



“Catch the Rain” Initiatives at IIT(ISM) Dhanbad

Owing to the need for conservation of water and achieving zero water discharge at IIT(ISM) Dhanbad campus, following initiatives are being taken under the guidance of Prof Rajiv Shekhar, Director, IIT(ISM) Dhanbad:

Rain Water Harvesting

IIT(ISM) Dhanbad campus have been converted to **Fully Rainwater Harvested** through a total of Artificial Recharge Structures (54 nos.) spread over the campus area of 218 acres of land. All the major buildings are connected to rain water harvesting pits and we are catching the roof top rain water and recharging it into the groundwater aquifers. After the construction of roof top rain water harvesting campus the reported increase in the Recharged Quantity of ground water from 2014 to 2015 is 4.06% while that from 2015 to 2016 is 27.20%. Total amount of recharge during the year 2016 has been reported as 425,923 m³.

The provision of rooftop rainwater harvesting is mandatory in all newly constructed buildings at IIT(ISM) Dhanbad.



Fig 1: Photographs of Rain water Harvesting pits at IIT(ISM) Dhanbad



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Utilization of treated sewage for gardening

Wastewater generated from IIT(ISM) Campus is currently being treated by three Sequential Batch Reactor (SBR) plants. SBR-1 is located near observatory and is having a capacity of 150 KLD. SBR-2 is situated near Dhaiya Gate and is having a capacity of 150 KLD whereas SBR-3 is situated near 180 TypeV/VI quarters and is having a capacity of 450 KLD. Hence, the total capacity for treatment of wastewater is 750 KLD. Total wastewater generated from hostels and residential and other buildings of IIT(ISM) Dhanbad assuming a population of 8500 is 1360 KLD. Assuming that the grey water is 50% of total wastewater generation, we generate 680 KLD of sewage water. Hence the existing capacity of SBR is sufficient to treat the sewage water.

The treated wastewater is currently being utilized for gardening purposes and a dedicated pipeline for supplying this water from SBR-1 & 2 is already completed. Hence, a total of 680 KLD of treated wastewater will be available for gardening purposes.



Fig 2: Photographs of Sewage Treatment Plants (STPs) at IIT(ISM) Dhanbad



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Utilization of Grey Water for Flushing toilets

Sources of greywater include, sinks, showers, baths, clothes washing machines or dish washers and are free from pathogenic contamination. This water can be used directly for flushing of toilets. IIT(ISM) has constructed a pilot scale plant for treating 40 KLD of grey water generated from Sapphire hostel. We are now using the treated grey water for flushing the toilets of Sapphire hostel. The photograph of the installed ETP is shown in Fig 3. IIT(ISM) Dhanbad is planning to install such ETP plants for all the hostels in near future. Moreover, in the new buildings it has been instructed to the CPWD to construct dual piping system and the flushing cisterns will be connected to the treated grey water which will reduce the load on fresh water for flushing purposes. On completion of segregation of grey water and sewage water discharge from all the buildings a total of 680 KLD of grey water will be used in flushing of toilets.



Fig 3: Photograph of 40 KLD ETP installed at Sapphire Hostel



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Management and Storage of storm water at IIT(ISM) Dhanbad

At present surface runoff generated from the entire campus goes to drain outside campus. The total amount of surface runoff generated during the rainy season will be approx. 300 ML/annum. The institute plans to develop storage for this water which can be later used for various purposes. Possibility can be explored to purify this water and use for drinking purposes also. The detailed advice of experts will be sought in this aspect so that the storm water can be contained within IIT(ISM) campus.

The planning of the campus, for making zero water discharge campus, will be carried out phase wise and once the system is successfully implemented in one phase it can be extended to other phases. In addition to above measures Institute is already employing water load shedding by supplying water to the campus for one time only during summer/dry season. The residents are being encouraged to stop wastage of water.