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Po16

Eco sense is climate resilient and real urban water secure

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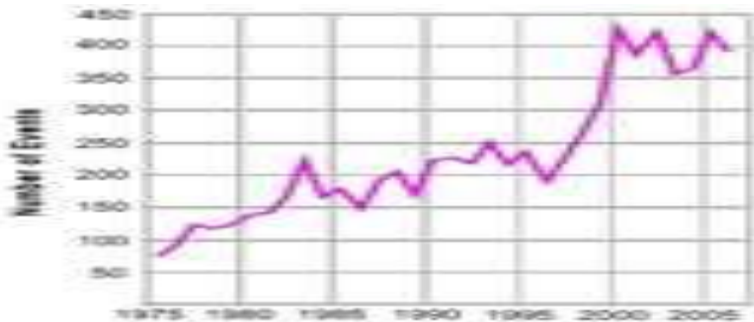
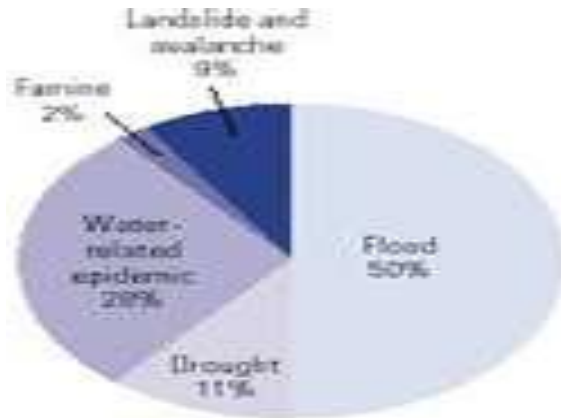
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ABSTRACT

- Climate resilient lifestyle is an inbuilt factor as an ecological engineering practice. It is a real cultural heritage of any sustainable society.
- Climate resilient urban water security best practices are working in India at domestic, Industrial and service sectors. community centred and organisational initiatives are relevant for sustainable integrated water resources management.
- Focused civil and environmental planning have integrated ecological engineering principles for over three decades at space centres in India.
- Eco sense is embedded in ecological engineering practices and are sustainable only along with community empowerment for Climate Resilience.
- Selected best practices in space centres and a dozen eco engineering practices at a dwelling home in a middle class family at Mysuru City, India are reported.

CLIMATE CHANGE COMMUNITY IS THE WORST HIT

DISASTERS & FREQUENCY



The frequency and the intensity of natural disasters are also growing rapidly worldwide. 50 per year in 1900 to 200 per year in 2000.

Best Eco Practices at Space Centres

Water : rainwater harvesting, recycling and reuse of domestic waste water, use of trees and storm water drains for ground water recharge. Scale of operation range from 10 KLD to 1 MLD recycling waste water are sustained ecological cases at space centres. 3 to 6 years is the rate of return.

Solid Waste : segregation of solid waste at source for legal compliance and financial benefits. INR 36K was earned in three years by the segregated Plastic waste sale.



Recharging trees



Waste Storage Tank

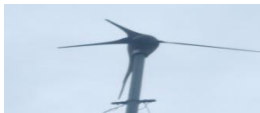


Segregated Plastic Waste

Eco Home, Mysuru, India :
a dozen eco engineering practices, since 2008
First Reported at IEES Workshop at Amsterdam, The Netherlands , 2010



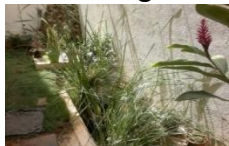
Eco Home



Wind power



Kitchen Biogas



Wetland for Grey water



Daily Dump Composting

Based on Indigenous efforts and state(subsidy support for solar energy),

- 1) Solar Wind Hybrid 550 Watts 24 X 7 lighting : **Operational**
- 2) Daily Dump : Wet Solid Waste Composting : **Working**
- 3) Grey water recycling & reuse for gardening : **Operational**
- 4) Rainwater Harvesting & Recharging bore well : **Working**
- 5) Rock Garden with grey water cascading : **Operational**
- 6) Hollow clay Blocks and filler roof slab structure : **Integrated**
- 7) 19 Sq M Gardening all round the building : **Working**
- 8) CFL lamps for all electrical fixtures : **Operational**
- 9) 2 to 5 kg/day Kitchen Bio Gas Plant for Cooking : **Working**
- 9) Terrace Gardening : **Working**
- 10) Road side tree recharging : **Working**
- 11) Granite drains as recharge points: **Working**
- 12) Free Space Eco Literacy and Sky Watch Orientation virtual one hour a week for 5 to 9th Std students with a handhold in a parent/ teacher/ guardian **in 7th Week focusing on Ecological Engineering**

(Planning & Design of Civil Works : **Architect Dr Shashi Bhooshan & Associates, Mysore**)

Reuse, recycle and reintegration of domestic waste for non potable uses 10 KLD to 1 MLD tertiary treatment Plants at space centres, India operational since 1985

Line of treatment :

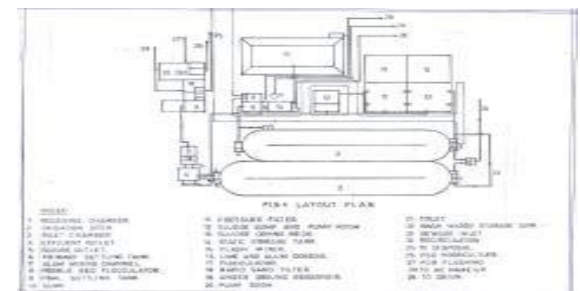
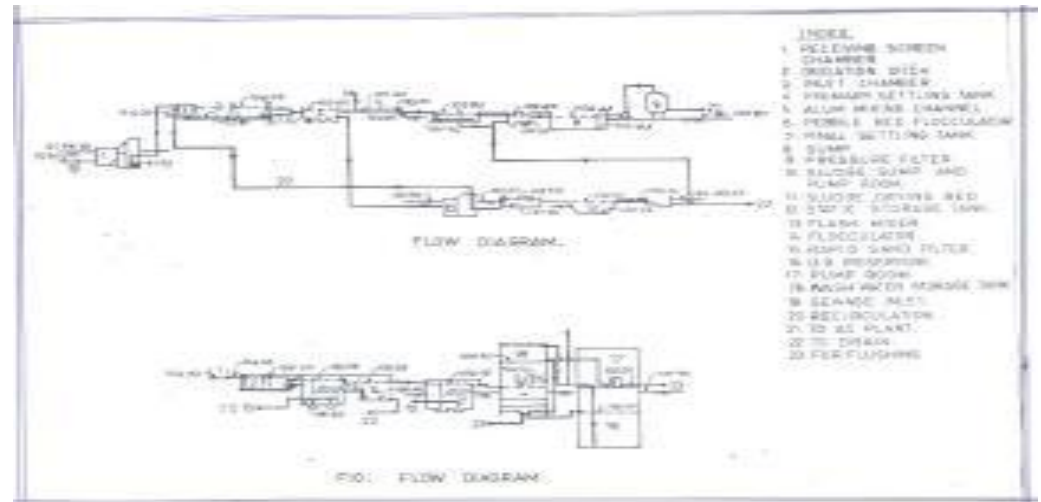
Extended Aeration by conventional Oxidation Ditch, Baffled Wall Flocculation, Plate Settlers sedimentation, Rapid Sand Filters, Activated Carbon Pressure Filter, pre chlorination :

End Uses :

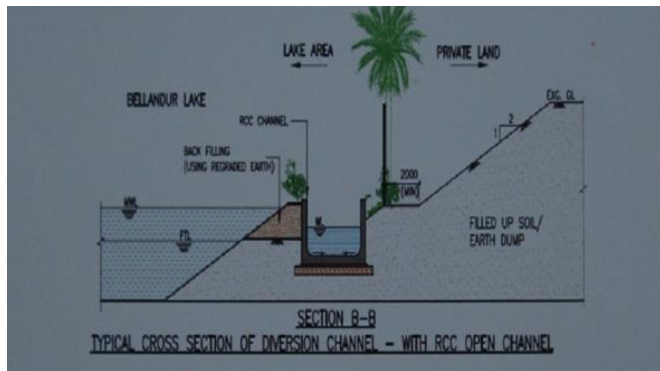
Non Potable, A/C Cooling Water, Water Closet, Urinal Flushing and Gardening.

Economics :

3 years repayment.



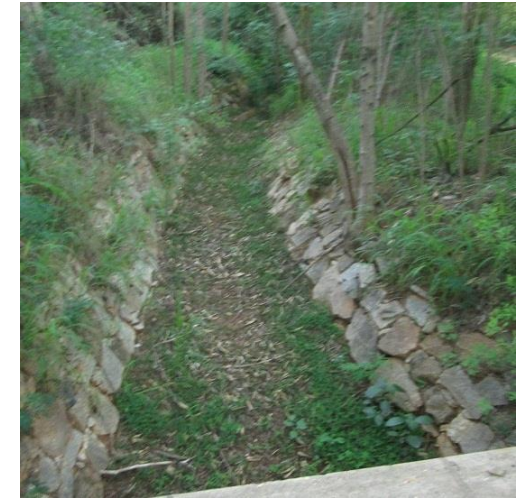
Natural drains vs Eco Illiteracy RCC drains



RCC Drains for Rain Water



Natural drains pervious sides and bottom



Eco Sense is Cost Free

Eco Illiteracy at its Best

Over 1000s trees at SCC, ISTRAC ISRO Campus, Bengaluru Rain Water Recharge Ecological Engineering Cost Free Option



Two-foot-deep trenches dug around 1,000 trees in ISTRAC-ISRO campus in Peenya

Trees Step into the Trenches, Recharge Peenya's Water Table

● Vidya Vijay

Around 1,000 trees have been converted into recharge points to replenish and increase groundwater levels in Peenya by ISTRAC ISRO.

Prof V Jagannatha, deputy manager and a scientist/engineer at ISRO Telemetry Tracking & Command Network (ISTRAC), came across this method during his trek in the Western Ghats in 1994. A civil engineer who specialised in environmental engineering says the method opted is extremely easy and inexpensive.

In this method, circular trenches are dug two-feet deep around the trees. Water after rains or from any other source then directly would flow into these concrete pits, and can go up to 50-feet deep, thus allowing 2,000 litres to a maximum of 5,000 litres of water, to percolate and stay within these pits. This in turn leads to rise in ground water levels in the surrounding regions.

Prof Jagannatha says that over the three years they have started implementing this method, they've observed a lot of subtle changes in the area. "Firstly, soil moisture content has increased. Secondly, trees don't shed much leaves dur-



Prof V Jagannatha

ing summer. Also, the levels of water were very low in the borewells earlier. Now, we are able to hear the splash of water when we throw a stone," he says.

Stopping the flow of running water and allowing it to percolate is the key philosophy of this method, which is neglected in the most urban watershed management methods.

If adopted in a city like Bengaluru, it can produce great effects, given that there are between 12 and 17 lakh trees in this city, he adds.

Although methods like afforestation can be practised along side, they continue to fall under big budget schemes of the government, he says adding, "this method of conserving water is relatively economical and environmental friendly."

In Peenya, this practice is implemented with the help of an existing workforce involved in external environmental maintenance of the ISRO ISTRAC campus.

Prof Jagannatha firmly believes that each resident can take up the task of converting trees to recharge points and increase the soil moisture content. Roadside trees and park and open spaces especially of the central government and corporate campuses could be the focus points, he suggests.

Manvel Alur, founder of EN-SYDE, an NGO working on environmental solutions comments, "Digging of such trenches around trees is a very useful method to increase the ground water level, especially given the flash-flood rain patterns in the city. It is of common knowledge that trees should not be cemented up to their barks and enough space has to be left around them for water percolation. Sadly, this does not happen in most cases."



Enabling communities to care for their own environments

Ecological Engineering Sustainability Pathways

ACTION POINTS

- Action : 01 : Provide Communities and individuals with access to resources and an equitable share in managing them.
- Action : 02 : Improve exchange of information, skills, and technologies.
- Action : 03 : Enhance participation in conservation and development.
- Action : 04 : Develop more effective local governments.
- Action : 05 : Care for the local environment in every community.
- Action : 06 : Provide financial and technical support to community environmental action.

(**Caring for the Earth: A Sustainable Living** : IUCN/UNEP/WWF, 1991)

Ecological Engineering is a Tunnel Effect

An Eco Literacy Model planned and implemented in Lockdown period

Free Virtual Ten week Upasaki Prof V M Parvathamma Memorial Space Eco Literacy and Sky Watch Orientation Course for 5th to 9th Std Students with a parent, teacher or a guardian

Week # 01 : Climate Action

Week # 02 : Pandemics since 1000 AD

Week # 03 : Eco Sense is Cost Free

Week # 04 : Lakes Eyes of Earth

Week # 05 : International Space Station and International Space University

Week # 06 : ISRO : A Saga of Self Reliance in Space

Week # 07: Tunnel Effect is Ecological Engineering

at

People Science Forum

A unit of KRVP in Popularizing science activities with students and citizen as per Preamble of Constitution of India

our elders live in us and Science is in our breath

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