

Best Practices for sustainable sanitation

And

Innovative Solution to improve Life of sanitation workers and bring Green revolution.

“Accucel Sarvadhaar Toilet”

-H.R. SHUKLA managing director Accura polytech pvt.ltd Ahmedabad

Urgent need for sustainable sanitation particularly in Asia and Africa. (Developing Countries)

- 2.6 Billion people do not have proper sanitation and defecate in open.
- Huge expenditure incurred on public health and due to natural water/as well as ground water pollution.
- Large water resources are used and discharged as waste water whereas world is likely to face drinking water problem.
- Basic dignity and social up gradation / security particularly for women needs proper sanitation.
- Prevent manual scavenging.
- Prevent global warming by coupling sanitation and plantation.
- Save our soil by recycling rich nutrients in human excreta back to nature.
- Improve food quality by use of rich nutrient effluent water from bio-toilet as organic manure for agriculture/kitchen garden and save costly chemical fertilizer.
- More than 19 cr. Toilets required by 2019 attracting business worth 10 to 15 billion US \$.
- Prefab bio-toilets easy to install, transport and maintain within a short period.
- Multiple, flexible, DIY design.

MISSION – S.O.S. - save our soil

- Energy saving , Help regenerate soil.
- To develop ACCUCEL GREEN ENERGY GENERATING TOILETS as part of organic cycle to achieve primary goal of S.O.S.
- Enztech Green Technologies is established with the mission of ‘**Save our Soil, Prosper our Future**’. We have developed Innovative Enzymes Technology for the disposal of sewage waste and proper sanitation to achieve open defecation free India, public hygiene/health and promote organic farming and plantation for Green revolution as well as global warming solution improving social life of common man



Contents -Enzymes are natural occurring proteins.

Enzymes catalyse the chemical reaction rate to decompose sewage /effluents to convert into nutrients for easy use for agricultural use/disposal without polluting environment/soil.

Active Ingredients :

Bacteria: Nitrosomonas sp.Nitrobacter sp.Aerobacter sp.BacillusSubtilis,Cellulomonas sp.

Enzymes : Protease, Amylase, Hemicellulase, Lactase, Lipase

This product is not harmful to humans, animals, plants and water sources.

Enzyme Functioning

Enzymes activates the chemical reaction rate millions of times and produces specific end products. Enzymes disintegrates different undesirable elements present in effluents like fats, oil, greases, undesirable proteins to acceptable effluent standard for agricultural use without costly sewage treatment plants employing aeration, filtration, coagulation etc.

Low cost solution to treat waste from domestic Septic Tanks, Farm/dairy Effluent, Municipal Sewage and waterless urinals

Enzymes helps in reducing foul odour and works to remove scale-up in pipelines and reduce suspended solids and improves efficiency of effluent treatment plant

These enzymes promote the growth of 'planktonic' bacteria already present in a minority in the existing effluent systems, thereby giving quick solutions.

The enzyme promotes Planktonic bacteria, provided given the opportunities, grow very fast, thereby remove the harmful diseases causing , sludge forming, odour causing bacteria, by starving them of nutrients

When there is no flow into the tank, the enzyme remains dormant while the enzyme previously introduced to the tank will continue to stimulate reaction

Advantages

Rapidly digests organic waste assuring easy pump outs. Attacks and neutralizes fly larvae

Reduces bad smells , Non hazardous to people, animals and water bodies,

Being natural process, energy requirement is low and reduces pumping, aeration, filtration cost and time , Enzymes acts instantly on charging, Easy to install and operate

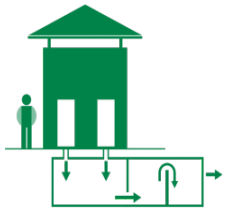
Low cost, economical, simple and maintenance free effluent treatment process

Easy to adopt and flexible process to meet population growth requirements

Enzymes resist common cleaning materials like soap, detergents etc.

Enzymes brings down the BOD (Biological Oxygen Demand) from high value for effluent of 1100-1500 mg/l to< 100 mg/l acceptable for irrigation needs.





Application System in Enztech Green Technology, “Sarvadhara Toilet” Treatment of Sewage waste in Domestic / School Toilets

Specific quantity of enzyme pack diluted in liquid water (20-50 lits.) depending on no. of persons using the toilet/day, (~15-20) is charged for start-up initial fill-up of water approx. 200-300 liters. And use by 5-10 person of toilets.

Special candle filter bags containing enzyme pack is placed in flush tank for better effective process charging on daily basis. This filter bags are replaced every month.

Enztech kit is supplied for 1 year operation along with supply of toilet and service kits provided for annual for annual maintenance thereafter.

For community and public toilets/municipal sewage treatment plants, special design and quantity are worked out on custom made needs.

Enztech Green Technologies, the promoter of Modular Prefab Eco Toilet ‘Sarvadhara Toilet’, has entered into the **Joint Venture** with Accura Polytech Pvt Ltd. ,manufacturer of Solid uPVC Foam profiles with integral skin at its state of art manufacturing unit at Sanand, Gujarat with breakthrough technology from Italy for building and furniture sector since 1995.

Promoters are technocrats having immense experience in polymer field and have worked in International market. Accura Polytech has developed an innovative solution to rapidly changing demands of Modern Society, wide range of prefab structures for Toilets and other end use application.

Objective

Government of India has launched “Swachh Bharath Abhiyan” in the year 2014 for promoting clean hygienic toilets and achieve open defecation free India by 2019

Eradication of Manual Scavenging

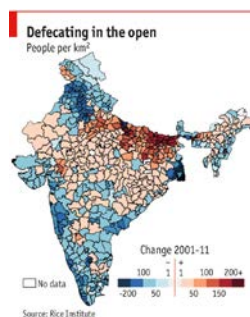
Modern and Scientific Municipal Solid Waste Management

Save Scarce natural Resources like wood, water, energy, relieve water stressed cities by saving water/ground water Pollution/river pollution, provide Solution to Global warming, improve Social life of common man

To effect behavioural change regarding healthy sanitation practices

Generate awareness about sanitation and its linkage with public health

To overcome with this, Enztech Green Technologies has decided to support Government of India by promoting ‘Sarvadhara Toilet’ under this scheme



How it can be achieved



Provide ‘**Sarvadhaar**’ Toilets to Community/Public Toilets to schools, rural and urban areas on priority basis to prevent open defecation at the earliest.

Domestic, School, individual/Community requirements with incorporation of Enztech Green Technology will prevent manual scavenging as well as save water and improve public hygiene/health, basic dignity.

Nutrient rich effluent water from Enztech STP Tank can promote organic farming, self employment, women empowerment, agricultural production. This will also save large requirements of Chemical Fertilisers/pesticides.



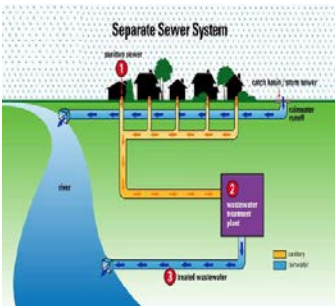
Sanitation clubbed with plantation can reduce global warming as trees can dissociate CO₂ and release oxygen. Possibility of Plant growth and survival of plantation increases manifold by nutrient rich effluent from Enztech STP Tank.

Make Cooperative societies to promote, maintain and expand sanitation activities as business and provide self employment.

By creating awareness for proper sanitation practices, public health/hygiene as well as social life of common man can be improved considerably.

Expenditure on Municipal sewage treatment plants as well as maintenance/repair of pipelines can be reduced to a great extent.

Municipal Solid waste management can also be handled at low cost by “Enztech Green Technologies”.



River Pollution(**including Ganga**) can be prevented by carrying out primary treatment of sewage and other effluents by ‘Enztech Green Technology’ before allowing effluents to mix into river water

By use of nutrient rich effluent water, we can prevent groundwater pollution and elevate soil quality and thereby food quality.

Use of urine and wash water as fertiliser also saves water resources and saves costly chemical fertiliser and subsidies thereof.

Make Toilets and sanitation products excise and vat free as well as offer easy availability at all locations.



Remove subsidies and ensure proper quality guidelines for sanitation practices.

Use of Solar Lights on Toilets can be a large source of renewable energy and provides safety to woman in particular.

Municipal Corporation as well as panchayats can earn substantial amount by treating public/community Toilets as advertising /Hoarding space to install and maintain public/Community Toilets. This amount can also be used to motivate common man to use and get paid to effectively provide clean and hygienic environment in cities/villages.



Economical Solutions for

Domestic sewage Tanks
 Portable Toilets
 Farm/Dairy Effluent
 Cleaning Rivers
 Waterless Urinals

Public Community Toilets
 Solid Waste Management
 Municipal Sewage
 Smart Clean City

Advantages of Sarvadaaar Toilets



Modular Designs
 No Construction Hazards
 Fire retardant
 Acid proof, Alkali proof
 easy to transport in ckd condition
 Earthquake resistant
 Energy Efficient
 Elegant
 Corrosion resistant
 Economical in construction
 No maintenance/painting

100% Portable
 Aesthetically designed
 water proof ,termite proof
 Light weight
 high wind velocity resistant
 long lasting
 Heat and sound insulant
 Unlimited configurations.
 Cost effective
 Environment Friendly
 Weather resistant





Prefab Modular Sarvadhara Toilet: model sizes

Single Unit(1wc/ 1Urinal,1 Bath, Gents/Ladies) - 3'x3', 4'x4', 1100mm x1100mm

Twin unit (2 wc/1wc + 1 Urinal), (1wc + 1 Bath Gents/Ladies) - 6'x3', 6'x 4', 1100mm x 2200mm

Quadruple unit (4 wc+ 2 wc+2 Bath, 2 wc + 2 Urinals, Gents/Ladies) - 8' x 6', 12' x 3', 12' x 4'



School/Public/Community Toilets : (1 wc+2 urinal,Boys/Girls) 7'x4' (1wc+4 Urinal,Boys/Girls) - 11' x 4'

Public/Community - 10' x 8', 10' x 10', 20'x 8', 20' x 10'

Social Impact

Enztech Green Technology is most ideal for rural area and Tribal areas where costly sewage treatment plants are unviable and unmanageable.

Economical, promotes clean and hygienic solution for sustainable sanitation improving public health , dignity , organic farming and agricultural production Saves water resources and energy Reduces global warming

Improves Social life by providing self employment and woman empowerment Prevent Manual scavenging



Waterless urinal valve



WATERLESS URINALS

Urinals have been flushed for over 80 years solely to carry the urine to the waste pipe.

- The composition of urine is 96% water 2.4% urea and 0.6% various acids. All plumbing fixtures are laid out for gravity flow down.
- We do not need water to transport water !!**
- 1000 urinals in the smart city (Airport, Bus/ Rly/ Metro stations, Gardens, Schools, Cross Roads etc)
- Average use by 100 persons / day
- Flush urinal uses approx 2 lits of water per flush.
- $1000 \times 100 \times 1 \times 2 \text{ Lit} = 2,00,000 \text{ lits / day} \times 365 \text{ days} = 730,00,000 \text{ Lits}$
- Save lacs of lits of water per year which is hygienic and odourless.
- ‘Moth Balls’ or any other addition in the urinal is NOT necessary
- Save water, maintenance & sewer cost.
- More hygienic use as only when urine is combined with water that the foul odour occurs or when urine is splashed onto the floor
- Urine is sterile, until mixed with water so waterless urinals are more hygienic than water borne units
- Many beneficial by products in urine , from fertilizers to cancer inhibiting properties
- Clean with water and neutral detergent only. No acid or harsh chemicals.

UPGRADING OF URINAL FROM WATER FLUSHED TO WATERLESS.



Installation Instructions:

1. Remove the grate, waste fitting and trap from the existing ceramic unit.

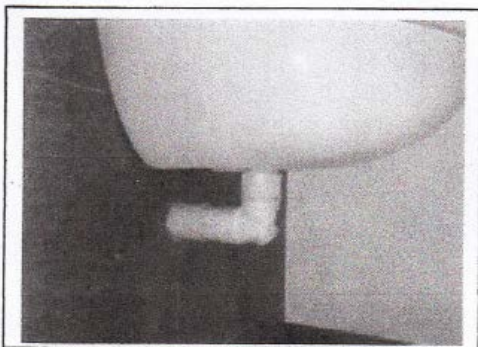
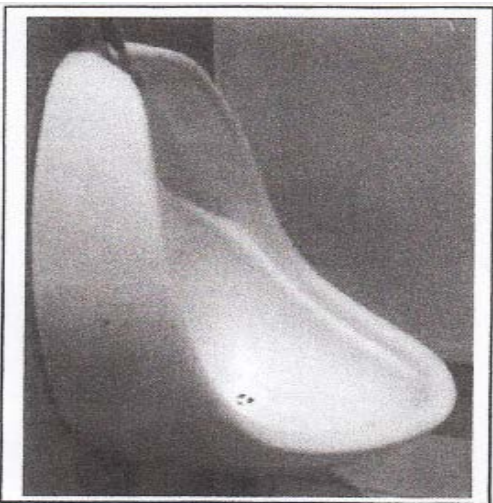
2. Clean away any debris/old putty from the unit and make sure the waste line is clear of any sludge or blockages.

3. Install the waste and connect straight into the waste line using flexible piping or an elbow and connectors. (Use sikaflex/silicon to make sure the waste is firmly fitted into the urinal.)

4. Firmly insert the Free flowing Waterless Urinal Valve into the waste and check for leaks.

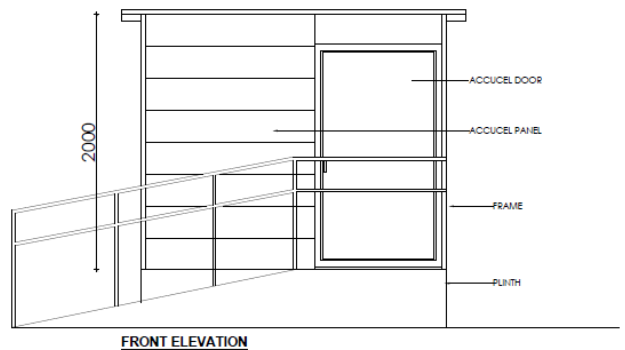
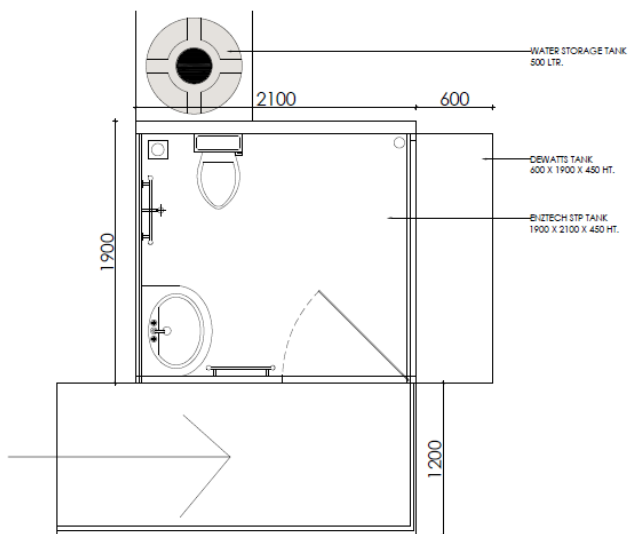
5. Turn off the water supply.

Cleaning Instructions: Clean with water and neutral detergent (soft soap) only. No acid or harsh chemicals.





ACCUCEL CWSN TOILET -FOR DIFFERENTLY ABLED PEOPLE



SPECIFICATION

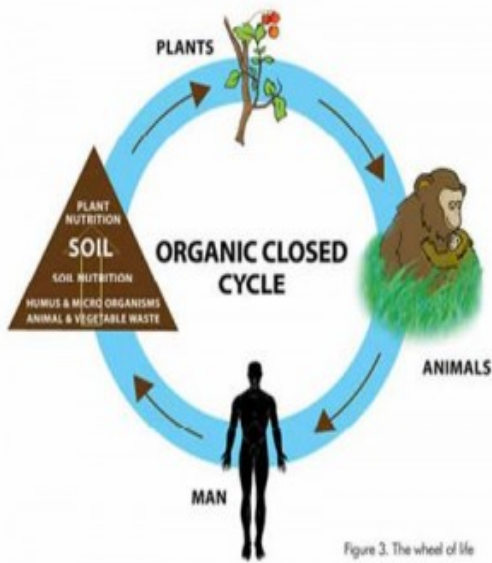
OVERALL SIZE	2700 X 1900 X 2450mm ht.
TOTAL UNIT	1 NOS.
ONE UNIT SIZE	1900 x 2100 x 2450mm ht.
DOOR SIZE D2	900 x 1780 mm
DOOR NOS.	1 NOS.
BI-ZTECH STP TANK	1900 x 2100 x 450mm ht.
DEWATT TANK	1900 x 600 x 450mm ht.

**ACCUCEL PREFAB BIO TOILET FOR
CWSN**
TOILET UNIT DESIGN (2100 X 1900 X 2440HT)

DATE
20.02.2018

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ACCUCEL
THE ENVIRONMENT FRIENDLY ALTERNATIVE



Enzyme Treated effluent organic water use in agriculture eliminating needs for chemical fertilizer and Pesticides

Use as Organic Fertilizer : Rich in N,P & K

Soil differences : Increases the microbial life

Soil structure improves and becomes fertile

Nutrients available for longer period

Crop difference: No chemical residues present in crop

Protect from pests and diseases

Premium quality of fruits and vegetables and crops fetching high value

Way to change life of sanitation workers

- Let us form the “Green and clean Environment brigade(GCEB)”By enrolling sanitation workers as members/soldiers to implement cluster activities at village , taluka , district , state and national level to build, operate and maintain sanitation and plantation work on a self sustainable basis.
- Provide identity cards and certificates to members along with proper skilled development programme to carry out designated different type of work like masonry , assembly , cleaning , transportation, bioenzyme distribution and application , nutrient water extraction , collection and agricultural use , plantation , agric produce storage and marketing etc..
- Provide proper uniform , tools and equipments to carry out work in efficient and targeted way
- Provide finance and subsidy fund to clusters for faster implementation on micro and macro level.
- Get sponsorers and raise revenue through advertising space on toilets installed.
- Collect revenue through organic fertilizer and agriproduce sales .
- Saving of water resources and prevention of groundwater pollution will enhance social life and public health..
- Prevention of open defecation will save high cost spent on public health.

- Promotion of tourism and railways through clean and hygienic facilities at all locations.
- Prevention of global warming due to plantation growth through sanitation water usage.
- Saving costly subsidy given on chemical fertilizers and expense on same by using
- nutrient rich effluent water for agriculture purpose and reaping high yield and quality of food.
- Saving our soil and prospering our future.
- sansad adarsh gram yojana (SAGY) and public /community sanitation facilities for metros and mini metros as well as school toilet under “sarva shiksha abhiyan “ can provide initial start up funds under their various govt. schemes

Moreover , various schemes under rehabilitation of manual scavengers as well as sanitation workers can be used for developing sanitation as business and providing self employments.

Let’s all join hands together to bring welcome change in life of common men and society and achieve our mission of

SAVE OUR SOIL,PROSPER OUR FUTURE



Recommendations

•Priority

Promote prefab bio-toilets under CSR to achieve green revolution.

•Form a Committee

Form a committee comprising of architects, technologists, approving government officials, builders, designers, processors and craftsmen to promote wider use of bio toilets and waterless urinals.

•**Create Awareness**

Display and demonstration on wheels to create mass awareness.

•**Focused development**

We are confident that **focused development can lead to green revolution business worth more than USD 1 billion for WPC products.**

•**Environment protection as Criteria for Growth and development**

Environment safety , prevention of manual scavenging, saving of water resources, self employment, women empowerment , ground water pollution check, prevention of global warming should be the criteria for growth of economy and society.

•**Commitment**

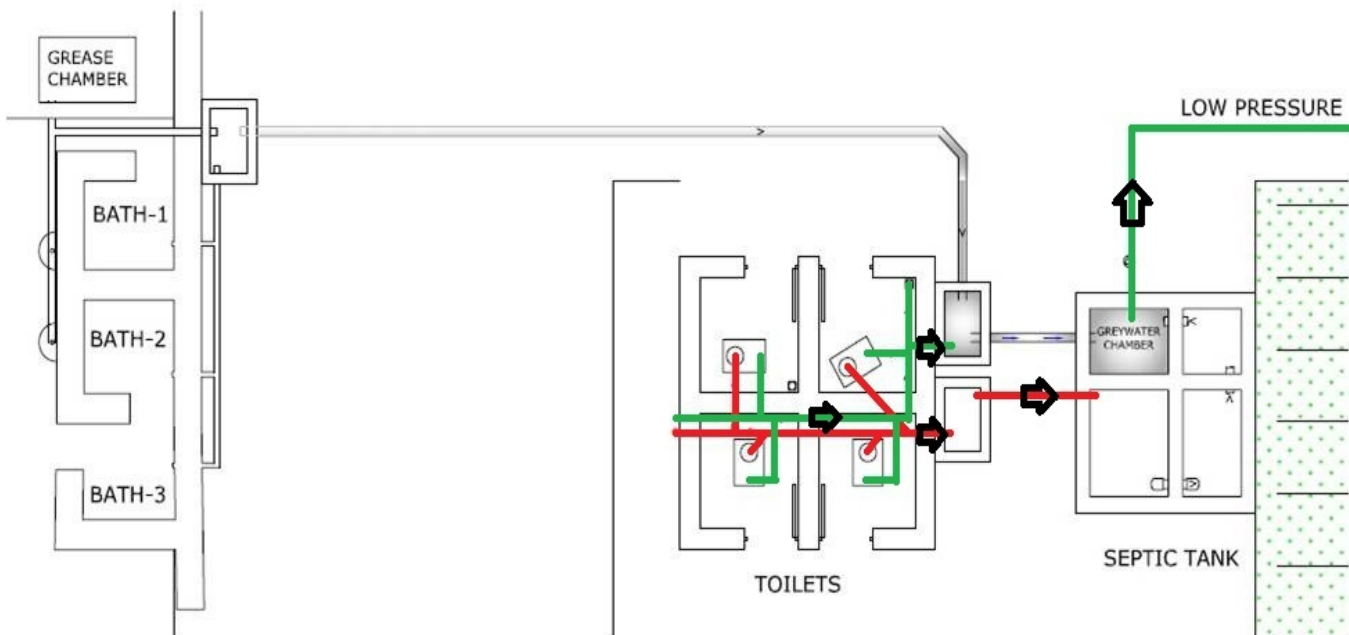
There is no need to enforce a law to promote the right product. As a proud citizen let us commit ourselves to use bio toilets and waterless urinals.

Innovative Revealing Experiment and case study

-Shree Upendra Raval and H.R. Shukla

We consider carbon dioxide and excreta as heavenly gifts and not a waste , we will confine our discussion on excreta as valuable resource only. Our sanitation and water resource management expert associate Mr.Upendra Raval (muni kaka) took up challenge to demonstrate use of sanitation water and nutrient effluent for agriculture use in khadir village in Kutch desert, Gujarat where is barely 1” rain in a year as well as no irrigation water available. Even the soil test by agricultural university , Anand stated that no crop is possible in such sandy soil how ever we produced maize crop with in 90 days to the utter surprise and joy of local residents and authorities

GRAYWATER & BLACK WATER PATH TO PILOT FARMING



PILOT PLOT Accassia-Bawal- REMOVED



Sustainable Farming at Khadir Village



Sustainable Farming at Khadir Village



Both Domestic + Agriculture in <25 LPCD Decouple Agriculture from Fossil Fuel

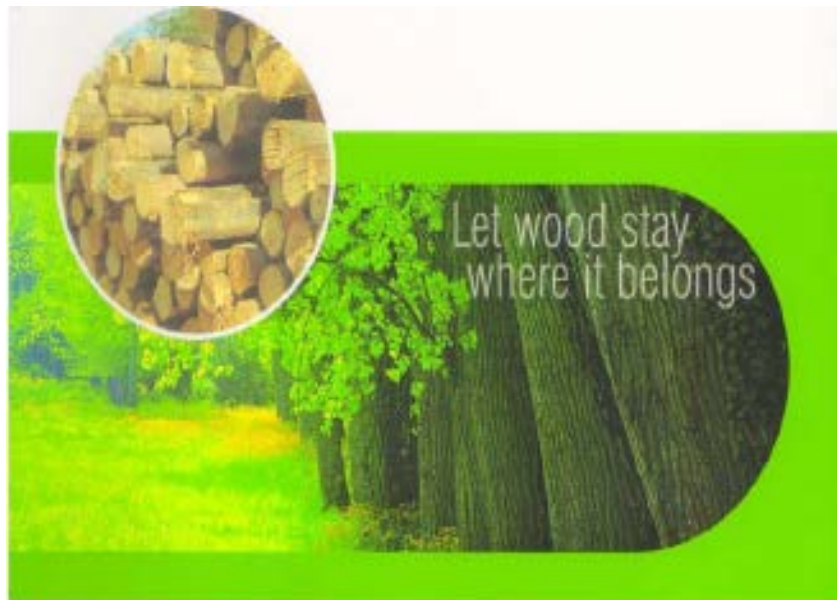


Best practice for sanitation

The experiment justifies the use of nutrient effluent water for agricultural and plantation purpose to bring green revolution in the country and increase GDP of our nation considerably at a fast pace ,save our precious water resources and solve global warming problem by coupling sanitation with plantation of neem, ambla , moringa and other trees to provide medicinal value as well as dissociating carbon dioxide.

We recommend all citizens and govt authorities to adopt this as best practice for sanitation and say good bye to subsidy.

Thank You



**Let wood stay
Where it belongs**

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