KULGAON BADLAPUR MUNICIPAL COUNCIL, KULGAON
DIST- THANE (MAHARASHTRA)

ECOLOGICAL SANITATION (ECO SAN) RECYCLING & REUSE OF WATER

(PROJECT FINANCE)
MMR ENVIRONMENT IMPROVEMENT SOCIETY

ecosan
ecological sanitation

Kulgaon Badlapur Municipal Council has won National Urban Water Award (NUWA) 2009 for "Best Ecological Sanitation – Municipal"

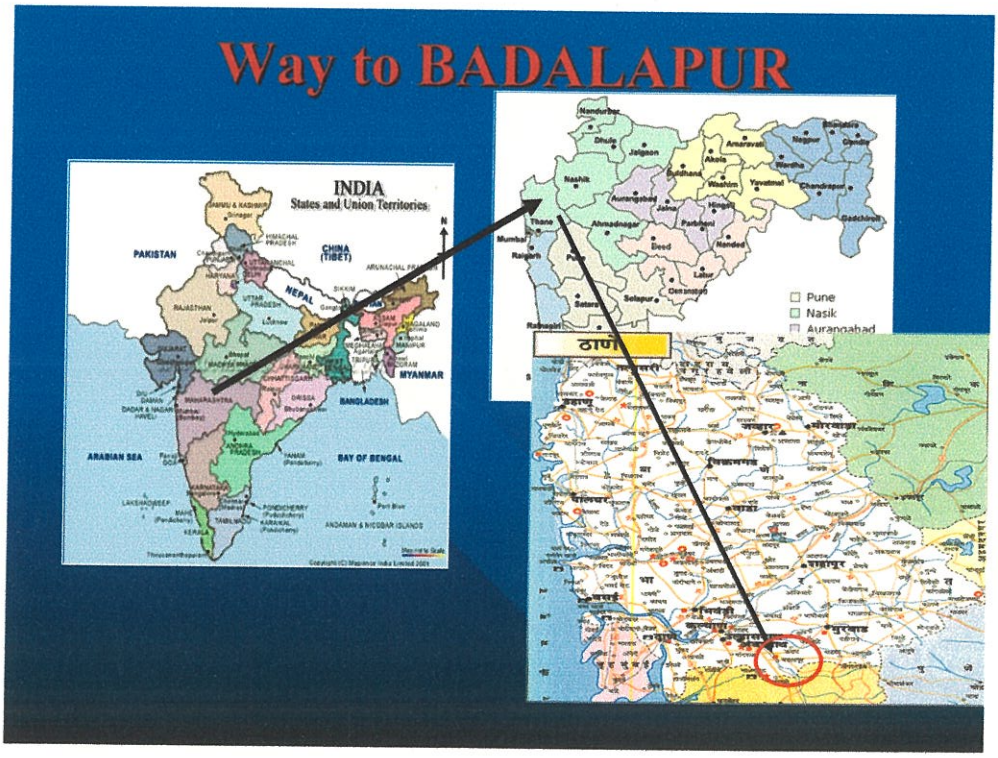
KULGAON-BADLAPUR MUNICIPAL COUNCIL

KULGAON, TAL-AMBERNATH, DIST-THANE
(MAHARASHTRA)

WELCOME

INTRODUCTION:

Kulgaon Badlapur city is situated on the banks of Ulhas river amidst beautiful and peaceful natural surroundings of the sahayadris mountain range & is a fast developing city, since Badlapur city is connected to Mumbai metropolis through rail link, it has large population of middle class families it is widely acknowledged as a cultural centre where arts, cultural activities, a variety of social events & programmes & educational activities flourish and the city has rightly attained prime place on the cultural map of the state of Maharashtra.



Kulgaon-Badlapur Municipal Council was established in 1992. It is a B class Municipal and having a population of 97,948 in 2001 census report. Kulgaon-Badlapur Municipal Council is located at central Rly main line between Mumbai-Pune section & away by 63 Km from Mumbai.

Kulgaon Badlapur Municipal Council was honored By Hon. President of India with a national award for its barrier free environment created for the physically handicapped.

ECOSAN

Context

Ecological sanitation(ecosan) is a new paradigm in sanitation that recognises human excreta and household wastewater not as waste but as resources that can be recovered, treated where necessary and safely used again.

Ideally, ecosan systems enable a complete recovery of nutrients in wastewater and their reuse in agriculture. In this way, they help preserve soil fertility and safeguard long- term food security, whilst minimizing the consumption and pollution of water resources.

Conventional sanitation technology are coming under increasing critism for being economically and ecologically unsustainable. It is evident that the United Nations Millennium Developments Goals(MDG) cannot be achieved by conventional sanitation solutions alone and that alternative approaches are urgently needed.

Indian Scenario

Most towns and cities in India face serious problems in providing adequate sanitation, sewers and wastewater management systems for the whole community. Where conventional, waterborne sewerage systems exist, human wastes are flushed away with huge amonts of scarce freshwater, polluting rivers and the drinking water sources of people living further downsteam. In addition, more than 650 million Indians do not have access to adequate sanitation at all- there is a huge demand which cannot possibly be met by conventional sanitation systems due to enormous costs for the pipe network, lack of water and serious environmental drawbacks. For this reason, many countries(almost 65 nos) like Holland, China, Mali, Nepal,etc have a paradigm shift to provide sustainable sanitation and waste management.

Ecosan is an established, cost effective and environmentally as well as socially sound alternative that can help to solve the pressing problems concerning inadequate sanitation. This not only improve the environmental situation, but also improves the living conditions in a sustainable way and lowers risks for human health. Put shortly, it is an approach to turn waste into wealth.

Ecological Sanitation for Adarsh College of Arts & Commerce in Kulgaon, Badlapur, Maharashtra / INDIA

Introduction

This project is about a "ecological sanitation" system for a daily school in Badlapur, Maharashtra, established in the context of the EU pilot project "ASIA PRO ECO II".

The school has about 2600 students (1300 at morning, 1300 at afternoon). The campus of the School is often used for local cricket matches and wedding ceremonies.

The ecosan system consist of a toilet center and a on-site wastewater treatment unit, which end-products can be reused locally.

The system is in use since September 2008.

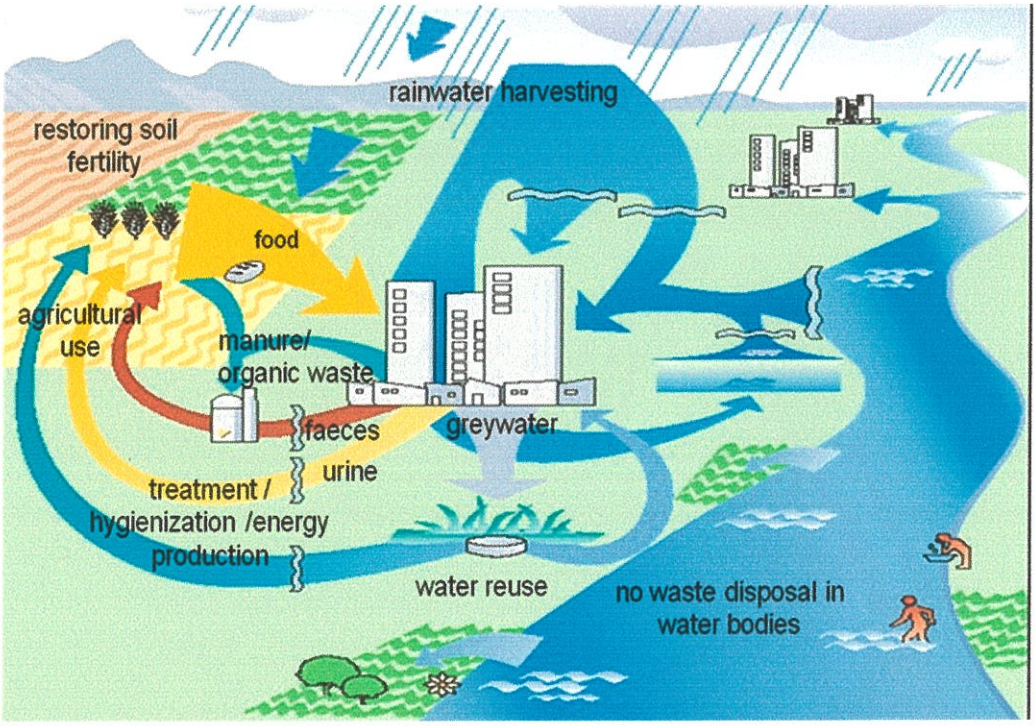
Description of the system:

In general

The implemented sanitation concept consists of a combination of measurments and technologies allowing to collect, discharge and treat wastewater in a eco-friendly way, and enable a fully reuse of the products out of the treatment. It is about "ecological sanitation" which aims at:

- hygienically sound conditions with adequate sanitary infrastructure, to prevent uncontrolled dissemination of wastewater borne deseases
- closing the nutrient loop
- reduction of water consumption
- keep process energy for wastewater discharge and treatment as low as possible

That means that the wastewater generation should be as low as possible, the treatment of the wastewater should not require energy (instead it should generate energy) and the products out of the treatment products should get reused on-site. Besides that local materials and labours should be used for construction and running of the system



Picture 1: Ecosan closing the loop (source: gtz)

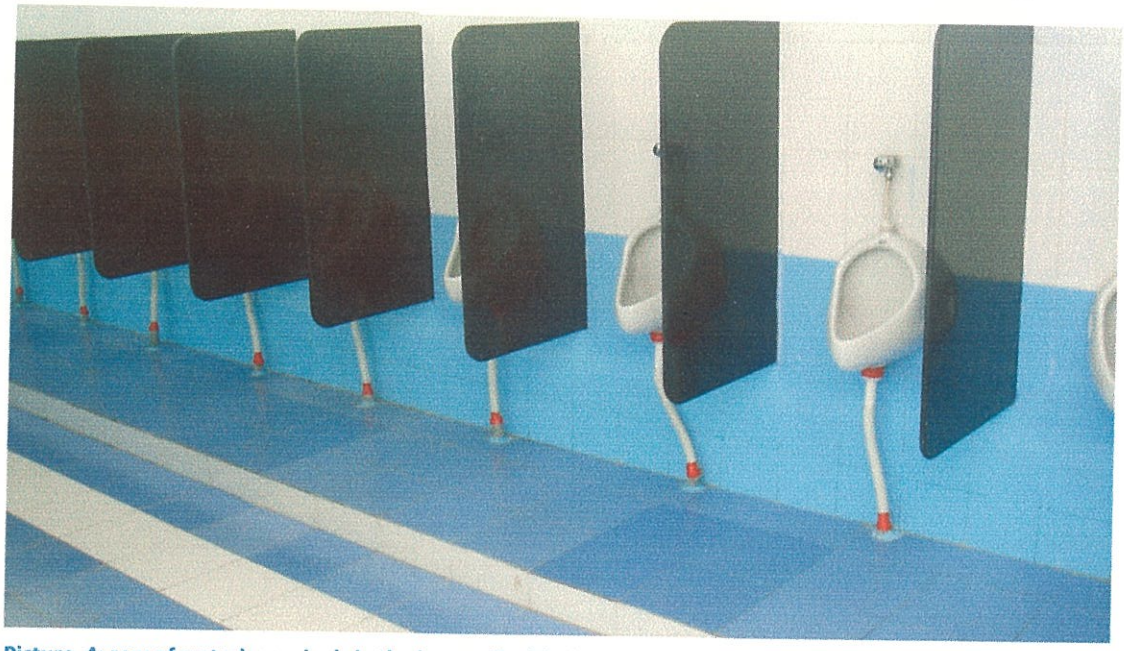
Reduction of water consuption:

- poor „low flush" toilet pans; pan with steep slope, reuires only 3-4l for flushing.mit mehr
- waterless urinals for boys toilet block; membrane acts as smell trap. To clean the urinals, they get flushed just two times per day.

(No urinals for girls, because no membrane units for girls urinals available on the market yet)

Picture 2: low flush pan

Picture 3: left: Memmbrane valve for waterless urinal; middle: common urinal; right: membrane valve attached at the urinal



Picture 4: row of waterless urinals in the boys toilet block. (source: ESF, 2008)

Seperate urine collection from boys urinals

- Collection of urine in a $3m^3$ Syntex tank outside the tolet building, with fail-save overflow into the treatment system in case of uncomplete reuse of the collected urine.
- Hygienisation of the urine by storage (1month) of the urine in separate tanks.

Urin consits:

- 90% of the nitrogen
- 75% of the phosphorus
- 75% des potassium

  we excrete!

→ INDIA: 4.6g N, 0.6g P, 2.2g K per liter[1]

Picture 5: composition of urine in % (source: internet)

The hygienisist urine can be used as liquid fertilizer, comparable with conventional N:P:K fertilizer, but with additional tracer elements. In our project, the urine is used on the campus as fertilizer for landscaping and gardening. Surpluses can be given to farmers in the region, which are interested to use this.

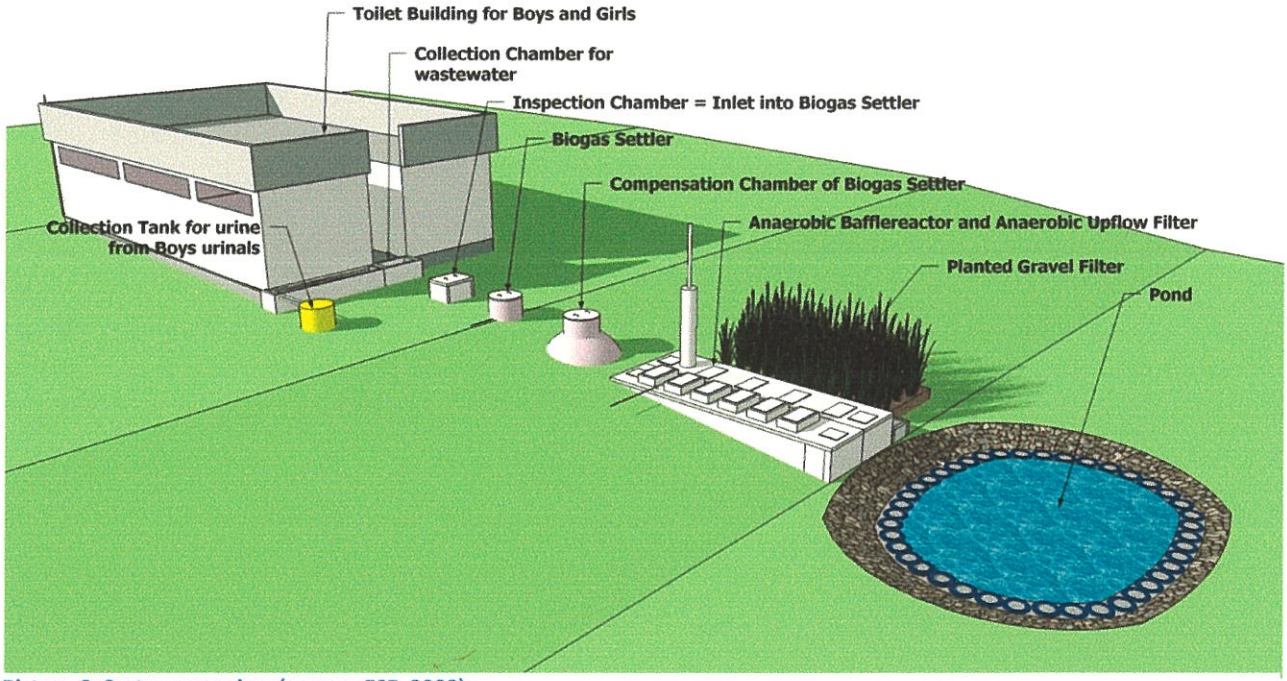
Wastewater treatment :

The wastewater generated in the toilet block is treated in system with several treatment steps. It is about so called "DTS" (Decentralized Treatment System) consisting of 3 anaerobic steps followed by two anaerobic/aerobic steps for polishing of the water. The output products of the system are Water, **Nutrients** and **Energy** ready for reuse on the campus.

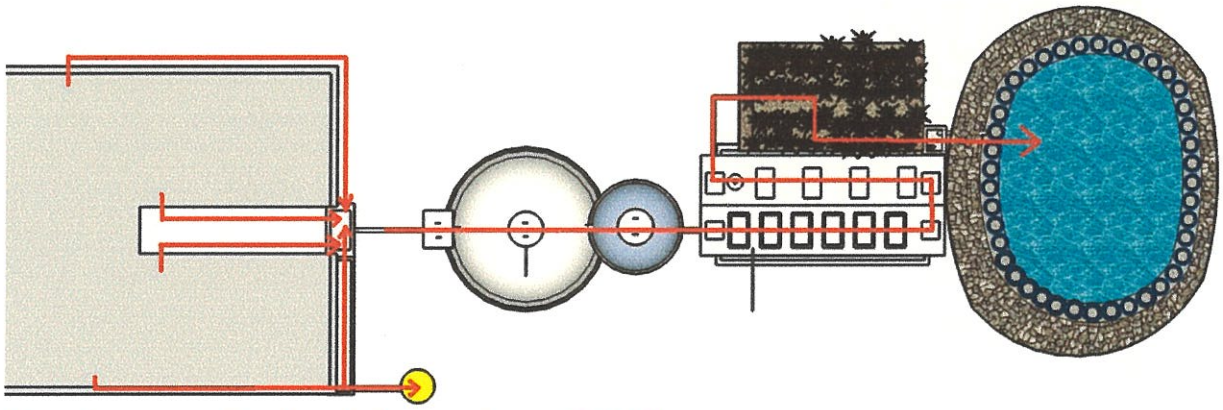
Design parameter :

The treatment system is designed on a max organic load, like it occurs only at big events on the campus (e.g. wedding ceremony) or at a dysentery epidemic at the school. So it is able to treat more wastewater than it generally receives. But the school plans to top the existing toilet building with a second floor what will double the collection capacity. To ensure that the treatment system will not get overloaded in case of such an extension, it is designed for this expected future load.

[1] Jönsson, H. & Vinnerås, B. 2004



Picture 6: System overview (source: ESF, 2008)

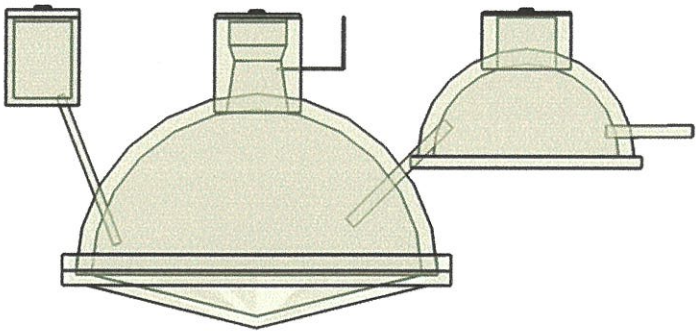


Picture 7: wastewater flow through the system (source: ESF, 2008)

Treatment steps:

Biogas Settler

The settler can be considered as a gas tight septic tank with low hydraulic retention times. Two main treatment processes take place: First, a mechanical treatment retains contaminants by sedimentation/flotation, and the wastewater from the clarified layer flows through the outlet. Second, biological treatment through anaerobic microorganisms which partially decompose the organic pollutants. The digestion process ensures that the accumulated sludge is reduced and stabilized. Storage volume for sludge is provided for 18 to 24 months, defining the desludging period. Average reduction of organic content (BOD,COD) is between 25 and 40%. The produced methane can get captured in form of biogas and be used as an energy source in direct application or electricity production via gas-generator. The settler is resistant to shock load and variable inflow.



Picture 8: Biogas Settler with compensation chamber (right), (source: ESF, 2008)

II. Anaerobic Baffle Reactor (ABR)(anaerob)

The ABR consists of a series of chambers, in which the wastewater flows up-stream. Activated sludge is located at the bottom of each chamber. The inflowing effluent is intensively mixed up with the sludge, wherein it is inoculated with bacterial mass which decompose the contained pollutants. The BOD reduction rate of the baffled reactor is up to 90 %. The Baffled Reactor is resistant to shock load and variable inflow, the operation and maintenance is simple and virtually no space.

The ABR is also gas tight and the produced biogas get captured and can be reused on the campus for running a gas stove.

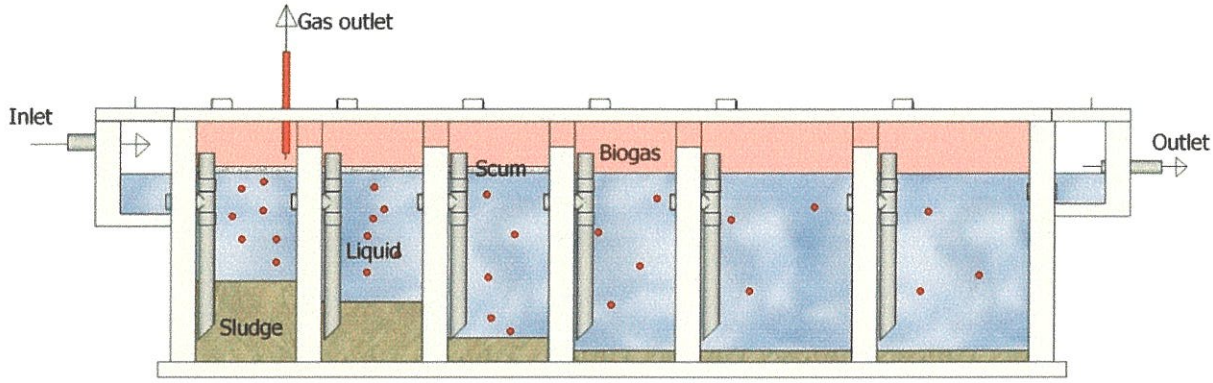
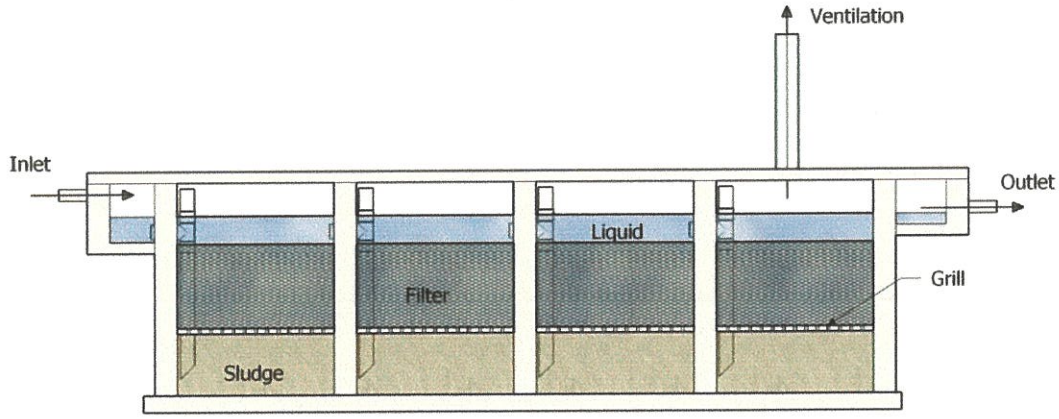


Abbildung 9: Anaerobic Baffle Reactor (source: ESF, 2008)

III. Anaerobic Upflow Filter (AF)(anaerob)

- The anaerobic filter is also known as fixed bed or fixed film reactor and has a similar flow pattern like the Anaerobic Baffle Reactor. Some filter materials such as gravel, rocks or specially formed plastic pieces provide additional surface area for bacteria to settle. Non-settleable and dissolved solids are treated by bringing them in close contact with a surplus of active bacterial mass fixed on filter material. The BOD removal rate is in the range of 70-90%. The surplus of activated sludge produced has to be removed in intervals of 1 to 3 years. The AF has his strongness in further stabilization (BOD,COD,TSS reduction) of low strength wastewater e.g. the effluent from the ABR.



Picture 10: Anaerobic Up-flow Filter (AF) (source: ESF, 2008)

IV. Planded Gravel Filter (PGF) (aerob/anaerob)

The Horizontal Gravel Filter (HGF) is made of planted filter bodies consisting of fine gravel. Bottom slope is 1 %. The flow direction is mainly horizontal. The filter is normally planted with helophytes like cattails or reeds. The main removal mechanisms are biological conversion, physical filtration and chemical adsorption. Mechanisms of BOD removal are mainly aerobic and anoxic .The function of the HGF is mainly post treatment. Reduction rate of BOD is between 75 - 90 %. Reduction of infective organisms is over 95 %. Operation and maintenance of the system is simple (mainly garden work). The spatial requirements are compensated by integrating it with the landscapes.

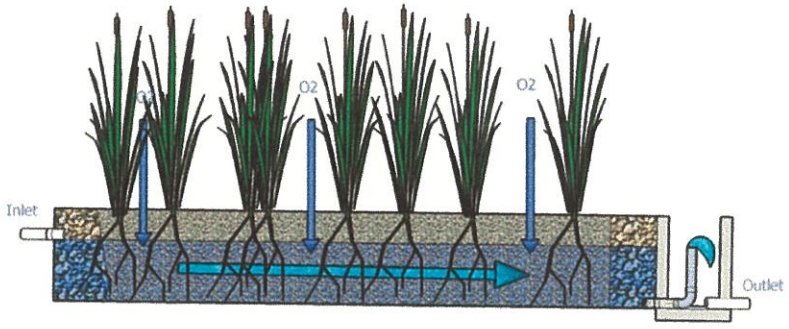


Abbildung 11: Planted Gravel Filter (PGF) (source: ESF, 2008)

V. Polishing Pond (aerob/anaerob)

Polishing ponds are shallow artificial lakes. The removal mechanisms are sedimentation of non-degraded and degraded suspended particles, and aerobic oxidation by intake of oxygen via water surface and photosynthesis of algae. The elimination of pathogens by exposure to UV-rays represents the third treatment mechanism. The efficiency of polishing ponds is strongly related to their surface and their hydraulic retention time. The BOD removal normally ranges between 20 – 30% and the pathogen removal is up to 95%.

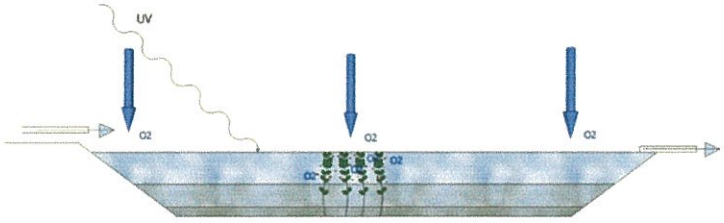


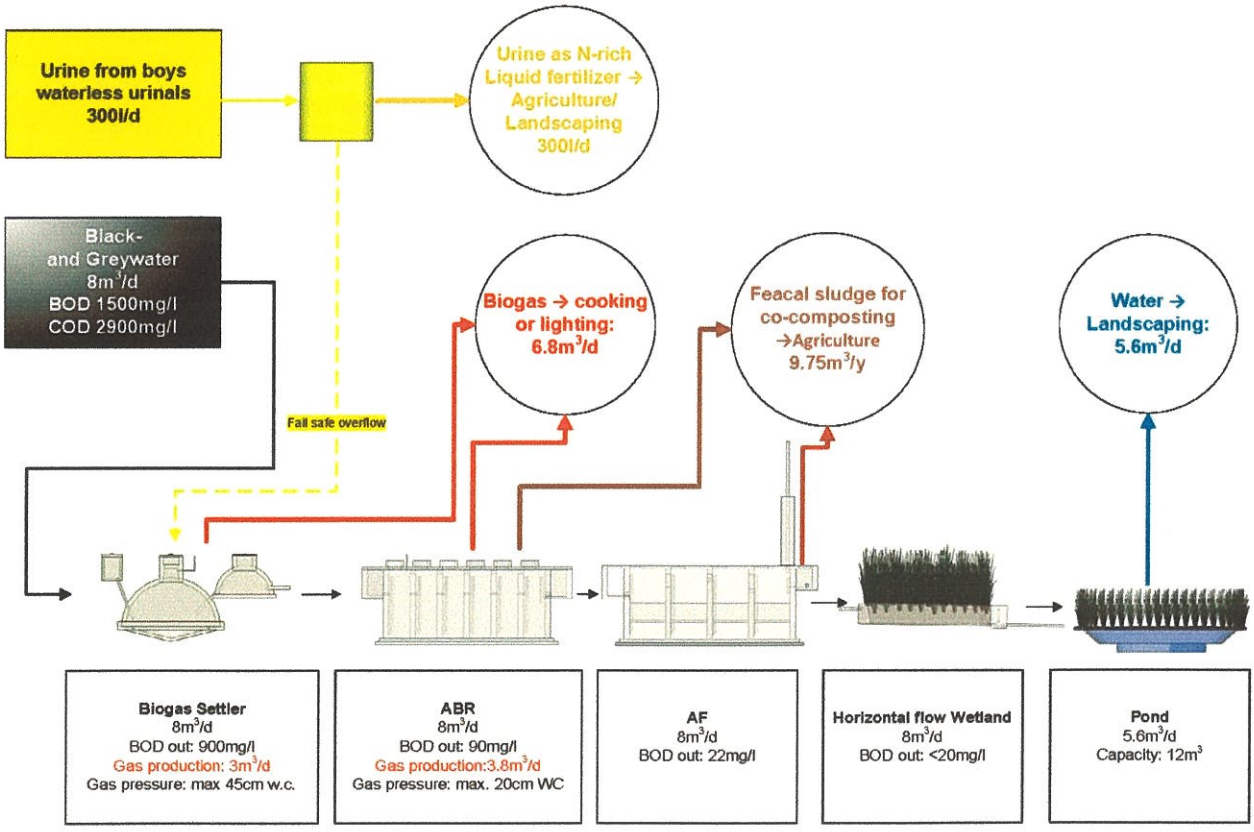
Abbildung 12: Polishing Pond (source: ESF, 2008)

Reuse

The products out of the treatment system are:

- Water → reused for irrigation purpose on the campus
- Biogas → used for running a gas stove
- Mineralized slude → rich in nutrients; sludge has to be pumped out of the Settler, ABR and AF every two years. After co-composting with organic material (e.g. kitchen waste) it becomes a valuable compost earth which gets used for gardening on the campus
-

Mass Balance



Picture 13: Mass balance of the treatment system, (source: ESF, 2008)

Benefits of the system:

Water efficiency

Compared with conventional toilet facilities, the measurements taken in our project to reduce the water consumption allow significant reduction.

The following table shows the comparison:

Assumptions take for the comparison:

- Conventional system uses toilets with a 10l flush cystern
- Conventional urinals are flushed with 3l per flush

Table 1: Analysis of water consumption in ecosan system

Ecosan System (with water saving measures)	uses	Water consumption per use	Water comsumption per day
	[N]	[l]	[l]
Waterless urinals (boys)	1000		
flush urinals	2	100	200
Use of toilets for urination (girls)[2]	800	2	1600
Toilet use	400	5	2000
Hand washing	2200	1,5	3300
Toilet cleaning			600
		total	**7700**

[2] 2l for flushing and cleansing

Table 2: Analysis of water consumption in conventional system

Conventional system (without water saving measures)	uses	Water consumption per use	Water comsumption per day
	[N]	[l]	[l]
Waterless urinals (boys)	1000	3	3000
Use of toilets for urination (girls)	800	10	8000
toiletuse	400	10	4000
Hand washing	2200	1,5	3300
Toilet cleaning			600
		total	**18900**

Closing the nutrient cycle

Humans are eating the best part of the produced edibles, with a high proportion of nutrients. Almost all of these nutrients leave out body in our excreta (urine and feces). Normally discharge in the next water body where they over fertilize this sensitive ecosystem which leads to its eutrophication because of excessive algae growth. The consequence of it is that we need to fertilize out agricultural fields with artificial fertilizer to keep the soil fertility.
Therefore it is indicated to keep the nutrients in a closed loop instead of duping them in the next water body.

Table 3: Nutrients in urine and feces ((source: gtz Folienkatalog-Agriculture. 2006.05.30)

Nutrients in Kg for crop production.

Nutrient	Urine (500 l/year)	Faeces (50 l/year)	Total	Required for 230 Kg de cereales
Nitrogen	5,6	0,09	5,7	5,6
Phosphorous	0,4	0,19	0,6	0,7
Potassium	1,0	0,17	1,2	1,2
Total N + P + K	7,0 Kg (94 %)	0,45 Kg (6 %)	7,5 Kg (100%)	7,5 Kg

In our system the nutrients don't leave the campus. Part of it is in the urine, part of it remains in the mineralized sludge and the rest is solved in the treated effluent water which will give this water some fertilizer effect when used for irrigation.

Energy production

Conventional wastewater treatment happens with aerobic bacterias, which need high amount of oxigen for stabilisation wastewater. This oxygen has to be blown in aerators, which requires energy input. Besides that in conventional systems the wastewater is lifted up into tanks for treatment, which requires again energy input. In our system we make use of the natural gifts from nature, enabling anaerobic stabilization of the wastewater because of high average temperatures (more than 20°C). A by-product of the anaerobic degradation is methane which is the main component of biogas. Our system doesn't need any process energy, instead it generates energy in form of biogas, which is used for a gas stove in the nearby "Ecosan Exibition Hall".

→ Energy requirements: 0kWh

The max. expected biogas production (with full system load) is **6.8m^3 per day**. These 6.8m^3 correspond to 4.8m^3 earth gas or 4 liter diesel. The biogas used for cooking purpose saves LPG which would be used normally to run the gas stove. Therefore our system helps to save energy and with this the additional emission of greenhouse gases, which would have been emitted for the energy allocation of the LPG.

Advantages of ECOSAN

- Improvement of health by minimising the introduction of pathogens from human excreta into the water cycle,
- Promotion of safe, hygienic recovery and use of nutrients, organics, trace elements, water and energy,
- Preservation of soil fertility,
- Conservation of resources,
- Preference to modular, decentralised partial-flow systems for more appropriate, cost efficient solutions,
- Promotion of holistic, interdisciplinary approach,
- Material flow cycle instead of disposal.

Ecosan Projects under implementation in India

Badlapur Adarsh College Project,Maharashtra

Navsarjan School, Gujarat

Public Toilet Project, Bangalore

Tsunami Relief Projects, Tamil nadu

Rural sanitation schemes, Tamil nadu,

And many more under active consideration

Recently We have also entered in to the system of Recycling of Waste water. Our President visited Germany on 19th June 2007 along with MJP Chief Engineer and other senior officers after Indian Water Works invited personally. The complete study program was designed for 10 days. During the same he has visited various sites including rain water harvesting, Ecosan and recycling technology projects.

This visit has given him a healthy technical back up for the said project.

Some of the photographs enclosed.

The basic technology of Ecological sanitation(ecosan) is a new paradigm in sanitation that recognizes human excreta and household wastewater not as waste but as resources that can be recovered, treated where necessary and safely used again.

The technology helps the recovery of nutrients in wastewater and their reuse in agriculture. In this way, they help preserve soil fertility and safeguard long- term food security, whilst minimising the consumption and pollution of water resources.

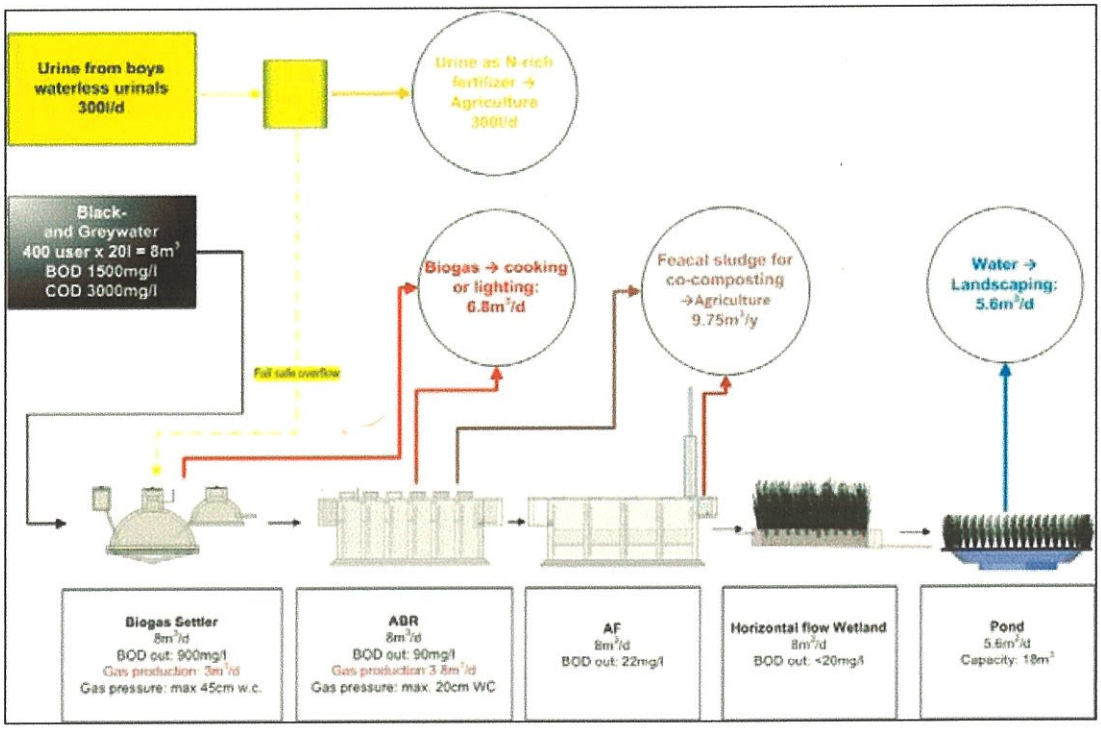
Conventional sanitation technology is coming under increasing critics for being economically and ecologically unsustainable. It is evident that the United Nations Millennium Developments Goals(MDG) cannot be achieved by conventional sanitation solutions alone and that alternative approaches are urgently needed.

Our first step in this project is,
Adarsh College Kulgaon Badlapur.

Beneficiaries: College with 2600 students per day (1300 morning 1-6 standard, 1300 afternoon 7- 12 standard); besides school time campus used for cricket matches and wedding ceremonies (up to 800 people). Board of the college decided to go for new eco□friendly toilet centre. Toilet centre adjacent to existing school building provides independent enclosures for girls and boys.
2'500 students During holydays campus can get hired for private parties e.g. wedding (up to 500 users)

Assumptions:
Wastewater: 7 CUM/day (bw from toilets, gw from hand wash facilities
Urine 300l/day (only from boys urinals; 250 x 1.2l)

Design and construction:
Treatment of wastewater from toilet building in a **D**ecentralized **T**reatment **S**ystem (DTS); 5 different treatment steps: Biogas Settler, Anaerobic Baffle Reactor (ABR), Fixed Film Reactor (AF), Constructed Wetland, Polishing Pond.

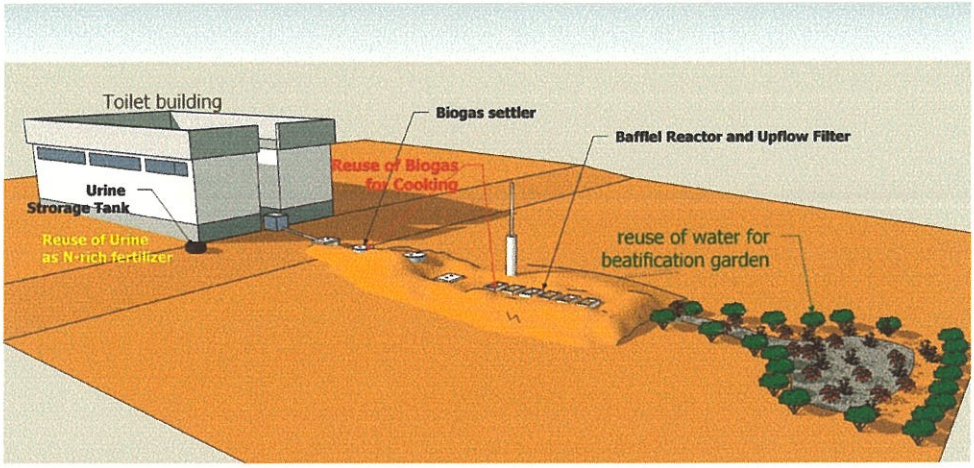


Design parameters: Because of possible further extend of toilet block with a second level, treatment system is designed to handle also additional load → Organic load of 12kg COD/day and peak flow of 1m3/h (about125 toilet uses/h).

Construction material: Biogas Settler, ABR and AF out of cement blocks, with outside and inside plastering for water tightness. Additional special plaster layers inside Biogas Settler and ABR for gas tightness. Slabs for Biogas Settler, ABR and AF are RCC. For sealing wetland and pond, 2-3 layers of special plastic sheets have been laid at the bottom. Pipes are pvc.

Costs:
4.3 Lakhs → Biogas Settler 1.2 Lakhs, ABR 1.2 Lakhs, AF 1.2 Lakhs, Wetland 0.5 Lakhs, Pond 0.2 Lakhs.
Cost□Benefit Ratio: 4.3 Lakhs / 2600 persons = 166Rs./person

Ongoing ESF Project in Badlapur



Reuse: - Water: Treated water for gardening purpose
- Collected urine from gents waterless urinals for fertilizing purpose
- Biogas out of the settler and the baffle reactor for cooking purpose

-furhemore the sludge out of the treatment system ca get composted with other organic material → good soil amendmend

→ Complete reuse of Water, Nutrients and Energy

Reuse:

Treated water gets reused on site for irrigation purpose.

Biogas from Biogas Settler (gas pressure 45cm water column) and ABR (gas pressure 20cm w.c.) reused for show case in nearby Ecosan Exhibition Hall for running gas stove and gas lamp.

Urine from boys waterless urinals used by local Agricultural College for research of fertilizer effect of urine application in agriculture.

Nutrients settle in mineralized sludge. System has to get desludged frequently (every two years) → Sludge can get co composted on□site with organic material (e.g. kitchen waste) to valuable soil amendment for on-site gardening.

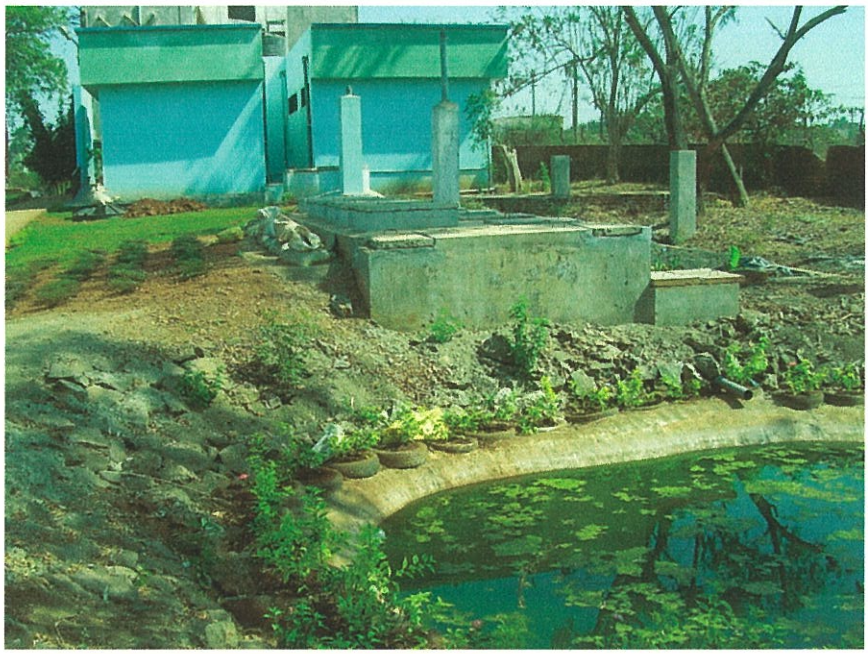
Display Board at Adarasha College EcaSan Toilet

AGRICULTURE BANANA USING FOR FERTILIZER URINE

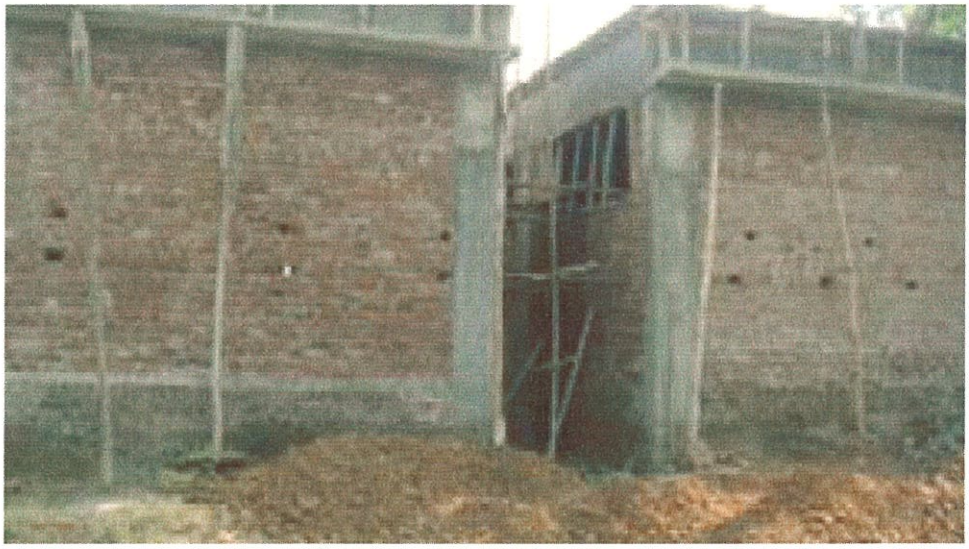
COMPLETE PROJECT UNIT (ECOSAN)

Adarasha College EcaSan Toilet

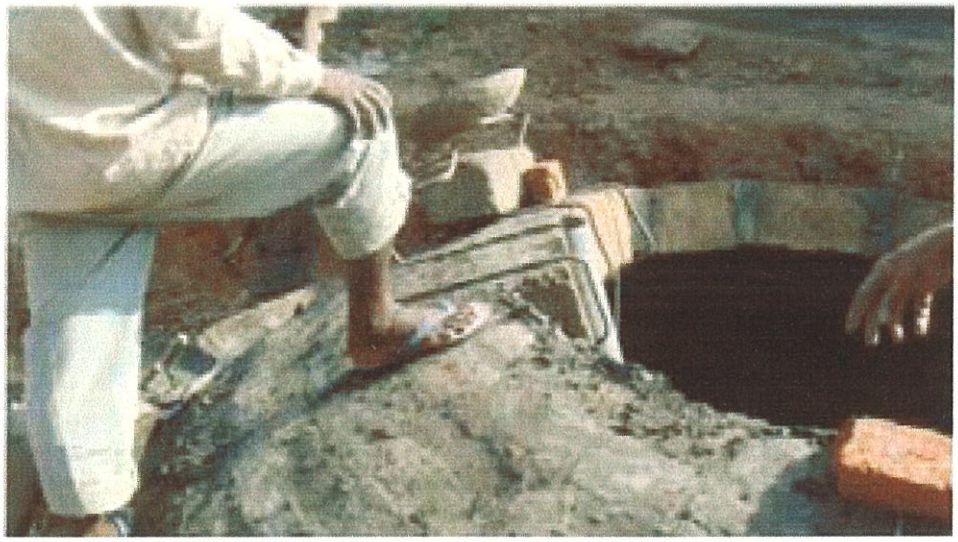
Adarasha College EcaSan Urinals



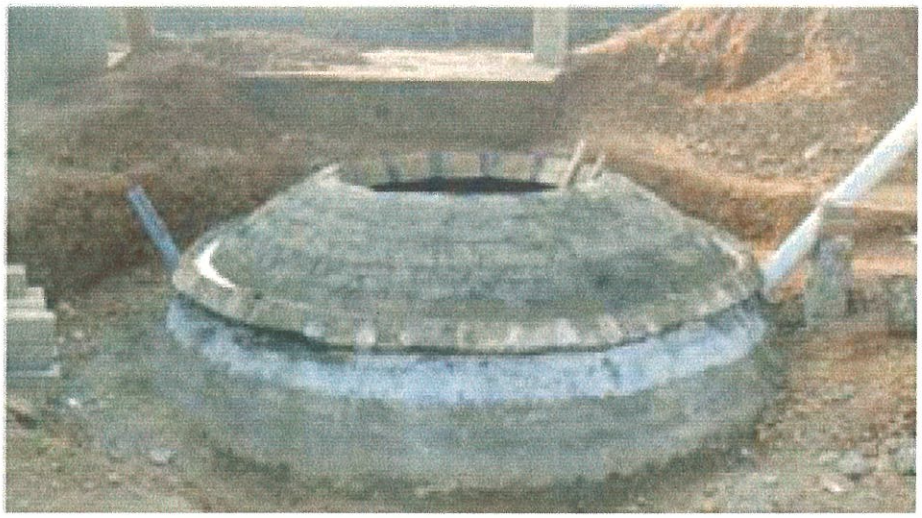
Banana Farm at Adarasha College EcaSan Project



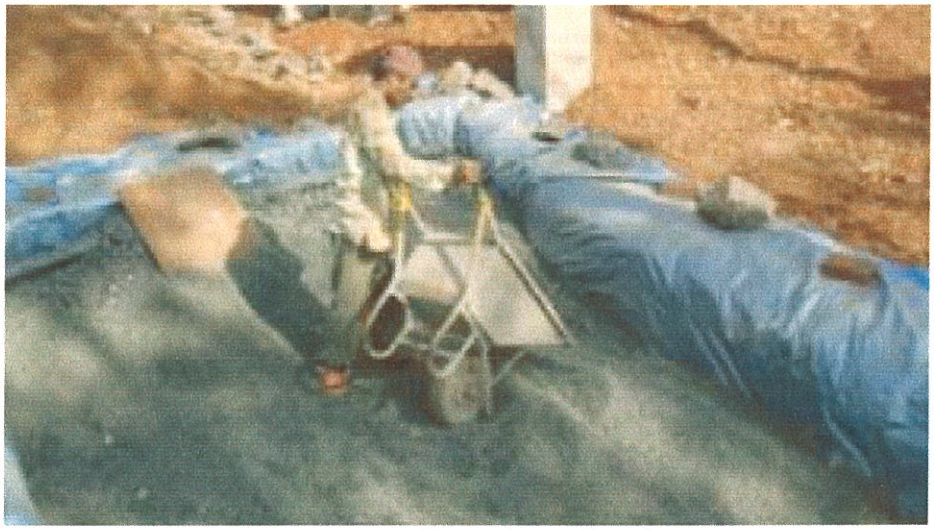
Toilet building under construction



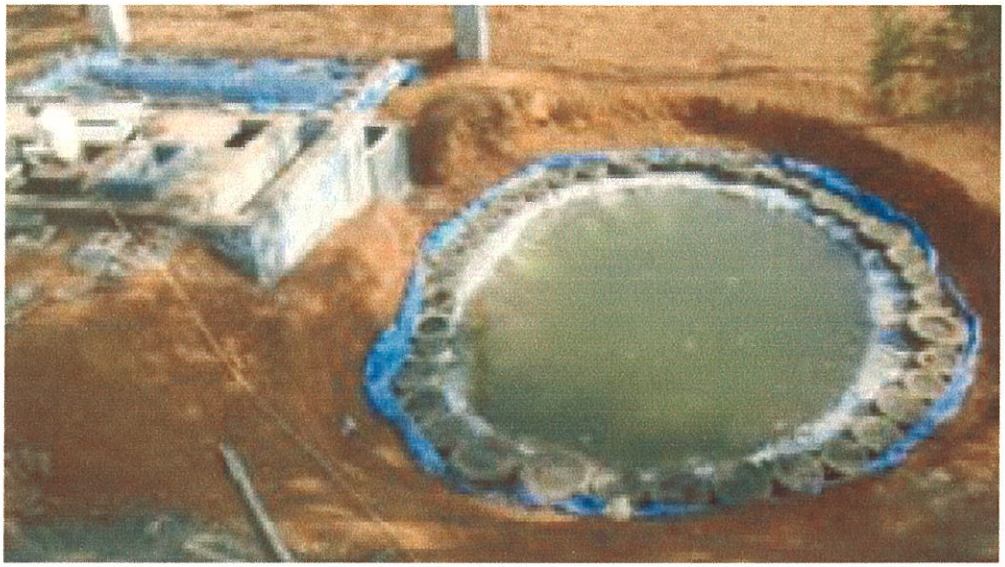
Doom construction of B. Settler



Construction of ABR (r) and AF (l)



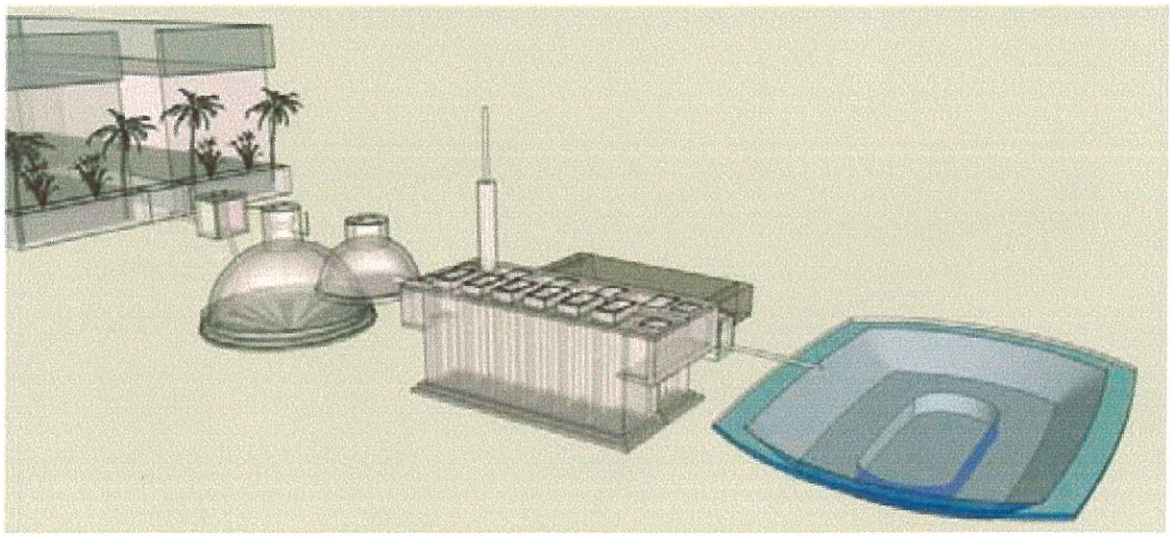
Construction of Wetland



Pond with a tire line as bank

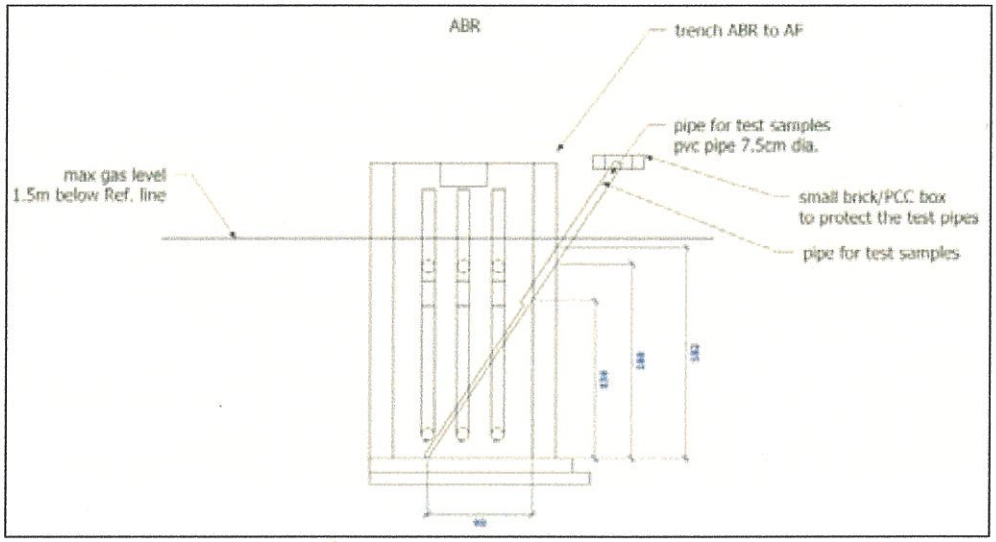
Silent features:
Waterless urinals for boys with membrane valve which prevents odors.
Urine gets collected in 3m3 Syntex tank outside toilet building.

>97% of produced biogas gets captured for reuse → Almost no release of methane (serious greenhouse gas) into atmosphere → CO2 neutral system, no need of energy; production of eco□friendly energy!
Help to reduce global warming!



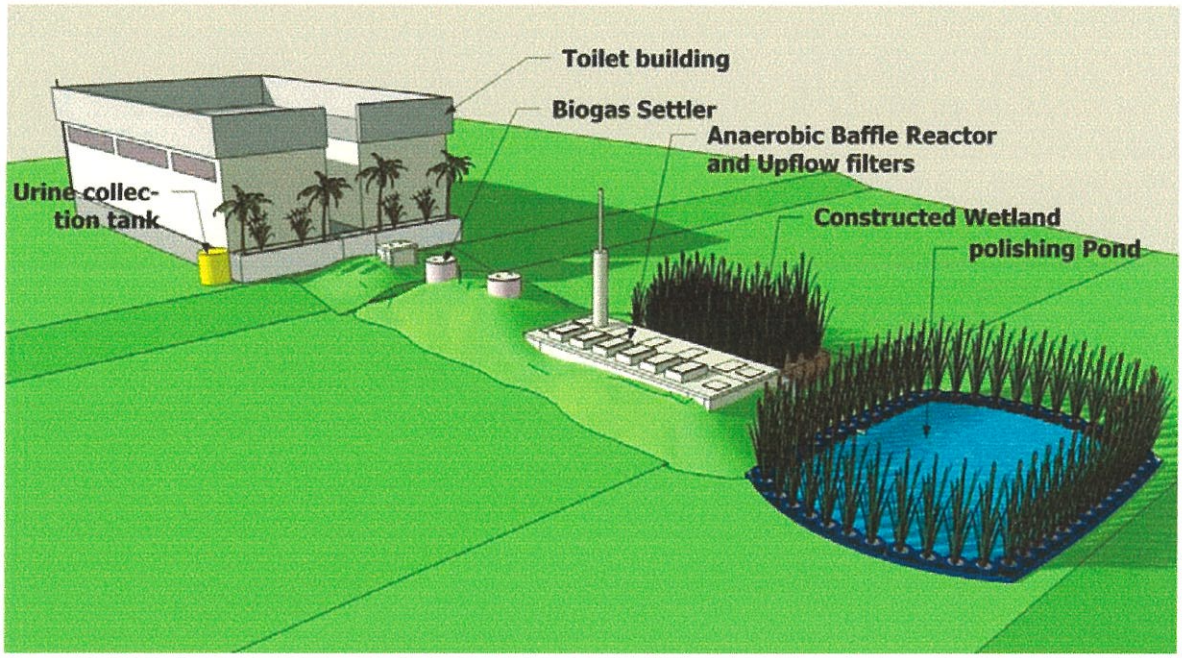
X - ray view of the whole system

Inspection pipes into every chamber of ABR. → Easy monitoring and research of treatment performance.

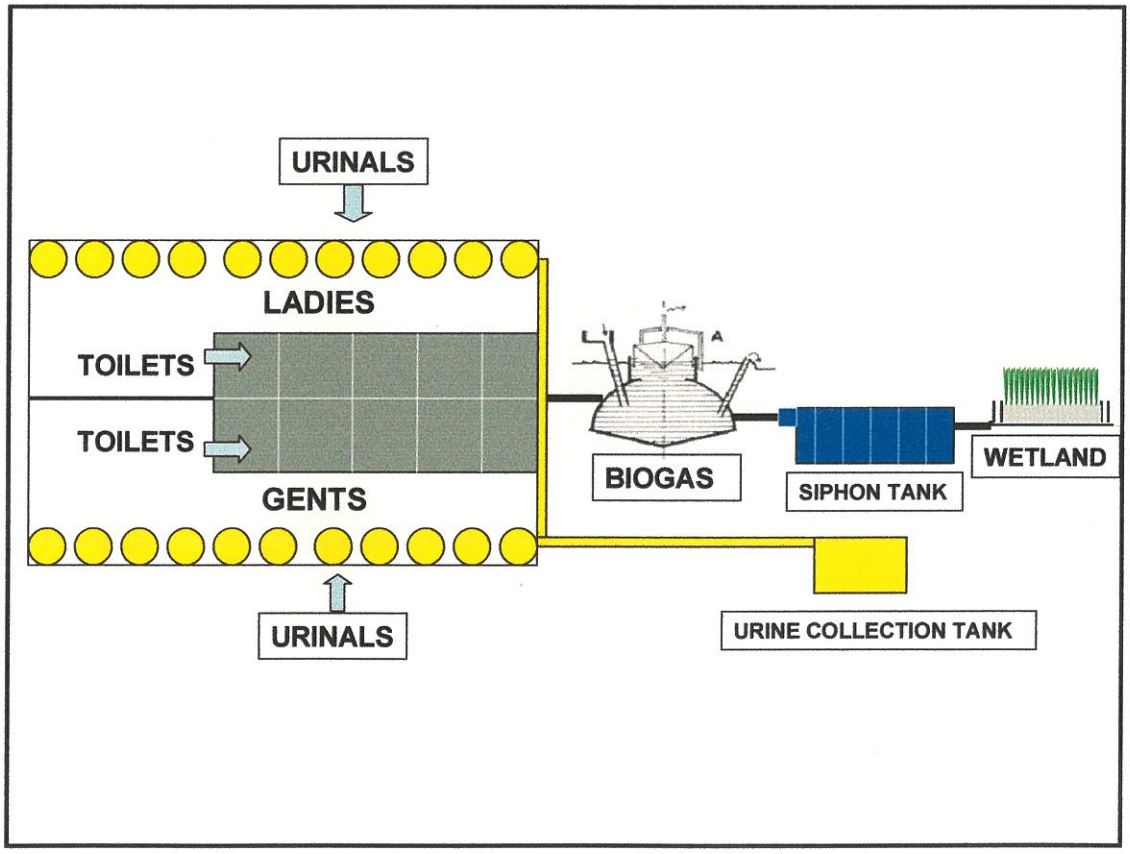


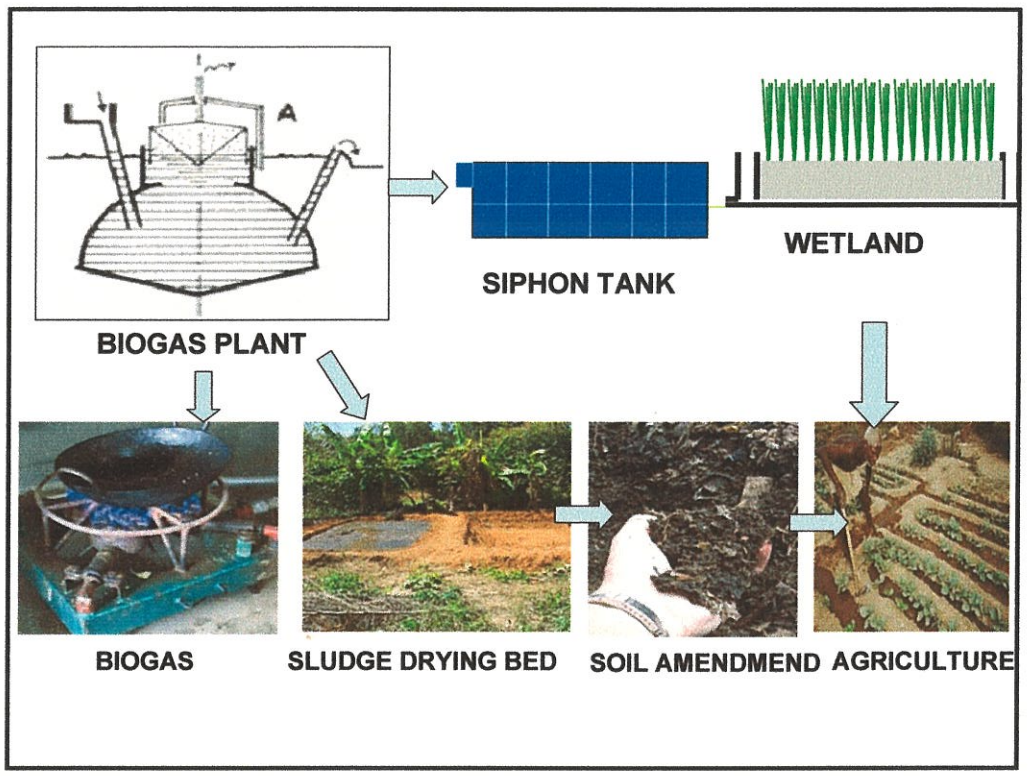
Detail plan for the test pipes

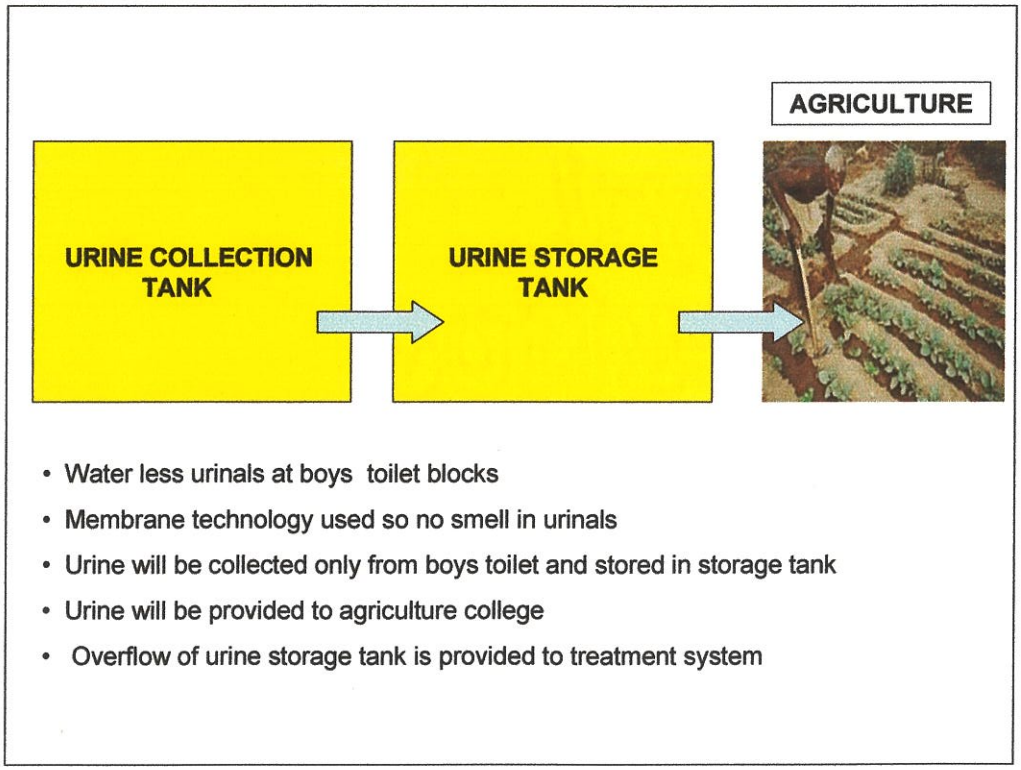
Test pipe into last chamber of the ABR



3D - Sketch of entire system



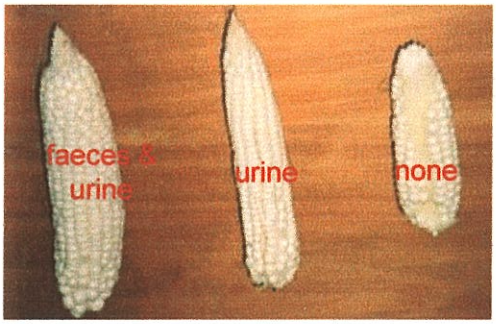




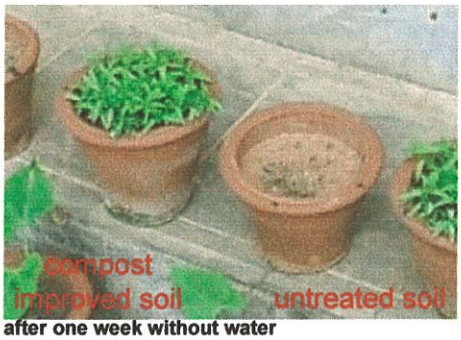
- Water less urinals at boys toilet blocks
- Membrane technology used so no smell in urinals
- Urine will be collected only from boys toilet and stored in storage tank
- Urine will be provided to agriculture college
- Overflow of urine storage tank is provided to treatment system

Benefits of ecological sanitation

- restored soil fertility through nutrient reuse



- improved soil quality through reuse of organics

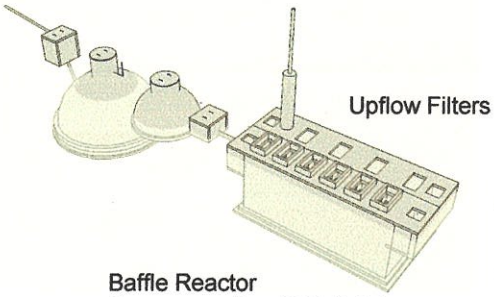


after one week without water

Status of construction

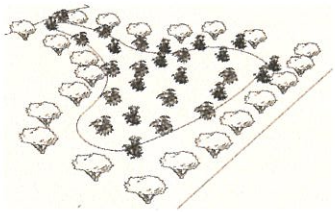
Ongoing ESF Project in Badlapur

Biogas Settler: gas generation 800 lit /day



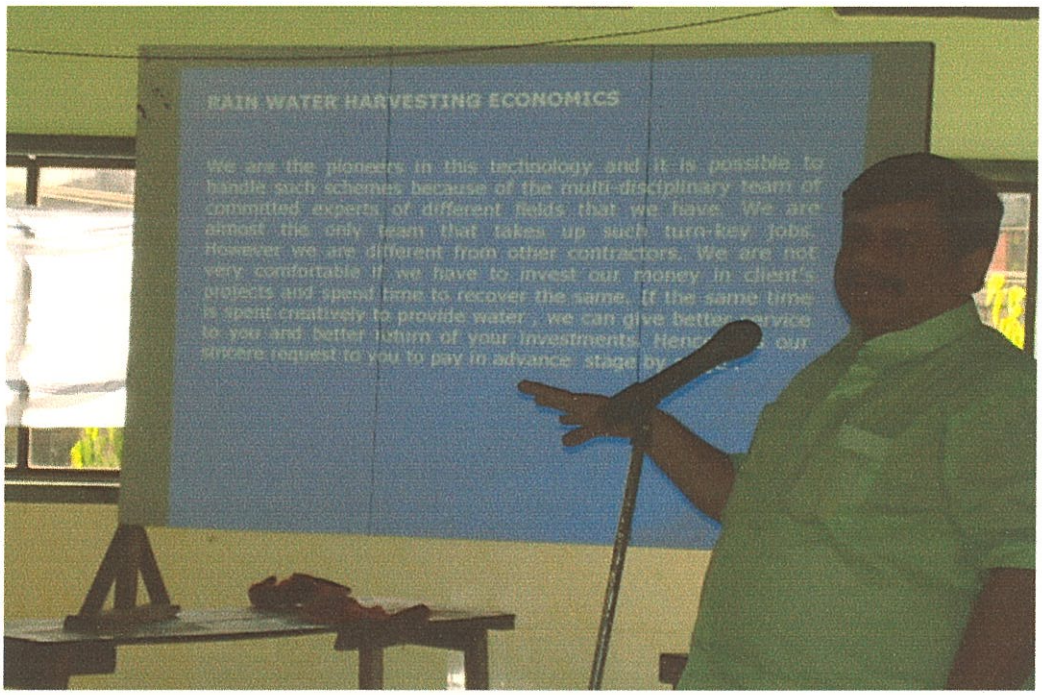
Upflow Filters

Baffle Reactor
Gas generation 1200 lit / day



Garden
(with gravel and Sand)

KBMC President explaining "ECOSAN" Scheme to HSBC International staff .



President explaining RWH Scheme to various Hous.So. in KBMC area.

President explaining "ECOSAN" Scheme to Architect Asso of Badlapur.

Asian Development Bank, Water Dept Head visited "ECOSAN" project.

Discussion with Rein Muller, Project Manager Tech. Vagwall, Germany.

Member of Parliament of Germany visited ECO-SAN Project.

Kulgaon Badlapur Municipal Council has won UNESCO Water Digest Award 2007- 08 for "Best Water Management – Municipal"

SUHAS RELEKAR

KBMC is gearing up to be the first corporation to launch German technology in rain water harvesting system

KBMC takes German route

DK+ Correspondent

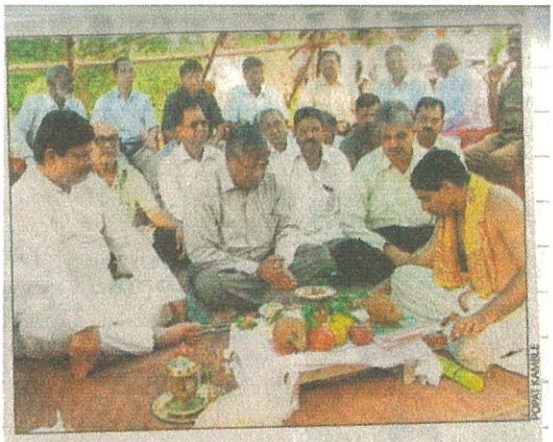
If everything goes as per the plan, the Kulgaon Badlapur Municipal Council (KBMC) is all set to adopt German technology in water harvesting system for sanitation purpose.

Germany-based companies will be providing assistance to the council for constructing eco-friendly drains and will also enlighten them about water saving schemes. In an attempt to provide additional information about Ecological Sanitation Project, the German government invited KBMC president Ram Patkar, for their weekly enlightening program. The tour was organised from 15 to 22 June to converse about sanitation technology. The tour was organized by Indian Water Works Association and German firm Deutsche Gesellschaft fur Technische Zusammenarbeit (GTZ).

"The German based GTZ Company would assist in constructing eco-friendly drains all over the city and VAG Company is all set to provide pressure equalizer and plunger water pipe connection system", informs Ram Patkar. He continued that following the use of plunger water pipe connection system, the council would be able to save upto 40% of rain water.

The KBMC has already launched a pilot project titled 'Ecological Sanitation' at local Adarsh School. The project has started converting human excreta into fertilizer. "The school has about 2,000 students and it would provide a great help in preparation of the project soon", informed Patkar. Furthermore, as per water saving scheme, the KBMC has already started the rainwater harvesting system at one Shiv Darshan Society in the city. "The council is equipped with the appropriate permission to start the water harvesting system, which will be installed in 45 housing societies of Badlapur", concluded Patkar.

Publicity in Various News Papers



KBMC STARTS ECO-SANITATION PROJECT

Alka D Joshi | *Badlapur*

THE municipal council of Kulgaon-Badlapur have launched a pilot project that would convert human excreta into fertilizer. The project titled 'Ecological Sanitation, short form Ecosan, considers human excreta and water from households as resources that can be recovered, treated and safely used as manure.

The Kulgaon-Badlapur Municipal Council (KBMC) inaugurated the Ecosan project at the Adarsh Vidyalaya premises in the last week.

"The system offers a range of low-cost, high-tech sanitation option which is hygienically safe, comfortable to use and environmental friendly. It's also more economical than conventional systems," informs Ram Patkar, KBMC president.

The KBMC and the Adarsh Vidyalaya have initiated the project with guidance from the Indian Water Works Association (IWWA) and German firm Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ).

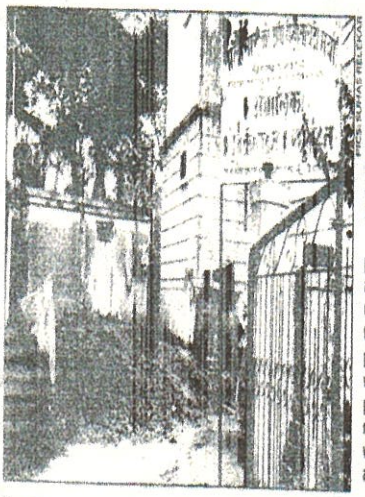
"The Ecosan project has been very successful in banana plantations in our country and is really appreciable that the KBMC accepted such a project," says Martin Wefller, a representative of the GTZ.

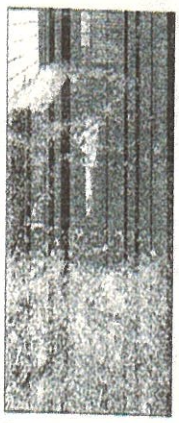
The inauguration function witnessed the presence of MLA Ramdas Mote, MLC Sanjay Kelkar and SICON representative Johnson Hib among others.

While explaining about the advantages of Ecosan project, D B Panse, chairman of Ecosan asserted that such a method would enable complete recovery of nutrients in household wastewater and its reuse in agriculture. This helps to preserve soil fertility and safeguard long-term food security, while minimising the consumption and pollution of water resources.

Panse asserted that it's not a technique but philosophy to recycle wastage. He informed that human excreta contain rich fertilizers such as potassium, sodium and phosphorus that will enhance fertility of land and also reduce use of chemicals in agriculture.

KBMC starts rain water harvesting project





Vinayak Jadhav

Worried of acute shortage of water, the Kulgaon Badlapur Municipal council (KBMC) has announced a new project to end shortage of water. The project involves harvesting of rain water and would be set up in a mega residential colony on an experimental basis.

Ram Patkar, the chairman of the KBMC informed that the new project involves making Badlapur and Kulgaon self dependent for water supply in the long run. "It is the first such project of its kind in the entire state. We have selected a group of 40 buildings for the purpose. The buildings would be supplied with filtered ground water from the project" he said and added that the council would assess the experiment before making the project common in other parts of the council.

The Mumbai Metropolitan Region (MMR) Environment Society is funding the Rs 16 lakh for the project. The Shiv Darshan society, a cluster of 36 buildings has been selected for the pilot project. Four other buildings in the vicinity are also included in the project. Together, the 40 buildings have around 500 flats.

Like other rain water harvesting projects this project is also based on the same theory. The civic administration would create facilities to recharge underground water resources using the rainwater. The waters from the project would be supplied to the Meenatai Thackeray filtration plant where they would be treated before being passed on to the cluster of 40 buildings for a period of one year. The waters from this project would be supplied to other areas if the need so arises.

The project is extremely cost effective. The KBMC will charge Rs 70 per flat in the colony of 500 flats for the project. Out of the collected amount of Rs 35000 per month, Rs 15000 would be spent on the maintenance of the project every month. The remaining sum would be used to improve cleanliness and garbage disposal mechanism of the area.

Notably the KBMC gets waters from the state owned Maharashtra Jeevan Pradhikaran (MJP). The MJP supplies water to the region at the rate of Rs 6.90 per 1000 litres. Besides this, the state agency often cuts waters to the area particularly during the summer months leading to scarcity of water in most parts of Kulgaon and Badlapur. The present project is aimed at ending the dependence upon MJP and at the same time ensuring proper environmental balance.

बदलापूरमध्ये इकोसॅन शौचालये

वार्ताहर/दि. २१

बदलापूर - येथील नगरपालिकेने पर्यावरणाशी सुसंगत स्वच्छता व मलनिःसारण पद्धत अवलंबून इकोसॅन शौचालये बांधण्यासाठी आदर्श महाविद्यालयानजीक भूमिपूजन केले आहे. हा प्रकल्प शाळा वा महाविद्यालयाच्या सहकार्याने केलेला भरतातला पहिला

भारतातला पहिला पथदर्शी प्रकल्प

पथदर्शी प्रकल्प असल्याचे नगराध्यक्ष राम पातकर यांनी सांगितले.

या शौचालयात भांड्याला दोन भोके असणार असून, मल व मूत्र वेगळे करून त्याचे खत म्हणून वापरे केला जाणार आहे. हे खत येथील नजीकच्या शेतकी महाविद्यालयांना पुरविले जाणार आहे. हा प्रकल्प इंडियन वॉटर वर्क्सच्या मार्गदर्शनाखाली तयार होणार आहे.

या योजनेअंतर्गत २० मुताऱ्या व ८ शौचालये बांधण्यात येणार आहेत. त्यामध्ये अपंगांसाठी विशेष सोय असलेली एक मुतारी व शौचालय असेल.

नुकत्याच झालेल्या या शौचालय भूमिपूजन समारंभात आदर्श शाळा सभागृहात आमदार संजय केळकर म्हणाले की, या जिल्ह्याची लोकसंख्या १९८६ साली ८६ लाख होती व आता १ कोटीच्या वर गेली आहे. सर्व राजकीय पक्षांनी आपले राजकीय मतभेद विसरून जिल्ह्याच्या विकासासाठी एकदिलाने एकत्रित प्रयत्न केले पाहिजेत. अन्यथा, हा जिल्हा महाराष्ट्रातला सर्वात बकाल जिल्हा म्हणून ओळखला जाईल.

या समारंभाच्या अध्यक्षस्थानी नगराध्यक्ष राम पातकर हे होते. ठाणे जिल्हा भाजपाध्यक्ष जगन्नाथ पाटील, आमदार रामनाथ मोते, इकोसॅन अध्यक्ष पानसे, जर्मन इकोसॅन तज्ज्ञ जॉन हिन्स, मुंबई विद्यापीठाचे माजी प्र-कुलगुरू डॉ. नरेशचंद्र यांनी मार्गदर्शन केले. प्रास्ताविक सूत्रसंचालन व आभारप्रदर्शन अनुक्रमे प्राचार्य प्रकाश देशपांडे, सुषमा वैद्य व नगरपालिका मुख्याधिकारी प्रकाश बोसे यांनी केले.

Publicity in Various News Papers

ठाणे परिसर

बदलापूर नगरपालिका राबविणार इको सॅनिटेशन प्रकल्प

बदलापूर, दि. १० (प्रतिनिधी) -

इकोसॅन प्रक्रिया पद्धतीचे महत्त्व लक्षात घेऊन कुळगाव-बदलापूर नगरपरिषदेने इकोसॅन पथदर्शी प्रकल्प राबविण्याचे मान्य केले आहे. त्याला अनुसरून या प्रकल्पाचा भूमिपूजन सोहळा बुधवारी आदर्श विद्या मंदिरात झाला.

इकोसॅन प्रक्रिया पद्धतीचे महत्त्व जाणून घेऊन गेली ३६ वर्ष पाणीपुरवठा आणि मलनिस्सारण क्षेत्रात देशव्यापी स्तरावर कार्य सुरू आहे. नवीन इंटरनॅशनल फिलॉसॉफी, इंटरनॅशनल वॉटर वर्क्स असोसिएशन आणि इंटरनॅशनल टॉयलेट असोसिएशन यांच्या प्रयत्नानंतर इको सॅनिटेशन फिलॉसॉफी सर्व जगाने स्वीकारावी, असा मतप्रवाह निर्माण झाला. त्यालाच अनुसरून बदलापूर नगरपरिषदेने इकोसॅनचा प्रकल्प हाती घेतला आहे. त्या अंतर्गत भारतातील पथदर्शी प्रकल्पाचा भूमीपूजन सोहळा बुधवारी आदर्श विद्या मंदिरात पार पडला. या ठिकाणी इकोसॅन पद्धतीचे टॉयलेट ब्लॉक बांधण्यात येणार आहेत. महाराष्ट्रात खत निर्मितीसाठी १२३४ रुपये सबसिडी लागते. युरीनच्या माध्यमातून कितीतरी खत वाया जाते. युरीन २१ दिवस ठेवून त्याचा खत म्हणून वापर केला तर पिकांमध्ये प्रचंड वाढ होते. पर्यावरण संवर्धनाच्या दृष्टीने हा प्रकल्प अत्यंत उपयुक्त आहे. या कार्यक्रमाप्रसंगी आमदार संजय केळकर, आमदार रामनाथ मोते, माजी आमदार जगन्नाथ पाटील, इकोसॅन प्रकल्पाचे जर्मन तंत्रज्ञ मार्टीन वॉल्फर, जॉहनेब हिब आदी मान्यवर उपस्थित होते. नगराध्यक्ष राम पातकर यांच्या अध्यक्षतेखाली हा कार्यक्रम पार पडला. अपंग पुनर्वसनानंतर इकासॅनच्या माध्यमातून पर्यावरणाशी सुसंगत प्रणाली तयार करण्याचा प्रयत्न बदलापूर नगरपालिका करीत असल्याबद्दल मान्यवरांनी पालिका प्रशासनाचे कौतुक केले. यावेळी इकोसॅनवर आधारीत स्लाईड शोद्वारे सचित्र माहिती देण्यात आली. आदर्शमध्ये टॉयलेट ब्लॉकद्वारे तयार होणारे खत शेतकी महाविद्यालयाला उपलब्ध करून देण्यात येणार आहे. ठाणे जिल्ह्यात ९ नगरपालिका, महानगरपालिका आहेत. मात्र ९ मध्ये अभिनव प्रकल्प राबविण्याची इच्छा शक्ती बदलापूर नगरपालिकेमध्येच आहे, असे गौरवोद्गार संजय केळकर यांनी काढले. एकूणच निसर्गाकडून उपलब्ध होणारी साधनसंपत्ती पुन्हा निसर्गाला परत करायची आणि या प्रक्रियेतून पर्यावरणाच्या संवर्धनासोबत लाभ मिळवायचा, अशा प्रकारचा हा इको सॅनिटेशन प्रकल्प आहे.

Publicity in Various News Papers

दि० ३०।६।०७

लोकमत HELLO ठाणे

बदलापूर होणार इकोफ्रेंडली

नगराध्यक्षांच्या जर्मनी दौऱ्याची फलश्रुती

■ मयुरेश कडव

ठाणे, दि. २९ - भारतासारख्या शेतीप्रधान देशात पावसाचे प्रमाण इतर देशांच्या तुलनेत समाधानकारक असूनही पाण्याचा सदुपयोग होत नाही. परिणामी, वारंवार पाणीटंचाईचा प्रश्न भेडसावतो. या पार्श्वभूमीवर पर्यावरणाशी सुसंगत स्वच्छता आणि मलनि:सारण पद्धती अर्थात इकोलॉजिकल सॅनिटेशन ही संकल्पना रुजू होत आहे. ही संकल्पना जगमान्य झाल्यानंतर ठाणे जिल्ह्यातील बदलापूर नगर परिषदेनेही इको सॅनिटेशनचा उपक्रम हाती घेतला आहे.

या पार्श्वभूमीवर बदलापूरचे नगराध्यक्ष राम पातकर यांनी नुकताच जर्मनीचा दौरा केला. त्यात तेथील जनतेने पर्यावरणाची केलेली पाठराखण त्यांना अनुभवता आली. या दौऱ्यासंदर्भात बोलताना त्यांनी 'लोकमत'ला जर्मनीतील अनुभव सांगितले.

इकोलॉजिकल सॅनिटेशन याचाच अर्थ पर्यावरणाशी सुसंगत स्वच्छता आणि मलनि:सारण पद्धती. या पद्धतीत मल आणि मूत्र वेगळे केले जाते. मलापासून खत, मिथेन आणि मूत्रावर प्रक्रिया केल्यावर मिळणारे खत झाडांना उपयोगी पडू शकते. या खतामुळे कणीस, केळी अशा पिकांची तिपटीने वाढ होते, असा शास्त्रज्ञांचा दावा आहे. शिवाय शासनाचे २५०० कोटींचे अनुदानही वाचू शकते.

> जर्मनीने पर्यावरणाचे उत्तम संतुलन राखले आहे. सांडपाण्याचा निचरा होण्यासाठी पर्यावरणाशी सुसंगत भूमिगत गटारे आहेत. जीटीझेड या जर्मन कंपनीने बदलापूरला एका विभागात अशा प्रकारची गटारे बांधून देण्याचे मान्य केले आहे. तसेच पाणी गळती रोखण्यासाठी वॅग कंपनीने प्रेशर इक्विलायझर व प्रजर वॉल तयार केले आहेत. अशा वॉलमुळे ४० टक्के गळती थांबते. १ कोटी १० लाखांचा हा वॉलही एका विभागात लागणार आहे. या दोन गोष्टींमुळे दौरा सार्थकी लागला, अशी भावना नगराध्यक्ष पातकर यांनी व्यक्त केली.


नगराध्यक्ष राम पातकर

बदलापुरातील पथदर्शी प्रकल्प

नगर परिषदेने पहिल्या टप्प्याअंतर्गत आदर्श महाविद्यालयात पर्यावरणाशी सुसंगत शौचालये बांधण्याचा निर्णय घेतला. आदर्श विद्यालयात २० हजार विद्यार्थी आहेत. त्यामुळे येथील शौचालयांतील मलमूत्रापासून खतनिर्मिती हा त्यामागील उद्देश आहे. गेल्या वर्षी ९ ऑगस्टला हा प्रकल्प सुरू झाला. प्रकल्पातून तयार होणारे खत सवलतीने शेतकऱ्यांना देण्याचा मानस पालिका प्रशासनाने व्यक्त केला आहे. इकोसॅनविषयी उत्सुकता असलेल्या नगराध्यक्ष राम पातकर यांना या प्रकल्पाच्या निमित्ताने जर्मनी दौऱ्यावर जाण्याचा योग आला. या दौऱ्यात त्यांना महत्त्वपूर्ण माहिती मिळाली. हॅम्बर्ग विद्यापीठात काल्फ वुटर फॉल्क आणि पी. एफ. प्लॉ या तज्ज्ञांनी त्यांना इकोसॅनबाबत मार्गदर्शन केले. जर्मनीतील प्रकल्पाची माहिती देण्यात आली. मूत्र कसे संकलित होते, बायोगॅस कसा तयार होतो, त्यावर प्रक्रिया कशी केली जाते, या विषयीची माहिती प्रात्यक्षिकांव्दारे देण्यात आली. भारतात शौचालयात दहा लीटर पाणी वापरले जात असताना जर्मनीत केवळ अर्धा लीटर पाणी वापरले जाते. कारण येथील शौचालये 'व्हॅक्युम टॉयलेट' आहेत. आदर्श महाविद्यालयातील शौचालये याच धर्तीवरील असून त्याचा खर्च रूडीगर ही जर्मन कंपनी करणार आहे. जर्मनीने भूगर्भातील पाणी शुद्ध करण्यावर आणि त्या पाण्याची पातळी रेन वॉटर हार्वेस्टिंगद्वारे वाढविण्याचा प्रयत्न चालविला आहे. प्रत्येक घरासाठी ही योजना आहे. बदलापुरात शिवदर्शन सोसायटीत हा उपक्रम प्रायोगिक तत्त्वावर सुरू आहे. तेथील नद्या आपल्यापेक्षा स्वच्छ आहेत. नदी, नाले, गटारांत कचरा वा घाण टाकली जात नाही, असेही पातकरांनी सांगितले.

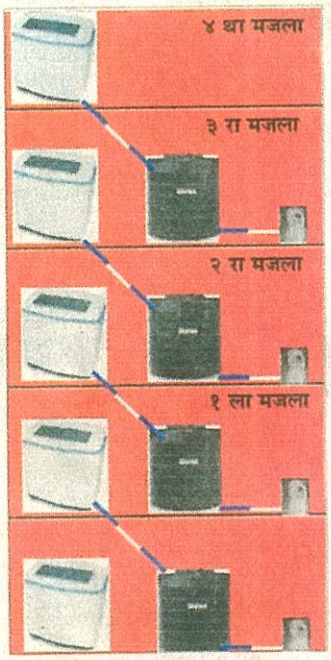
पाणीटंचाईवर मात करणारा कुळगांव-बदलापूर पॅटर्न

● नरेश इंगावले

दिवसेंदिवस जगभरात पाणीटंचाईची समस्या तीव्र होत चालली आहे. कुळगाव–बदलापूरवासीयांनी या समस्येवर अक्सीर मात्रा शोधून काढली असून इथल्या नगरपालिकेने हाती घेतलेली रिसायकलिंग योजना दोन दिवसांत कार्यान्वित होणार आहे. वॉशिंग मशीनमधल्या पाण्याचे रिसायकलिंग करून या योजनेद्वारे एका चार मजली इमारतीत वर्षाला सुमारे साडे चार लाख लिटर पाण्याची बचत करण्यात येईल.

कुळगांव बदलापूर नगरपालिका हद्दीतील वनराई कॉम्प्लेक्समध्ये या प्रकल्पाची चाचपणी होतेय. वनराई-कुंजचे रहिवासी या योजनेत सामील झाले आहेत. नगरपालिकेचे नगराध्यक्ष राम पातकर यांनी पाणी वाचवण्यासाठी केलेली ही सूचना सोसायटीच्या रहिवाशांना इतकी पसंत पडली की त्यांनी बहुमताने ती उचलून धरली आणि एकत्र मिळून राबवायला सुरुवातही केली.

या प्रकल्पाबद्दल सोसायटीचे चेअरमन डॉ. नितीन चोणकर म्हणाले, आमच्या तळमजला धरून चार मजल्यांच्या बिल्डिंगमध्ये १६ फ्लॅट आहेत. चौथ्या मजल्यावरच्या वॉशिंग मशीनचं पाणी तिसऱ्या मजल्यावरच्या रूममध्ये १०० लिटरच्या टाकीत साठवून टॉयलेटमध्ये फ्लश करण्यासाठी वापरण्यात येईल. तिसऱ्या मजल्यावरचे दुसऱ्या मजल्यावर, दुसऱ्याचे पहिल्या मजल्यावर अशी ही योजना आहे. या योजनेसाठी सोसायटीला साधारण ५० हजार रुपये खर्च येईल. दिवसाला १०० लिटर पाणी टॉयलेटसाठी वापरलं जातं असं गृहीत धरलं, तर तीन मजल्यांवरच्या सर्व फ्लॅट्सचं मिळून १२०० लिटर पाणी वाचू शकतं. म्हणजे महिन्याला ३६,००० लिटर तर वर्षात चार लाख ३८ हजार लिटर पाणी वाचवू शकतो. एका तीन मजली बिल्डिंगमधून एवढं पाणी वाचलं तर आमच्या कॉम्प्लेक्समध्ये १६ बिल्डिंग्ज आहेत. विचार करा, किती पाणी आम्ही वाचवू शकतो. आमची ही सोसायटी रोल मॉडेल बनू शकते.'



मुंबईतला पाऊस आपलं लहरी रूप नेहमीच दाखवतो. यंदा बरेच दिवस दडी मारून त्याने लहरीपणा पुन्हा सिद्ध केलाय. ज्या भागात नेहमीच पाण्याची टंचाई असते त्यांची पाणीकपातीच्या काळात काय परिस्थिती असते, हे त्यांचं त्यांनाच माहित.

अशा सर्व वस्त्यांना हा प्रकल्प मार्गदर्शक ठरू शकेल. येत्या काही वर्षांत पाणीटंचाईने भीषण रूप धारण करण्यापूर्वी अशा प्रकल्पांच्या माध्यमातून आपण त्यावर मात करायला सज्ज राहायला हवं, असं नगराध्यक्ष राम पातकर म्हणाले.

naresh.ingawale@timesgroup.com

Response from public for our awareness programme of Reuse of water

Delegation of Republic of Malavi visited ECO-SAN Project.

॥ आ नो भद्रा क्रतवो यन्तु विश्वाः ॥
ADARSH VIDYA PRASARAK SANSTHA'S
ADARSH COLLEGE OF ARTS & COMMERCE
(Permanently Affiliated to University of Mumbai)
Near Kulgaon-Badlapur Municipal Council Office, At & Post KULGAON.
Rly. Stn. Badlapur (E) Pin 421 503-Dist. Thane.

Dr. Vaidehi Daptardar
PRINCIPAL

ACAC/2008-09/282 11.02.2009

The President,
Kulgaon-Badlapur Municipal Office,
Kulgaon-Badlapur.

Dear Sir,

This is to express our sincere thanks and gratitude for choosing Adarsh College Campus for ECO-SAN Project. The ECO-SAN Toilets have been made operational for last two years in the campus.

Every day more than 2000 boys and girls students are using ECO-SAN toilets. They are being found waterless, odorless and environment friendly having best use and reuse and close to the nature. The treatment plants have been operational and will give good fertilizer which we will be using for preparation of bio-gas to be used ultimately for cooking purpose (for our primary section).

It is found that ECO-SAN Toilets are very user friendly and as such a new culture of ECO-SAN is being developed. With a lush green garden around the ambience is found to be pleasant and students are happily and preferably using the same over their home toilets.

We once again express our thanks for the project in our campus and are proud to be a part of **Eco-Friendly World**.

With regards,

Thanking you,

Yours faithfully,

(Dr. Vaidehi Daptardar)
Principal

Tel. : 0251-2693692 Email : adarshcollege@rediffmail.com