients, visitors, healthcare providers and community by adopting appropriate safety measures.
- JSS Dental College and Hospital has an organized Infection Control Committee and Infection Control Team which formulates policies and measures aimed at reducing and eliminating infection risks to patients, housekeeping staff, visitors and to the environment.
- JSS Dental College and Hospital has an infection control and elimination programs and policies that are well documented.
- Infection control and elimination programs are performed regularly with yearly up gradations.
- JSS Dental College and Hospital has a well-coordinated Infection Control Committee that supervises all infection control and elimination programs
- Adequate washrooms at each floor for both men and women separately with hygienic and sanitized facilities. The college ensures adequate and equitable sanitation and hygiene by monitoring through task forces periodically.
- Rain water harvesting system available at the campus as per state government norms to meet the scarcity and rejuvenate the ground water level. The drinking water facility is made available at all position of the institution viz hostel and college.
- About one third of the campus is construction free to maintain the eco systems by planting trees and maintaining wetlands. As the previous year were on covid pandemic and student availability was not there no NSS activity were carried out.

RO WATER FACILITIES- REVERSE OSMOSIS DRINKABLE WATER SYSTEM FOR STAFF AND STUDENTS

JSSAHER has an excellent Infrastructure for academic and residential purpose with the Centralized gas facilities for laboratories and hostels. RO water facility in the academic and residential areas along with in the premises of hostels is available. The regular water testing is performed in Department of Pharmaceutical Biotechnology of our college and the report is generated and based on that the necessary action is taken if the samples are found contaminated. The campus also provides RO water facilities for staff and students.

SAVE WATER SIGNBOARDS -Water Conservation




LDB-1 Ground Floor
SAVE WATER
REDMI NOTE 6 PRO
MI DUAL CAMERA


DRINKING WATER
Oscillus
Oscillus


SAVE WATER


SAVE WATER

2020 CAMPUS WISE WATER CAPACITY DETAILS

Name of the Campus	Total Storage Capacity in litres				Approximate Usage per day				Campus population				Approximate Usage per day from all the sources
	Volume of water ***(OHT + Sump + Others)***	Inbound **(treated / extracted water)**	Collected from **Rainwater**	**Reused / Recycled** water	Volume of water ***(OHT + Sump + Others)***	Inbound **(treated / extracted water)**	Collected from **Rainwater**	**Reused / Recycled** water	**Hostel inmates**	**Day scholars**	**Staff**	**Water usage volume for Gardening *(in ltrs)***	
JSSMI Campus @ Mysuru	9.40 lakhs	0.50 lakhs			5.75 lakhs	0.16 lakhs	-	0.80 lakhs				0.80 lakhs	6.55 lakhs
JSSCP Campus @ Mysuru	2.00 lakhs	0.20 lakhs	--	--	1.25 lakhs	--	--	--	500	600	110	0.40 lakhs	1.65 lakhs
JSSCP Campus @ Ooty	1.00 lakhs	0.20 lakhs	-	-	0.61 lakhs	-	-	-	550	520	120	500	36.23 Litre / *person / day including gardening*
Other Off Campus Buildings @ Mysuru	0.61 lakhs	0.50 lakhs	0.24 lakhs										
School of Life Sciences @ Ooty	0.35 lakhs	0.30 lakhs	0.10 lakhs	0.01 lakhs	0.04 lakhs	-	0.075 lakhs	0.01 lakhs	-	150	15	0.02 lakhs	0.08 lakhs
TOTAL	**13.36 lakhs**	**1.70 lakhs**	**0.34 lakhs**	**0.01 lakhs**	**7.65 lakhs**	**0.16 lakhs**	**0.075 lakhs**	**0.81 lakhs**	**1050**	**1270**	**245**	**1.22 lakhs**	**8.28 lakhs**

1. Availability of clean drinking water in the campus, i.e water purifiers are kept in all floors of college and hostels and Rs.65,853/- is incurred towards annual maintenance of the same.
2. The overhead water storage tanks in college and hostels are cleaned periodically at a total cost of Rs.17,000/- per time.
3. The water which is used in the campus are analyzed for the microbial content and records are maintained.
4. The wastewater from RO plant is used for gardening which reduces the wastage of water.
5. Washrooms for students both Boys and Girls are in sufficient numbers in the college and are cleaned frequently.
6. Separate RO water pipe lines are connected to the kitchen which is used for cooking food at the hostels.
7. Sprinkler system is used for watering the plant to the maximum extent to save water.
8. Sewage treatment plant (STP) proposal is in process at the approximate cost of Rs. 60 lakhs.
9. Rainwater harvesting system has been proposed and is under process.
10. Sanitary napkin incinerators are placed in campus (05 in girls' hostel and 01 in college) at the cost of Rs.1,26,343/- to ensure the water safety and prevent contamination.

PUBLICATIONS RELATED TO THIS SDG

1. Dr Devananda Devegowda, The association of fluoride in drinking water with serum calcium, vitamin D and parathyroid hormone in pregnant women and newborn infants, Sept.2020, European Journal of Clinical Nutrition, P-1-9, ISSN-0954-3007 (INTERNATIONAL).
2. Dr Narayana Murthy M.R., Empowering Village Health Sanitation and Nutrition Committee members on dengue prevention and control: An educational interventional study in rural areas of Mysuru, Karnataka, Oct.2020, Indian Journal of Medical Sciences, P-1-5, ISSN-0019-5359 (NATIONAL).
3. Dr Raghavendra Shanbhog, Dr Thippeswamy H M, Dr Nanditha Kumar M, Dr Prashanth S N, M Girish, Linear regression approach for predicting fluoride concentrations in maternal serum, urine and cord blood of pregnant women consuming fluoride containing drinking water, 2021, Clinical Epidemiology and Global Health, Vol.10, ISSN: 2452-0918 (INTERNATIONAL).
4. Meridith Mario Wormald, Dr Thippeswamy H M, Dr Prashanth S N, Dr Devananda Devegowda, Dr Nanditha Kumar M, The association of fluoride in drinking water with serum calcium, vitamin D and parathyroid hormone in pregnant women and newborn infants, 2021, European Journal of Clinical Nutrition, P-1-9, ISSN: 0954-3007 (INTERNATIONAL).

WASTE MANAGEMENT & POLICIES OF JSSAHER SUPPORTING SDG 6

WASTE MANAGEMENT:

- Bio – medical waste management service is being availed since May 2003 (Dental & Medical) from M/s. Shree Consultants.
- Segregation and collection of dry and wet garbage is in practice.
- Color coded dustbins are provided across the campus.

Waste collection bins placed at various locations in the campus Waste collection by municipal lorries

Policies:

1. **Waste Management Policy**
2. **Recycling Policy**
3. **Smart Campus Policy**

JSS ACADEMY OF HIGHER EDUCATION &RESEARCH, MYSURU

Energy Conservation & Recycling Policy

Purpose

In order to minimize energy usage, improve the efficiency of all energy/ resources (natural resources, water, electricity) consuming systems and equipment, and improve the environment in all facilities, JSS Academy of Higher Education & Research has adopted a energy / resources conservation and recycling policy.

Definitions

- Energy conservation : Energy conservation is a practice of decreasing the quantity of energy used and achieved through efficient energyuse.
- Recycle: Recycle is a process of collecting and reprocessing materials that would typically be consideredwaste.

Responsible Office

Office of the Vice Chancellor, Registrar & Finance Officer

Policy

Conservation of energy and natural resources and recycling process is an integral part of JSS Academy of Higher Education & Research (JSSAHER) facilities' design and usage. The JSSAHER employs a variety of energy conservation, recycling, and other techniques to lessen the consumption of resources and achieve the lowest feasible life cycle costs. However, occupant health, safety, comfort, and program requirements shall always be the primary concerns. Energy conservation measures will be achieved by using the most cost-effective, energy-efficient approach with consideration given for flexibility of use and future remodeling convenience. Recycling efforts are encouraged at the Institution/departmentlevel.

Responsibilities

A. All faculty, staff, students, design consultants, and construction contractors must observe energy and resource conservation measures employed by thecampus.

B. The Campus Facilities Maintenance & Management Authority- Deputy Registrar shall be the principal coordinator of all design disciplines, which includes responsibility for the implementation of thispolicy.

C. Constituent Colleges & Departments shall be responsible for internal energy conservation, recycling efforts.

Related Policies

The energy conservation and recycling policy of JSS Academy of Higher Education &Research (JSSAHER) follows :

- The Swachh Bharat Mission (Urban) guidelines- Government ofIndia.
- National conservation strategy and policy statement on environment and development- Government of India.

Date of implementation

This policy will come into immediate effect from 11.10 .2016

Date of revision

10.09 .2020

JSS Academy of Higher Education & Research
(Deemed to be University)
Accredited 'A+' Grade by NAAC
Sri Shivarathreeshwara Nagara
Mysuru – 570 015, Karnataka, INDIA

JSS Academy of Higher Education & Research

Mysuru

"Waste disposal Policy"

"Reduce – Recycle – Reuse" is a social responsibility, let us work together for a better tomorrow

Waste disposal Policy Statement

This policy document contains information on the procedure being followed at the JSS Academia of Higher Education & Research and its constituent colleges and departments. The document is prepared based on the Central Pollution Control Board, Govt of India and Karnataka State Pollution Control Board guidelines. The document will undergo revision as and when the central pollution control board makes amendments / changes and also as per the academia documentation policy. Sharing or copying the information in written, photocopy or any other mode without prior consent of the academia is discouraged.

Key personnel in waste disposal management

S No	Waste Disposal Activity	Function	Key Personnel	Contact details
1	Solid waste	Supervision of Collection and disposal	Mr Prashanth	9980613010
2	Green waste	Supervision of Collection and disposal	Mr Shivamanju	9886260635
3	E-waste	Supervision of Collection and disposal	Dr Ravindra	8105278665
4	Radioactive waste	Supervision of Collection and disposal	Dr Mahesh KP	9845189703
5	Biomedical waste	**Supervision of collection and disposal of Biomedical waste disposal** ▪ Collection ▪ Segregation at source ▪ Packing and Transport to central storage area ▪ Storage and Handover to CBMWTF	Dr Saravana Babu C	9042222277
		Disposal	Mr Umesh	9900970844
		Updating of biomedical waste register		
		Updating and Display of reports on website		

JSS Academy of Higher Education & Research

JSS Academy of Higher Education & Research (JSS AHER), formerly known as JSS University, is a deemed to be university located in Mysore, Karnataka. It was established in the year 2008 under Section 3 of the UGC Act 1956. JSS AHER is recognized by MHRD and accredited with A^+ Grade (CGPA of 3.47 out of 4) by National Assessment and Accreditation Council (NAAC) during re-accreditation in 2018. National Institutional Ranking Framework (NIRF) has listed JSS AHER at 37 ranks in the Universities Category. JSS AHER has the credit of being the top YOUNG University in the Karnataka State Universities Rating Framework (KSURF).

JSS AHER focuses on Medical and health-sciences studies through its constituent colleges, JSS Medical College, JSS Dental College & Hospital, JSS College of Pharmacy, Mysuru and JSS College of Pharmacy in Ootacamund, Faculty of Life Science. With a view to extend the academic horizon in the field of Health Sciences, Faculty of Life Science & Faculty of Health System Management was formed. Water health, HSMS, W&H

WASTE MANAGEMENT POLICY

Scope

This document provides information on the procedure being followed on waste management in the Deemed to be University

Applies to

All the teaching and non-teaching faculties, contractors and housekeeping staff

Preamble

Definitions

"Authorization" means permission granted by the Deemed to be University for the generation, collection, reception, storage, transportation, treatment, processing, disposal or any other form of handling of bio-medical waste in accordance with the rules and guidelines issued by the Central Pollution Control Board, Govt of India.

"Authorized person" means a person authorized by the Deemed to be University to generate, collect, receive, store, transport, treat, process, dispose or handle bio-medical waste in accordance with the rules and guidelines issued by the Central Pollution Control Board, Govt of India

"Biological" means any preparation made from organisms or micro-organisms or product of metabolism and biochemical reactions intended for use in the diagnosis, immunization or the treatment of human beings or animals or in research activities

"Bio-medical waste" means the wastes generated during the diagnosis, treatment or immunization of human beings or animals or research activities

"Bio-Medical Waste Treatment and Disposal Facility" means the facility wherein treatment, disposal of bio-medical waste or processes incidental to such treatment and disposal is carried out, and includes common bio-medical waste treatment facilities

"Handling" in relation to bio-medical waste includes the generation, sorting, segregation, collection, packaging, storage, loading, transportation, unloading, treatment, destruction, transfer, disposal of waste.

"Healthcare facility" means a place where diagnosis, treatment or immunization of human beings is provided irrespective of type and size of health treatment system, and research activity

"Occupier" means a person having day to day administrative control over the clinic / lab generating bio-medical waste, which includes a hospital, mortuary, anatomical wastes, pathological laboratory, animal house, blood bank, irrespective of their system of medicine

"Operator of a common bio-medical waste treatment facility" means a person who owns or controls a Common Bio-medical Waste Treatment Facility (CBWTF) for the collection, reception, storage, transport, treatment, disposal or any other form of handling of bio-medical waste.

"Prescribed authority" mean the State Pollution Control Board in respect of State and Pollution Control Committee in respect of Union Territory. In Karnataka it is Karnataka State Pollution Control Board (KSPCB)

"Point of Generation" means the location where wastes initially generate and accumulate.

"Storage" means the holding of biomedical waste for a temporary period at the end of which the bio-medical waste is treated or disposed.

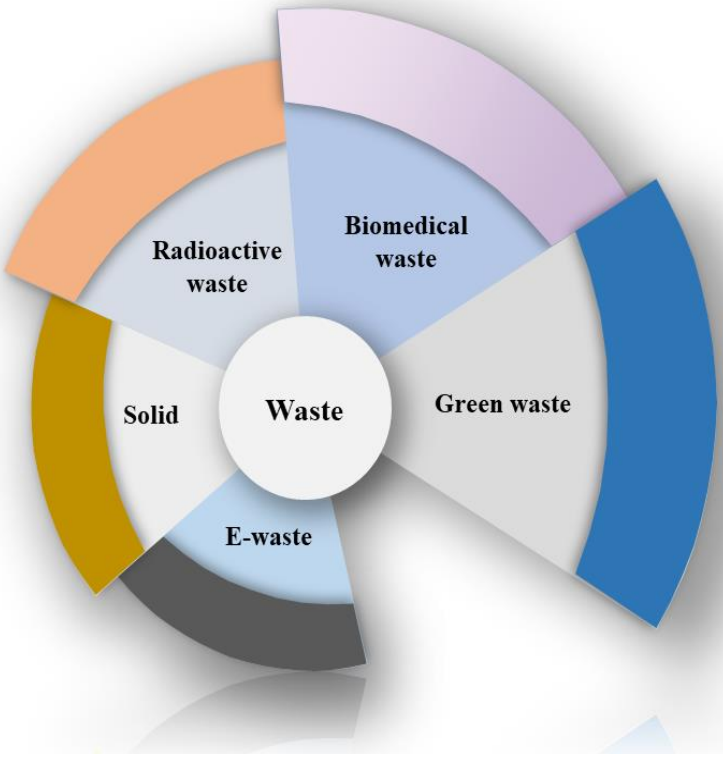
"Treatment" means any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological characteristics or composition of any hazardous waste

"Waste" any substance which is discarded after the primary use, or it is worthless, defective, and of no use

Policy

Classification of waste generated from the University, hospital and laboratories:

- **General solid wastes**: Domestic garbage, food and food packing materials, papers and cardboards, construction and demolition debris, sanitation residues, packaging materials, usually disposed through municipality
- **Bio-medical wastes**: Solid or liquid wastes including containers, intermediate or end products generated during diagnosis, treatment & research activities of medical sciences.
- **Green waste**: Wastes generated from gardens and herbal gardens activities. These substances are mostly biodegradable.
- **Radioactive wastes**: Waste containing radioactive materials. Usually these are byproducts of nuclear processes. e.g. radio-isotopes, chemical sludge etc.
- **E-wastes**: Electronic wastes generated from electrical or electronic devices. Electronic scrap components, such as CRTs, may contain contaminants such as Pb, Cd, Be or brominated flame retardants.



Procedure

General Wastes

It constitutes all the waste other than bio-medical wastes and which has not been in contact with any hazardous or infectious, chemical or biological secretions and does not includes any waste sharps. This waste consists of mainly:

1) Newspaper, paper and card boxes (dry waste)
2) Plastic water bottles (dry waste)
3) Aluminum cans of soft drinks (dry waste)
4) Packaging materials (dry waste)
5) Food Containers after emptying residual food (dry waste)
6) Organic / Bio-degradable waste - mostly food waste (wet waste)
7) Construction and Demolition wastes

These general wastes are further classified as dry wastes and wet wastes and should are collected separately. The quantity of such waste is around 80 % to 90 % of total waste generated from the University, hospital and laboratories.

Food wastes

Food wastes from the hostels are collected in closed containers in respective collection area and are taken to piggery to feed the pigs. Food waste is disposal ensured through third party contract. Pilot trials under process to convert food waste in to organic manure and biogas

Green waste

The dried / wet plants materials such as leaves, stem, trunk, roots, flowers etc collected or cut or shred from the garden. Approximately 20 tonnes per year green waste is generated from the campus. The collected materials are processed in pits and approximately 12 tonnes of manure are prepared from the green wastes which are used for gardening purpose spread over in different locations of the campus.

Construction and Demolition waste

As part of infrastructure development in the Deemed to be University, as and when renovation or new construction are planned, the solid debris generated are cleared from the campus through the contractors taking-up the construction work. These wastes are disposed through trucks and used as landfill (approximately 5 acre) at Belavatha site located 1 km from the main campus

E-waste

Electronic wastes – computers, televisions, circuit boards, hard disks, printers and copiers, used batteries, which are not covered under biomedical wastes are disposed as and when such wastes are generated as per the provisions laid down under E-Waste (Management) Rules, 2016, Batteries (Management & Handling) Rules, 2001, and Rules/guidelines under Atomic Energy Act, 1962 respectively. This is outsourced through third part contract.

Radioactive isotopes

Dept of Radiology, JSS Dental College and Hospital, is practising a safe way of radiology waste disposal as required by the Bhabha Atomic Research Centre (BARC), Govt of India, since decades. Following are the radiology wastes generated at JSSDC & H

1. Fixing Solution.
2. Lead foils.
3. Radiographs (X- Ray Hard copies).
4. Developer Solution.

Depleted Fixing solution is given to a private agency party (Amaron, Pit stop) to recycles and extract silver from it. The same is followed in the case of x-ray films once, which were collected for so many years excluding the last 10 years record. Lead foils are collected over a period of time and are given to battery manufacturers for recycling. Depleted Developing solution is with excessive water and disposed in drains as suggested by BARC.

"Bio-medical waste" means waste that are generated during diagnosis, treatment or immunization of human beings or animals or research activities or in the production or testing of biologicals. Medical waste includes all the waste generated from the Health Care Facility which can have adverse effects on the human health or to the environment in general if not disposed properly. In general, the quantity of biomedical waste will be 5% to 10% of total waste generated from the campus, hospitals and laboratories. These wastes consist of the materials originated patient or animals blood, secretions, infected parts, biological liquids such as chemicals, medical supplies, medicines, lab discharge, sharps metallic and glassware, plastics etc.

Bio Medical Waste Management Rules, 2016 categorizes the bio-medical waste generated from the health care facility into four major categories based on the segregation pathway and colour code:

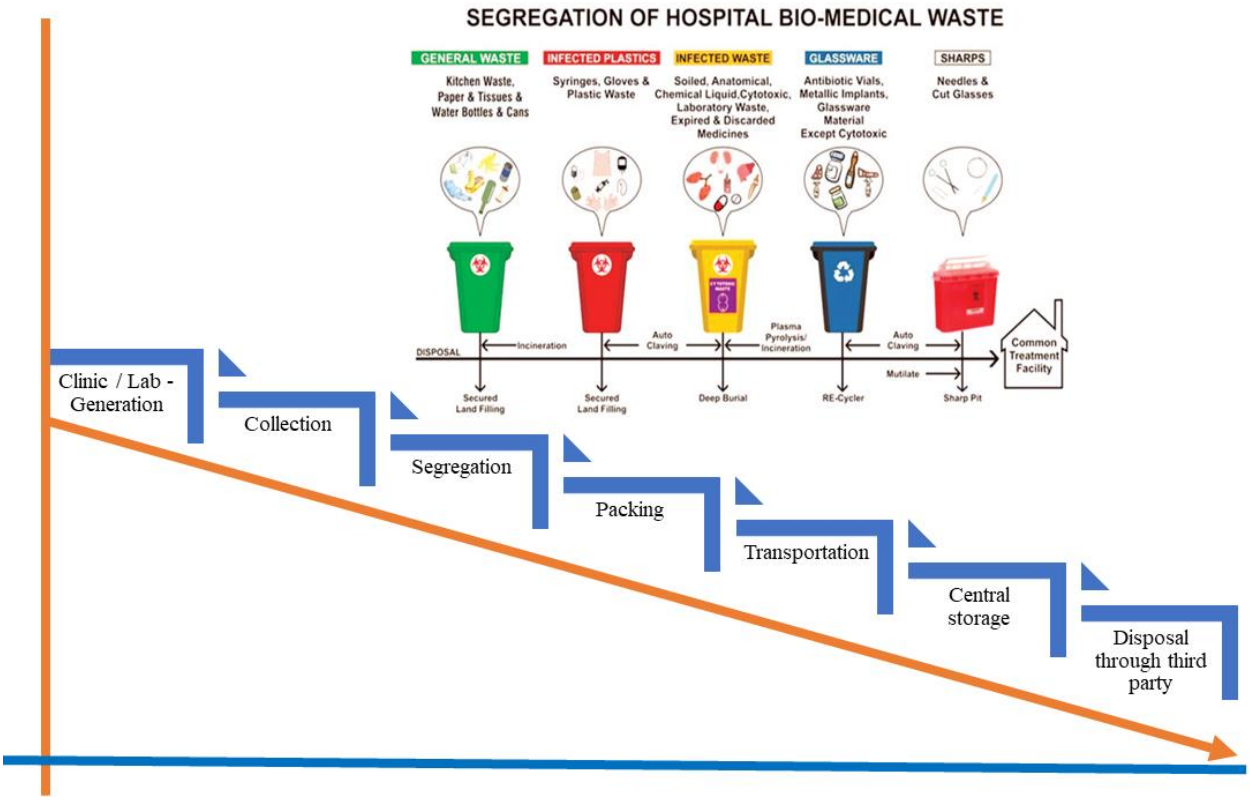
1. **Yellow Category**
2. **Red Category**
3. **White Category**
4. **Blue Category**
5. **Black Category**

S.No	Category	Type of waste	Color & Type of container
1	YELLOW	➢ Human Anatomical Waste ➢ Animal Anatomical Waste ➢ Soiled Waste ➢ Discarded or Expired Medicine ➢ Microbiology, Biotechnology and other clinical laboratory waste ➢ Chemical Waste ➢ Chemical Liquid Waste	Yellow colored Non-Chlorinated Plastic Bags (having thickness equal to more than 50 µ) or containers  Note (i) Infected secretions, aspired body fluids etc from laboratory are disinfected before mixing with another wastewater (ii) Liquid chemical wastes are pre-treated/ neutralised before mixing with other wastewater from hospital.
2	RED	➢ Contaminated Waste (Recyclable)	Red Colored Non-Chlorinated Plastic Bags (having thickness equal to more) 
3	WHITE	➢ Waste Sharps including metals	White Colored translucent, puncture proof, leak proof, Temper Proof containers 
4	BLUE	➢ Glassware ➢ Metallic Body Implants	Cardboard boxes with blue colored marking or blue colored puncture proof, temper proof containers 

BIOMEDICAL WASTE SEGREGATION

Biomedical waste generated from the hospital and laboratories are segregated at the point of generation as per the colour coding stipulated under Schedule I of BMWM Rules, 2016.

- Personnel Protective Equipment are provided to the bio-medical waste handling staff.
- Waste are segregated at the point of generation of source and not in later stages. “Point of Generation” means the location where wastes initially generate, accumulate and is under the control of doctor / nursing staff / lab etc. who is providing treatment to the patient / animals and in the process generating bio-medical waste.
- Posters / placards for bio-medical waste segregation are installed at the point of generation.
- Adequate numbers of colour coded bins / containers or bags are available at the point of generation of bio-medical waste.



BIO MEDICAL WASTE COLLECTION

Time of Collection

- Bio-medical waste should be collected on daily basis from each ward of the hospital / lab at a fixed time. There can be multiple collections during the day. All the biomedical waste should collected, segregated, packed and sent to central biomedical waste storage every evening before 4.30 pm
- Clinics and labs should ensure collection, transportation, and disposal of bio-medical waste within 48 hours.
- Bio-medical waste bags and sharps containers should be filled to no more than three quarters full. Once this level is reached, the bags are tied or sealed with plastic tags.
- Replacement bags or containers are available at each waste-collection location so that full ones can immediately be replaced.
- All the bags and containers to be transported to CBWTF are labeled with following details:
    - Date of Generation
    - Type of waste category
    - Dept name
    - Contact Person Name and Phone Number

Interim Storage

Interim storage of biomedical waste is discouraged in the clinics / labs

- If waste is needed to be stored on interim basis in the departments it is stored in the dirty utility/sections.
- In absence of dirty utilities/ sections such BMW must be stored in designated place away
- No waste is in patient care area / working area and procedure areas

General waste should not be collected at the same time or in the same trolley in which bio-medical waste is collected.

Labeling

All the bags/ containers/ bins used for collection and storage of bio-medical waste, are labelled with the warning Symbol of Bio Hazard or Cytotoxic Hazard as the case may be as per the type of waste in accordance with the BMWM Rules, 2016.

Bio-Hazard Label

Cyto-Toxic label

In-house Transportation of Biomedical waste

Transportation Trolleys & Carts

In-house transportation of biomedical waste from site of waste generation/ interim storage to central waste collection, with in the premises is done in closed trolleys/containers fitted with wheels for easy maneuverability. Such trolleys or carts are dedicated only for the purpose of biomedical waste transportation.

Waste Collection Cart

Waste Transport Trolley for a Particular category of waste

Route of transportation is planned in such a way that:

- Transportation does not occur through traffic and high-risk areas
- Supplies and waste are transported through separate routes
- Central waste collection area is accessed easily through the route adopted

Central waste collection area – for temporary storage

A central collection center situated within its premises for storage of bio-medical waste, till the waste is transported for treatment and disposal to CBMWTF. Center storage is manned and is under lock and key under the responsibility of a designated person. Central collection area has proper ventilation through the use of exhaust fan, hand wash area, weighing balance etc.

- Location of central waste collection facility is away from the public/visitors' access.
- The space allocated for collection is sufficient for the quantity of waste generated from premises
- Space is sufficient to store at least two days generation of waste
- Center has a concrete ramp for easy transportation of waste collection trolleys
- Flooring is of tiles with slope so as to easy the cleaning of the area
- Center has good ventilation through the use of exhaust fan and by use of wire meshes window
- Central storage station ensured for fire hazard like installation of fire extinguisher, smoke detector etc.
- Water supply is provided for cleaning and washing of this station containers. The drainage from the storage and washing area is routed to the effluent treatment plant (ETP).
- Sign boards indicating relevant details such as contact person and the telephone number is provided.
- It is ensured that no general waste is stored in the central waste collection area.
- Healthcare facilities need to maintain the record of waste generated and handed over to the authorized recycles.
- Centre is protected from stray animals in the academia and has installed cattle traps at main gate
- Pest control program is in place

Colour codes for Biomedical waste collection and Packing

				
▪ Human and animal anatomical wastes ▪ Soiled wastes, ▪ Discarded or expired medicines ▪ Chemical wastes, ▪ Blood and body fluids ▪ Microbiology / Biotechnology wastes	▪ Contaminated waste (recyclable)	▪ Sharps including metals ▪ Needles ▪ Scalpels ▪ Blades	▪ Broken and contaminated glass including vials and ampoules ▪ Metallic body implants	▪ Food items ▪ Papers / paper plates, ▪ Water bottles, etc

References

- https://kspcb.gov.in/aboute.html (Bio-Medical Waste Management Rules, 2016)
- https://kspcb.gov.in/aboute.html (Construction & Demolition Waste Management Rules, 2016)
- https://kspcb.gov.in/aboute.html (E-waste Management Rules 2016)
- https://kspcb.gov.in/aboute.html (Solid Waste Management Rules, 2016)
- http://www.barc.gov.in/randd/rwm.html (Bhabha Atomic Research Centre)

Water Pollution Control at JSSAHER

Introduction

Water is an essential element in many industrial and commercial production processes, again both as an input and as a medium of waste disposal. Large amounts of water are used by farmers for irrigation, especially in the Prairie provinces. In-stream, non-consumptive uses of water include water-based sports and recreation as well as simply the enjoyment of a scenic vista.

The water resource system itself consists of a vast array of interconnected components, Surface-water system includes the huge main-stem rivers, the Great Lakes, and other large lakes, such as Varuna Lake Wetlands, one of nature‘s ecosystem rechargers and life supporters abound. The vast, but unseen, system of groundwater aquifers, typically exceeding surface waters in terms of sheer quantity of water. Marshes and coastal lowlands are critical for fish and wildlife resources; beaches and scenic coasts are important recreational resources; coastal waters provide transportation and pleasure boating services; and saltwater fisheries are a major source of food.

Water Pollutant identified across the region

- Organic wastes: degradable wastes such as domestic sewage and residuals from pulp mills and food-processing plants; chemicals such as pesticides, detergents, and solvents; oil.
- Inorganic substances: chemicals such as toxic metals, salts, and acids; plant nutrients such as nitrate and phosphorous compounds.
- Non-material pollutants: radioactivity, heat.
- Infectious agents: fungus ,bacteria, viruses, plants.

Point sources include outfalls from industry and domestic wastewater treatment plants.

Nonpoint sources include agricultural runoff of pesticides and fertilizers and the chemicals and oils that are flushed off urban streets by periodic rains.

Many sources, especially point sources, have continuous emissions, related to the rate of operation of the industrial plant or the domestic sewer system.

There are also many episodic emissions, such as accidental releases of toxic materials, oil tanker accidents, or occasional planned releases of industrial pollutants.

Degradable wastes also include a variety of infectious bacterial agents, parasites, and other micro-organisms that can cause acute gastroenteritis, kidney damage, typhoid, cholera, dysentery, and other nasty diseases. Waste heat is also a degradable pollutant; it comes mostly from large-scale industrial processes that use water for cooling purposes.

Persistent water pollutants are those that remain for a long period of time, either because they are non- degradable or because the rate of degradation is very slow. This category includes thousands of inorganic and organic chemicals of various descriptions, the wastes of a modern, chemical-based economy. Industrial wastes contain many such persistent pollutants. Wastes from mining operations can contain various metals as well as acid- mine drainage. Agriculture is the source of a variety of pesticides, fertilizers, and soil runoff. Radioactive waste is physically degradable over very long periods, but measured in terms of a human scale it is essentially a persistent pollutant. Some viruses may also be in this category.

Supporting the Government Policy

The Water (Prevention and Control of Pollution) Act, 1974

The Water Prevention and Control of Pollution Act, 1974 (the "Water Act") has been enacted to provide for the prevention and control of water pollution and to maintain or restore wholesomeness of water in the country.

Technology-based standard

A technology-based standard include determining

- a definition of –virtual elimination;
- rules for monitoring and interpreting the data obtained;
- which chemicals should be monitored and regulated;
- how to verify industry data;
- what to do for water bodies of very different initial water quality;
- what constitutes compliance with the regulation;
- when the regulations are to be reviewed and revised and what new compounds should be added to the initial list.

A technology-based effluent standards an effluent standard set at the level of emissions that a source would produce if it were employing a particular type of abatement technology. It would require enormous effort to establish effluent standards for each and every individual source. This is a process that uses a large amount of water for cleaning and processing purposes; thus, the wastewater may contain large amounts of suspended solids.

Efficiency and Cost-Effectiveness

The technology-based effluent standards are designed, to be applied on a provincial basis. The same standards for, say, leather-processing plants will be applied to all in the province, whether they are located on a river just upstream from a large urban area or on a river in some remote part of the province. It is for all pollution sources because the imposition of a specific technology may affect costs quite differently depending on their size, product mix, and other factors. A totally technology-based approach to pollution control thus be either cost effective of socially efficient. Cost-effectiveness examines the maximum effect, in terms of reduced emissions, for the money spent.

Indian government has introduced national standards for some compounds, addressed some interjurisdictional water pollution problems, and established national guidelines for water quality. Water quality is a problem in parts of India.
The Water (Prevention and Control of Pollution) Act, 1974

The Water Prevention and Control of Pollution Act, 1974 (the "Water Act") has been enacted to provide for the prevention and control of water pollution and to maintain or restore wholesomeness of water in the country.

JSS ACADEMY OF HIGHER EDUCATION & RESEARCH
(DEEMED TO BE UNIVERSITY) MYSURU

SMART CAMPUS POLICY

INTRODUCTION:

JSS Academy of Higher Education & Research, Mysuru has established its state of art Campus using cutting edge technology. It has achieved smart campus status in implementing the below technologies like:

1. Smart Physical Security and Surveillance “Safety & Security”
2. Smart Wi-Fi Enabled Campus “Connectivity and Digitization”
3. Smart Buildings “Establishment & Development”
4. Smart Recycling Process “Waste, Water, Air Management”
5. Smart Working &Transportation System “Services & Connectivity”.
6. Smart Energy Conservation and Utilization practice “Water, gas, electricity &infrastructure”
7. Smart Environment Management “Green environment resilient”
8. Smart Hostel & Smart Canteen management “Food & Health”
9. Smart Teaching & Learning “Education, learning & digitization”
10. Smart Extra Activities “Sports, cultural & Recreation”
11. Smart Outreach Activities “Social Service & Connectivity”

I. OBJECTIVE:

- Embed the use of smart technology into daily life of the campus; providing an opportunity for the development and application of innovation and technology to support a smart campus.
- Integrate an enhanced process and program focused on materials, security, health, transport, energy and environmental management.
- Focus on maintaining “Eco friendly institution” thorough best practice.
- Provide world class facilities and enabling nationally and internationally renowned industrial/institutional partners to co-locate on the campus.

II. SMART CAMPUS INITIATIVES:

a). Over all activities:

- The JSS Academy of Higher Education & Research implemented CCTV Cameras regarding students’ day and night from the year2010.
- The surveillance has built in analytic and intelligence for immediate remedial measures.
- Students are always connected to smart Wi-Fi.
- Healthy environment to support the mental, physical, and social wellbeing of the students and staff of the JSS Academy of Higher Education & Research.
- Daily power and water consumption data per student and room basis captured and analyses for reducing consumption cost.
- Smart help system for students to attend to all their hostel requirements on the services front.

b). Students Centric Smart Campus:

- Students are fully safe and secure with homely atmosphere and are being monitored round the clock.
- Students have dedicated band width with high-speed internet both on campus and hostel rooms.
- Smart Metering has given lot of data in terms of consumption pattern based on which several optimization measures have been implemented.
- Smart portal has a great impact on both students and other stakeholders who are directly involved in daily hostel operations.

c). ICT Based Smart Campus:

- Physical security of students in the campus was a big challenge.
- 400 CCTV cameras are always in operations for surveillance.
- Internet plays a vital role in enabling students to pursue their academic goals. Internet with adequate band width was provided to make the campus Wi-Fi enabled.
- Optimization and improvement can only be brought about by identifying consumption patterns. The goal was to reduce the consumption of water and electricity to the lowest levels possible. Smart Metering was implemented for taking optimal decisions.
- Many students join every year. JSS Academy of Higher Education & Research needed a SMART portal where in all services are taken care centrally from student entry in hostel and to their exit. Smart Portal was always made operational for connectivity with students.

d). Environment Friendly Smart Campus:

- In order to minimize energy usage, improve the efficiency of all energy/ resources (natural resources, water, electricity) consuming systems and equipment, and improve the environment in all facilities, JSS Academy of Higher Education & Research has adopted a energy / resources conservation and recycling policy.
- Conservation of energy and natural resources and recycling process is an integral part of JSS Academy of Higher Education & Research facilities' design and usage.
- The JSS Academy of Higher Education & Research employs a variety of energy conservation, recycling, and other techniques to lessen the consumption of resources and achieve the lowest feasible life cycle costs.
- Energy conservation measures will be achieved by using the most cost-effective, energy-efficient approach with consideration given for flexibility of use and future remodeling convenience. Recycling efforts are encouraged at the Institution/department level.
- All faculty, staff, students, design consultants, and construction contractors observe energy and resource conservation measures employed by the campus.
- The Campus Facilities Maintenance & Management Authority- Deputy Registrar shall be the principal coordinator of all design disciplines, which includes responsibility for the implementation of this policy.
- Constituent Colleges & Departments are responsible for internal energy conservation, recycling efforts.
- The Transport Policy provides the JSS Academy of Higher Education & Research with a standard procedure for the acquisition, enhancement, use, control, maintenance, repair, checking fuel efficiency and disposal of the JSS Academy of Higher Education & Research's vehicles and for the management of related forms of transport engaged for official purpose.

III. LONG TERM GOAL:

The long-term strategy of the JSS Academy of Higher Education & Research focuses on the creation of a world-changing, connected, healthy and vibrant JSS Academy of Higher Education & Research campus. Within this the JSS Academy of Higher Education & Research will concentrate on:

a). Digital Environment

- Open, flexible, integrated, interoperable, secure, and scalable ICT architecture.
- Sense, capture, monitor and evaluate data to support and study the performance of the campus in real time.

b). Integrated Urban Energy Systems

- Low carbon, low impact energy in a complex urban environment, focusing on generation, storage, distribution, and management.

c). Data-driven Infrastructure Innovation

- Resilient infrastructure systems.
- Innovation in infrastructure design and delivery.
- Building Information Modelling (BIM) for design and life-cycle performance.

d). Health & Wellbeing

- Evaluate, understand, and improve the physical environment
- Develop new practices for workplace wellbeing.
- Develop the technology, including wearable technology, to measure and influence health related behavior.

e). Student Experience and Pedagogy

- Data-driven services and spaces for an improved student experience.
- Technology-enabled learning & teaching (including active learning, interactive teaching, flexible study).

IV. AUTHORITY:

The Vice-Chancellor, Registrar & Deputy Registrar of JSSU holds delegated authority and is responsible for all aspects of the JSS Academy of Higher Education & Research's "SMART CAMPUS POLICY".

The Smart Campus Policy of JSS Academy of Higher Education & Research follows:

- The Swachh Bharat Mission (Urban) guidelines, Government of India.
- National conservation strategy and policy statement on environment and development, Government of India.
- National Cyber Security Policy, Ministry of Communication and Information Technology, Government of India.

JSS ACADEMY OF HIGHER EDUCATION & RESEARCH
(DEEMED TO BE UNIVERSITY) MYSURU

SMART CAMPUS SUPPORTING SUSTAINABLE DEVELOPMENT GOALS

SOCIAL RESPONSIBILITY - TOUCHING THE LIVES OF MILLIONS

JSS AHER'S Social Responsibility is an approach of ethical and intelligent management, which involves both its impact on its human, social and natural context, and its active role on the promotion of Sustainable Human Development of the country. Within this approach, "Sustainable Campus" is a strategy that strives to reduce the ecological footprint of the Institution via a rational use of resources and to educate the JSSAHER community on the ethics of sustainability.

INITIATION OF THE CONCEPT OF SMART CAMPUS

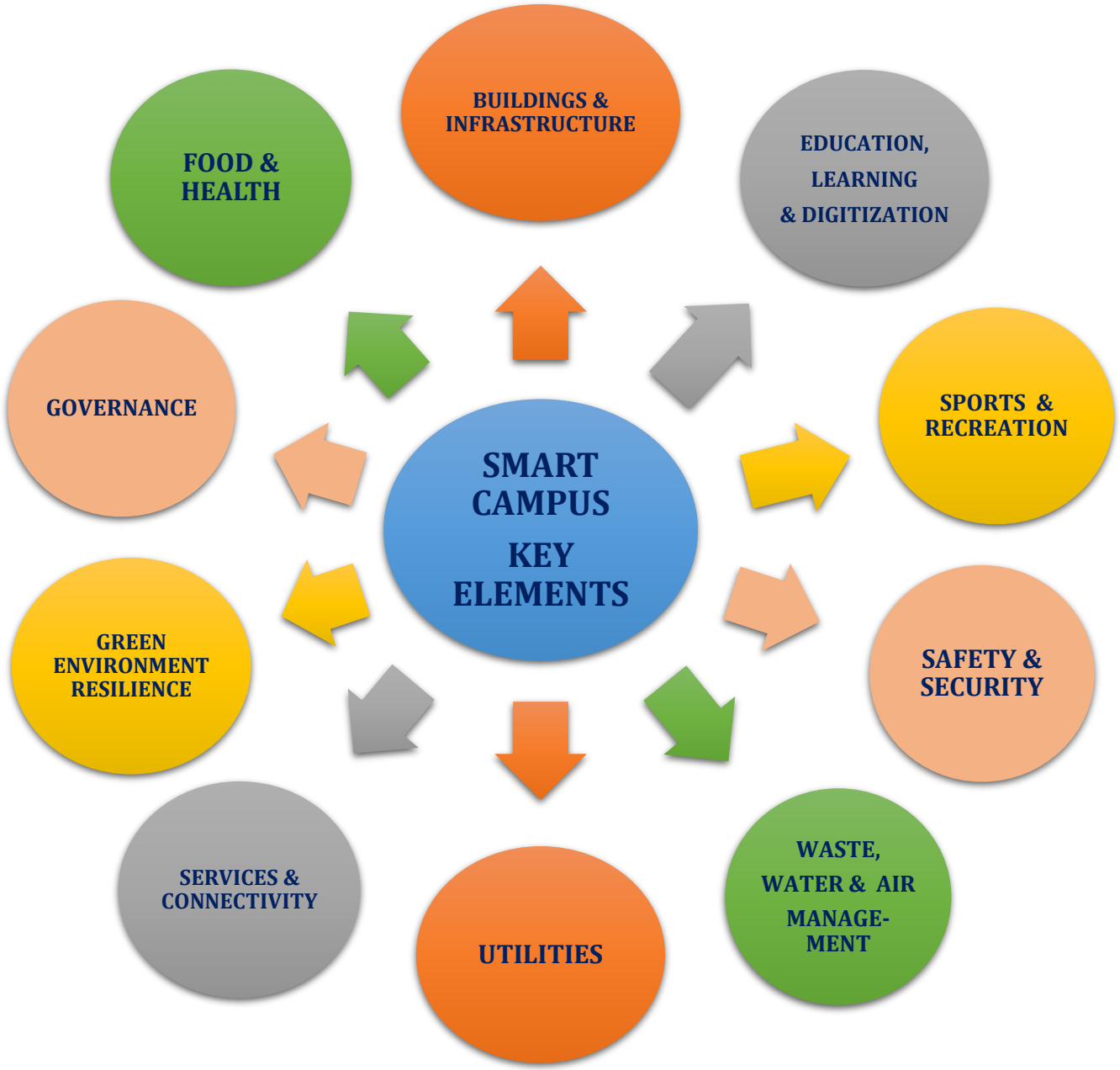
First Meeting on 29-11-2017

Meeting on 16-04-2020 & 03.04.2021
To take measures in protecting the campus from COVID 19 Pandemic

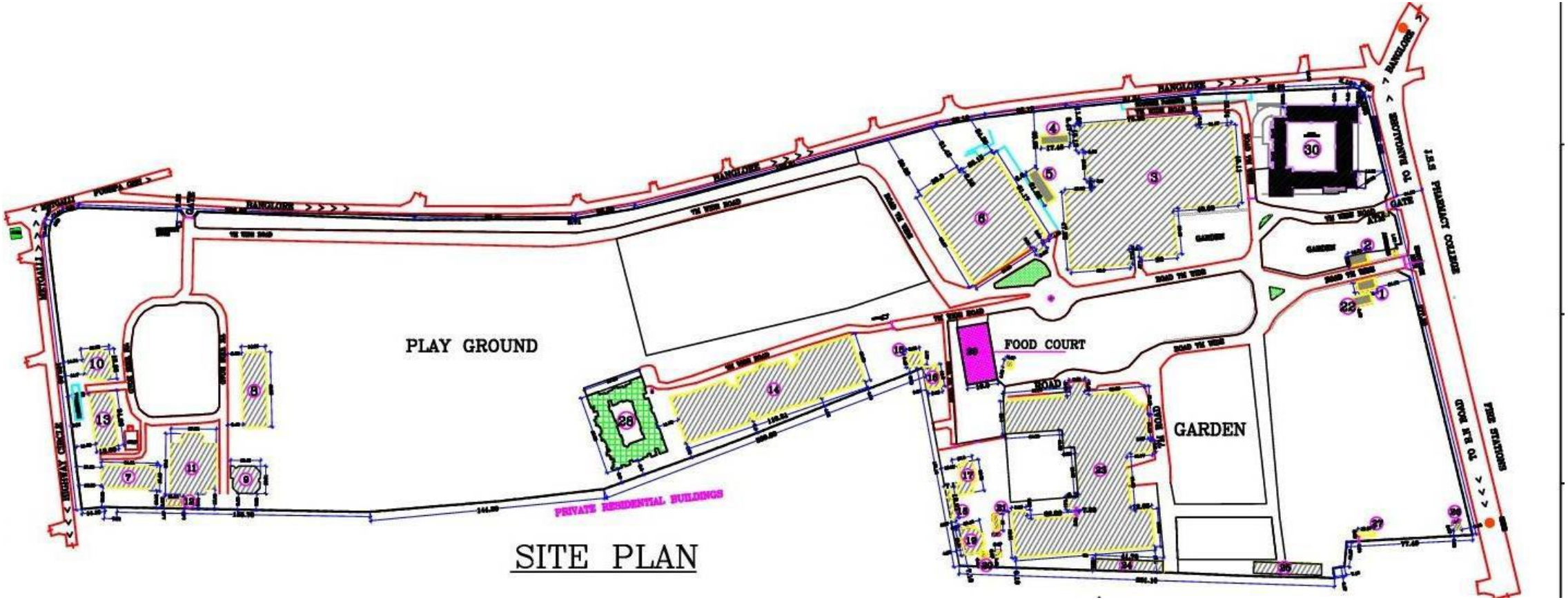
Key Elements of a Smart Campus

1. BUILDINGS
2. EDUCATION & LEARNING
3. SPORTS & RECREATION
4. SAFETY & SECURITY
5. WASTE, WATER, AIR MANAGEMENT
6. UTILITIES – WATER, GAS, ELECTRICITY
7. INFRASTRUCTURE
8. SERVICES
9. GREEN ENVIRONMENT RESILIENCE
10. WORKING
11. RETAIL
12. FOOD & HEALTH
13. CONNECTIVITY & DIGITISATION

1. FOOD & HEALTH
2. CONNECTIVITY & DIGITISATION
3. BUILDINGS & INFRASTRUCTURE
4. ONILINE EDUCATION, LEARNING
5. MENTAL HEALTH & RECREATION
6. WASTE, WATER, AIR MANAGEMENT
7. SERVICES, CONNECTIVITY & RETAIL
8. GREEN ENVIRONMENT RESILIENCE
9. SAFETY & SECURITY
10. GOVERNANCE


SMART CAMPUS KEY ELEMENTS
BUILDINGS & INFRASTRUCTURE
EDUCATION, LEARNING & DIGITIZATION
SPORTS & RECREATION
SAFETY & SECURITY
WASTE, WATER & AIR MANAGE-MENT
UTILITIES
SERVICES & CONNECTIVITY
GREEN ENVIRONMENT RESILIENCE
GOVERNANCE
FOOD & HEALTH

JSS MEDICAL INSTITUTIONS CAMPUS OF JSSAHER
TOPOGRAPHICAL VIEW



SITE PLAN

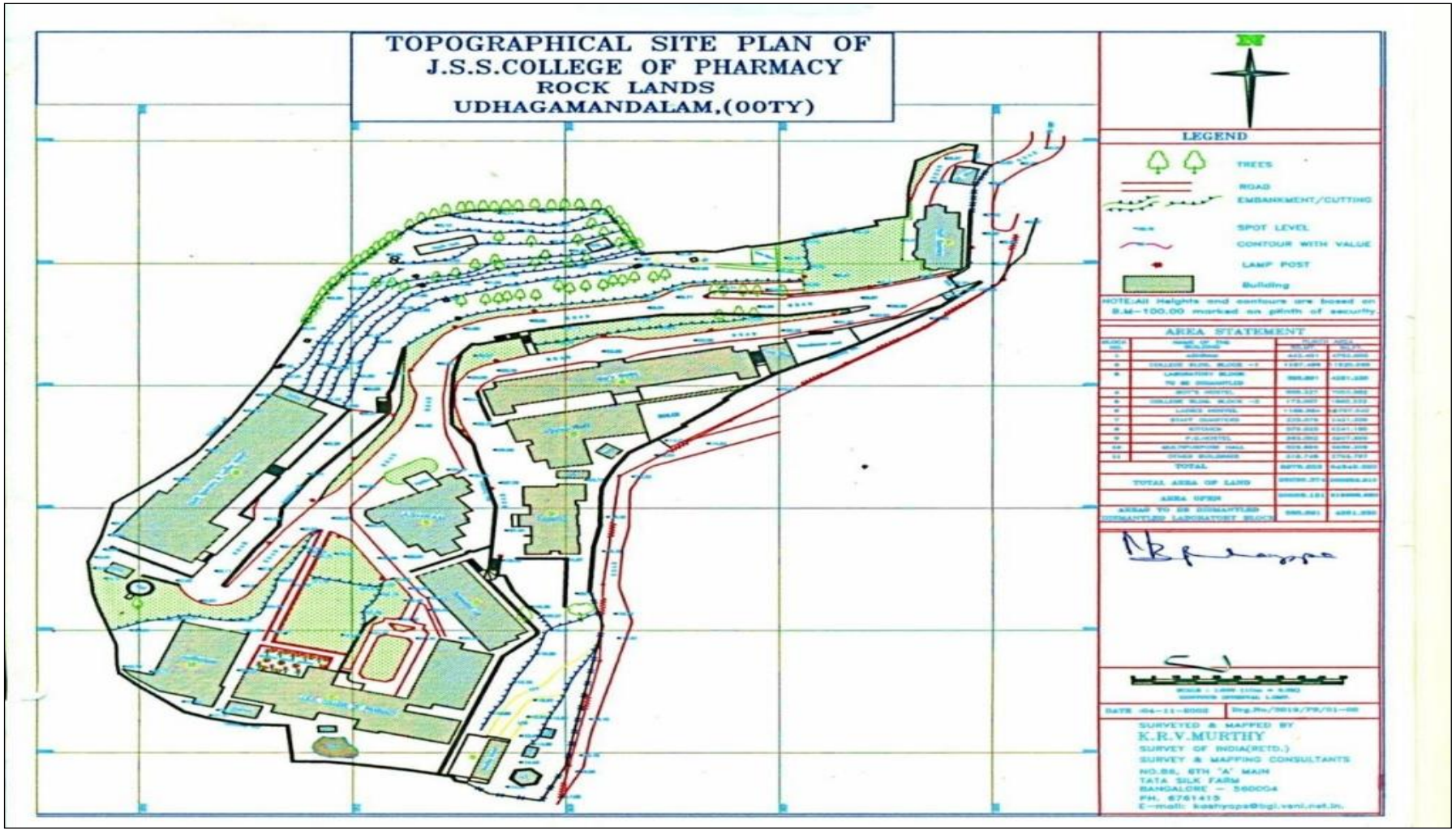
TOTAL AREA STATEMENT

AREA in Sq. Mt – 1,76,459.63

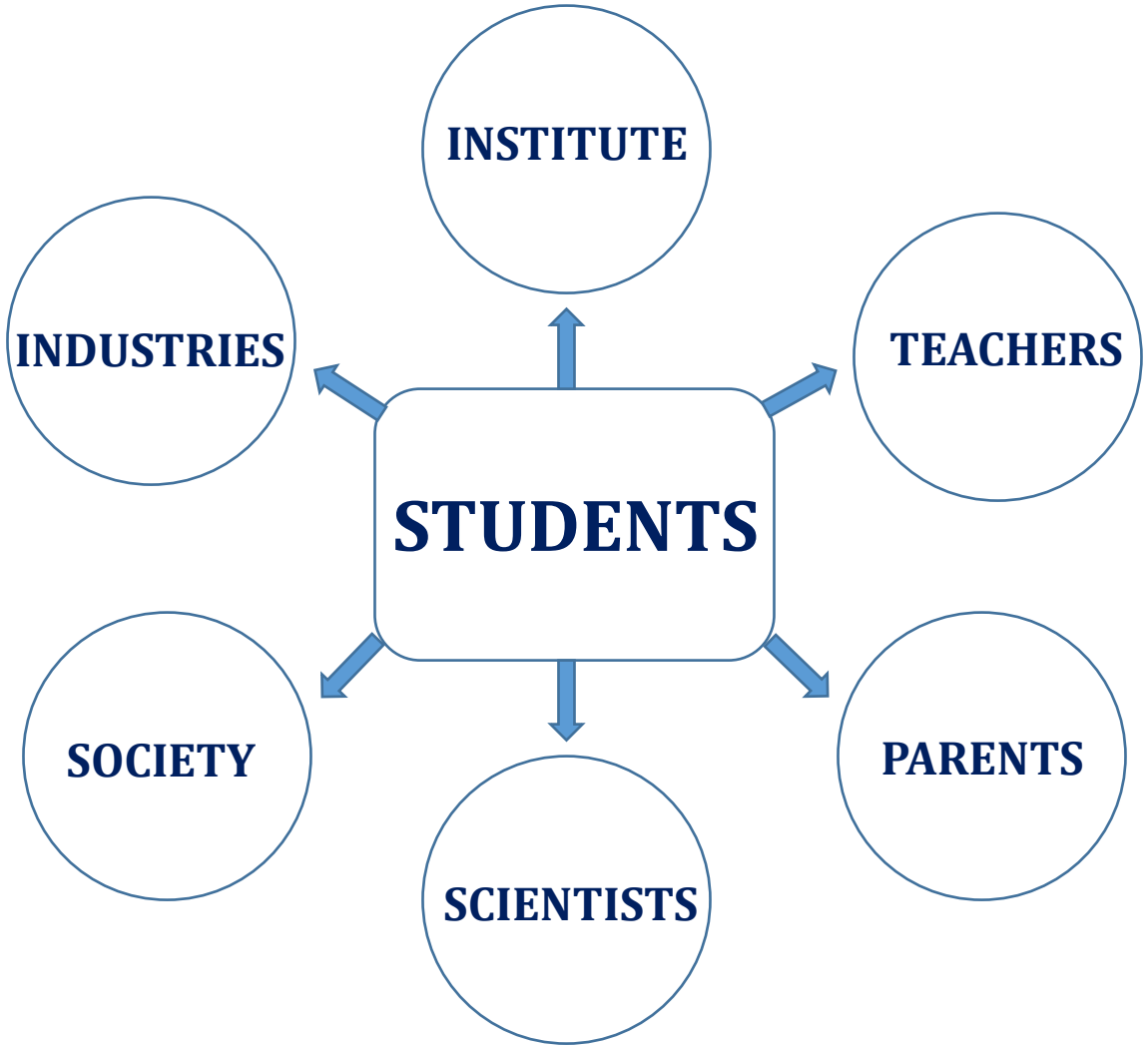
AREA in Sq. Ft – 1,899,411.41

AREA in Acres – 43.60

JSS PHARMAY INSTITUTIONS CAMPUS OF JSSAHER
TOPOGRAPHICAL VIEW



SMART CAMPUS – BEGINNING & STAKE HOLDERS



For meaningful and successful sustainability programs in campus we need to

- ❖ Set clear strategies and goals
- ❖ Comprehensive approach
- ❖ Integrate students, faculty, staff and external partners
- ❖ Initiate pilot projects in several areas involving students
- ❖ Plan policies, financial resources, facilities management, curriculum, sustainability literacy, ecosystems, land use, energy resources, etc.

SMART CAMPUS POLICY

OBJECTIVE:

- ✓Embed the use of smart technology into daily life of the campus; providing an opportunity for the development and application of innovation and technology to support a smart campus.

- ✓Integrate an enhanced process and programme focused on materials, security, health, transport, energy and environmental management.

- ✓Focus on maintaining “Eco friendly institution” through best practices.

- ✓Provide world class facilities and enabling nationally and internationally renowned industrial/institutional partners leading to meaningful collaboration.

SMART CAMPUS POLICY

a). Students Centric:

✓Students are fully safe and secure with homely atmosphere and are being monitored round the clock.

✓Students have dedicated band width with high speed internet both on campus and hostel rooms.

✓Smart Metering has given lot of data in terms of consumption pattern based on which several optimization measures have been implemented.

b). ICT enabled:

✓Physical security of students in the campus was a big challenge.

✓400 CCTV cameras are in operations for surveillance at all times.

✓Wi-Fi enabled.

✓Students needed a SMART portal where in all services are taken care centrally from student entry in hostel and to their exit. Smart Portal was made operational for connectivity with students at all times.

SMART CAMPUS POLICY

c). Environment Friendly:

✓JSS AHER has adopted an energy / resources conservation and recycling policy.

✓Energy conservation measures will be achieved by using the most cost-effective, energy-efficient approach with consideration given for flexibility of use and future remodeling convenience. Recycling efforts are encouraged at the Institution/department level.

✓All faculty, staff, students, design consultants, and construction contractors observe energy and resource conservation measures employed by the campus.

✓The Transport Policy provides standard procedure for the acquisition, enhancement, use, control, maintenance, repair, checking fuel efficiency and disposal of the vehicles and for the management of related forms of transport engaged for official purpose.

STATUS OF SMART CAMPUS PROJECT

BUILDING & INFRASTRUCTURE

- Accessibility
- Safety and Security
- Energy efficient
- Rain Water Harvesting
- Walkable campus
- Bicycle
- Sustainable Transport
- Road network
- Signage

EDUCATION, LEARNING & DIGITIZATION

- Smart Classroom
- E-Resources
- Wi-Fi Connectivity
- ICT Enabled services
- Modular Laboratories
- Innovation Centre
- Virtual Class and Laboratories
- Outreach Programmes

SPORTS & RECREATION

- Playgrounds
- Sport facilities- Indoor and Outdoor
- Recreational space
- Open Gym
- Yoga facilities
- Amusement park
- Open air theatre
- Swimming pool

SAFETY & SECURITY

- CCTV surveillance
- Fire alarms
- Fire fighting
- Peripheral safety
- Visitor management system
- Biometric system
- Anti-ragging
- Women safety
- Student counselling

WASTE, WATER & AIR MANAGEMENT

- Sanitation and cleanliness
- STP
- Solid waste management
- Plastic waste management
- E-waste management
- Automatic sensor taps
- Air monitoring system

UTILITIES

- Solar Projects
- Smart lighting System
- Emergency power backup
- Smart micro grids
- Bio-gas plant
- Kiosks

GREEN ENVIRONMENT RESILIENCE

- Green Campus
- Landscaping
- Preserving open space
- Soil erosion control
- Ground water recharging

FOOD & HEALTH

- Wellness Centre
- Health Centre
- Potable water facility
- Personal Hygiene
- Nutritional Values
- Dietary Components

SERVICES & CONNECTIVITY

- Online services
- Amenities- Bank, Food court, Stationery, pharmacy
- Wi-Fi Services
- LAN

GOVERNANCE

- ERP
- Less paper Office
- Training and Development
- ART- Accountability, Responsibility, Transparency

VISIT TO SANKALP APARTMENTS – BIO WASTE MANAGEMENT

ACHIEVEMENT OF KEY ELEMENTS - VALIDATION

GREEN BUILDING AUDIT
INDIAN GREEN BUILDING COUNCIL (IGBC)
Consultancy by Godrej

IGBC Rating Program to suit Different Building Types

IGBC Green Homes
IGBC Green Factory Buildings
IGBC Existing Buildings
IGBC Green Townships
IGBC Green Landscapes
IGBC Green Interiors
IGBC Green School
IGBC Green Campus
IGBC Green New Buildings
IGBC Green Data Centre
IGBC Green Healthcare

ACHIEVEMENT OF KEY ELEMENTS

GREEN BUILDING AUDIT- INDIAN GREEN BUILDING COUNCIL (IGBC)

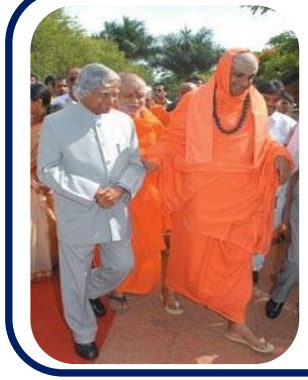
Consultancy by Godrej

No	Category	Points
1	Site Planning & Management	22
2	Sustainable Transportation	11
3	Water Conservation	18
4	Energy Efficiency	21
5	Material & Resources	03
6	Health & Well being	06
7	Green Education (GE)	03
8	Innovative Practices	06
	Total	**90**

Certification Level	New Campus	Existing Campus	Recognition
Certified	40 - 49	36 - 44	Best Practices
Silver	50 – 59	45 - 53	Outstanding Performance
Gold	60 – 74	54 - 66	National Excellence
Platinum	75 - 100	67 - 90	Global Leadership

5 categories prerequisite & 29 possible credits

SOCIAL RESPONSIBILITY - TOUCHING THE LIVES OF MILLIONS



JSS AHER'S Social Responsibility is an approach of ethical and intelligent management, which involves both its impact on its human, social and natural context, and its active role on the promotion of Sustainable Human Development of the country. Within this approach, "Sustainable Campus" is a strategy that strives to reduce the ecological footprint of the Institution via a rational use of resources and to educate the JSSAHER community on the ethics of sustainability.

TOUCHING THE LIVES

OF the students

1. As a most respected Higher Education Institute in the health sciences attracting students from a range of backgrounds nationally and internationally.
2. Responsive to students with a shared understanding of our mutual responsibilities.
3. Student support that covers all issues including support to low-income group students.
4. Transforming students as responsible citizens for a Sustainable Development.

OF the staff

1. Adopt best practices in its Human Resources Management policies and Practices.
2. Professional development.
3. Observe the fundamental tenets of human rights, safety and non-discrimination.
4. Involve employees in the decision-making processes, where appropriate.
5. Providing opportunities for staff to undertake projects with local communities.

SOCIAL RESPONSIBILITY - TOUCHING THE LIVES OF MILLIONS

TOUCHING THE LIVES

OF our environment

1. Ensure that the developments in JSS AHER are sustainable and do not have a negative impact on the environment.

2. Promote the concepts of the 3Rs of Reduction, Reuse and Recycling and eliminate, where possible, the use of non- degradable materials.

3. Aim for a continuous reduction of the carbon footprint of the Institution.

4. Provide equipment, training and other resources to ensure a healthy and safe environment for the students and staff.

5. Continuously work and evolve environmental improvements in the way we manage our transport, waste and energy.

TOUCHING THE LIVES

OF our City and our Community

1. To work with the City of Mysore and regional partners to raise the health profile of the City and neighboring districts ; and in partnership help secure the economic, health, social and cultural regeneration of the City and region.

2. Make significant and major contributions through our Faculty to the Social Responsibility agenda including: - the training of the future health professional workforce
   - The ongoing support for health professionals
   - Support JSS Hospital to provide access to quality healthcare at affordable costs
   - Nurture and contribute to research that impacts healthcare and health policies and makes significant contribution to national and global health.

4. Working with young people in local schools: - to discuss health and science and its relevance to their everyday lives
   - to inspire them to consider careers in science and health
   - to devise creative and fun activities to help engage them

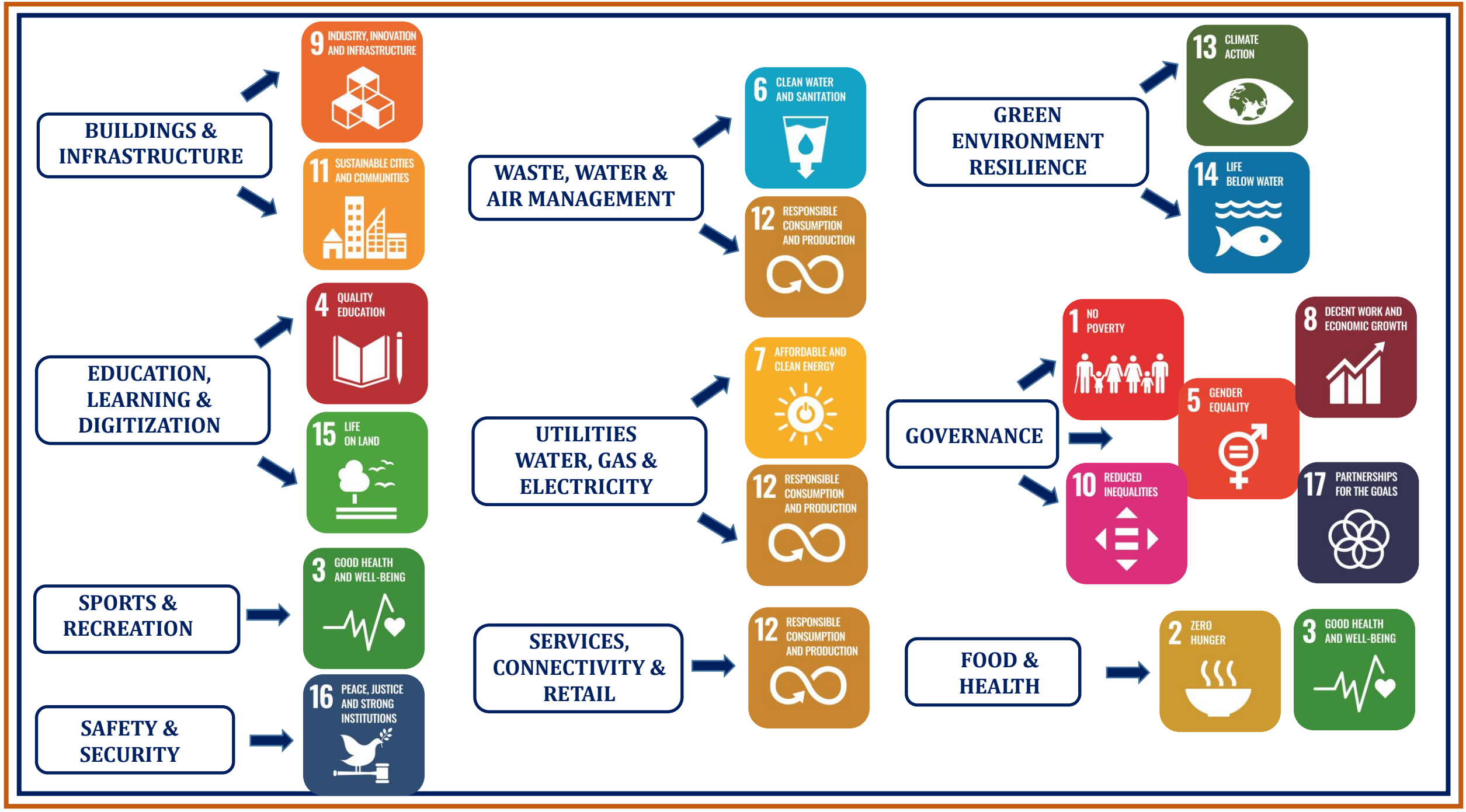
5. By involving the public/patients in our work to improve the quality of our teaching and healthcare delivery.

SMART CAMPUS INITIATIVES IN LINE WITH SUSTAINABLE DEVELOPMENT GOALS (SDGs OF THE UN)


SMART CAMPUS KEY ELEMENTS
BUILDINGS & INFRA-STRUCTURE
EDUCATION, LEARNING & DIGITIZATION
SPORTS & RECREATION
SAFETY & SECURITY
WASTE, WATER & AIR MANAGE-MENT
UTILITIES
SERVICES & CONNECTIVITY
GREEN ENVIRONMENT RESILIENCE
GOVERNANCE
FOOD & HEALTH
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

INTEGRATION OF SDGs INTO KEY ELEMENTS OF SMART CAMPUS

No	KEY ELEMENTS	SDGs
1	BUILDINGS & INFRASTRUCTURE	SDG 9 (Industry, Innovation & Infrastructure), SDG 11 (Sustainable Cities & Communities)
2	EDUCATION, LEARNING & DIGITISATION	SDG 4 (Quality Education), SDG 15 (Life on Land)
3	SPORTS & RECREATION	SDG 3 (Good Health & Well- Being)
4	SAFETY & SECURITY	SDG 16 (Peace, Justice & Strong Institutions)
5	WASTE, WATER, AIR MANAGEMENT	SDG 6 (Clean Water & Sanitation), SDG 12 (Responsible Consumption & Production)
6	UTILITIES – WATER, GAS, ELECTRICITY	SDG 7 (Affordable & Clean Energy), SDG 12 (Responsible Consumption & Production)
7	SERVICES, CONNECTIVITY & RETAIL	SDG 12 (Responsible Consumption & Production)
8	GREEN ENVIRONMENT RESILIENCE	SDG 13 (Climate Action), SDG 14 (Life Below Water)
9	GOVERNANCE	SDG 1 (No Poverty), SDG 5 (Gender Equality), SDG 8 (Decent Work & Economic Growth), SDG 10 (Reduced Inequalities), SDG 17 (Partnerships for the Goals)
10	FOOD & HEALTH	SDG 2 (Zero Hunger), SDG 3 (Good Health & Well-Being)


BUILDINGS & INFRASTRUCTURE
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
11 SUSTAINABLE CITIES AND COMMUNITIES
EDUCATION, LEARNING & DIGITIZATION
4 QUALITY EDUCATION
15 LIFE ON LAND
SPORTS & RECREATION
3 GOOD HEALTH AND WELL-BEING
SAFETY & SECURITY
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
WASTE, WATER & AIR MANAGEMENT
6 CLEAN WATER AND SANITATION
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
UTILITIES WATER, GAS & ELECTRICITY
7 AFFORDABLE AND CLEAN ENERGY
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
SERVICES, CONNECTIVITY & RETAIL
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
GREEN ENVIRONMENT RESILIENCE
13 CLIMATE ACTION
14 LIFE BELOW WATER
GOVERNANCE
1 NO POVERTY
10 REDUCED INEQUALITIES
5 GENDER EQUALITY
8 DECENT WORK AND ECONOMIC GROWTH
17 PARTNERSHIPS FOR THE GOALS
FOOD & HEALTH
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING

STUDENTS SUSTAINABILITY PROJECT OF THE YEAR – INTERNATIONAL RECOGNITION – ASIA PACIFIC TRIPLE E AWARDS

CULTIVATION OF SPIRULINA – NUTRITIONAL DRINK EMPHASIZING ON WOMEN HEALTH – TOP 5 STARTUPS BY TiE - MYSURU CHAPTER

SUSTAINABLE DEVELOPMENT GOAL RANKS OF JSSAHER

SDG No.	GOAL	2019	2020 (India)	2020 (Global)
	Overall Ranking	101 - 200	3	201 - 300
1	No Poverty	-	2	60
2	Zero Hunger	-	2	101 - 200
3	Good Health and Well Being	46	1	20
4	Quality Education	201 - 300	13	401 - 600
5	Gender Equality	201+	2	101 - 200
6	Clean Water & Sanitation	-	12	101 - 200
7	Affordable & Clean Energy	-	7	101 - 200
8	Decent Work and Economic Growth	-	6	400+
9	Industry, Innovation and Infrastructure	201 - 300	12	400+
10	Reduced Inequalities	101 - 200	7	301 - 400
11	Sustainable Cities and Communities	101 - 200	5	301 - 400
12	Responsible Consumption & Production	16	6	201 - 300
13	Climate Action	-	2	101 - 200
14	Life Below Water	-	-	-
15	Life on Land	-	3	73
16	Peace, Justice and Strong Institutions	91	8	400+
17	Partnership for the Goals	201 - 300	5	201 - 300

THE Impact Rankings 2021

MENU THE DataPoints

JSS Academy of Higher Education and Research

- Home
- Data+
- Explore
- New Data
- Reputation
- WUR Release
- NEW SDG Impact Dashboard
  - Overview
- Settings
- Logout
- Cookie Policy
- Terms and Conditions

THE Impact Rankings 2021

Data & methodology | Download

OVERALL SCORE

80.3 out of **100**

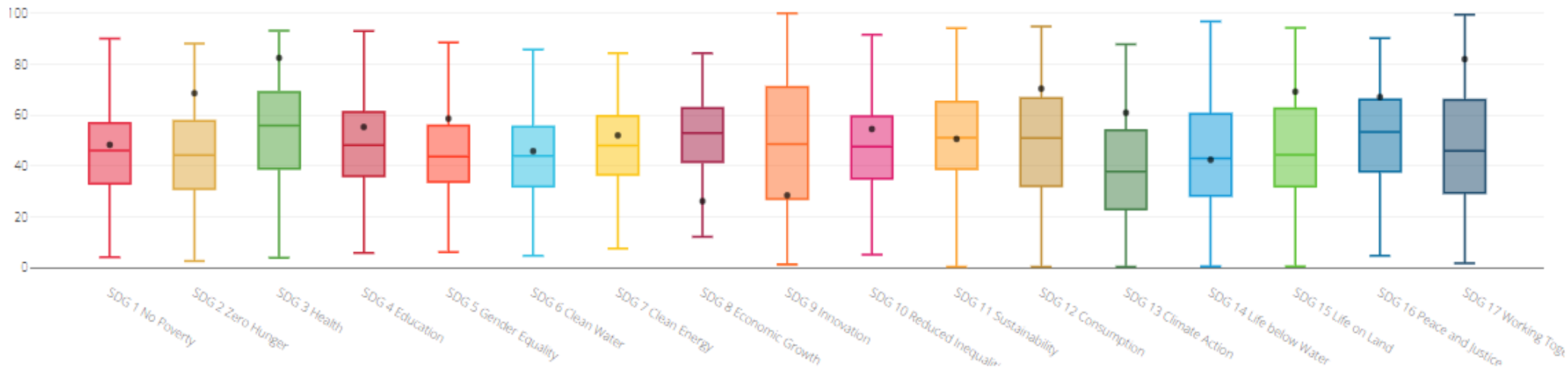
OVERALL RANK

101–200 out of **1117** institutions

SDG PARTICIPATED

17 out of **17** Sustainable Development Goals

SDG SCORES



THE Impact Rankings 2021

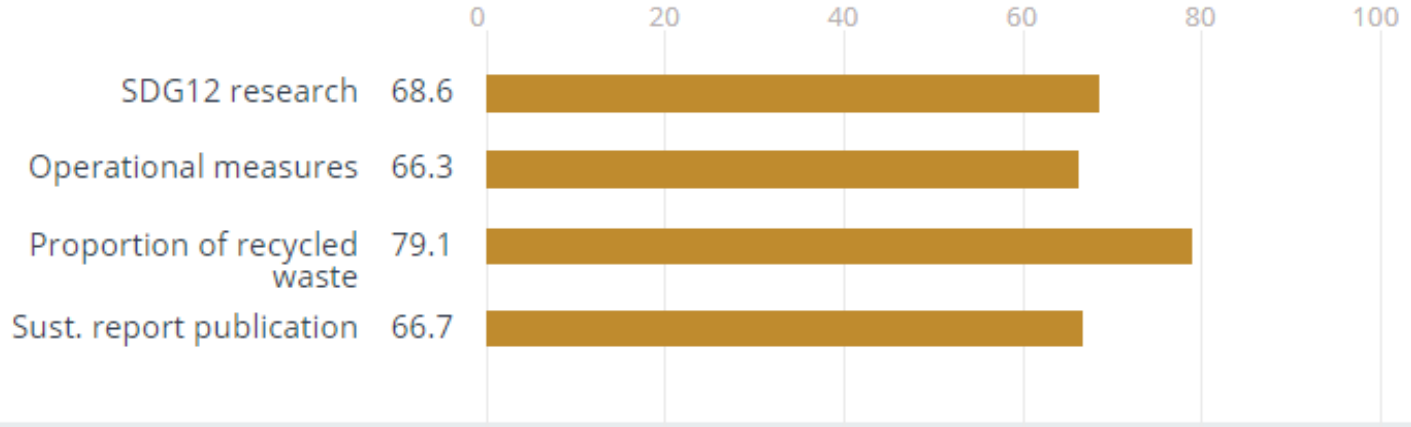
JSS Academy of Higher Education and Research

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

QUALIFYING SDG - 26% OF OVERALL

SCORE **70.4**

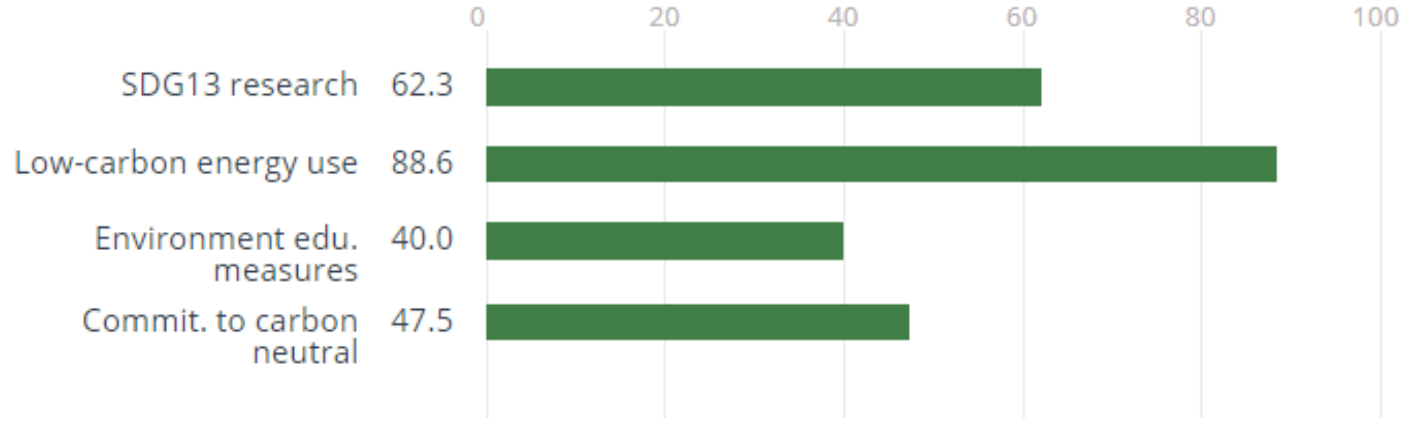
RANK **97** out of **503** institutions



13 CLIMATE ACTION

SCORE **60.9**

RANK **=81** out of **566** institutions



THE Impact Rankings 2021


Sustainable Life @
JSS ACADEMY OF HIGHER EDUCATION & RESEARCH
(DEEMED TO BE UNIVERSITY) MYSURU
"Leaving No One Behind"
Sustainable Development Goals
Smart Campus

JSS ACADEMY OF HIGHER EDUCATION & RESEARCH
(DEEMED TO BE UNIVERSITY) MYSURU

INFRASTRUCTURE & MAINTENANCE POLICY

JSS ACADEMY OF HIGHER EDUCATION & RESEARCH, MYSURU

PREFACE

JSS Academy of Higher Education & Research is focused on medical and health-related studies, and comprises JSS Medical College, JSS Dental College and JSS College of Pharmacy at the main campus in Mysore as well as in Ootacamund, Tamil Nadu. With a view to extend the horizons in the field of Health Sciences, the Department of Water and Health, Department of Health System Management were also started.

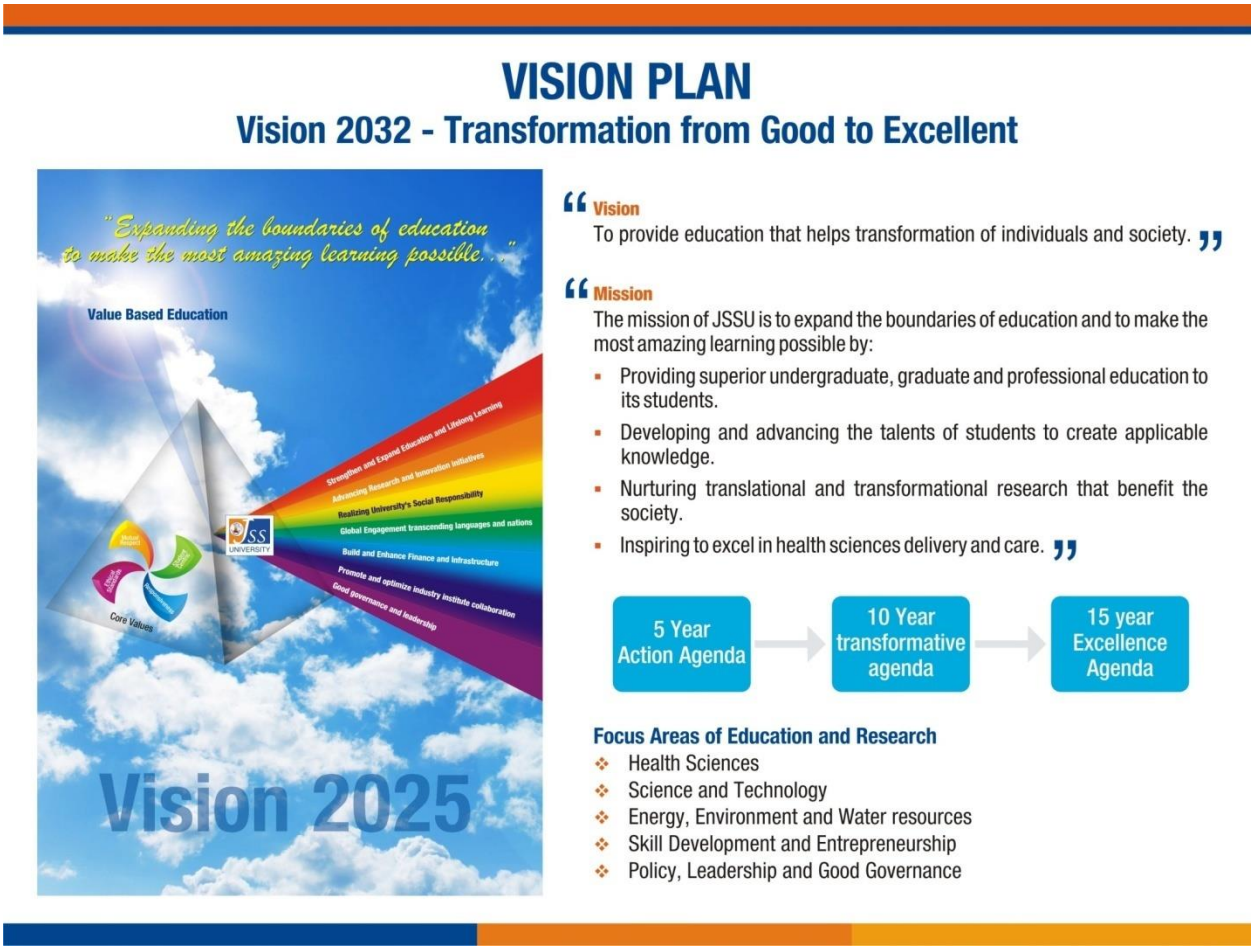
Over the years JSS Academy of Higher Education & Research has amassed several accolades. The institute is accredited with A+ Grade (CGPA of 3.47 out of 4) by National Assessment and Accreditation Council (NAAC) during 2018 re-accreditation. The Deemed to be University is continuously sustaining its position since three years in top 50 universities & top 10 pharmacy colleges in NIRF ranking. For the first time JSS AHER has been recognized globally by the Times Higher Education within top 500 universities and the institute has been listed in the band of 200-300 Universities across the world.

Continuing its efforts to impart quality education and infrastructure, JSS AHER has taken an initiative towards building up a Smart Campus by enhancing its teaching – learning resources, infrastructure, upgradation of technology, research & innovation, waste management and green environment resilience. The institute has planned to incorporate smart thinking which leads to sustainable living and working conditions especially among the students who are not only the main stake holders but also the future ambassadors of smart and sustainable life styles.

Table of Contents

Executive Summary

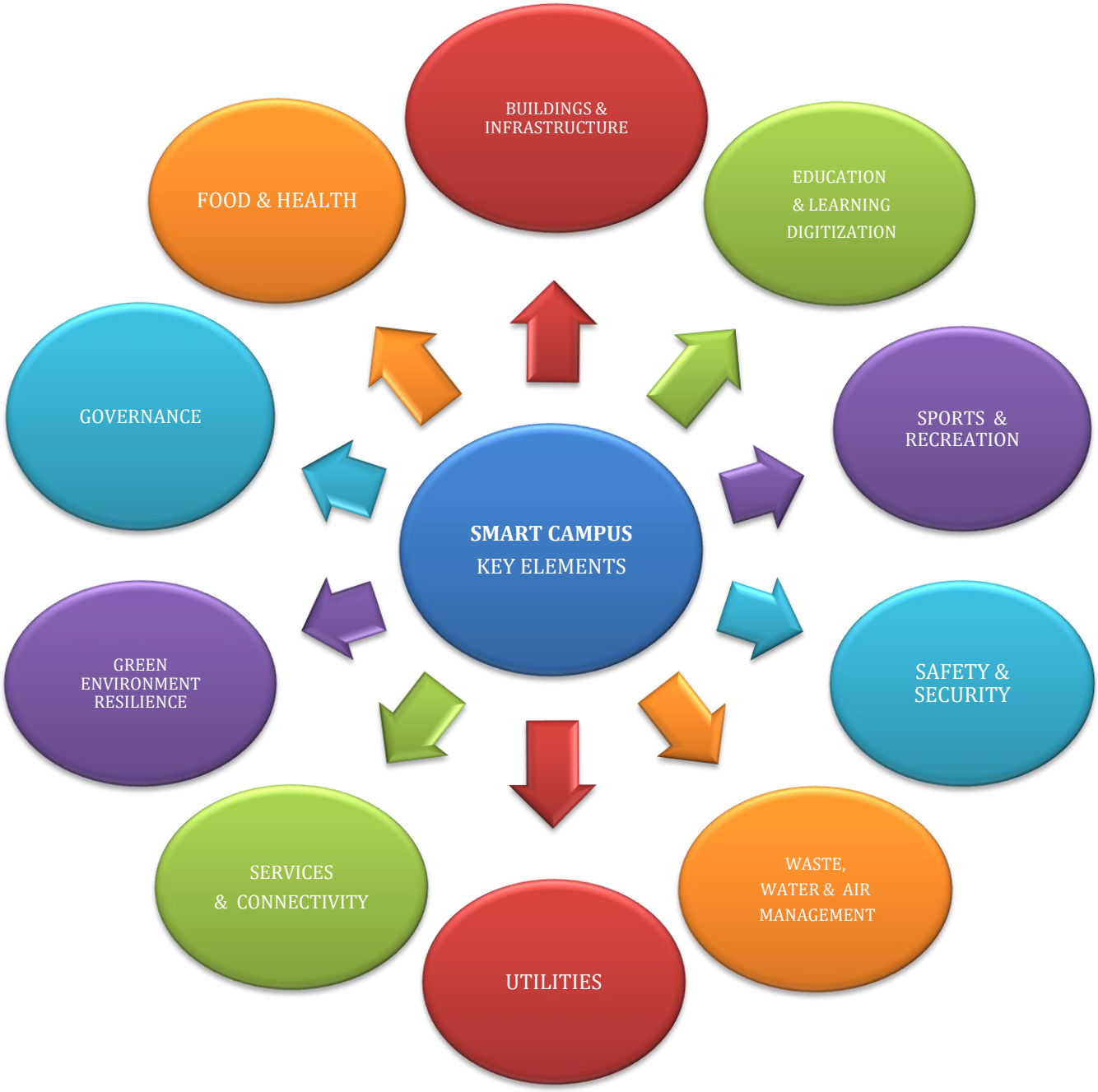
JSS group of institutions has a number of educational units at different regions and the JSS Academy of Higher Education & Research or shortly JSS AHER is one of the important milestones in the societal contribution of the parent organization, JSS Mahavidyapeetha and it has grown tremendously in just over a decade which is because of the continuous striving to fulfill the Vision & Mission of the Deemed to be University. The institute has set up a Vision Plan for the next 15 years to reach a status of excellence.

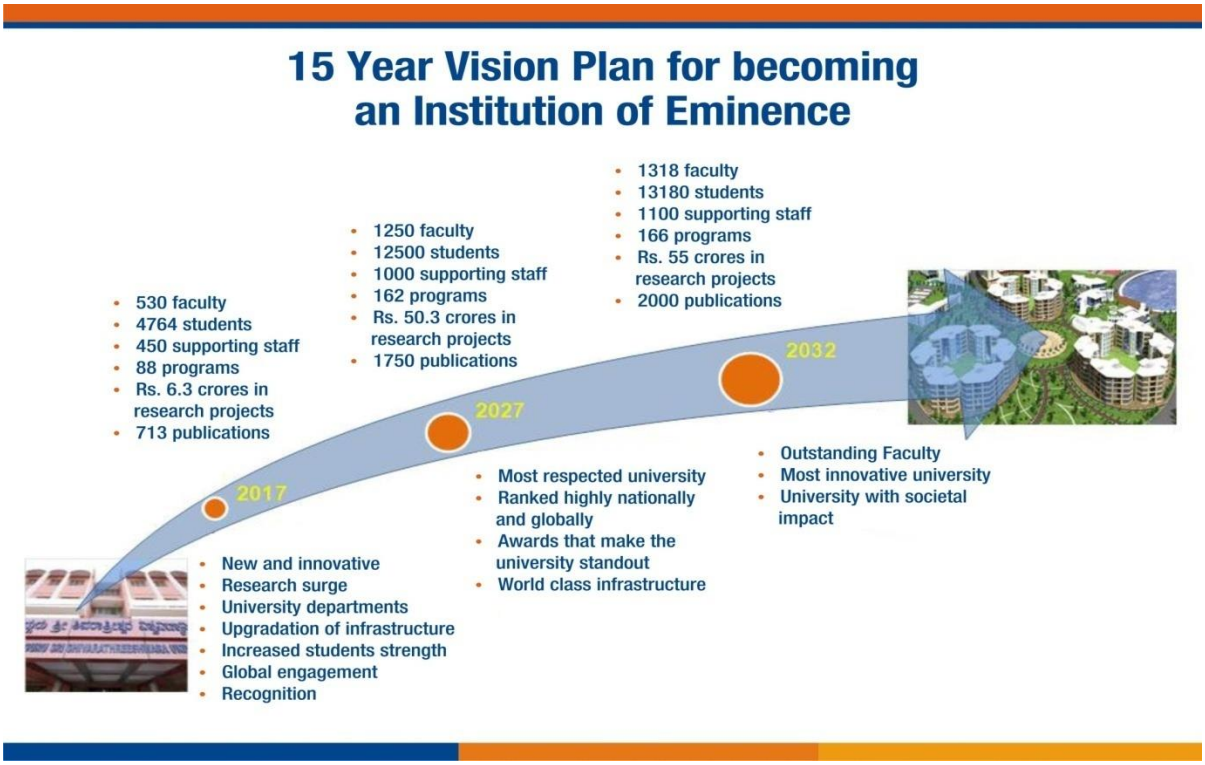


The institute is situated in a 43 acre land and comprises of Medical College, Dental College and University Departments (Faculty of Life Sciences and Health Systems Management Studies). JSS AHER has planned to adapt for a smart campus as per the need of the hour. The institute is focusing on 10 key elements that comprise smart campus viz. 1. Buildings & Infrastructure, 2. Education, Learning & Digitization, 3. Sports & Recreation, 4. Safety & Security, 5. Waste, Water, Air management, 6. Utilities – Water, Gas, Electricity, 7. Services & Connectivity, 8. Green environment resilience, 9. Governance & 10. Food & Health.

As an initial step, the institute has surveyed the available facilities which would enable either to enhance or add smart features. Further, discussions and feedback from stake holders are in progress which would add significant values towards the goal. Students are the central part of the smart campus as they are the ambassadors of a sustainable future.

To begin with, the institute has planned to focus on Swachhta Ranking, an initiative by the MHRD, Government of India which earmarks the potential of an institute to be smart.





JSS AHER has set a long term goal of establishing its new campus at Varuna with an estimated budget of Rs. 2000 Crores.

An over view of the architectural plan of the proposed Varuna campus

With the vision already set, the implementation of smart and best practices will be an important aspect to be followed for a smart and sustainable future of the employees and

the student communities at large. Executing the practices of energy conservation, reducing carbon footprints by sustainable food habits among the faculty and students, proper drinking water facilities, water re-usage, managing food, solid and other wastes, healthy living standards through habits of well being, pollution control within the campus achieved through pedestrian friendly atmosphere and reduction of vehicle commuting, increasing the green carpet and preserving open spaces and other institutional best practices are the key players of achieving a smart campus.

1. INTRODUCTION:

A Smart Campus actively learns from and adapts to the needs of its people and place, unlocking the potential of e-technology and enabling world-changing learning and research methodologies. Also to create an environment friendly atmosphere enabled with technology is the main goal of a smart campus. It is a modern application in the standard of the internet of things. The idea of building a "smart campus" implies that the institution will adopt advanced ICTs to automatically monitor and control all the facilities on campus. The students and staff members will benefit from location-aware services for using campus equipments and collaboration services. This will add values for students and increases the attractiveness of the campus. New emerging technologies have changed human lifestyles dramatically. The smart campus implements an IoT-based system to a selected part of campus like the Campus Environment, Campus Security, Campus Parking, Campus Building, Campus offices, and classroom to create smart environment, smart security, smart building, smart parking, smart offices, and smart classrooms.

Apart from focusing on technology, smart campuses are inevitable to restore environment and resources and also help the student communities for a smart and sustainable future. There are more than 750 universities, 40,000 colleges and institutes, and 1.5 million schools in India where around 200 to 300 million students are engaged in learning. Apart from being a significant consumer of energy, water and other utility and material resources, the educational campuses provide captive young thinkers action-based education on sustainable development. They are the spaces bubbling with potential opportunities to create skilled and 'job-ready' professional force.

Government of India has initiated a project on smart campuses throughout the country. The project is flagship activity of Technology, Education, Research and Rehabilitation for the Environment (TERRE) Policy Centre, a think-tank and action platform for sustainable development. It is called Smart Campus Cloud Network (SCCN).

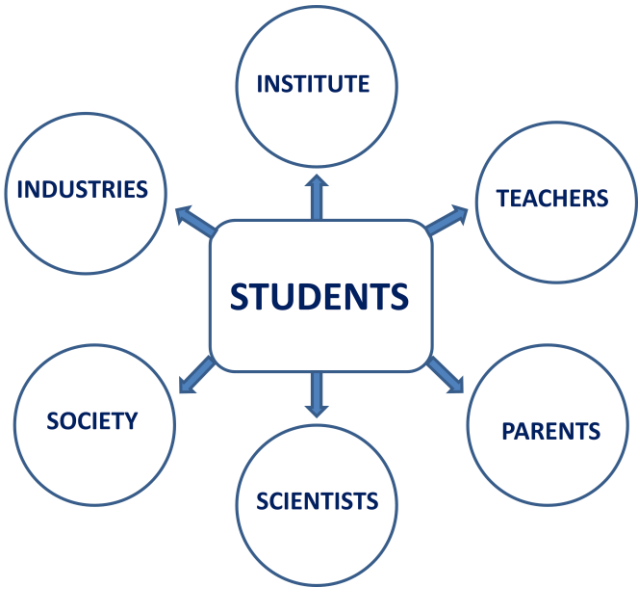
A smart campus is achieved by integrating sustainability to every component of an institute including building structures, renewable resources, digitalization through internet of things (IoT), bringing together the institute, stake holders, faculty and external members to understand the necessity of a sustainable and environment friendly campus.

JSS AHER has established its State of Art Campus using cutting edge technology. In order to achieve the smart campus status the institute and the constituent colleges have initiated the process of implementing technologies like

1. Smart Physical Security and Surveillance
2. Smart Wi-Fi Enabled Campus
3. Smart Metering
4. Smart Recycling Process
5. Smart Transportation System
6. Smart Energy Conservation and Utilization practice
7. Smart Hostel Management
8. Smart Canteen/food court management

For meaningful and successful sustainability programs in campus we need to

- Set clear strategies and goals
- Have a comprehensive approach
- Integrate students, faculty, staff and external partners
- Initiate pilot projects in several areas involving students
- Plan policies, financial resources, facilities management, curriculum, sustainability literacy, ecosystems, land use, energy resources, etc.



Stake holders involved in the building of a smart campus with students occupying the central position

2. SMART CAMPUS POLICY

I. OBJECTIVE:

- To embed smart technology into daily life of the campus, providing an opportunity for the development and application of innovation and technology to support a smart campus.
- To integrate an enhanced process and programme focused on energy, materials, security, health, transport and environment management.
- To focus on maintaining "Eco friendly institution" through best practice.
- To educate students on the importance of sustainability for a smart future
- To provide world class facilities to enable nationally and internationally renowned industrial/institutional partners to co-locate on the campus.

II. SMART CAMPUS INITIATIVES:

a) Over all activities:

- The Institute implemented CCTV cameras for the security of students day and night from the year 2010.
- The surveillance has built in analytic and intelligence for immediate remedial measures.
- Students are always connected to smart Wi-Fi.
- Healthy environment to support the mental, physical and social well being of the students and staff of the Institute.
- Daily power and water consumption data per student and room basis are captured and analyzed for reducing consumption cost.

b) Students Centric Smart Campus:

- Students are ensured a safe and secure homely atmosphere and are being monitored round the clock.
- Students have high speed internet both on campus and hostel rooms.
- Smart portal has a great impact on both students and stakeholders who are directly involved in daily hostel operations.
- Students are involved in the making of smart campus through several mini and major projects.

c) ICT Based Smart Campus:

- Physical security of students in the campus was a big challenge.
- 400 CCTV cameras are in operations for surveillance at all times.
- Internet plays a vital role in enabling students to pursue their academic goals. Internet with adequate band width was provided to make the campus Wi-Fi enabled.

- Optimization and improvement can only be brought about by identifying consumption patterns. The goal was to reduce the consumption of water and electricity to the lowest levels possible. Smart Metering was implemented for taking optimal decisions.
- A large number of students join every year. University needed a SMART portal where in all services are taken care centrally from student entry in hostel and to their exit. Smart Portal was made operational for connectivity with students at all times.

d) Environment Friendly Smart Campus:

- In order to minimize energy usage, improve the efficiency of all energy/ resources (natural resources, water, electricity) consuming systems and equipment, and improve the environment in all facilities, JSS AHER has adopted an energy / resources conservation and recycling policy.
- Conservation of energy and natural resources and recycling process is an integral part of JSS AHER facilities' design and usage.
- The University employs a variety of energy conservation, recycling, and other techniques to lessen the consumption of resources and achieve the lowest feasible life cycle costs.
- Energy conservation measures will be achieved by using the most cost-effective, energy-efficient approach with consideration given for flexibility of use and future remodeling convenience. Recycling efforts are encouraged at the Institution/department level.
- All faculty, staff, students, design consultants, and construction contractors observe energy and resource conservation measures employed by the campus.
- The Campus Facilities Maintenance & Management Authority- Deputy Registrar shall be the principal coordinator of all design disciplines, which includes responsibility for the implementation of this policy.
- Constituent Colleges & Departments are responsible for internal energy conservation and recycling efforts.
- The Transport Policy provides the Institute with a standard procedure for the acquisition, enhancement, use, control, maintenance, repair, checking fuel efficiency and disposal of the Institute's vehicles and for the management of related forms of transport engaged for Institute activities.

III. LONG TERM GOAL:

The long-term strategy of the University focuses on the creation of a world-changing, connected, healthy and vibrant university campus. To achieve the goal, the Institute will concentrate on:

a) Digital Environment

- Open, flexible, integrated, interoperable, secure and scalable ICT architecture;
- Sense, capture, monitor and evaluate data to support and study the performance of the campus in real time.

b) Integrated Urban Energy Systems

- Low carbon, low impact energy in a complex urban environment, focusing on generation, storage, distribution and management.

c) Data-driven Infrastructure Innovation

- Resilient infrastructure systems
- Innovation in infrastructure design and delivery
- Building Information Modeling (BIM) for design and life-cycle performance.

d) Health & Wellbeing

- Evaluate, understand and improve the physical environment
- Develop new practices for workplace wellbeing
- Develop the technology, including wearable technology, to measure and influence health related behavior.

e) Student Experience and Pedagogy

- Data-driven services and spaces for an improved student experience
- Technology-enabled learning & teaching (including active learning, interactive teaching, flexible study).

IV. AUTHORITY:

The Vice-Chancellor & Registrar of JSS AHER hold delegated authority and are responsible for all aspects of the Institute's "SMART CAMPUS POLICY".

The Smart Campus Policy of JSS AHER follows:

- The Swachh Bharat Mission (Urban) guidelines, Government of India.
- National conservation strategy and policy statement on environment and development, Government of India.
- National Cyber Security Policy, Ministry of Communication and Information Technology, Government of India.

3. DEMOGRAPHICAL VIEW OF MEDICAL INSTITUTIONS

4. KEY ELEMENTS AND SUB ELEMENTS OF A SMART CAMPUS

1. **Smart Buildings & Infrastructure**
   - Accessibility
   - Safety and Security
   - Energy efficient
   - Rain Water Harvesting (RWH)
   - Walkable campus
   - Bicycle
   - Sustainable Transport
   - Road network
   - Signage
2. **Smart Education, Learning & Digitization**
   - Smart Classroom
   - E-Resources
   - Wi-Fi Connectivity
   - ICT Enabled services
   - Modular Laboratories
   - Innovation Centre
   - Virtual Class and Laboratories
   - Outreach Programmes
3. **Smart Sports & Recreation**
   - Playgrounds
   - Sport facilities-Indoor and Outdoor
   - Recreational space
   - Open Gym
   - Yoga facilities
   - Amusement park
   - Open air theatre
   - Swimming pool
4. **Smart Safety & Security**
   - CCTV surveillance
   - Fire alarms
   - Fire fighting
   - Peripheral safety
   - Visitor management system
   - Biometric system
   - Anti-ragging
   - Women safety
   - Student counselling system

5. **Smart Waste, Water & Air Management**
   Sanitation and cleanliness
   STP
   Solid waste management
   Plastic waste management
   E-waste management
   Automatic sensor taps
   Air monitoring system
6. **Smart Utilities**
   Solar Projects
   Smart lighting System
   Emergency power backup
   Smart micro grids
   Bio-gas plant
   Kiosks
7. **Smart Services & Connectivity**
   Online services
   Amenities- Bank, Food court, Stationery, pharmacy
   Wi-Fi Services
   LAN
8. **Smart Green Environment Resilience**
   Green Campus
   Landscaping
   Preserving open space
   Soil erosion control
   Ground water recharging
9. **Smart Governance**
   ERP
   Less paper Office
   Training and Development
   ART- Accountability, Responsibility, Transparency
10. **Smart Food & Health**
    Wellness Centre
    Health Centre
    Potable water facility
    Personal Hygiene

ACTION TAKEN REPORT

4.1. **Smart Buildings & Infrastructure**

Buildings & Infrastructure are the main criteria of functionability. The JSS Medical Institutions comprise JSS Medical College, JSS Dental College, Faculty of Life Sciences (Heritage Building), Hostels and Playgrounds.

To realize the vision of providing education for transformation of individual and society, each faculty has been provided to have their own separate self contained buildings to meet the academic, administrative, research, training and extension activities associated with teaching learning process. The infrastructure is provided to meet the modern requirements by retaining the conventional methods wherever required to accommodate the following requirement:

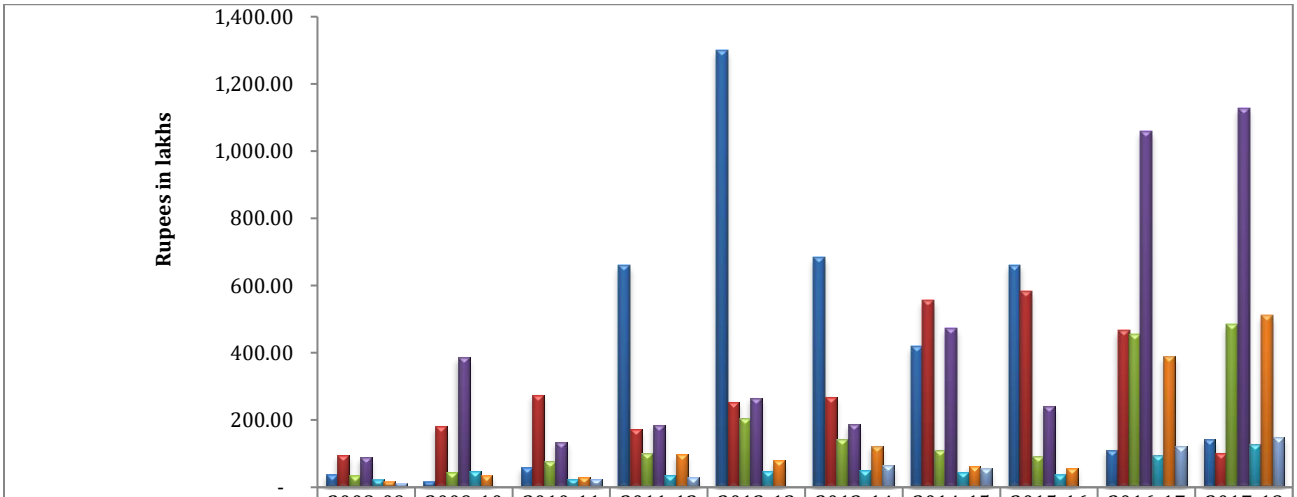
- ✓ To have national and international strategic tie – ups and to collaborate with reputed universities, industries and research organizations.
- ✓ To build global network through alumni and to have multidimensional partnerships with faculty and institutions around the world to foster flow of ideas.
- ✓ To establish centers of excellence.
- ✓ To ensure the quality education system nationally & internationally and necessary certification recognition are obtained.
- ✓ To attract the best researchers and research students by providing comprehensive support and motivation.
- ✓ To drive inter – disciplinary approach as desired by the global world.
- ✓ To work in partnership with policy makers and practitioners worldwide, to bring improvement in real time to people's lives.

JSS AHER is a multi campus institution located with its campuses at Mysuru and Ooty. The campuses have a total extent of land area of 57.24 acres and house the four constituent colleges and two university departments. The campus is endowed with the state of the art buildings comprising of the physical infrastructural facilities that support and facilitate teaching – learning process.

Following are the details of land of JSSAHE&R Campuses and the expenditure incurred towards providing infrastructure to create an excellent ambiance and atmosphere for work.

Sl. No.	JSSU Campuses	Total Area in acres	Total Built up Area	Plinth Area / in %	Infrastructure Provided
1	JSSMI Campus, Mysuru	43.60	79861.81 Sqm	15.06%	• Academic Infrastructure • Library & Information Services & ICT • Amenities • Support Services
2	JSSCP Campus, Mysuru	7.19	17,966.82 Sqm	27.90%	
3	JSSCP Campus, Ooty	6.40	37932.76 Sqm	22.96%	
4	NRI Studio Apartments *– Off campus (B+G+3)*	0.275	1747.60 Sqm	33.67%	
5	Staff Quarters – *Off campus (G+2)*	0.275	1982.00 Sqm	56.67%	

Expenditure Incurred towards providing Infrastructure



	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Buildings	37.16	16.94	58.12	659.40	1,300.43	684.55	418.45	661.33	111.13	142.69
R&M / R&U of Building	95.15	181.75	274.51	171.16	253.53	268.85	555.10	582.74	467.53	102.00
Furniture & Fixutres	34.11	44.73	76.91	101.37	205.73	142.97	111.71	92.51	453.78	483.42
Instruments & Equipments	89.38	387.54	135.62	185.60	264.81	187.48	471.80	241.68	1,057.29	1,125.92
Computers & Softwares	22.52	48.30	25.13	35.79	48.54	50.82	45.95	36.73	94.72	126.46
Books & Journals	17.19	34.47	30.82	97.35	79.77	122.54	63.09	57.13	388.16	511.86
Pur. Of Vehicles	12.81	-	25.01	29.46	-	64.74	55.59	-	121.42	149.30

Academic infrastructure

Auditorium

Auditoriums and multipurpose halls are fully equipped with AC, lighting and AV solutions for conducting various functions, meetings and cultural activities as below:

Sl. No.	Name of the Institutions	Seating Capacity
1	JSS Medical College, Mysuru JSS Hospital, Mysuru	600 500
2	JSS Dental College & Hospital, Mysuru	300
3	JSS College of Pharmacy, Mysuru	500
4	JSS College of Pharmacy, Ooty	500




Gallery / Seminar halls

Sl. No.	Name of the Institution	Details	Seating Capacity	Number
1	**JSS Medical College, Mysuru**	Lecture Hall (Gallery Type)	275 x 1 250 x 4 200 x 2	07
2	**JSS Hospital**	Lecture Hall	250 x 1 150 x 1	02
		Seminar Room	60 x 100	14
3	**JSS Dental College & Hospital, Mysuru**	Lecture Hall	100 x 4 60 x 2	06
		Seminar Hall	50 x 9	09
4	**Dept., of Water & Health**	Lecture Hall	40 x 3 20 x 4 15 x 6	13
		Seminar Room	100 x 1	01
5	**Dept., of HSMS**	Lecture Hall	40 x 2	02
		Seminar Room	40 x 1	01

PG guest hostel

JSS AHER has newly constructed the PG Guest Hostel at the North East Corner of JSSMI Campus comprising B+G+2 floors.

Guest House






Sub Elements of Smart Buildings & Infrastructure

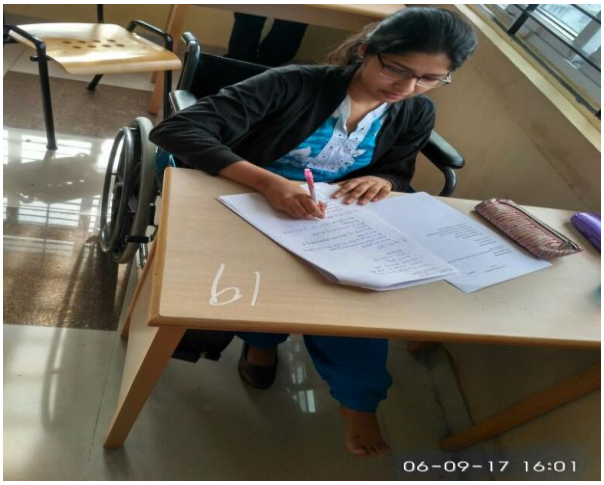
Accessibility

JSS Medical College campus is situated on the Mysore – Bangalore Highway and it is well accessed by all the stakeholders. College has bus facilities for students and it is also well connected through local bus routes.

Disabled access facilities provided for physically challenged

For the physically challenged personal the following facilities are made available in the college campus.

- ✓ Wheel Chairs
- ✓ Stretchers
- ✓ Ramps provided in all the floors of the college and hostel
- ✓ Suitable toilets provided in college and hostels
- ✓ Lift facilities available



Accessibility for disabled or students who require additional support during examinations

Hostel Facilities

Wash room – physically challenged access

All the institutions of JSSAHE&R have provided the Physically Challenged Friendly Washrooms for the convenience of them.

Safety and Security

All the buildings are safe and do not pose any threat to students, employees and other stakeholders due to wide spaced rooms and corridors. Fire alarms and fire extinguishers are in place. Laboratories are equipped with first aid accessories.

Energy efficient

Most of the buildings are equipped with enough natural lighting, avoiding the use of artificial lighting during majority of the time. Wherever lighting is required, all the energy consuming bulbs have been converted to LED lamps which conserve energy. There is enough ventilation allowing natural air passing through the buildings, thereby reducing the use of air conditioners.

Name of the Institution	Power generation (SRTP)	Date of Solar plant charging (of panels) / generation	Details of Feeders used for Solar power generation		Impact of the initiative
			No. of feeders	Capacity	
JSSDCH	172 kw	19th May 2019	04	50kw*2no's 36kw*2no's	Total Power dependency on KEB is reduced by 50% in JSS Medical Institution campus of JSS AHER @ Mysuru
JSSMC	200 kw	3rd June 2019	04	50kw*4no's	
JSSCPM	100 kw	19th July 2019	02	50kw*2no's	Total Power dependency on KEB is reduced by 70% in JSS College of Pharmacy campus of JSS AHER @ Mysuru

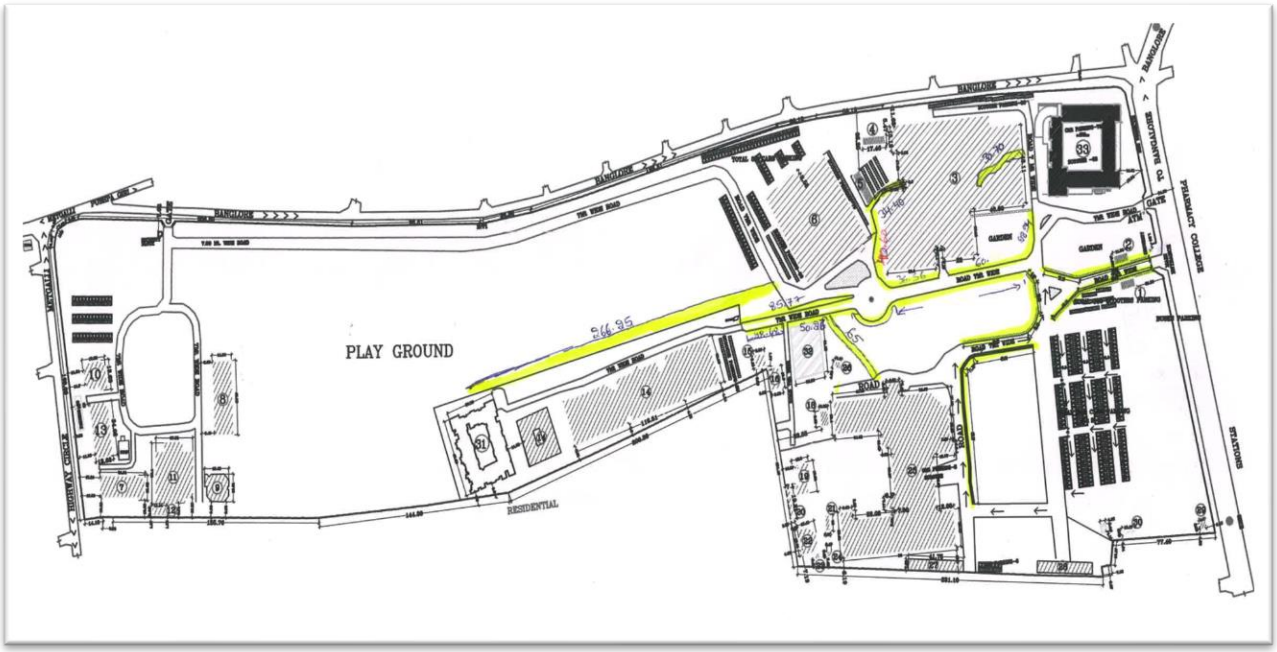
Rain Water Harvesting (RWH)

There are a couple of pits available within the campus which is connected by water pavements which collect rain water.

Walkable campus

The Medical College campus is well accessed by walking between the different constituent colleges. Almost 1 km of walking pavements have been arranged making the accessibility better.

Walking pavements within the campus



Bicycle

JSS AHER has introduced bicycles for the convenience of students and faculty at different points which has considerable reduced the usage of motor vehicles. This initiative goes in line with creating a green campus, reducing the carbon output.

Bicycle stand constructed within the campus

Sustainable Transport

JSS AHER has provided a well connected transportation to large number of students. Bus facility is provided for easy transit between the different units of the Institute for students, teachers and other employees. The college buses are regularly checked for their efficiencies, such that no extra fuel is utilized. The institute provides regularly maintained vehicles for commutation and the concept of car pooling and use of bicycles within the campus have been initiated.

Type of Vehicle	Total
Buses	11
Mobile Van / Ambulance	02
Bolero / Jeeps	08
Cars	03
Two Wheeler	01

Road network & Signage

The entire campus is well connected with roads and there are proper signage displayed wherever necessary.

4.2. SMART EDUCATION, LEARNING & DIGITIZATION

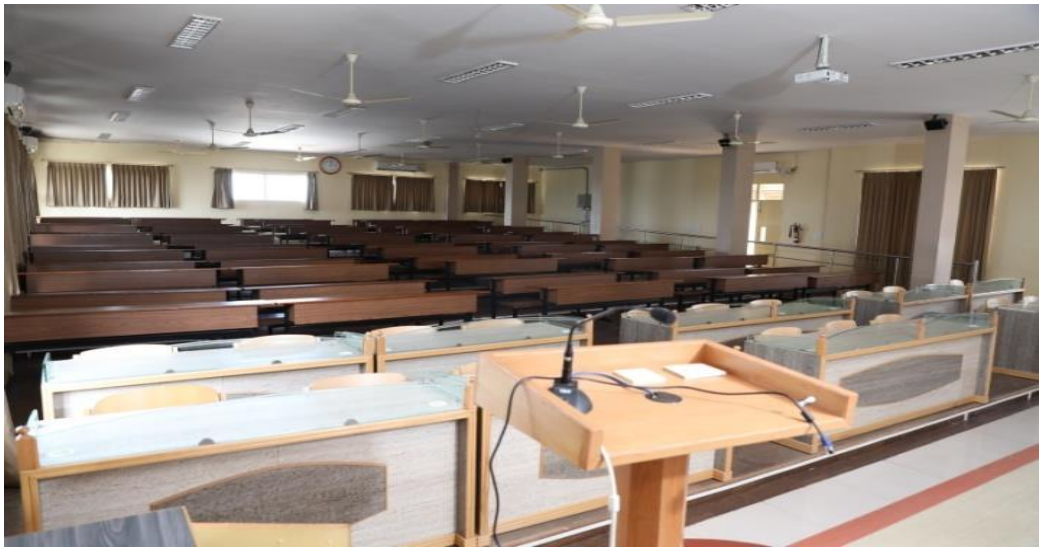
Digitization of teaching and study materials is under process. Accessibility to study materials by students is rendered through Wi-Fi connectivity in the entire campus. Most of the rooms are IT enabled in order to enhance learning through powerpoints and videos.
Spacious and well furnished libraries cater the needs of students in learning.

Existing Facilities

- Smart class room – 2 no's (MC & DCH)
- Simulation lab (Pharmacology and Physiology)
- Digital Library – 4 no's (MC - 40 no's. DCH – 15 no's. HSMS – 5 no's. FLS – 28 no's)
- Outreach programme facility (ISRO open Learning)
- IT enabled classroom (with projectors)
- Upto 1 GBPS uninterrupted internet services through NKN connectivity for a period of 10 years is availed *(presently, 300 mbps)*
- All the buildings are connected with OFC cable.
- Wifi connectivity is enabled *(within the building)*
- MS Windows license version computers
- JSSU online services *(for all official communication)*

Smart Classroom

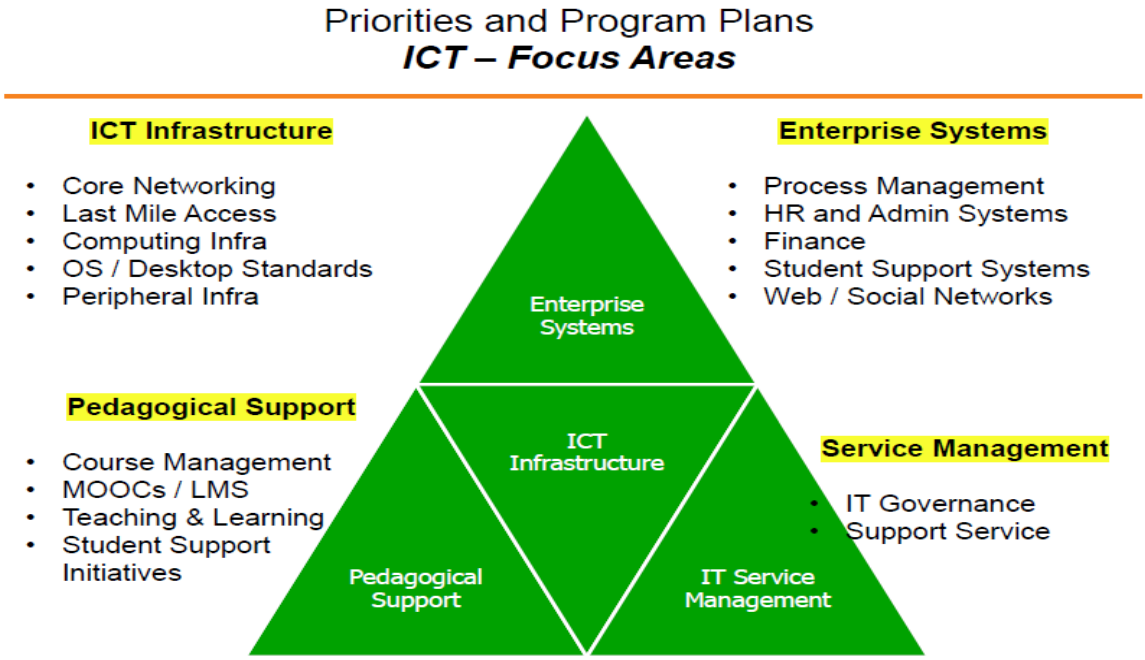
Smart classrooms are provided to extract the potential of best online resources in teaching and learning process and to go extra mile to grasp information other than the curricula, online resources can improve the curiosity and creativity among the students.



JSS AHER has provided smart class rooms with facilities up to date for benefit of the students.

ICT Enabled services, Wi-Fi Connectivity & E-Resources

The entire campus if Wi-Fi enabled and students can access to learning materials wherever they are. All the study materials have been available through the JSS AHER online portal so that students can access through their login credentials and the same has been demonstrated during the most difficult times. Further, the institute is well equipped with digital library which hosts several thousands of books and journals readily accessible for students and teachers.



Digital Journal of Clinical Medicine

In the era of Digital Technology and online learning, the concept of "Digital Journal of Clinical Medicine" is being introduced in order to help medical students learn in a better and more holistic manner. With smart phones and online learning gaining a significant role in every student's life, it would only make sense to incorporate something that would be educative for them in a short span of time.

SWAYAM portal and MOOCs

Swayam is a programme initiated by Government of India and designed to achieve the three cardinal principles of Education Policy viz., access, equity and quality. The objective of this effort is to take the best teaching learning resources to all, including the most disadvantaged. SWAYAM seeks to bridge the digital divide for students who have hitherto remained untouched by the digital revolution and have not been able to join the mainstream of the knowledge economy.

Online Teaching

JSS AHER has stepped up to take its teaching online during the most difficult times making use of the ICT enabled services, Wi-Fi connectivity and E-Resources. The services provided were aptly rewarded.

Modular Laboratories

Innovation Centre

JSS AHER provides opportunities to incubate innovative ideas from both students and faculty. The innovation/incubation centre is called SPARKLE CINE. SPARKLE signifies Science Promotion through Advancement of Research & Knowledge for Life through Entrepreneurship, & CINE stands for Centre for INnovation & Entrepreneurship.

Sparkle CINE is a Section 8 company established under the aegis of JSS Academy of Higher Education & Research for the purpose of promoting translation of educational excellence to ideas and to catalyse the power of the idea towards innovation and entrepreneurship focused on advancement of Science.

Virtual Class and Laboratories

In view of providing experimental training for the students in the Physiology and Pharmacology Depts of University, the students, researchers and faculty are given the facility of training **through simulation technology** via Elsevier Animal Simulation Software across the University. This is an attempt to comply with the CPCSEA guidelines.

Outreach Programmes

The Motto of NSS "NOT ME BUT YOU" reflects the essence of democratic living and upholds the need for self-less service. NSS helps the students develop appreciation to other person`s point of view and also show consideration to other living beings. JSS AHER started NSS activities at its constituent colleges with important objectives of identify the needs & problems of the community & involve them in problem-solving and to develop among themselves a sense of social and civic responsibility. It helps the students to acquire leadership qualities and democratic attitudes, to develop capacity to meet emergencies and natural disasters and practice NATIONAL INTEGRATION and SOCIAL HARMONY. We have 5 NSS Units spread across the constituent college with a strength of 450 NSS volunteers and 5 NSS Program Officers.

JSSAHER'S Social Responsibility is an approach of ethical and intelligent management, which involves both its impact on its human, social and natural context, and its active role on the promotion of Sustainable Human Development of the country. Within this approach, "Sustainable Campus" is a strategy that strives to reduce the ecological footprint of the Institution via a rational use of resources and to educate the JSSAHER community on the ethics of sustainability.

4.3. **SMART SPORTS & RECREATION**

Health and well-being are an important aspect of academic success and retention; when a student is healthy in mind and body, they are better able to focus on and complete their studies. By taking measures to improve a student's health and well-being, an institution is actually helping its self by potentially increasing the student's GPA and graduation, and retention rates.

The goal is to have the campus community flourish and be fulfilled individually and within our communities where we live, learn, work, and play. As one of the vital stakeholders in Health & Well-Being, the Sports and Campus Recreation Complex should fulfill this vision by providing space and opportunities for students to discover and affirm their own well-being practices in five different dimensions (emotional, physical, social, professional and spiritual) that lead to a healthy lifestyle.

Playgrounds

Sport facilities-Indoor and Outdoor

Open Gym

Yoga facilities

Amusement park – Yet to create
Open air theatre – Yet to create
Swimming pool – Yet to build

4.4. **SMART SAFETY & SECURITY**

CCTV surveillance

The entire campus is under CCTV surveillance to ensure the safety of students around the clock. Majority of the laboratories are also equipped with cameras to attend to any accidents. Hostels are also continuously monitored through the cameras.

Fire alarms & Fire fighting

Peripheral safety

Round the clock security guards (Male & Female for respective hostels) as well as CCTV cameras are placed for continuous monitoring and vigilance for the safety of students.

Safety parameters

- High raised buildings are equipped with fire/smoke sensors.
- Regular workshops on safety management are being conducted for both faculty and students to help them handle emergency situations.
- Interaction with Laboratory managers and electricians should be facilitated for the safety of the campus. Their contacts should be displayed and readily available in case of emergency.

Visitor management system

Visitors are monitored and entertained only after getting prior consent from the concerned Department. Security offices are advised to keep a record of visitors who enter the premises.

Biometric system

Biometric system is already in practice for all the teaching and non-teaching faculty of the institution.

Anti-ragging & Women safety

Committee comprising of faculty against ragging and sexual harassment is highly functional and therefore such circumstances are completely avoided in the campus.
Hostel premises are equipped with about 120+ CCTV cameras and continuous surveillance under security personnel.

Student counselling system

An efficient committee for student counseling system has been constituted to further address issues of students both academically and personally. The system is integrating students, teachers and parents.
Hostel premises are equipped with cameras and continuous surveillance under security personnel. A regular check of food for nutrition and hygiene is carried out in order to provide safe health.

4.5. **SMART WASTE, WATER & AIR MANAGEMENT**

Sanitation and cleanliness

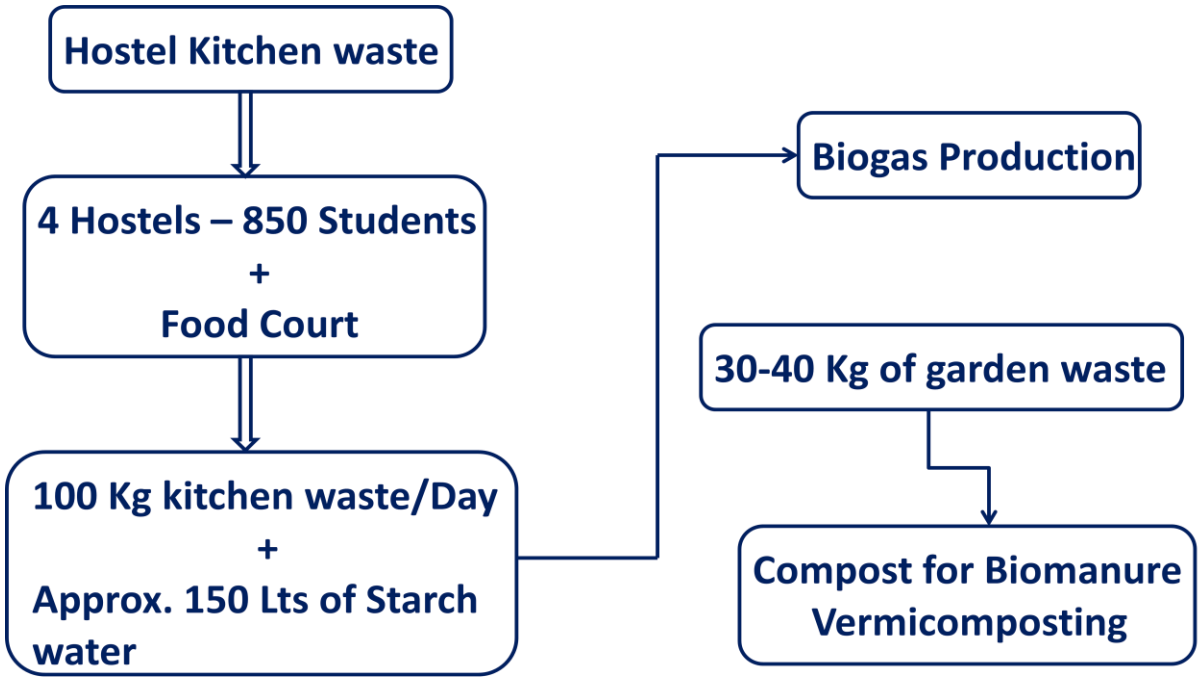
Waste materials being cleared by the municipality

Colour coded bins for segregation of waste

Solid waste management

- Bio – medical waste management service is being availed since May 2003 (Dental & Medical) from M/s. Shree Consultants.
- Bio – medical waste management service is being availed (JSSCPM) from M/s. Gips
- Segregation and collection of dry and wet garbage is in practice.
- Color coded dustbins are provided across the campus.

Bio/food waste



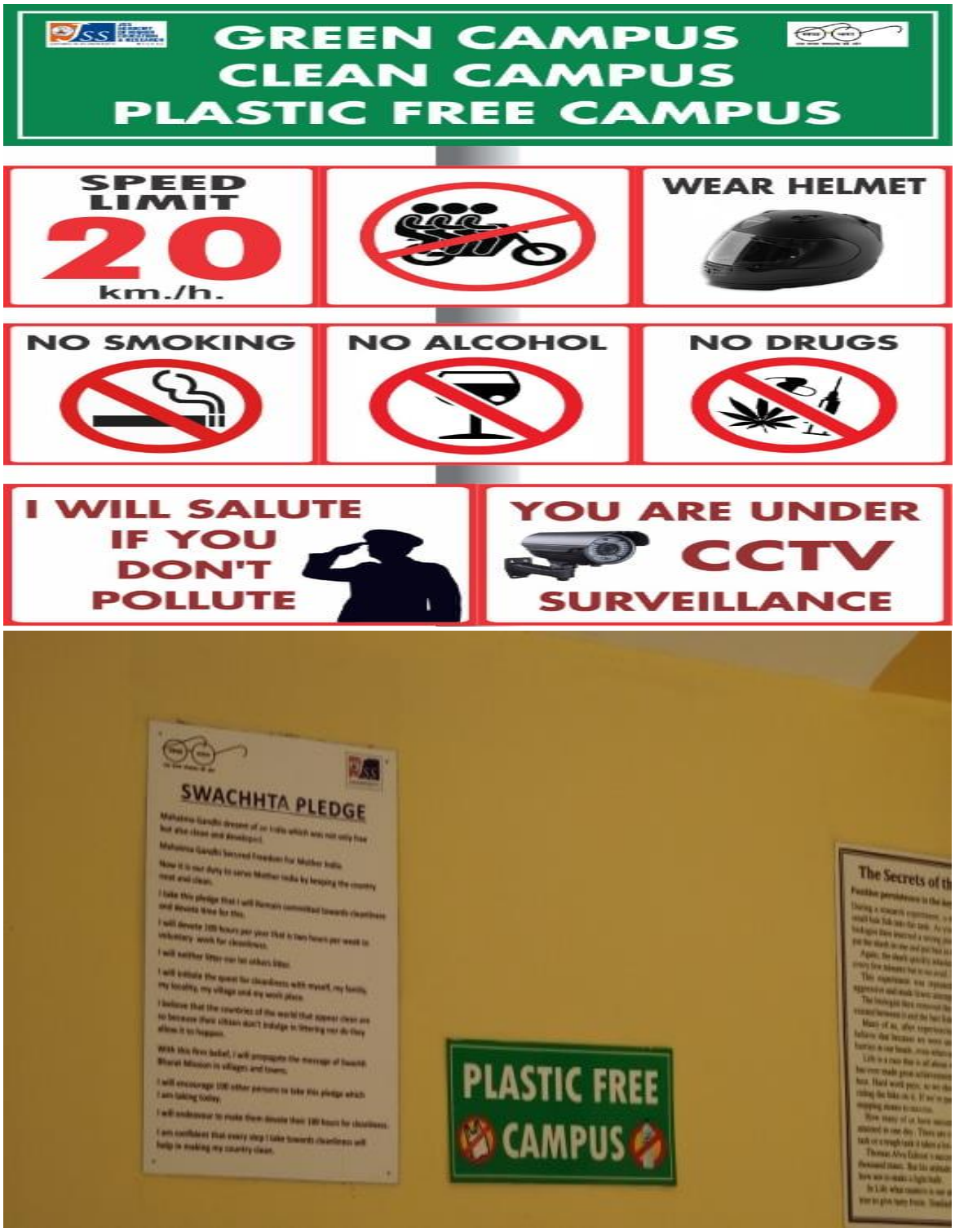
Vermicomposting

Vermicomposting is the use of earthworms and microorganisms to accelerate the composting process. Worms, through digestion, liberate plant nutrients from organic material converting it to rich humus. Worms consume up to their own weight daily, excreting castings which contain from five to eleven times the amount of plant available nutrients in the material consumed. Worms have been recognized to play a very important role in the enhancement and maintenance of soil penetrability, redistribution of nutrients, water flow and gas exchange. The pedogenic value of worms, in addition to the release of nutrients, has vast applications in agriculture and soil reclamation. The vigorous ability of worms to convert organic residue into a nutrient rich growth medium also has applications in waste management.

Need for a Vermicompost unit within the campus

Our Institute maintains a very good green carpet area making the campus a green environment. With a number of trees within the campus, accumulation of fallen leaves and other plant materials account to around 50 – 100 Kg of bio-waste which is being dumped and finally removed by external agencies. With the smart campus initiative gearing up, it is worthwhile to consider our own strategies to handle the waste generated within the campus. In this connection the vermicompost unit would come handy to handle the plant waste materials which not only will help us manage waste but also serves as a student centered project to produce bio-manure.

Plastic waste management



The Institute has pledged to reduce the use of plastics throughout the premises. Constantly the students and faculty are being advised not to use plastics wherever possible. JSS AHER is continuously supporting the Swachh Survekashan, an initiative by the city Municipal Corporation.

E-waste management

Certificate No.	MERL/1819/0015 Date: 2-MAY-2018
Date of Material Receipt	12-APRIL-2018
Weight	610kgs
Customer Reference No.	MOU Dated 3-AUG-2017

eRecyclebin

CERTIFICATE OF E-WASTE RECYCLING

This is to Certify that e-waste received for recycling from

JSS Academy of Higher Education & Research, MYSURU-15

has been safely disposed at our registered facility in an environment friendly manner.

MAHALAXMI E RECYCLERS PVT LTD KOLHAPUR

For Mahalaxami *e* Recyclers

Authorized Signatory

MPCB Reg. No. : MPCB/RO(HQ)/REG/14/E-Waste/HWMD-182 | Date : 31st July 2014

Renewed Reg. No. : MPCB/RO(HQ)/REG-15/EWASTE/HWMD-257/Dt. 9th Oct. 2015 Valid till 8th Oct. 2020

Mahalaxmi e-Recyclers Pvt. Ltd. Plot no: J-5 (Part), Gokul Shirgoan MIDC, Tal : Karveer, Dist : Kolhapur | Website : erecyclebin.com

Waste water management

Hostels, for instance are the main source of sewage water, while waste water from canteens, restaurants and campus buildings add up to the sewage. An effective sewage water treatment in a biological aspect can replace conventional chemical water treatment, as a need for sustainable green management is vital for a smart campus.
Student Projects/Pilot Projects are a main source of ideas that can be implemented after successful completion of the projects.

Sewage treatment plant

Existing small scale sewage treatment plant in the guest house

Usually a sewage treatment plant (STP) is considered as a liability and is only planned to comply mandatory regulations. But same can be made an asset that produces revenue at the same time addresses the mandatory environmental compliances.
An STP can be considered to be an industry where the raw material (sewage and food waste) is of reliable supply and available at no cost. The treated water which is the product of this unit can substitute fresh water required for gardening and thus reducing the current water bills and finally the biogas which can substitute/supplement LPG in the kitchens and reduce LPG bills. Below is brief overlook of a model:

- Raw material is reliable
- Raw material is free
- Treated water (end product) has demand
- By-product (biogas) out of treatment has a demand
- Sludge produced can be used as a valuable source of fertilizer for the landscape irrigation

The specific salient features of the ARBiT™ STP are listed below:

1. ARBiT™ STP can be commissioned and operated even with low occupancy of the college unlike other technologies that requires at least 40% occupancy in the college project.
2. The ARBiT™ STP will be located between the B & C Blocks of girls hostel.
3. The ARBiT™ water reclamation plant will be located below and above the ground.
4. Wastewater unseen during the treatment process.
5. Zero noise and vibration during operation.
6. Power consumption is very low and approximately 70% lesser than conventional systems

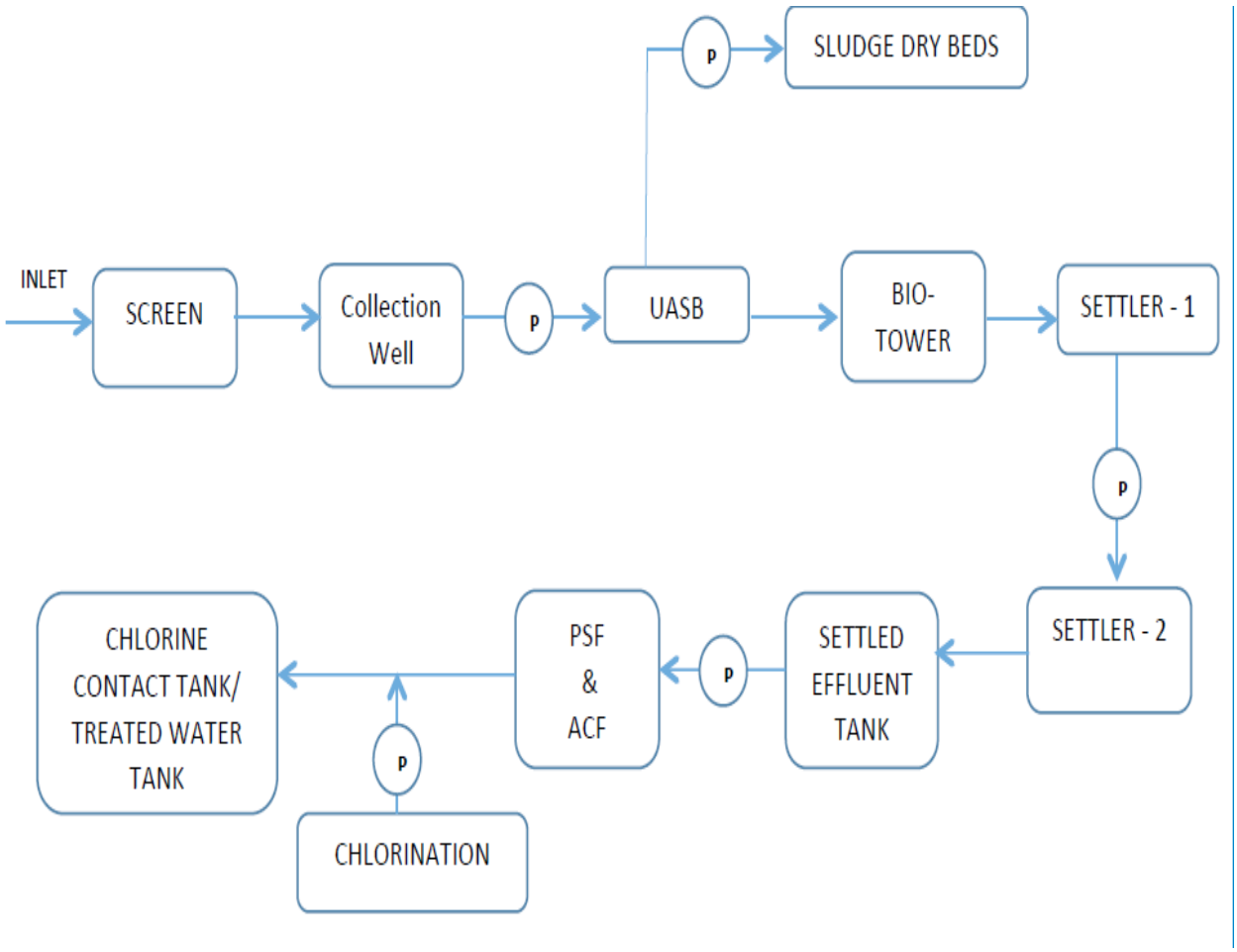
7. The area required for the STP is also approximately 30% lesser than conventional systems. This will also reduce on the civil construction cost effectively reducing the capital required.
8. The odor produced from the STP will be collected, contained and discharged without causing inconvenience to the occupants or neighbors.
9. The quality of the treated water will meet the reuse standards specified by Karnataka State Pollution Control Board.
10. The disinfection of the treated effluent may be done using Hypochlorite.
11. The biogas generated during the treatment process can be used for beneficial purposes if required.
12. Optional treatment for the disposal of the organic solid waste from the canteens can be integrated with this ARBiT™ STP. High volumes of biogas can be generated and may be supplied to the canteens to reduce the LPG consumption or generate electricity.

Proposal of the STP to address the wastewater treatment for the girls hostel

As seen during the site inspection, we propose the location to establish next to the compound wall between the B&C block
The capacity of the plant: 90 KLD (detailed calculations given in the proposal)
Implementing the biogas utilization unit along with the STP is possible since the leftover food from the canteen and the organic wet waste from the kitchen is very nearby and can be converted into biogas. The biogas is produced both from the sewage and left over food and vegetable waste.
The expected production of biogas per day equivalent of LPG is: 30 Kg which works out to Rs 47,400/- per month savings. The treated water can be used for the gardening and toilet flushing with small change in the plumbing. Recycling water will also reduce the fresh water consumption and in turn reduce the water bills.
The project thus meets the sustainability aspects, economical and entire campus become "Green".

ARBiT™ PROCESS

The ARBiT™ process (Anaerobic Reactor with Bio-tower) is a combination of both anaerobic and aerobic treatment of wastewater. The wastewater is first introduced into an anaerobic reaction tank (UASB tank) with a designed retention time. A floating sludge blanket is formed inside the UASB reactor under anaerobic conditions. Anaerobic degradation of organic matter (BOD) is achieved up to 75-80%. The overflow of this reactor is fed into the bio-tower for further removal of BOD under aerobic conditions.



Flowchart of the processes of water reclamation plant

Automatic sensor taps

The institute has fixed touch sensor water taps during the first phase to validate the use of such taps. Following the data of water saved, automatic sensor taps may be installed during the second phase of up gradation.

Air monitoring system – Yet to be initiated

4.6. SMART UTILITIES – WATER, GAS & ELECTRICITY

Water conservation

• Awareness program shall be held in campus once in 3 months for Sensitizing the staff and students

• The students in hostels shall be sensitized about water conservation in their orientation meetings.

• Printed stickers / labels with the slogan 'Save Water' to be fixed in strategic places of the college and hostels.

• Reducing car washing and the vehicles on the campus shall be washed based on the real needs rather than regular washing.

• The gardens shall be irrigated only with sprinklers and drip irrigation systems to save the wastage of water in plantations.

• All the existing flushes in the toilets to be changed into duel flush system in a phased manner.

• Sticker Reminders as part of the 'Energy Awareness Campaign' shall be placed near taps to remind everyone to conserve water by reducing wastage and closing the tap.

Recycle

• Green wastes shall be composted and reused as composts manure.

• All the waste bins to be replaced with duel bins with tag and pictorial signs "biodegradable waste" & non-degradable waste".

• The biowaste disposal shall be only through Government approved disposal service contracts.

Rainwater harvest

To meet the needs and sustainable management of fresh water, the rainwater harvesting and utilization systems have been established in all the campuses of the JSSAHER to aid towards the greater objectives of water management and conservation and increasing recharge of groundwater by capturing and storing rainwater, rainwater harvesting from rooftop run-offs and natural water bodies and the community development. The below-mentioned models are established in the various buildings based on the size of the building and the extent and topography of the land.

The systems include –

• Simple roof water collection systems - Most of the rooftop rainwater harvesting has been completed by constructing five water storage structures with a storage capacity of 1000 m3.

• Land surface catchments – a simple way of collecting rainwater by retaining the flows (including flood flows) of small creeks and streams in small storage reservoirs (on surface or underground) created by low-cost dams.

• Collection of storm water – The surface runoff collected in storm water ponds/reservoirs is subject to a wide variety of contaminants and every effort is made to keep these catchments clean

JSSAHER and the constituent colleges shall continue to establish a combination of the above techniques to have meet the groundwater needs.

JSS Academy of Higher Education & Research (JSSAHER) is conscious of its responsibility and role in materializing its green policy using renewable energy, management of its water resources, and disposal of waste.

Purpose

In order to minimize energy usage, improve the efficiency of all energy/ resources (natural resources, water, electricity) consuming systems and equipment, and improve the environment in all facilities, JSS Academy of Higher Education & Research has adopted an energy / resources conservation and recycling policy.

Definitions

• Energy conservation: Energy conservation is a practice of decreasing the quantity of energy used and achieved through efficient energy use.

• Recycle: Recycle is a process of collecting and reprocessing materials that would typically be considered waste.

Policy

Conservation of energy and natural resources and recycling process is an integral part of JSS Academy of Higher Education & Research (JSSAHER) facilities' design and usage. The JSSAHER employs a variety of energy conservation, recycling, and other techniques to lessen the consumption of resources and achieve the lowest feasible life cycle costs. However, occupant health, safety, comfort, and program requirements shall always be the primary concerns. Energy conservation measures will be achieved by using the most cost-effective, energy-efficient approach with consideration given for flexibility of use and future remodeling convenience. Recycling efforts are encouraged at the Institution/department level.

Responsibilities

• All faculty, staff, students, design consultants, and construction contractors must observe energy and resource conservation measures employed by the campus.

• The Campus Facilities Maintenance & Management Authority- Deputy Registrar shall be the principal coordinator of all design disciplines, which includes responsibility for the implementation of this policy.

• Constituent Colleges & Departments shall be responsible for internal energy conservation, recycling efforts.

Related Policies

The energy conservation and recycling policy of JSS AHER supports

• Smart Campus Policy of JSSAHER

• The Swachh Bharat Mission (Urban) guidelines- Government of India.

• National conservation strategy and policy statement on environment and development-Government of India.

A survey of water utility and storage in the Medical Institutions Campus is given below

BUILDINGS	WATER CAPACITY
Main Over Head Tank	4,50,000 Ltr
Main Over Head Sump	2,00,000 Ltr
Over Head Tank Entrance	50,000 Ltr
Girls Hostel D Block Sump	85,000 Ltr
Girls Hostel D Block OHT	75,000 Ltr
Boys Hostel Sump	40,000 Ltr
MC Over Head Tank	30,000 Ltr
Guest House Sump	87,000 Ltr
Guest House OHT	25,000 Ltr
Canteen Sump	10,000 Ltr
Canteen OHT	10,000 Ltr
Total	10,62,000 Ltr

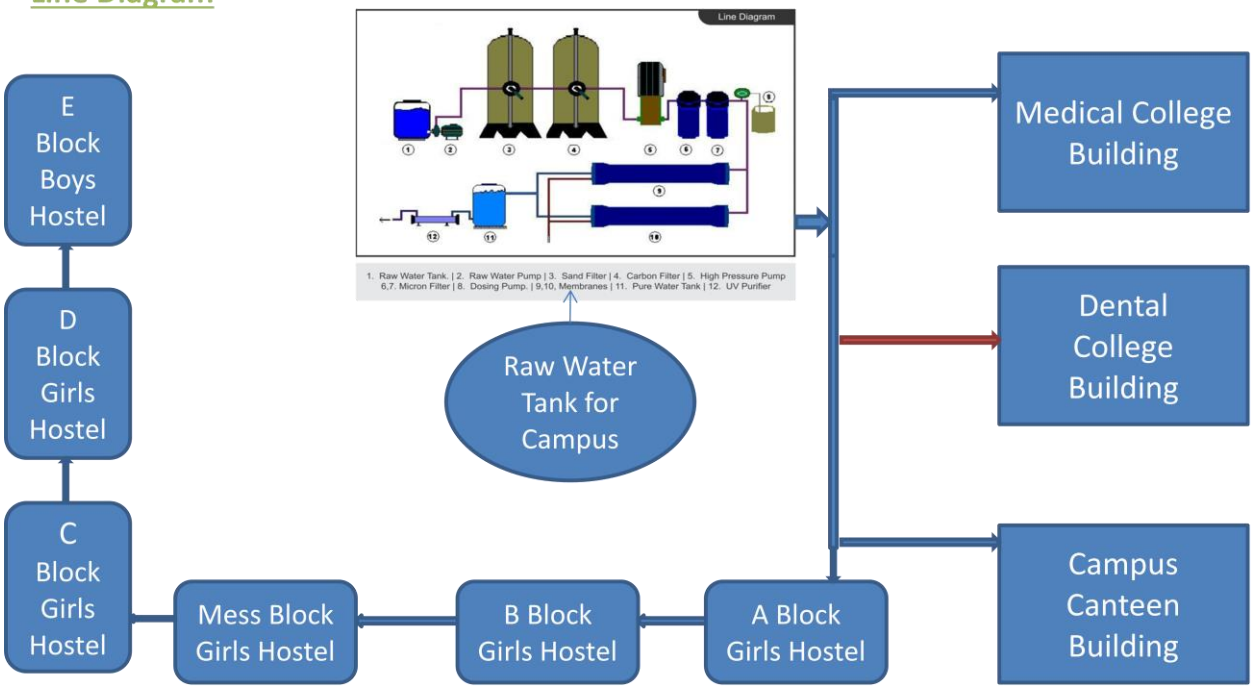
RAIN WATER HARVESTING / RO PLANT / WATER MANAGEMENT

- ✓ Rain water harvesting collection tank of 30,000 ltrs storage capacity.
- ✓ 10 no's of Ground water & bore well recharge pits and infiltration tank of about 15,000 ltrs capacity.
- ✓ STP of 25 KLD capacity by using SWR technology has been installed for treating of sewage & kitchen waste water of PG Guest Hostel & the treated water is using for the purpose gardening area developed surrounding the building.
- ✓ One tank of 10,000 ltrs capacity is made for re-use of RO rejected water for gardening purpose
- ✓ Water sprinklers are in place

RO WATER SUPPLY – CURRENT SCENARIO

An overview of the drinking water facility and the current situation of the RO plant installed in the campus help us to think how we can upgrade the RO plant to fulfill the RO water requirement for the entire campus. The present RO plant installed is not sufficient to fulfill the RO water requirement for the entire campus.

Line Diagram



Inspection Report

1) The entire campus has a one Commercial RO plant of capacity 3000 LPH.
2) Plant needs to be upgraded to fulfill the present requirement of the drinking water.
3) The product output of the plant is having only 40% of permeate water Only
4) The RO water is been distributed in 2 different lines for the entire campus.
   a) Line 1: Dental Block, Campus Canteen Block & Medical Block.
   b) Line 2: Girls Hostel A , B , C , Mess Block , D Block Canteen and Continued to Boys Hostel E Block.
5) The pump which is been used for the distribution of the RO water is a Cast Iron mould pump and impeller gets rusted inside the pump & discharge rust particles which gets mixed in the drinking water.
6) The Pipe line laid to distribute the RO water should be in CPVC. But in Dental Block GI line has been laid which discharges high rust which is getting settled in the drinking water.

7) All the Water which is been treated through RO plant is been Stored in a Syntex tank on the roof top of each and every building without the storage tank Lid and Instead they are using a wooden plank or a black stone slab to cover the same.

8) Since it is Purified water it has to be kept in a closed environment to avoid dust and microbes OR ELSE THERE IS NO POINT IN PURIFING THE WATER.

9) Rest of the Blocks distribution pipe line in Boys and Girls hostel is CPVC can be retained.

10) The Storage water tank of the RO water should be in SS (Stainless Steel)but all the storage tanks which is been installed is Syntex tank.

11) Using Syntax tank for drinking water storage is not suggested, because it reacts when sunlight falls on tank. Since all the tanks are kept in open terrace.

12) All the storage tanks should be sheltered to avoid bio aerosol and dust

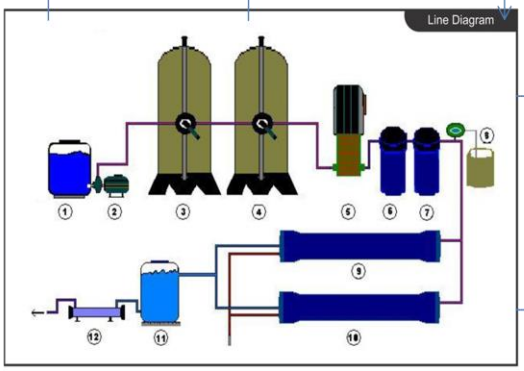
Current status of the RO Water Plant at the MCI

D BLOCK
Floors : 4 Floors
Students : 72
Drinking Water
Usage : 250

Mess Block
Floor : 2 Floors
Number of Students : 750
Floating
(3 Times Food)

A BLOCK
Floors : 4 Floors
Students : 78
Drinking Water
Usage : 250

E BLOCK (RO Plant)
Floors : 4 Floors
Students : 150
Drinking Water
Usage : 450



1. Raw Water Tank. | 2. Raw Water Pump | 3. Sand Filter | 4. Carbon Filter | 5. High Pressure Pump
6,7. Micron Filter | 8. Dosing Pump. | 9,10, Membranes | 11. Pure Water Tank | 12. UV Purifier

B BLOCK
Floors : 4 Floors
Students : 65
Drinking Water
Usage : 200

C BLOCK
Floors : 4 Floors
Students : 54
Drinking Water
Usage : 150

D Block
Floors : 7 Floors
Number of Students : 600
Water Consumption per day 2000 Liters

Proposed upgradation of RO Water Plant at MCI

Schema A:

1) Upgrading the commercial RO Plant in the campus to 6000 LPH to Centralized RO plant and decentralizing the distribution of drinking water to the entire campus with Storage tank in each block with automatic filling.
2) RO Plant room has to be expanded by another 300 Sqft.
3) CPVC Pipe Line has to be laid to the distribution units.

Time Period: To complete the above process setup it would require one month time.

Tentative Budget:

a) RO Plant Only : 15 Lakhs Rupees + 18% GST
b) RO Room Building : 6 Lakhs
c) Pipe Laying including Material Cost: 95 Rupees per feet
d) Storage Tanks, Pressure Boosting Pumps and Fittings can be designed only after exact requirement which will be an additional cost.

Overview of the RO water distribution in the MCI campus hostels

Energy conservation measures

Light Bulb Replacement

• It is estimated that replacing traditional incandescent bulbs with CFLs/LED can cut lighting costs by up to 75%. JSSAHER, Constituent Colleges & Departments shall exchange such traditional incandescent bulbs across campus with CFLs/LED in a phased manner. Thus 75 % of the bulbs shall be changed with CFLs/LEDs by 2017.

• Sticker Reminders as part of their 'Energy Awareness Campaign' shall be placed on switch boards to remind everyone to conserve energy by turning off the lights.

• Small pamphlets emphasizing the importance of energy saving shall be prepared and circulated to all the staff and students of the college.

• Solar water heaters installed in colleges and hostels and especially for cooking, solar energy is utilized in the hostels and in guest houses. Step shall be taken to replace use of LPG completely with solar energy by 2020.

ELECTRICITY – UNDERGROUND CABLE WORKS COMPLETED

Underground Cable works and power backup

POWER / ELECTRICITY (Power back up: 24 x 7)

JSSAHE&R provides has created the facility of providing 24 x 7 power / electric supply either in the form of power connection through CHESCOM / TNEB and in case of failure in power supply, generators are installed in all the campuses for providing uninterrupted electric / power supply.

Campus	RR No.	Contracted Demand in KVA	Motor Constant	Date of Connection / Service	Generator
JSSMI Campus	HT – 166	450 KVA	2500	May 1995	2 dedicated generators of 450 KVA & 500 KVA capacity is provided with auto switch over facility
JSSCPM Campus	HT – 384	150 KVA	750	May 1995	82.5 KVA & 160 KVA
JSSCPO Campus	HT - 107	150 KVA	200	May 1995	100 KVA, 125 KVA & 150 KVA capacity is provided

Solar Projects

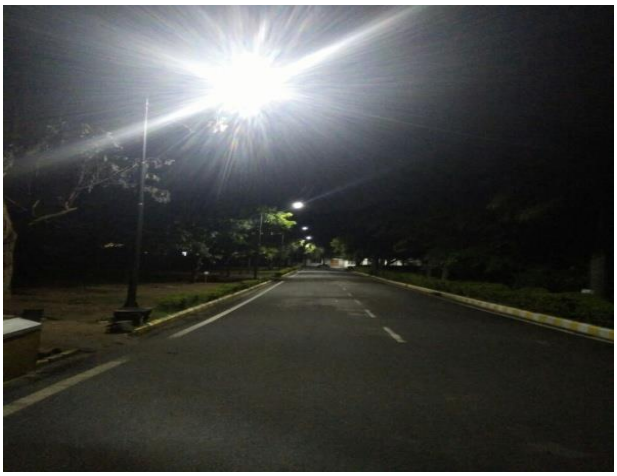
At the Institution level, solar panels have been installed which has considerably brought down the power consumption by at least 50% compared to earlier years. In order to set an example, the institution shares some of the electricity generated by solar energy to the local electricity board. Proper signages have been installed advising the users to always switch off the electricity when not in use.

Most of the lights have been replaced by energy saving bulbs and LEDs to save power. Continuous monitoring and maintenance of Air Conditioning, generators and other power appliances are being carried out to ensure that no power is being wasted under any circumstances.

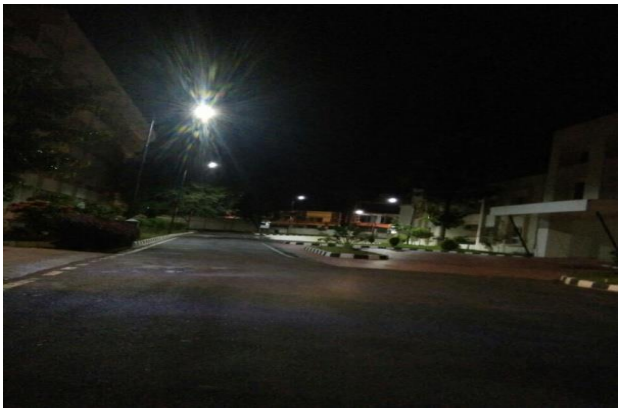
Emergency power backup & smart micro grids

Proper lighting

All the institutions campus of JSSAHE&R at Mysuru and Ooty are provided with LED lightings to promote security in the campus and to increase the quality of life by artificially extending the hours in which it is light and for the safety of hostel students.







Summary of power generation with the aid of solar panels

1	2				3		4		5	6
Month	KEB				Solar Units Generated		Total		KEB Rate	Saving
	A	B	C	D	A	B	A	B		
	Import Units KEB	Export Units from Solar	Actual Consumption of Units (2A-2B)	Amounts	Total Units	Amounts	Units	Amounts (2D+3B)		
Apr-19	144450	0	144450	1314716	0	0	144450	1314716	1314716	0
May-19	153225	0	153225	1419601	11909	73835.8	165134	1493436.8	1535134	41697.2
Jun-19	118150	75	118075	1096122	24708	153189.6	142783	1249311.6	1332678	83366.4
Jul-19	109425	450	108975	1023980	22879	141849.8	131854	1165829.8	1231164	65334.2
Aug-19	101250	1025	100225	944791	35607	220763.4	135832	1165554.4	1267196	101641.6
Sep-19	93125	4325	88800	850504	46215	286533	135015	1137037	1266547	129510
Oct-19	96375	7275	89100	852928	53755	333281	142855	1186209	1337953	151744
Nov-19	89025	10125	78900	764651	60973	378032.6	139873	1142683.6	1310793	168109.4
Dec-19	83575	9025	74550	720964	54812	339834.4	129362	1060798.4	1204710	143911.6
Jan-20	85600	3975	81625	781752	72663	450510.6	154288	1232262.6	1429742	197479.4
Feb-20	81425	17675	63750	628170	69004	427824.8	132754	1055994.8	1235333	179338.2

Mar-20	76300	19800	56500	560793	66086	409733.2	122586	970526.2	1132504	**161977.8**
Total	**1231925**	**73750**	**1158175**	**10958972**	**518611**	**3215388**	**1676786**	**14174360**	**15598470**	**1424110**

4.7. SMART SERVICES & CONNECTIVITY

Available Facilities

- Dental Hospital (366 dental chairs)
- Dental Mobile Van *(1 no. for community services)*
- Bank
- Post Office
- Pharmacy
- Co-operative Society
- Laundry / Cobbler
- Telecommunication
- Incinerators
- Photo copiers and bindings
- Health Insurance services(TATA AIG)
- JSS University NSS Unit
- Free Wi-Fi
- Common communication social platform like a link that connects faculty, students and the institute.
- An in house pharmacy is functioning within the campus to cater the needs of students as well as public.

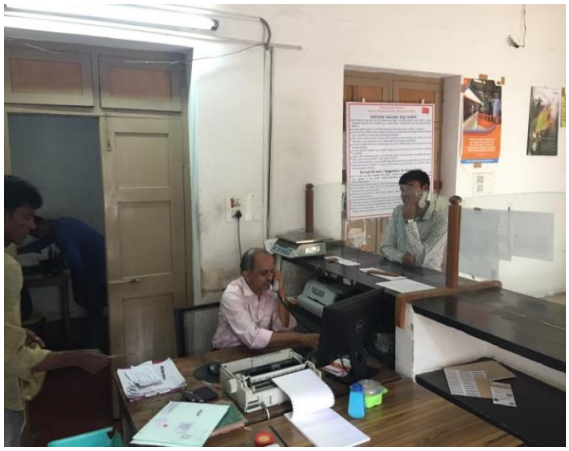
Amenities- Bank, Food court, Stationery, pharmacy

BANK

A branch of State Bank of India at S. S. Nagara, Mysuru shares its banking services with the JSSAHE&R in the JSSMI Campus. The 24 x 7 ATM counter is also attached to the JSSMI Campus Building for easy access to the students.

Post office

Both the Post Office (Sub Branch) and the Telegraph Offices are in the campus for easy access of students and staff.



Co-operative society

The co-operative society is also a part of the institution, which cater to the needs of the students with their essential daily requirements and other requirements such as text books, note books, papers, surgical items, etc. The society works on **'no profit - no loss'** basis.

Food Court

Health centre with pharmacy

4.8. SMART GREEN ENVIRONMENT RESILIENCE

The beauty of nature is a gift of God, and as responsible citizens it is our duty to protect this gift by all means. Hence, following actions are initiated by JSSAHE&R towards Green Initiative:

a) Greenery / Plantation
b) Prohibition on use of Plastic bags and bottles
c) E – scrape
d) Use of Incinerators
e) Solar – Power, Water Heater, Cooking System


GREEN CAMPUS
CLEAN CAMPUS
PLASTIC FREE CAMPUS
SPEED LIMIT
20
km./h.
WEAR HELMET
NO SMOKING
NO ALCOHOL
NO DRUGS
I WILL SALUTE IF YOU DON'T POLLUTE
YOU ARE UNDER CCTV SURVEILLANCE

The Medical Institutions campus maintains a very well developed green carpet throughout the campus.

Recently more arrangements have been made for better parking.

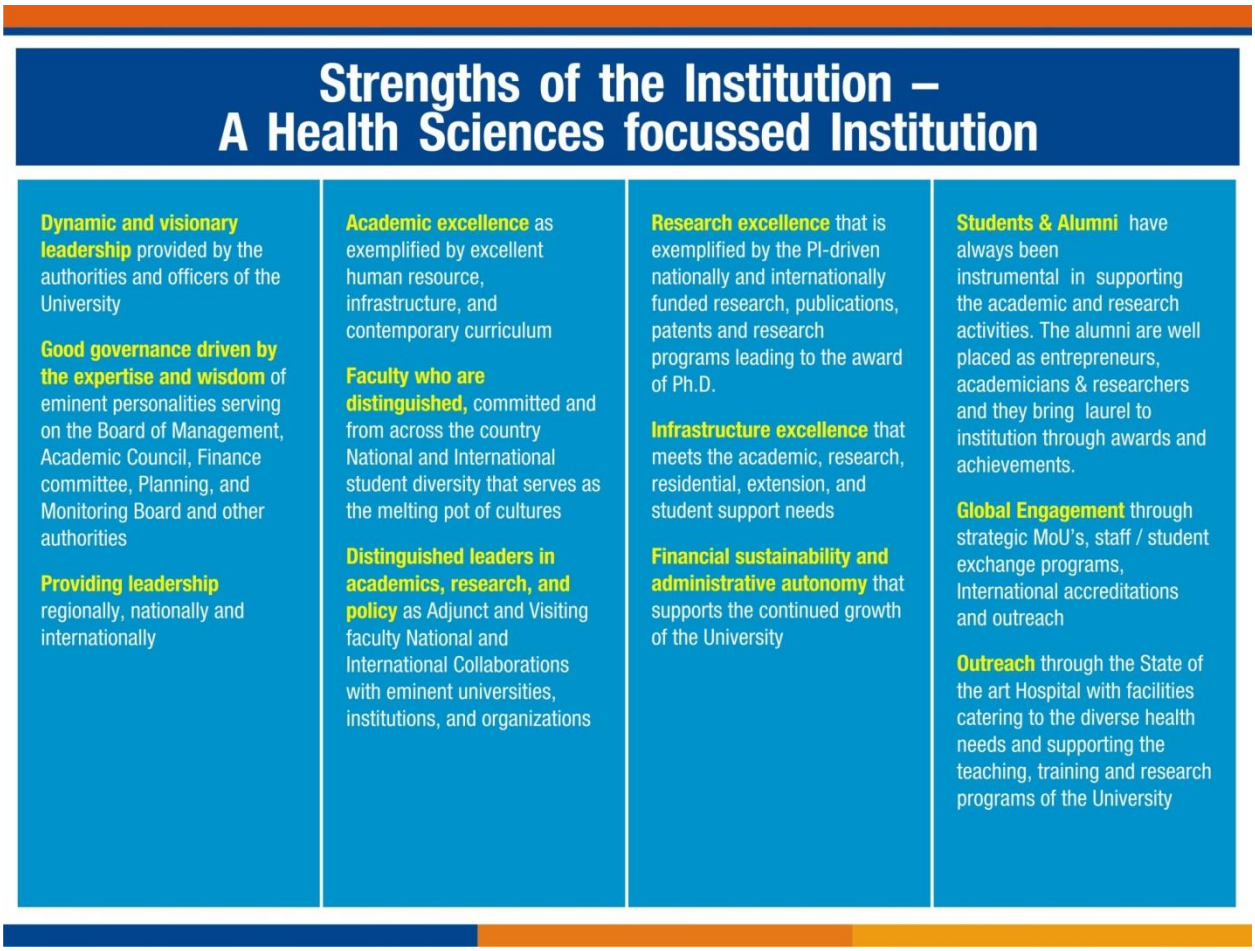
Reduction of carbon foot prints in the atmosphere is a challenging task

A complete tree survey has been completed with the help of eminent botanists and students in the whole of Medical Institutions campus. The survey is vital in order to understand the distribution of plants and their level of carbon uptake.

4.9. **SMART GOVERNANCE**

Existing Facilities:

- Periodical seminars & conferences,
- Faculty development programme
- Hands on training
- Skill development programs *(computer, Tally, Simulation, Software, Access to data bases)*
- JSSU Online Platform
- Computers / Laptops / Printers / Scanners / Photocopier's / Projectors etc., are provided based on requirement to the administrative & supportive staff and for the Depts., as required.



4.10. **SMART FOOD & HEALTH**

JSS Academy of Higher Education & Research (JSSAHER) is committed to its "JSSAHER Social Responsibility Statement & Vision" to provide sustainable, eco friendly smart campus. The "Food & Supplies Policy" is related to procurement, storage and maintenance of food at (JSSAHER), which is a part of "Smart Campus Policy". This policy provides provisions through which food to be procurement, stored, maintained and delivered to all the constituent colleges and departments of JSSAHER.

JSSAHER and its constituent colleges and departments are responsible in working with suppliers, contractors and partners to minimize environmental effects related to services and supports local suppliers and that all procurements represent value for money. All stakeholders shall assist JSSAHER in meeting the sustainable food & supply policy.

This policy is focused on but not limited to provision and procurement of food at JSSAHER. It applies to all aspects of sustainable food, including procurement, provision preparation, waste management, education, awareness and services.

JSSAHER ensures that:

- Procurement, storage and maintenance of food is reliable, safe and represent value for money.
- Environmental and social responsibility is factored in to all tenders and contracts and encourages small sized businesses.
- Suppliers are committed to sustainable use of transport, packaging, storing etc. Communication on progress made during the contract period.
- Recycling process for quantities and effective waste reduction.
- Usage of biodegradable packaging whenever possible.
- Recycling and reuse where applicable.
- Minimizing wastage while procurement, storage, maintenance and deliver.
- To serve sustainable food and to reduce plate waste.

Roles and responsibilities:

- JSSAHER and its constituent colleges and departments shall procure food in a sustainable manner in accordance with the "JSSAHER Social Responsibility Statement, Smart Campus Policy", which are available from the JSSAHE's website https://jssuni.edu.in.
- The Deputy Registrar has overall responsibility for the implementation and delivery of the policy within The University's catering department. However, different colleges and departments shall have particular responsibility for managing aspects relevant to the department.
- Responsibility for application of the principles and practical delivery of this policy within the college in general lies with the Administrative Officers.
- Responsibility for application of the principles and practical delivery of this policy within catering services lies with the hostel wardens, catering managers and teams.
- JSSAHER shall promote sustainable food to customers to increase awareness and sales through meetings and workshops.
- Any changes to our sustainable food practices will be communicated on an annual basis as a summary report.

• The summary report will be produced by the Campus Maintenance Committee following an annual review by the Registrar and Deputy Registrar.

• Promote and supply seasonal fruit and vegetables to customers.

• Engage suppliers to measure the amount of local and seasonal fruit and vegetables and use to help with procurement decisions.

• Increase the procurement and consumption of organic food, focusing on the health, well-being and environmental benefits.

• Move all disposable products to biodegradable alternatives where possible and reduce the amount of disposables used.

• Ensuring tap water and drinking water is available at every catering outlet

• Eco friendly and effective cleaning materials.

• Send zero food waste to landfill directly and recycle all waste.

• Encouraging sustainable food: Contribute to thriving local economies and sustainable livelihoods. Protect the diversity of both plants and animals and the welfare of farmed and wild species, and avoid damaging natural resources.

• Support a culture of healthy eating

• Provide social benefits, such as good quality food, safe and healthy products, and educational opportunities

• Sustainable procurement is partly about buying and sourcing green products but it's also about ensuring energy and resource efficiency as well as long term cost effectiveness.

• Fair-trade on better prices, decent working conditions and local sustainability.

• Saving costs measured across the whole lifecycle of a product

• Decisions on procurement and accreditation should be made on the basis of a rational assessment of value, ethics and market trends.

The Policy Supports:

• The Swachh Bharat Mission (Urban) guidelines, Government of India.

• National conservation strategy and policy statement on environment and development, Government of India.

• National Cyber Security Policy, Ministry of Communication and Information Technology, Government of India.

JSS Institute hostels are well known for its aesthetic food and hygiene. The Institute follows strict vegetarian food both in hostels and food court. A regular check on food and hygiene is carried out to ensure safe health of the students.

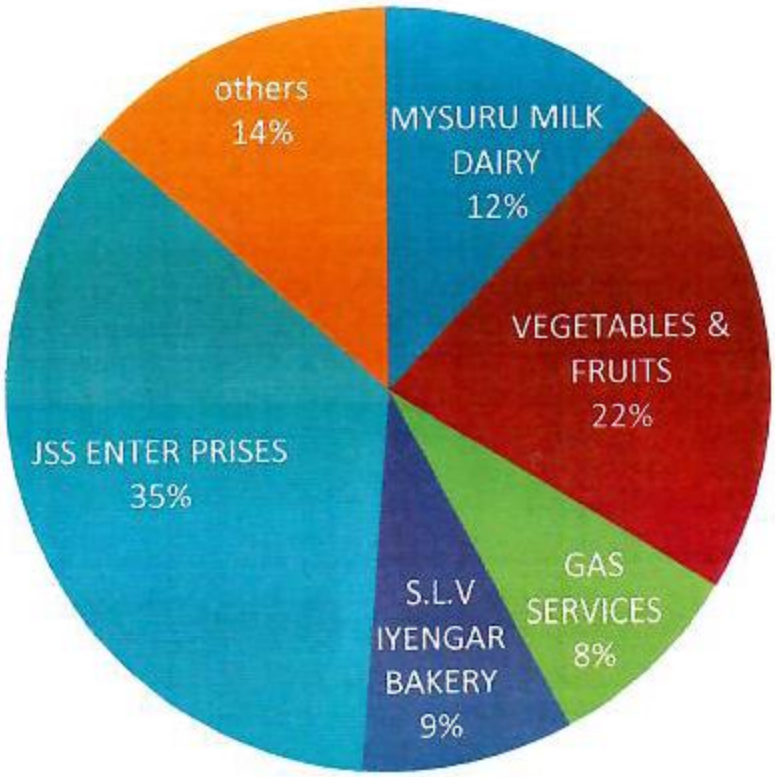
<u>Existing Facilities:</u>

- Food Court *(80 seating capacity)*
- Coffee vending machine
- JSS Health Center
- Mess / Kitchen (3+1 +1 Nos)
- Staff Dining Hall – 2 no's. (JSSU)
- Dining Halls @ Hostels, Guest House, Food Court (5 no's.)

JSS Institutions are already contributing to the reduction of carbon foot print by following strict vegetarian food habits throughout the entire campus.

Further, it is necessary to give orientation to the students regarding the practice of low carbon food and diet.

Hostel officials, care takers and cooks are being trained on the importance of cleanliness and hygiene in the kitchen premises. JSS Institutions ensure that quality food commodities and raw materials are procured from approved vendors and local clean markets.



The pie chart depicts the procurement strategies of JSS AHER

Summary

BUILDING & INFRASTRUCTURE

- Accessibility
- Safety and Security
- Energy efficient
- Rain Water Harvesting
- Walkable campus
- Bicycle
- Sustainable Transport
- Road network

EDUCATION, LEARNING & DIGITIZATION

- Smart Classroom
- E-Resources
- Wi-Fi Connectivity
- ICT Enabled services
- Modular Laboratories
- Innovation Centre
- Virtual Class and Laboratories
- Outreach Programmes

SPORTS & RECREATION

- Playgrounds
- Sport facilities- Indoor and Outdoor
- Recreational space
- Open Gym
- Yoga facilities
- Amusement park
- Open air theatre
- Swimming pool

SAFETY & SECURITY

- CCTV surveillance
- Fire alarms
- Fire fighting
- Peripheral safety
- Visitor management system
- Biometric system
- Anti-ragging

WASTE, WATER & AIR MANAGEMENT

- Sanitation and cleanliness
- STP
- Solid waste management
- Plastic waste management
- E-waste management
- Automatic sensor taps
- Air monitoring system

UTILITIES

- Solar Projects
- Smart lighting System
- Emergency power backup
- Smart micro grids
- Bio-gas plant
- Kiosks

GOVERNANCE

- ERP
- Less paper Office
- Training and Development
- ART- Accountability, Responsibility, Transparency

SERVICES & CONNECTIVITY

- Online services
- Amenities- Bank, Food court, Stationery, pharmacy
- Wi-Fi Services

GREEN ENVIRONMENT RESILIENCE

- Green Campus
- Landscaping
- Preserving open space
- Soil erosion control
- Ground water recharging

FOOD & HEALTH

- Wellness Centre
- Health Centre
- Potable water facility
- Personal Hygiene
- Nutritional Values
- Dietary

Short Term Goal

Most of the elements related to Smart Campus have been achieved. However, it can be claimed thus only after a valid certification that needs to be carried out by an authorized third party.

Godrej Services has been identified as one of such client to carry out the validation process in line with Institutional Green Building Council (IGBC).

IGBC Green Campus Rating System

- It is applicable for buildings which are in design stage as well as operational
- Is applicable for campus with multi-functionality buildings
- Is majorly done for addressing the infrastructure design of the campus
- Influences the individual buildings to opt for green building rating program
- Addresses the complete water, energy and waste management on a holistic approach

IGBC GREEN CAMPUS – CREDIT CATEGORIES

S.No.	Category	Points
1	Site Planning & Management	22
2	Sustainable Transportation	11
3	Water Conservation	18
4	Energy Efficiency	21
5	Material & Resources	03
6	Health & Well being	06
7	Green Education (GE)	03
8	Innovative Practices	06
	Total	90

IGBC GREEN CAMPUS – SITE PLANNING & MANAGEMENT

Credits	Category
SPM MR 1	Green Buildings within the campus
SPM MR 2	Soil Erosion control
SPM Credit 1	Green Buildings within the campus
SPM Credit 2	Site Preservation
SPM Credit 3	Green Cover & Vegetation
SPM Credit 4	Heat Island Reduction, Non-roof
SPM Credit 5	Outdoor Light Pollution Reduction

IGBC GREEN CAMPUS – SUSTAINABLE TRANSPORTATION & WATER CONSERVATION

Credits	Category
Sustainable Transportation	
ST 1	Pedestrian Network
ST 2	Bicycle Lane Network
ST 3	Access to sustainable transport
Water Conservation	
WC MR 1	Rain water harvesting
WC Credit 1	Rain water harvesting
WC Credit 2	Landscape Design
WC Credit 3	Management of irrigation system
WC Credit 4	Waste water treatment & Reuse
WC Credit 5	Optimise water use for construction
WC Credit 6	Water metering

IGBC GREEN CAMPUS – ENERGY EFFICIENCY

Credits	Category
Energy Efficiency	
EE Credit 1	Energy Efficiency in Infrastructural Equipment
EE Credit 2	On-Site Renewable Energy
EE Credit 3	Off-Site Renewable Energy
EE Credit 4	Energy Metering

IGBC GREEN CAMPUS – MATERIALS & RESOURCE MANAGEMENT

Credits	Category
Material & Resource Management	
MRM Credit 1	Segregation of Waste
MRM Credit 2	Organic Waste Management
MRM Credit 3	Handling of Construction Waste
MRM Credit 4	Local Materials

IGBC GREEN CAMPUS – HEALTH & WELL BEING

Credits	Category
Health & Well Being	
HWB MR 1	Tobacco Smoke Control
HWB Credit 1	Basic Amenities
HWB Credit 2	Health & Well Being Facilities
HWB Credit 3	Universal Design
HWB Credit 4	Basic Facilities for Construction

IGBC GREEN CAMPUS – GREEN EDUCATION

Credits	Category
Green Education	
GE Credit 1	**Green Education**
GE Credit 2	**Green Campus Guidelines**

IGBC GREEN CAMPUS – CERTIFICATION LEVELS

Certification Level	New Campus	Existing Campus	Recognition
Certified	**40 - 49**	**36 - 44**	**Best Practices**
Silver	**50 – 59**	**45 - 53**	**Outstanding Performance**
Gold	**60 – 74**	**54 - 66**	**National Excellence**
Platinum	**75 - 100**	**67 - 90**	**Global Leadership**

Budget

Accordingly, financial implications are as below:

1. Feasibility study, Facilitation, Energy modeling and Fundamental & Enhanced commissioning fee is proposed for **Rs. 6,40,000/-.**
2. **IGBC Fee details:**

- Registration fee ---> Rs. 30,000
- Certification fee ---> Rs. 3,68,000
- **TOTAL ---> Rs. 3,98,000**

Thus, the total financial implication would be around Rs. 10,38,000/-

Time Line

Gold certification could be attained in a period of 6 months.

Long Term Goals

Aligning the Key Elements of Smart Campus in line with the Sustainable Development Goals (SDGs) of the UNO

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests. Today, the Division for Sustainable Development Goals (DSDG) in the United Nations Department of Economic and Social Affairs (UNDESA) provides substantive support and capacity-building for the SDGs and their related thematic issues, including water, energy, climate, oceans, urbanization, transport, science and technology, the Global Sustainable Development Report (GSDR), partnerships and Small Island Developing States. DSDG plays a key role in the evaluation of UN system wide implementation of the 2030 Agenda and on advocacy and outreach activities relating to the SDGs. In order to make the 2030 Agenda a reality, broad ownership of the SDGs must translate into a strong commitment by all stakeholders to implement the global goals.


SMART CAMPUS KEY ELEMENTS
BUILDINGS & INFRA-STRUCTURE
EDUCATION, LEARNING & DIGITIZATION
SPORTS & RECREATION
SAFETY & SECURITY
WASTE, WATER & AIR MANAGE-MENT
UTILITIES
SERVICES & CONNECTIVITY
GREEN ENVIRONMENT RESILIENCE
GOVERNANCE
FOOD & HEALTH
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

S. No	SMART CAMPUS KEY ELEMENTS	SUSTAINABLE DEVELOPMENT GOALS (SDGs)
1	BUILDINGS & INFRASTRUCTURE	SDG 9 (Industry, Innovation & Infrastructure), SDG 11 (Sustainable Cities & Communities)
2	EDUCATION, LEARNING & DIGITISATION	SDG 4 (Quality Education), SDG 15 (Life on Land)
3	SPORTS & RECREATION	SDG 3 (Good Health & Well- Being)
4	SAFETY & SECURITY	SDG 16 (Peace, Justice & Strong Institutions)
5	WASTE, WATER, AIR MANAGEMENT	SDG 6 (Clean Water & Sanitation)
6	UTILITIES – WATER, GAS, ELECTRICITY	SDG 7 (Affordable & Clean Energy), SDG 12 (Responsible Consumption & Production)
7	SERVICES, CONNECTIVITY & RETAIL	SDG 12 (Responsible Consumption & Production)
8	GREEN ENVIRONMENT RESILIENCE	SDG 13 (Climate Action), SDG 14 (Life Below Water)
9	GOVERNANCE	SDG 1 (No Poverty), SDG 5 (Gender Equality), SDG 8 (Decent Work & Economic Growth), SDG 10 (Reduced Inequalities), SDG 17 (Partnerships for the Goals)
10	FOOD & HEALTH	SDG 2 (Zero Hunger), SDG 3 (Good Health & Well-Being)

SUSTAINABLE DEVELOPMENT GOAL RANKS OF JSSAHER				
SDG No.	GOAL	2019	2020 (India)	2020 (Global)
	Overall Ranking	101 - 200	3	201 - 300
1	No Poverty	-	2	60
2	Zero Hunger	-	2	101 - 200
3	Good Health and Well Being	46	1	20
4	Quality Education	201 - 300	13	401 - 600
5	Gender Equality	201+	2	101 - 200
6	Clean Water & Sanitation	-	12	101 - 200
7	Affordable & Clean Energy	-	7	101 - 200
8	Decent Work and Economic Growth	-	6	400+
9	Industry, Innovation and Infrastructure	201 - 300	12	400+
10	Reduced Inequalities	101 - 200	7	301 - 400
11	Sustainable Cities and Communities	101 - 200	5	301 - 400
12	Responsible Consumption & Production	16	6	201 - 300
13	Climate Action	-	2	101 - 200
14	Life Below Water	-	-	-
15	Life on Land	-	3	73
16	Peace, Justice and Strong Institutions	91	8	400+
17	Partnership for the Goals	201 - 300	5	201 - 300

Roadmap for attaining the Sustainable Development Goals through Smart Campus initiatives

1. Awareness
2. Advocacy at institution level
3. Implementation at institution level and association with local bodies
4. Monitoring
5. Where do we go from here?

The above listed strategies have already been suggested by Global Taskforce for Regional and local Governments to support and attain the 2030 agenda.