



**ExNoRa**

**Innovators**

**International**

**“Making YOU an INNOVATOR par excellence”**



**WATER ASSETS ExNoRa**

**WATER FOREVER**

- WATER WISER
- WATER FOREVER
- WATER a MATTER  
MATTERS
- CATER WATER

# 10 "R"s ExNoRa's CARE has six COMPONENTS



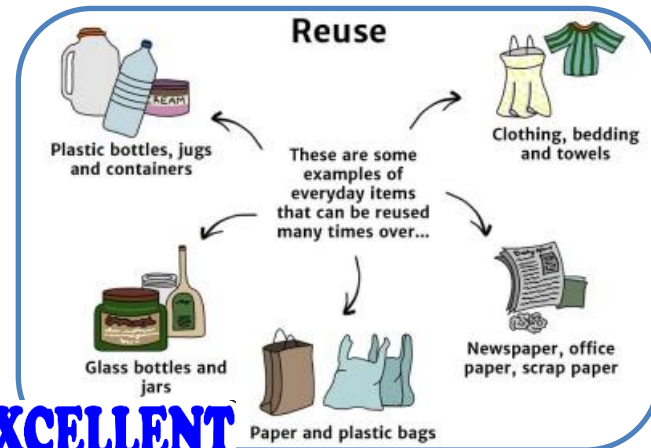
**1. RECONSIDER**  
Psych-Cycling & Reduce)



**2. REVIVE Precycling**  
(Reduce 2)



**3. RENDER**  
Freecycle



**EXCELLENT**

**4. REUSE**

**PREFERENCE ORDER**

# 10 "R"s ExNoRa's CARE has six COMPONENTS



5. REWORK Up-cycle



6. RECYCLE



7. RECOVER  
e cycling



8. REJECT  
Downcycling

**PREFERENCE ORDER**

# 10 “R”s



**9. REFUSE**  
**“Refuse”**



**10. REKINDLE**  
**Thinking**

**STICK to HOLISTIC**

The **NEED** is a

**HOLISTIC APPROACH**

We can never realize our Goals of  
**WATER QUANTITY & QUALITY** without  
our addressing the issue holistically.

# **GANGES AGES MANAGES**



**Not possible any MORE. Ganges stopped managing herself**

**But now GANGES  
GRUDGES  
due to the CHALLENGES  
by HUMANS dumping GARBAGES  
& SEWAGES**

**Nirmal's self-imposed rule is anything you say or write,  
it should be RHYME-MATIC. English is a Broadminded  
language. It accepts left and right words from other  
languages. In English,  
the original English is less than 50%.**



# **WHY ?**

**Why the water of most of the water bodies remain not fit for HUMAN CONSUMPTION?**

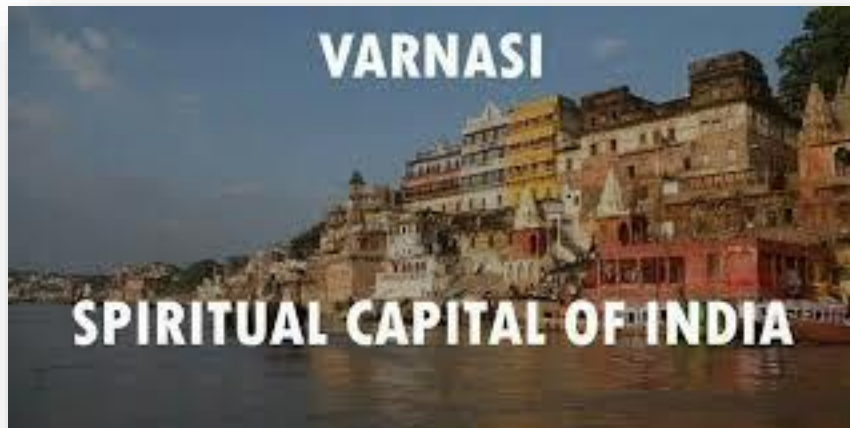
**The answer: Water there is polluted and dirty.**

**Can't we treat the dirty water in water bodies?**

**The answer:**

**No, it is like treating a cancer patient at an advanced stage and not at the initial stage.**

**The cities enroute are responsible for  
GANGES being dirty.  
RWA Call me +91 98400 34900).**



**Then what is the real problem ?**

**WE are the PROBLEM.**

**What is wrong with US?**

**“We treat the symptoms, not the disease.**

**We talk of the consequences, but never the causes.”**



**WATER BODIES ExNoRa**

**WATER FOREVER**

**UNSUNG HERO**



**ExNoRa**

**ExNoRa Innovators International  
recognizes**

**Exn. Sabari V Subramanian**

**as**

**ExNoRa WATER HERO of TAMILNADU**

**This presentation is  
dedicated to one of  
the wonderful  
human souls that  
we are fortunate to  
know and get  
associated with,  
Exn. Madipakkam  
“Sabari” V  
Subramanian,  
President, Water  
Bodies **ExNoRa****



**Exn. Madipakkam Sabari V Subramanian, President,  
Water Bodies ExNoRa is simply great because**

- **He is an**
- **Incurable Optimist with**
- **Undying**
- **Unquenchable**
- **Unshakable &**
- **Unstoppable Optimism**
- **and he is a chronic  
optimist & positivist**

அவருடைய மிக  
சிறந்த நாளுக்கு  
குணா  
அதிசயங்கள்

- தளராத மனம்
- தணியாத ஆர்வம்
- வற்றாத  
சின்களை

**ExNoRa** could save many water bodies thanks to the motivation of Exn. Madipakkam Subramanian (66 years old in 2021) . He was born in Thiruvattaru in Kanyakumari District. He did is SSLC and is a BA unfinished. He served the Nation via Indian Army for 5 years. Then he joined Madras Port Trust as a Clerk served there in that post until he retired . But what made us to consider him great has been his passion and knowledge on preserving Water Bodies last 24 years as President of Water Bodies **ExNoRa**. No doubt he is now a Human University with regard to water and water bodies.

# **ExNoRa WATER HERO of TAMILNADU,**

**Exn. Madipakkam Sabari V Subramanian**  
indeed a

**is**

## **REAL LIFE HERO**

**Our beloved,  
Exn. Madipakkam  
Sabari V Subramanian,  
President,  
Water Bodies ExNoRa**

**HOW?**



**He has served & is  
serving**

**1.Nation (Indian Army  
for 5 years)**

**2.Nature (Environment  
)**

**3.Nationals (the  
People)**

**Join us in saluting him.  
Call him, greet him and  
join him in his most  
sacred mission .**

**His WhatsApp Mobile:  
+91 98840 26023**



Exn. M B Nirmal, (Nirmal Basu) **GPian**  
**PROBLEM SOLVING MACHINE (PSM)**

**HumanE Being METAPHYSICIST**

**WORDSMITH**

**7<sup>th</sup> SENSE MASTER**

**INNOVENTOR (INNOVATOR + INVENTOR)**

**MIND PROGRAMMER ONENESS MESSIAH**

**SOCIAL SCIENTIST sPEAKer WRIGHtER**

**GARBAGELOGIST ENVIROTITLEMENTALIST**  
**(ENVIRONMENT + ENTITLEMENT)**



BORN

*to Change the*

WORLD

**INNOVATION** is the **NAME**  
of the **GAME**  
and **NIRMAL PLAYS** the **SAME**  
all the **TIME**  
in **GOD's FAME**

# *Your good time has started" -*

*By the GRACE of the DIVINITY,  
"i" the Humble "i" became a Problem-solving Machine.  
"i" realised that there is no problem without a solution.  
"i" found the solutions to every problem plaguing Nature,  
Nation, and Nationals, thanks to the ALMIGHTY.  
The PSM (Problem Solving Machine) instantly  
solved/solves the difficulties faced by any living species,  
from humans to animals.  
Relax Individuals, Families, and,  
Communities from the Planet  
to a Nation, Town,  
Community, and Colony.  
*Your good time has started" -**

*M B Nirmal,  
a Human **E** Being  
& Problem Solving Machine*



Great  
News

be happy

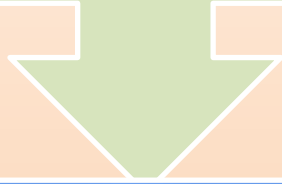
Solutions to the PROBLEMS of  
Individuals, Society, Nation,  
Nature, Nationals, Planet, People  
& Animals that have come to  
the notice of the  
**PROBLEM SOLVING MACHINE**  
(**PSM**) has been solved in toto,



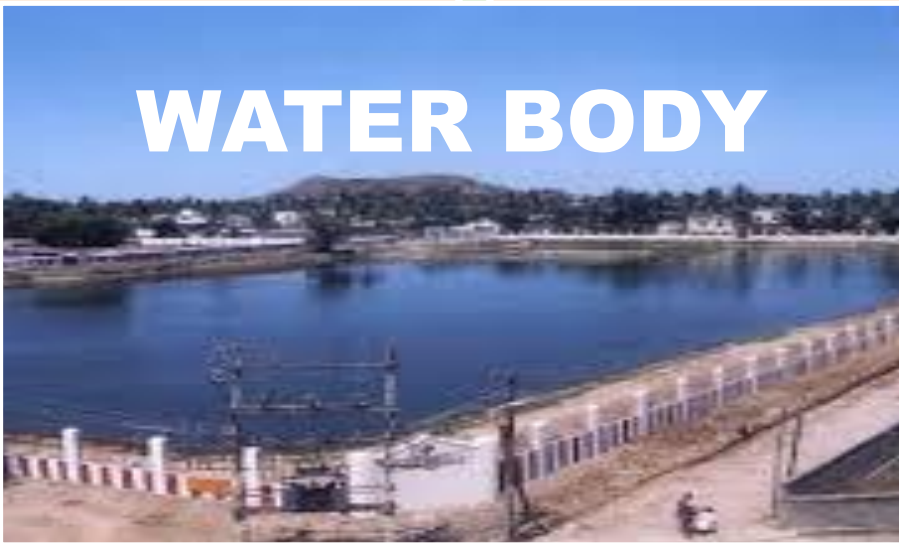
# Water Basics

# SOURCE &

Source refers to a place or origin from where something is obtained (WATER BODY).



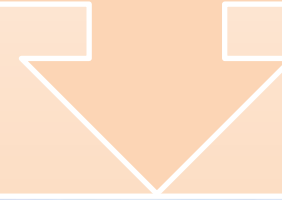
**WATER BODY**



**SOURCE**

# RESOURCE

A resource refers to materials, staff, supplies and other assets that are needed for something to function effectively. (WATER)



**WATER**



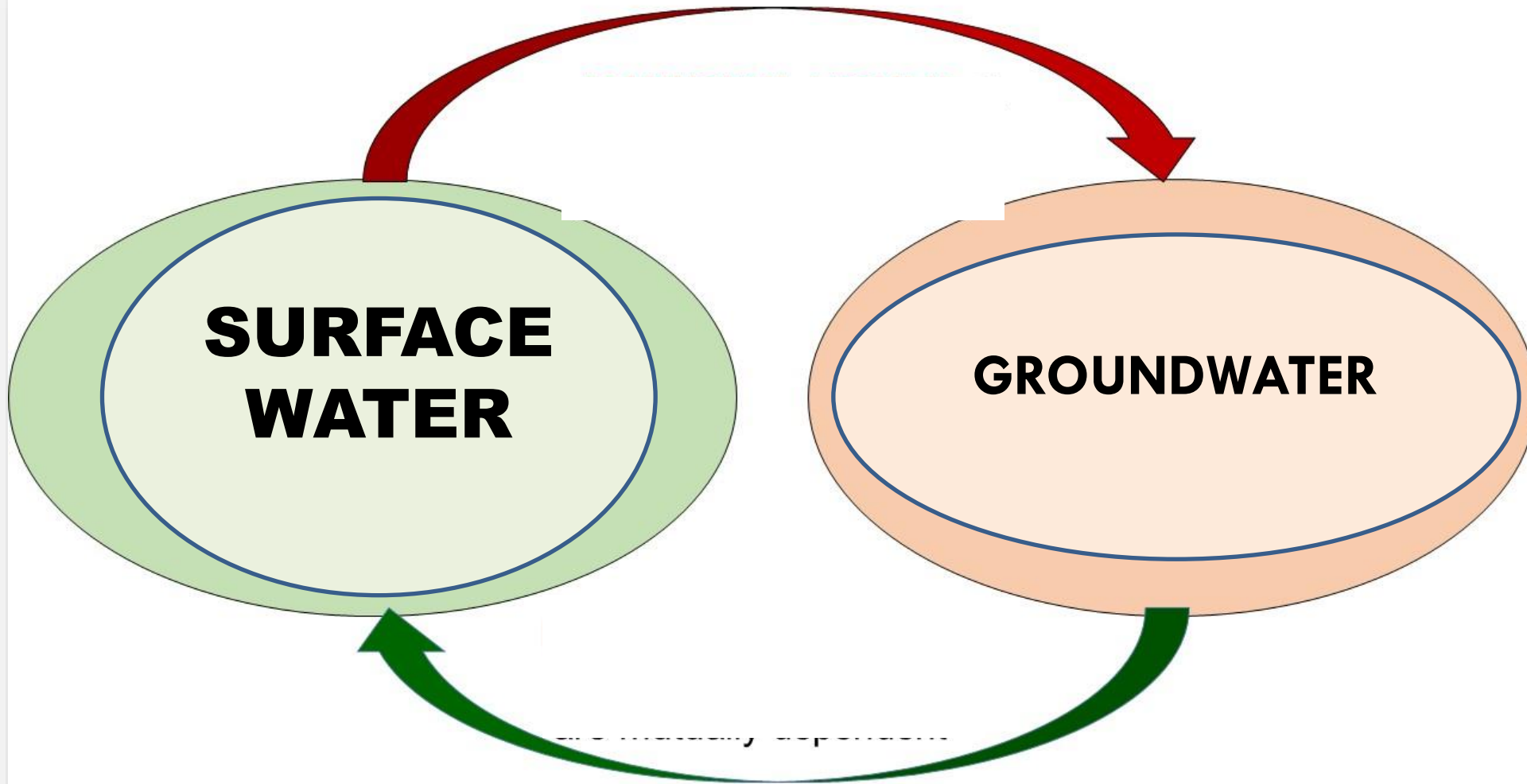
**RESOURCE**

# KNOW WATER

- Surface water is any body of water above ground, including streams, rivers, lakes, wetlands, reservoirs, and creeks.
- The ocean, despite being saltwater, is also considered surface water. Surface water participates in the hydrologic cycle, or water cycle, which involves the movement of water to and from the Earth's surface. Precipitation and water runoff feed bodies of surface water. Evaporation and seepage of water into the ground, on the other hand, cause water bodies to lose water. Water that seeps deep into the ground is called groundwater.
- SURFACE WATER and groundwater are reservoirs that can feed into each other. While surface water can seep underground to become groundwater, groundwater can resurface on land to replenish surface water. Springs are formed in these locations.



# Water for USE



# Know WATER



- There are three types of surface water:
  - 1. PERENNIAL,**
  - 2. EPHEMERAL, &**
  - 3. MAN-MADE.**
- Perennial, or permanent, surface water persists throughout the year and is replenished with groundwater when there is little precipitation. Ephemeral, or semi-permanent, surface water exists for only part of the year. Ephemeral surface water includes small creeks, lagoons, and water holes. Man-made surface water is found in artificial structures, such as dams and constructed wetlands.
- Since surface water is more easily accessible than groundwater, it is relied on for many human uses. It is an important source of drinking water and is used for the irrigation of farmland. In 2015, almost 80 percent of all water used in the United States came from surface water.

# A shortcoming amongst all of us

We TREAT the SYMPTOMS,  
not the DISEASE.

We talk about the CONSEQUENCES,  
not the CAUSES.

We see the water body problems there, and try to solve it. But the problems are created in our homes, streets and public places as wastes. Unless we solve it there at source, nip it in the BUD, we can never make a water body clean, nor consume its water.

# **PONDER OVER**

- **WATER COMES TO A WATER BODY FROM ALL AROUND.**
- **THE POLLUTANTS COME TO A WATER BODY FROM ALL AROUND.**
- **WATER FROM THE WATER BODY GOES TO PEOPLE ALL AROUND.**
- **IT IS THE DUTY OF THE PEOPLE ALL AROUND THE WATER BODY TO PROTECT AND MAINTAIN THEIR WATER BODY WHICH SERVES THEM TO SURVIVE.**

*M B Nirmal*



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**1.**

**PREVENT  
POLLUTANT**

**POLLUTION PREVENTION**

**(Pollutions happen at**

**Source, Carriage & Usage points)**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# **GOLDEN QUOTE**

**for SAVING WATER BODIES**

**Waste Management,  
“Enforce at Source”**

**Otherwise you will  
never achieve your  
save, protect and nurture  
water body goal.**

# **ENFORCE at SOURCE**

- Pollution in water bodies can never be successful unless you enforce waste management at the source of waste generation. i.e., Home, Office, Industry, Hospital, Hotel, Hostel, Marriage Hall, Places of Worship, Market, Mall, Educational Institution, Slaughter House, Park, Play Ground, Burial Ground / Crematorium, Lab, Mine, Stable, Treatment Plants, Building Construction Site, Flat Complex, Commercial Complex, Beach, Public Open Space, Railway Station, Bus Terminus, Picnic Spot, etc.

# Do you know?

*“Every two seconds a child dies, not drinking poison, but water.”*

**Millions of Deaths each Year**

- **Every 2 Seconds a Child Dies from Drinking Contaminated Water(UN)!**



# LAKE WITH SEWAGE, NOT WATER

WHY?

SOURCES for the SOURCE, WATER BODY



The So Called Storm  
Water Drainage



Open Canal



Ditch



**ExNoRa**

**Innovators**

**International**

**“Making YOU an INNOVATOR par excellence”**

**1994 ExNoRa**

**Garbage Yatra**

# Water bodies    Garbage Dump Bodies



# ExNoRa's Garbage Yatra that led to the organisation filing a suit in the Supreme Court , which ended in the enactment of MSW Rules 2000

ExNoRa

NOW PART OF HISTORY

**ExNoRa** Senator Late Capt. Velu and Environmental Activist Amrita Patel went on a tour from Kashmir to Kanyakumari under 'THE **ExNoRa** CLEAN INDIA PROJECT' to see the conditions particularly the role of local bodies in Solid Waste Management. They called their trip as **Garbage Yatra**. India was one and same from North to South. They found in no place the municipal solid waste was managed, it was only mismanaged. They filed a case in the Supreme Court which ended Supreme Court passing judgment directing the local bodies to do the work of Solid Waste Management including Zero Waste Management. This was followed by Government of India bring an enactment making it a Law requiring local bodies to do.

## WASTENET NEWS

Sponsored by HUDCO and produced by  
THE EXNORA CLEAN INDIA PROJECT

50 Kothnur, Bagalur Road,  
Bangalore 560077.  
Tel 080 - 546423,1 Fax 558 4196

No. 1

June, 1995

*Greetings, Dear Readers*

**Welcome to the World of Garbage!**

This is the first issue of a newsletter produced especially for municipal ties, their health officials and concerned citizens and groups, Which will bring you success stories and low cost solutions for the management of garbage; its sorting, collection, transport, processing and safe recycling into products useful to society.

**CALLING ALL MUNICIPALITIES:**

Through this newsletter, **you can share with us your problems and success stories. Do write to us**, so that we and other municipalities and Health Officers can suggest solutions to your problems or learn from your successes (and mistakes). **Please send us statistics** of your garbage volumes, vehicles and staff and absenteeism; your dumpsite areas and distances, where you own them and how long they will last, % uncollected garbage with reasons: % uncovered areas and details of contract arrangements. Also any special problems you face.

**TECHNOLOGY MISSION ON SANITATION & ENVIRONMENTAL HYGIENE:**

A WHO-Central Govt. Workshop on April 10-12 95 drew up Guidelines for a Proposed Technology Mission that Covered 5 Areas:

- Low Cost Urban Sanitation
- Urban Waste Water Management
- Urban Solid Waste Management .
- Rural Environment & Sanitation
- Health Surveillance

We will write about each of these subjects in future issues.

**EXNORA CLEAN-INDIA CAMPAIGNS**

You have heard of Veerappan, Prabhakaran, Dawood Ibrahim. All bad guys. Have you heard of EXNORA? INTACH? SEWA? All good groups, doing excellent, useful work. But they don't make headlines. Why not?

After Surat's plague three concerned citizens traveled around India to spread good news that does not come in the papers, especially about successful schemes for managing garbage from start to finish.(See Clean India Campaign#1, page 3).In every town and city, they found sincere, unappreciated Health Officers and Sanitary Inspectors doing a heroic job with low budgets against great odds and bursting populations. All were enthusiastic and eager to know about available solutions to solid waste management that we will share with you in **Wastenet News** Clean India Campaign #2.

SoWaM  
MBN





## THE EXNORA SYSTEM

This is well described in an article in **Femina Magazine**, 8.4.1995 (page 36, Bagging Rubbish, by Capt. J. S. Velu):

“**M. B. Nirmal**, a man with a dream founded **EXNORA** international a mix of **EXcellent**, **NOvel** and **RA**dical in 1989, on his return to India from Hong Kong after a stint there... He is a man with a vision of a clean India. And this is being realized through a simple strategy. **Action**. The slogan of “Clean my home and clean my street” is the war cry. The fight has begun. It is a fire, kindled in Madras, that has spread to Madurai, Bangalore, Vijayawada, Pune, Bombay, Baroda, Nagpur, Surat & Delhi.

**EXNORA** aims at people's participation. They are involved in cleanliness campaigns directly. In Madras, the organisation targets slums and areas where garbage has been accumulating for years. The cleanliness campaign after a garbage-logged area has been cleared up -- involves the launching of a primary collection system. This can be started anywhere in India. Tricycles sponsored by corporate sponsorships, have enabled **EXNORA** to make garbage collection possible, preventing refuse pile ups.

The tricycles collect garbage, house to house every day between 7-10 am. They cover about 225-250 house-holds in an area -- Two men are employed to maintain a street or a colony. A 'Street Beautifier' gets a salary of Rs. 600 p.m. and his assistant gets Rs. 300 p.m. Each house in the locality contributes Rs. 5 or Rs. 10 per month (according to the income bracket) towards paying their wages.

And they care. Most of the areas where the scheme has been implemented have now almost no dumps. People get up early in the morning and clean up their homes and actually wait patiently for the tricycles to collect the waste, which is then thrown in special (Municipal) Waste disposal pits, or is recycled.

## EXNORA CLEAN INDIA CAMPAIGN # 1

The Delhi HINDU of 4.12.1994

Described this novel communication yatra that traveled 7000 km through 29 cities in 10 States of India in 28 days from Nov 14-Dec 11, 1994:

“Three people.. an ex-Army Captain (J. S. Velu), an environmentalist (Almitra Patel) and a farmer (Sandhu)--who are members of a voluntary organization **EXNORA** International involved in a cleanliness campaign are now in Delhi. The team offering **EXcellent**, **NOvel** and **RA**dical solutions to the problems of keeping streets clean while collecting waste, started its **EXNORA** Clean India Campaign from Bangalore on November 14. It has covered Tumkur, Sira, Davangere, Ranebennur, Hubli, Dharwad and Belgaum in Karnataka, Kolhapur, Panchagani, Pune and Bombay in Maharashtra; U.T. of Daman, Surat, Baroda and Ahmedabad in Gujarat; Udaipur, Ajmer & Jaipur in Rajasthan and now to Delhi.”

### EXNORA #1 OBJECTIVE ACCOMPLISHED:

- Conducted on the spot research of solid waste Management collection, transport and disposal systems en-route
- Conveyed successful case studies stories of participatory solid waste Management from town to town and city to city.
- Shared indigenous low cost solutions for collection and disposal, which can easily be done every where.
- Discussed and planned solid waste Management implementation strategies with Administrators; Mayors, Commissioners, Health Officers, Corporations Municipalities, Town Councils & the media.
- Handed over copies of the Urban Solid Waste Management Model 1994 (developed in Bangalore in April '94 under U. of Amsterdam



& Kar. State Council for Science & Tech.) to HRD minister Arjun Singh for consideration and implementation in Indian cities, and to the Rajiv Gnadhi Foundation.

- Sent a copy to the USWM Model to Prime Minister's Office on request.
- Countered the damage done to India's image and economy by removing the panic of “plague”
- Follow-up with **EXNORA** launches in Nagpur, Surat, Delhi, Baroda, Ahmedabad.
- Ahmedabad Meet on 6.1.95 to formulate a National Action plan.

### A TALE OF TIHAR:

**EXCEL** Industries' microbial composting process was started by Kiran Bedi in 4 Delhi Jails, earning Rs. 8 lacs a year where earlier there was a garbage removal expense of Rs. 16 lacs a year. After composting began, the number of prisoners needing emergency medical treatment reduced remarkably to 10 per day from 250 per day earlier!

### EXNORA-INTACH CAMPAIGN ROUTE

**II: Kashmir to Kanyakumari** Similar to Campaign # 1, this will carry the waste-management message to 86 more cities and towns in 124 days and cover 14000 km:

July 15 - 31, 1995: Delhi, Ludhiana, Jalandhar, Amritsar, Jammu, Surinagar, Pathankot, Shimla, Chandigarh.

Aug 1 - 10: Chandigarh - Dehra Dun, Haridwar, Rishikesh, Roorkee, Meerut, Moradabad, Bareilly, Lucknow, Kanpur.

Aug 11-13 1995 : Delhi, Ludhiana, Jalandhar, Srinagar, pathankot, Shimla, Chandigarh.

Aug 1-30 Jamshedpur, Dhanbad, Madras, Pondy, Karaikal, Thanjavur - Trichy, Madurai, Kanyakumari.

Oct 22-31: Kanyakumari, Nagercoil, Trivandrum, Quilon, Alleppey, Cochin, Trichur, Calicut

Nov 1-15 : Calicut, Cannanore, Mangalore, Kumta, Karwar, Panaji, Belgalore, Kumta, Karwar, Panaj, Belgaum, Hubli, Hassan, Bangalore.

### CLEAN UP AND FLOURISH

OR

### PILE UP AND PERISH !!

“**Exnora Clean India Campaign**” headed by **EXNORA** Senator Captain Velu with Mrs. Almitra Patel of Intach culminated into a case filed in the Supreme Court by Exnora and INTACH and the subsequent passing of an Act by the Government of India requiring Municipalities and corporations all over the country to manage solid waste properly to ensure environment protection and public sanitation.

✘ ✘ ✘



# Excel Industries Limited



# Earthy Matters

## Himalayan Happenings



**Almitra Patel**



**Lalitha Krishnan**  
**Earthy Matters**

**The Important Interview**

***Thanks*** "[Earthy Matters](#)"

Meet Almitra Patel. The  
Garbologist who gave India  
Solid Waste

Management Rules says it all  
came from Nirmal



# IT ALL CAME FROM NIRMAL

EXNORA in Chennai- Excellent, Novel, Radical. This was MB Nirmal banker who went to Hong Kong with 11 other bankers on a study tour. The others went shopping and sightseeing and he kept going around, wondering, “How can this place be so clean?” And he came back to Chennai and he conceptualized this. He found the waste pickers grubbing in dustbins and he asked them, “What are you looking for?” (They replied) “Trying to take out recyclables to feed our families and educate our children. So then he said, “I’ll give you uniforms, I’ll call you ‘street beautifiers’ and I’ll ask you to collect dry waste, clean separate dry waste from every home.”

# IT ALL CAME FROM NIRMAL

Then he called some actor, cricketer for a neighbourhood meeting so everybody came. Then, those people said, “Keep your waste separate, don’t chuck it 24 hours a day at your neighbour’s gate, you know? Wait till it will be collected.” So, the whole policy which we have, I mean the rules, actually came from MB Nirmal’s EXNORA. And, ExNoRa Senator Vellu had been sent to Bangalore after a year in Vijayawada, to spend a year in Bangalore implementing that model somewhere.

# **IT ALL CAME FROM NIRMAL**

- **Then he said, “I can’t be sitting around. If I take a year per city it will take 300 years to cover India’s 300 Class I cities, means, one-lakh plus populations. That was the drivers first for the Clean India Campaign and after that, I was told, “If you want to get anything done, then go to the Supreme Court and ask for it.**

# Municipal Solid Waste (MSW) Rules 2000

of Government of India is a  
sequel to the case we filed in  
the Supreme Court in 1994,  
the judgment of it was  
delivered in the year 1996

**1989**

---

**The Fish Cart  
Magic**

**For Two Serious problems, one 7<sup>th</sup> Solution solution was found out. That solution became historical and practised from Kashmir to Kanyakumari**

**In 1989 Nirmal, an Animal Activist saw Bullock cart with ill-fed bulls**



**For Two Serious problems, one 7<sup>th</sup> Solution solution was found out. That solution became historical and practised from Kashmir to Kanyakumari**

**Nirmal as an Environmentalist saw Municipal Trucks hardly serviced, emitting poisonous smoke**



**Nirmal Convinced the fish cart manufacturer Mr James of James Rickshaw to do the modification who did it with great reluctance**

## **FISH CART taking a new avatar**



Today this tri cycle cart called as **ExNoRa** cart has become moving icon of Cleanliness with several thousands of Tricycle carts throughout India from Kashmir to Kanyakumari silently cleaning up waste

**Fish Carts converted as per Nirmal's suggestion as Trash Collection Cart by James Rickshaw**







**Pedal Energy** instead of **Petrol Energy**

**“We waste Natural Resources by using them up and we waste Human Resources by not using them up” . Hence was born Pedal energy**

**ExNoRa** saw a big flaw in trash collection, it was done by Bullock cart with ill fed bulls or

Municipal Trucks hardly serviced emitting poisonous smoke.

**TWO MINUSES** make a **PLUS**

**ExNoRa** thought that instead of **Bull Energy & Petrol Energy**, why not we use **Pedal Energy** ?

“We waste Natural Resources by using them up and we waste Human Resources by not using them up”. Hence was born Pedal energy

# James Rickshaw Industries



Manufacturers of : Cycle Rickshaw, School Rickshaw & Motorised Handicapped Vehicles, Spares & Accessories.  
 Factory & Office : 121, GANDHI ROAD, VELACHERY, CHENNAI-600 043. Phone : 22420899, 22431176

## இந்தியாவின் தூய்மைப் புரட்சியாளர் எம்.பி. நர்மல்

எம்.பி. நர்மல் திருவள்ளூர் மாவட்டம் திண்டிவனம் அருகே உள்ள ஊர். இவர் 1989-ஆம் ஆண்டு அக்டோபர் மாதம் சென்னை மாநகரில் அமைந்த 'சுற்றுச்சூழல் பாதுகாப்பு' என்ற கமிட்டியில் உறுப்பினராக பங்கேற்றார். இவரின் கவனம் ஊர்வலம் வந்த இந்தியாவின் மாவட்டம் 1989-ஆம் ஆண்டு நவம்பர் மாதம் திண்டிவனம் மாவட்டம் வந்தது. சிபிசி எம்.பி. நர்மல் அவர்கள் அவர்களை சந்தித்து, இந்த மாவட்டம் ஊர்வலம் வந்தது என்பதை அறியும்படி செய்தார். அதன் பின்னர் திண்டிவனம் மாவட்டம் ஊர்வலம் வந்தது என்பதை அறியும்படி செய்தார். அதன் பின்னர் திண்டிவனம் மாவட்டம் ஊர்வலம் வந்தது என்பதை அறியும்படி செய்தார்.



எம்.பி. நர்மல் அவர்கள்

**It happened in 1989**

• ஊர்வலம் வந்த சிபிசி எம்.பி. நர்மல் அவர்கள், திண்டிவனம் மாவட்டம் ஊர்வலம் வந்தது என்பதை அறியும்படி செய்தார். அதன் பின்னர் திண்டிவனம் மாவட்டம் ஊர்வலம் வந்தது என்பதை அறியும்படி செய்தார். அதன் பின்னர் திண்டிவனம் மாவட்டம் ஊர்வலம் வந்தது என்பதை அறியும்படி செய்தார்.

Letter from the fish tri-cycle cart manufacturer thanking M B Nirmal for the idea to convert the fish cart as trash collection cart. This tricycle is called as ExNoRa Cart & has become a moving icon for cleanliness all over India

**Today the Tricycle carts over 50,00,000  
throughout India silently using pedal  
energy making the NATION CLEAN**



**HOME IRKSOME**

**became**

**HOME HANDSOME**

# See **ExNoRa** MAGIC BEFORE & AFTER

**Dirty Dwellings**

**Paryavaran Shastra**

**BEFORE**



**AFTER**

became

Heavenly  
Homes

Home  
ExNoRa



**ExNoRa INNOVATORS CLUB/ Concepts & Nomenclature:  
NIRMAL**



# HOME WITH a HEART

**HOUSE IS BUILT BY CONCRETE**

**HOME IS MADE OF LOVE**

AS YOU  
IMPLEMENT,  
CHECK EACH BOX  
(TICK) ONE BY ONE



## CHECKLIST

<b>CLEAN HOME</b>	<input checked="" type="checkbox"/>	<b>WASTE CHASTE HOME</b>	<input checked="" type="checkbox"/>
<b>HYGIENE HOME</b>	<input checked="" type="checkbox"/>	<b>POLLUTION FREE HOME</b>	<input checked="" type="checkbox"/>
<b>GREEN HOME</b>	<input checked="" type="checkbox"/>	<b>REENERGY HOME</b>	<input checked="" type="checkbox"/>
<b>HEALTHY HOME</b>	<input checked="" type="checkbox"/>	<b>RESPONSIBLE HOME</b>	<input checked="" type="checkbox"/>
<b>SAFE HOME</b>	<input checked="" type="checkbox"/>	<b>CONSERVATION HOME</b>	<input checked="" type="checkbox"/>
<b>HAPPY HOME</b>	<input checked="" type="checkbox"/>	<b>MOTIVATED HOME</b>	<input checked="" type="checkbox"/>

Initiate **ENVIROTITLEMENT** in your home  
(All Eight Kinds of Environment )  
via your HOME **ExNoRa**

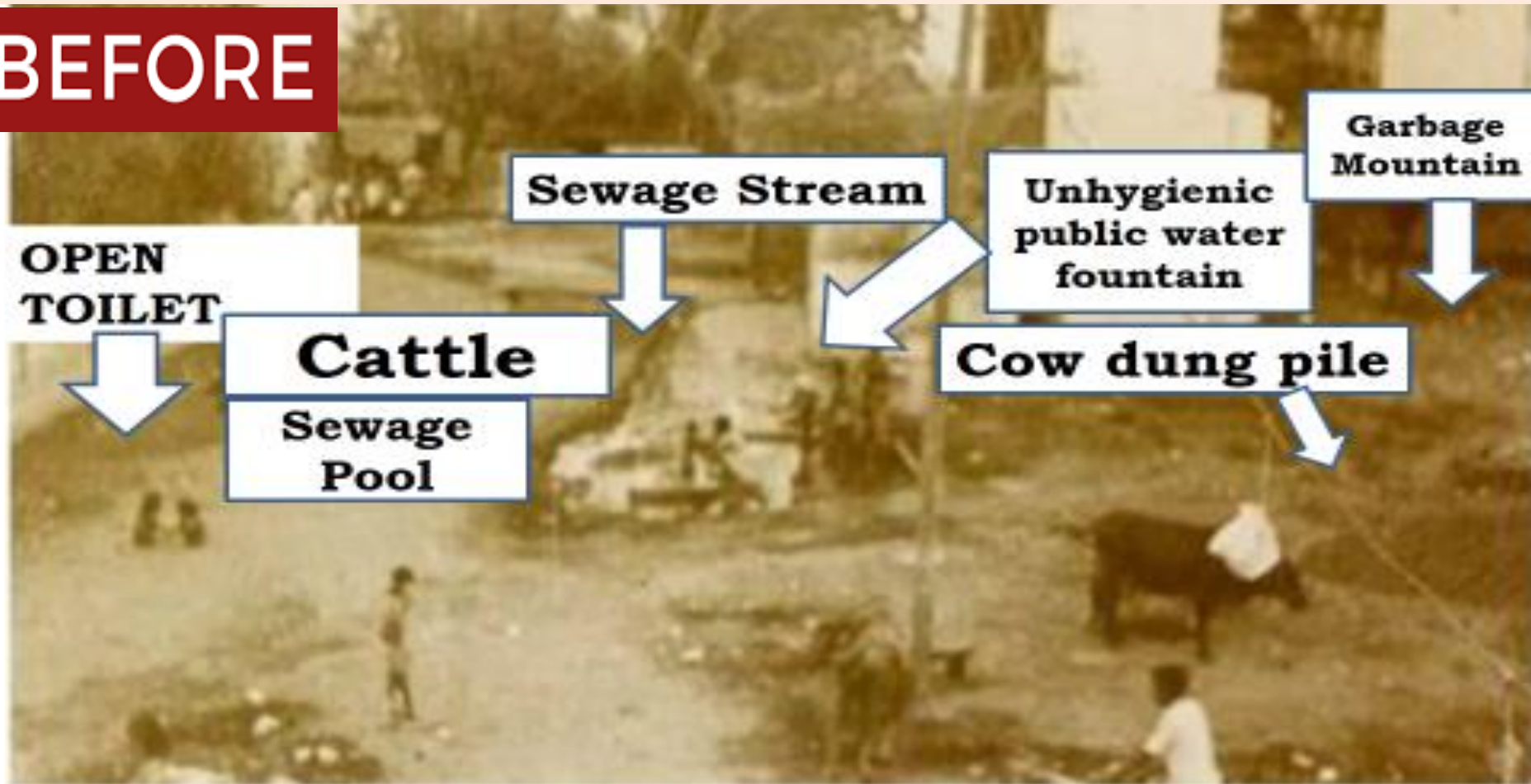


**STREET SHIT**  
**became**  
**STREET SWEET**

thanks to Residents Welfare Association **ExNoRa**

# street, open toilet & heaps of SHIT

**BEFORE**



became **VISUAL TREAT**

**AFTER**



Thanks to Residents Welfare Association **ExNoRa**

**A ROAD**  
**that was a SHITLOAD**  
**became BROAD**  
**& ODD**

THE *road that is  
not a road*

**BEFORE**



**A road that is  
not a road**

Would anyone call this a road? It is Giriappa Road, T. Nagar. Indian Express carried a report on the road on Friday (Aug 16) on page 6. The PWD, the Corporation and the Slum Clearance Board seem to have their...

**AFTER**

**The same place today , thanks  
to the street**

**Residents Welfare Association**

**ExNoRa**

**of the street**

# STREET SWEET



AS YOU IMPLEMENT  
CHECK EACH BOX (TICK)  
ONE BY ONE



## CHECKLIST

<b>CLEAN STREET</b>	<input checked="" type="checkbox"/>	<b>WASTE CHASTE STREET</b>	<input checked="" type="checkbox"/>
<b>HYGIENE STREET</b>	<input checked="" type="checkbox"/>	<b>POLLUTION FREE STREET</b>	<input checked="" type="checkbox"/>
<b>GREEN STREET</b>	<input checked="" type="checkbox"/>	<b>REENERGY STREET</b>	<input checked="" type="checkbox"/>
<b>HEALTHY STREET</b>	<input checked="" type="checkbox"/>	<b>RESPONSIBLE STREET</b>	<input checked="" type="checkbox"/>
<b>SAFE STREET</b>	<input checked="" type="checkbox"/>	<b>CONSERVATION STREET</b>	<input checked="" type="checkbox"/>
<b>HAPPY STREET</b>	<input checked="" type="checkbox"/>	<b>MOTIVATED STREET</b>	<input checked="" type="checkbox"/>

Initiate **ENVIROTITLEMENT** in your home  
(All Eight Kinds of Environment )  
via your Residents Welfare Association **ExNoRa**



**STREET**  
became  
**sTREEt &**  
a **VISUAL TREE**  
**(TREAT)**

thanks to Residents Welfare Association **ExNoRa**

See **ExNoRa** **MAGIC BEFORE & AFTER**

# Streets without **TREES**

**Paryavaran  
Shastra**

**BEFORE**



# became Social Forests



thanks to Residents Welfare Association ExNoRa

**SLUM GLOOM**

**became**

**SLUM BLOOM &**

**SLUM AWESOME**

thanks to COMMUNITY **ExNoRa**

# Before Community RWA ExNoRa

**BEFORE**



# After Community RWA ExNoRa

**AFTER**



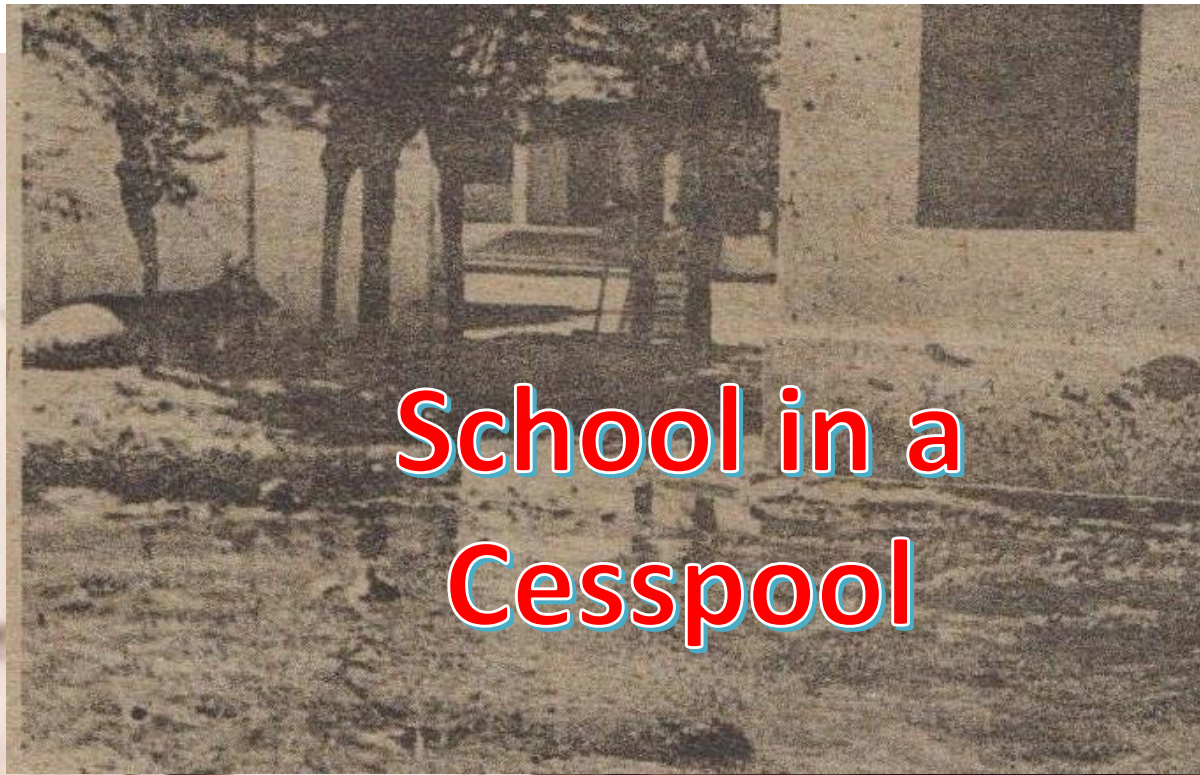
thanks to **COMMUNITY ExNoRa**

**SCHOOL in a  
CESSPOOL  
became  
SCHOOL COOL**

thanks to SCHOOL **ExNoRa**  
with students, teachers, staff and Parents

BEFORE

# School in a Cesspool





An aerial photograph of a school campus. A large, leafy green tree is the central focus, casting a shadow on the ground. To the left, there is a long, low concrete structure, possibly a water station or a covered walkway, with several people standing nearby. In the background, there are several multi-story buildings, some with balconies, and more trees. The overall scene is bright and sunny.

**AFTER**

**School Cool**

**thanks to SCHOOL ExNoRa  
with students, teachers, staff and Parents as MEMBERS**

**BARREN AREA**

**became**

**Wah Re Wah**

thanks to 40 Residents Welfare Association **ExNoRa**

FROM THE **WORLD TRADE FAIR**, ANNA NAGAR

**BEFORE**



**A VIEW FROM ANNA NAGAR TOWER (C.1968)**

**AFTER**



thanks to 40 Residents Welfare Association **ExNoRa**  
(Civic **ExNoRas**)

**MODELS**

**that**

**MODEL**

# MODELS



**HEAVENLY HOME © & Vertical Terrace  
Sky Farming ©**

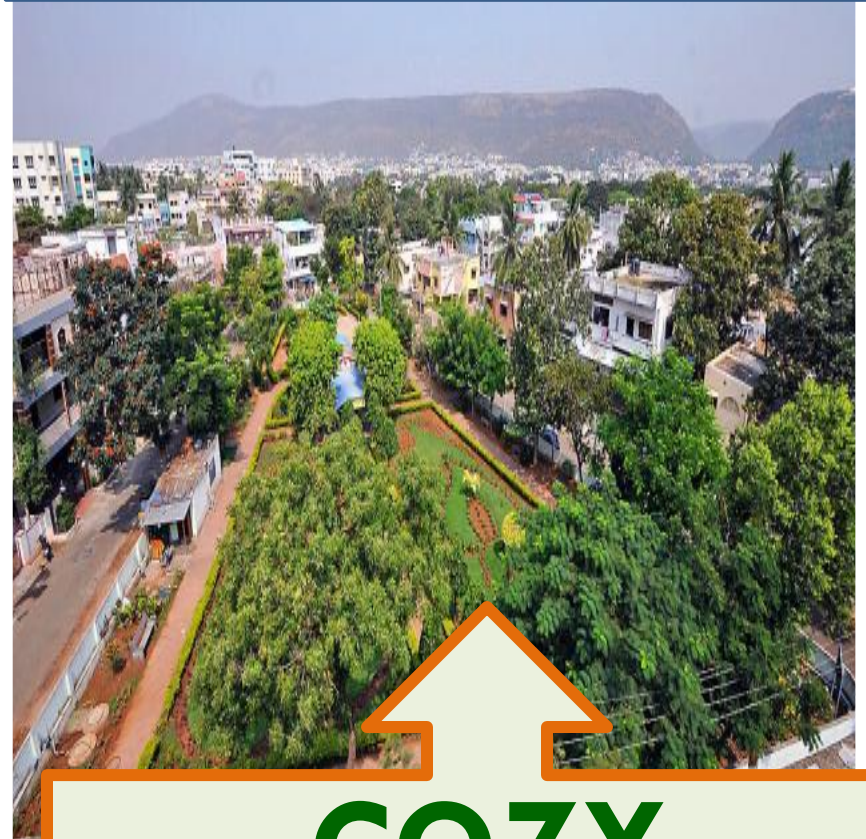
# MODELS

RWA ExNoRa



**STREET DELIGHT**

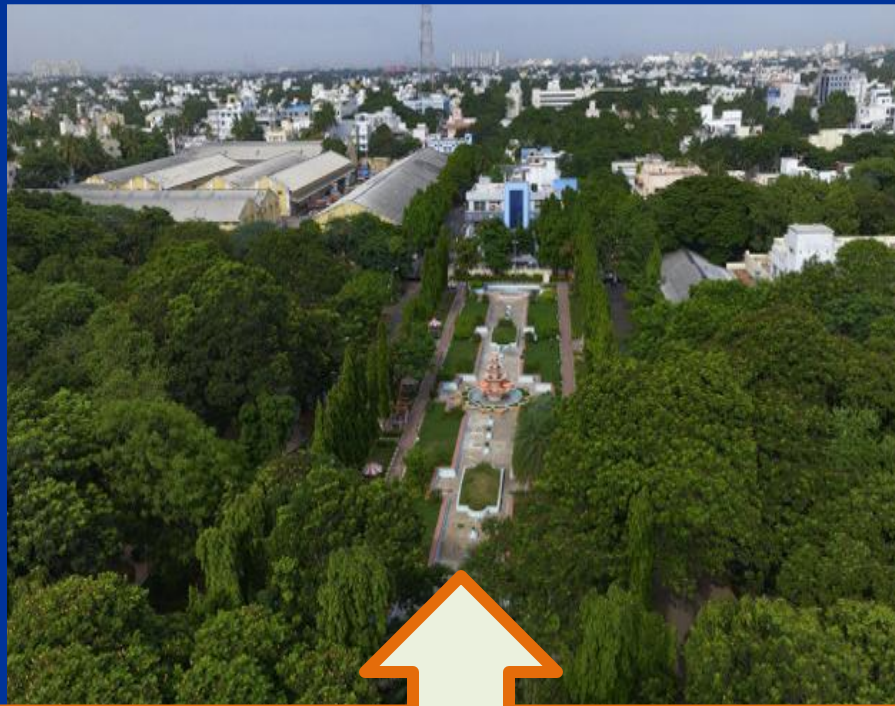
RWA ExNoRa



**COZY  
COLONY**

# MODELS

RWA **ExNoRa**



**AREA Wa Re Wah**

RWA **ExNoRa**



**MARKET MAGNET**



# MODELS

**SCHOOL ExNoRa**



**SCHOOL COOL**

**COLLEGE ExNoRa**



**COLLEGE  
"GREEN COLLAGE"**

# MODELS



**SCHOOL** ExNoRa



**OFFICE BLISS**

**INDUSTRY** ExNoRa

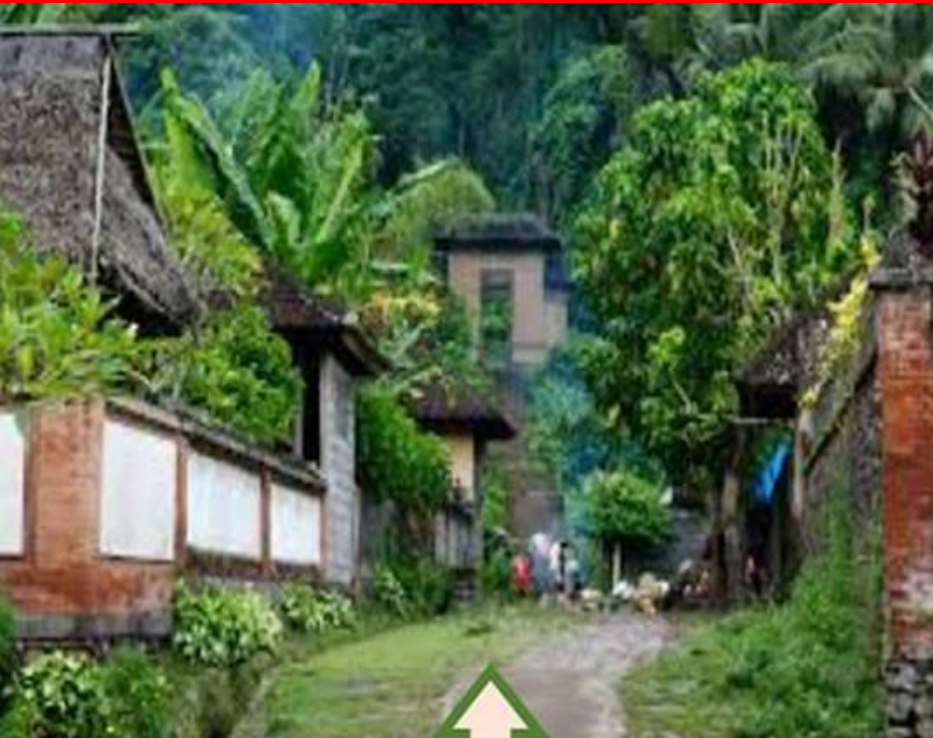


**INDUSTRY ARTISTRY**

[www.exnorainnovators.club](http://www.exnorainnovators.club)  
[www.exnora-innovators.club](http://www.exnora-innovators.club)

# MODELS

**VILLAGE** ExNoRa



**Village Vantage** ©

**COMMUNITY** ExNoRa



**Slum Awesome** ©

# **1. PREVENT POLLUTANT POLLUTION PREVENTION**

**VISIT OUR WEBSITE**

**1. PREVENT  
POLLUTANT  
POLLUTION  
PREVENTION**

**WATER BODIES ExNoRa**

**VISIT OUR WEBSITE**

**Different Ways to  
Prevent Water  
Pollution**

**VISIT OUR WEBSITE**

**WATER POLLUTION  
SOURCES**

**[www.exnora.website/water](http://www.exnora.website/water)**

**VISIT OUR WEBSITE**

**Great Greater Chennai.  
Blessed with 6000 lakes &  
ponds in Chennai &  
Neighbouring two districts  
please view Horrible Status of  
Water Bodies there**

# **1. PREVENT POLLUTANT POLLUTION PREVENTION**

**PREVENT POLLUTANT  
POLLUTION  
PREVENTION**

**A. Practise  
“Zero Garbage”**

**[www.exnora.website/zerowaste](http://www.exnora.website/zerowaste)**

**B. Practise  
“Zero Sewage”**

**C. Dispose Hazardous  
Waste in Secured  
Sanitary Landfill**

# 1. PREVENT POLLUTANT POLLUTION PREVENTION

## CHEMICAL POLLUTION

The most common type of water pollution, chemicals can infiltrate both underground water sources and those sitting on the Earth's surface. As an integral component of the agricultural industry, it's unsurprising that much of chemical contamination comes from the pesticides and fungicides used in farming, but metals and solvents from industrial sites are also leading contributors.

## GROUNDWATER POLLUTION

As mentioned above, agriculture is a key source of water pollution, especially for groundwater. Fertilisers and pesticides applied to crops can seep into the ground and contaminate underwater rivers and waterbeds, thus compromising the quality of wells, boreholes and other places from which groundwater is extracted

[www.exnora.website/zerowaste](http://www.exnora.website/zerowaste)

## MICROBIOLOGICAL POLLUTION

Unlike most others on this list, microbiological pollution is a naturally occurring form of water contamination. Microorganisms such as bacteria, protozoa and viruses can infiltrate water supplies, causing diseases such as bilharzia and cholera. Humans are most susceptible to this kind of pollution in places where adequate water treatment systems are not yet in place.

## NUTRIENT POLLUTION

While they're vital for underwater flora and fauna to flourish, an excess of nutrients can upset the delicate imbalance of water-based ecosystems. Fertilisers contain a high concentration of nutrients which, if they contaminate rivers, lakes and coastal areas, can cause algal blooming that can block out sunlight and inhibit the growth of other organisms.

# 1. PREVENT POLLUTANT POLLUTION PREVENTION

## OXYGEN-DEPLETION POLLUTION

Another consequence of algal blooms is their consumption of oxygen supplies. This means that those species which depend upon oxygen to survive are killed off, while anaerobic ones thrive. Some anaerobic microorganisms are capable of producing ammonia, sulphides and other harmful toxins, which can make the water even more dangerous to animals (and humans, too).

## SURFACE WATER POLLUTION

Referring to all water sources above ground, such as rivers, lakes, seas and oceans, surface water pollution can occur both naturally, accidentally and intentionally. For example, monitoring has an all-important role in natural flood management, which can lead to poor water quality, while accidental oil spills and negligent industries emptying waste into water bodies are also key contributors.

[www.exnora.website/zerowaste](http://www.exnora.website/zerowaste)

## SUSPENDED MATTER

Improperly discarded waste, such as fragments of plastic, rubber or other manmade materials, can find themselves into water sources and persist for a long time. Because they are too robust to dissolve in the water and too big to mix effectively with the molecules, they simply float on its surface and prevent oxygen and sunlight from penetrating below.

## WASTES POLLUTION MUNICIPAL SOLID & LIQUID WASTES POLLUTIONS

# Solid Waste Pollution





# Liquid Waste Pollution



**Three tiers of Waste Management.  
(both Solid & Liquid ) of ExNoRa for  
100% Zero Waste Management**

**SoWaM**

**Source Waste Management**

**DeWaM**

**Decentralised Waste Management**

**CeWaM**

**Centralised Waste Management**



**ZERO IN ON  
ZERO WASTE**

Waste is not waste  
UNTIL it is wasted



It is not  
**WASTE MANAGEMENT.**

It is  
**WEALTH MANAGEMENT.**



**“WASTE**  
**is a**  
**MISPLACED RESOURCE**  
**&**  
**UNRECOGNIZED WEALTH -**  
**WASTE NOT WASTE”**



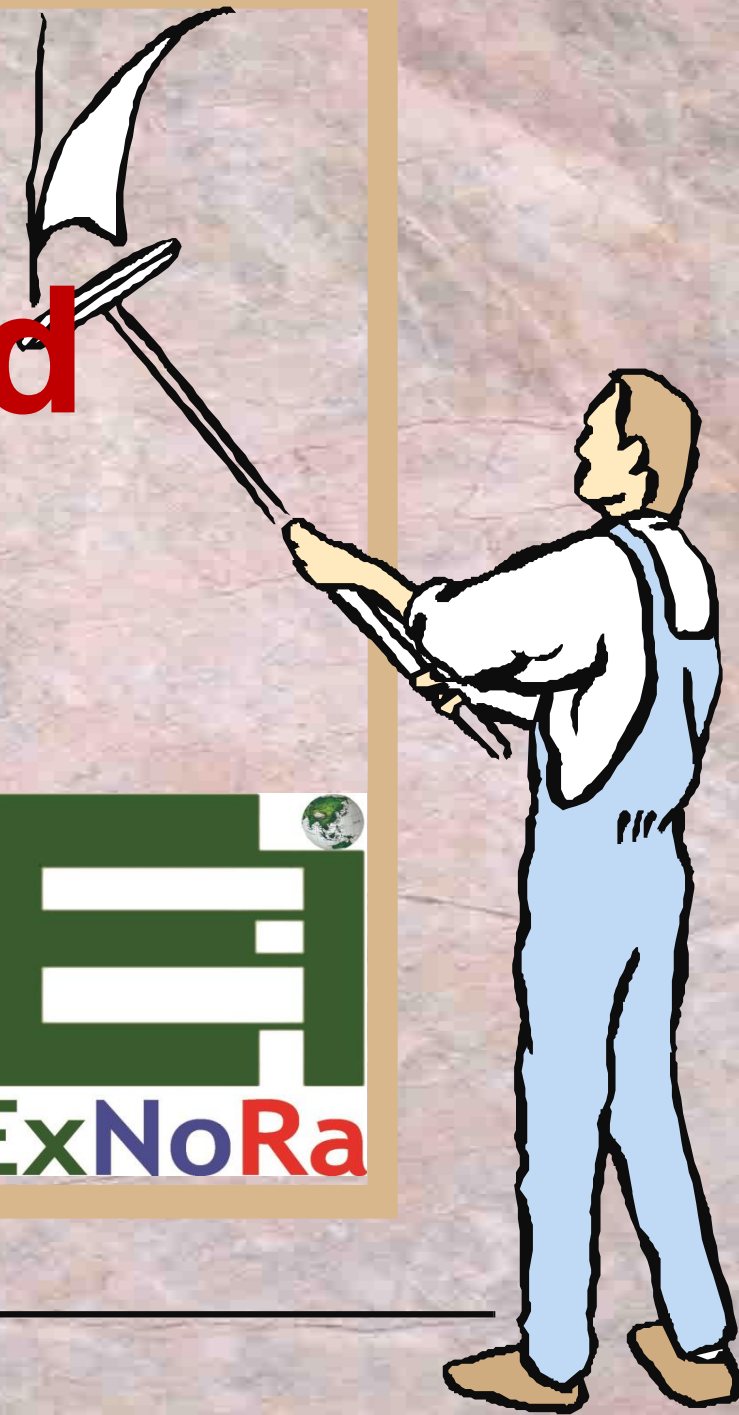
It is not  
**WASTE MANAGEMENT**

It is  
**RESOURCE MANAGEMENT.**

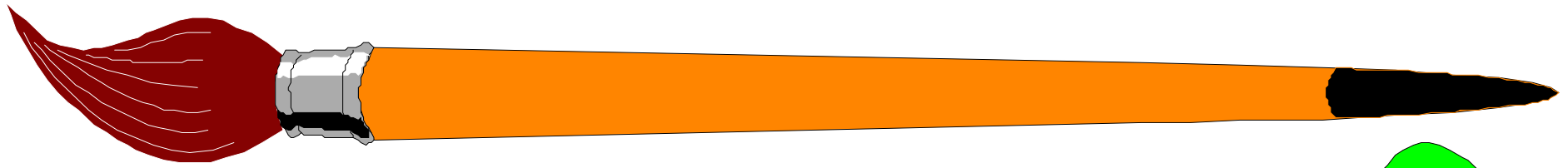
Recycling Industries are waiting for  
your waste, which are  
raw materials for them.



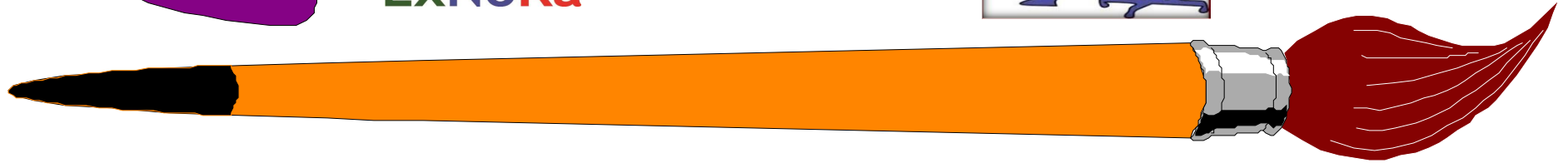
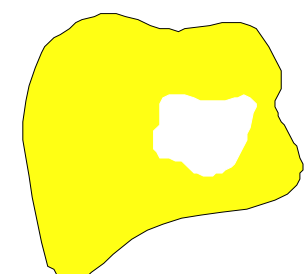
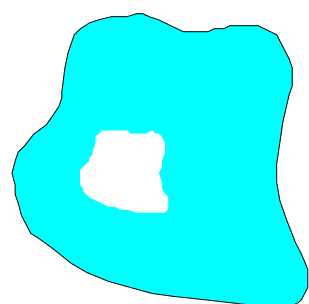
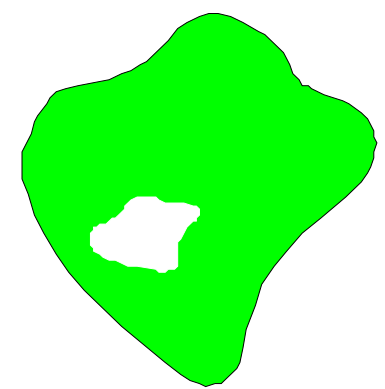
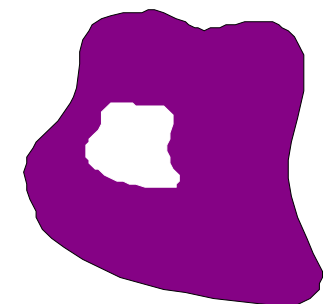
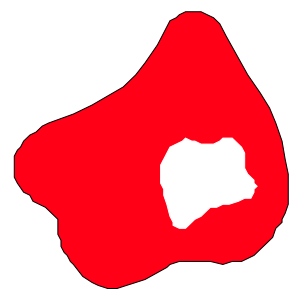
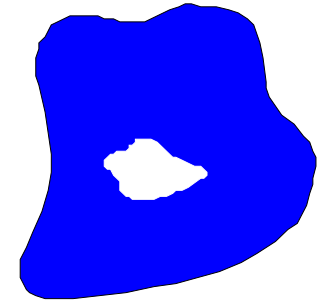
**“Waste is  
best managed  
when not  
generated”**







“Don’t  
TRANSFER  
WASTE,  
but  
TRANSFORM  
WASTE”





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

2.

**LEAKAGE  
STOPPAGE**

**AVOID WATER WASTAGE  
by LEAKAGE (Storage, Carriage and Usage  
LEAKAGES)**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

## 2. LEAKAGE STOPPAGE

(Storage, Carriage and Usage LEAKAGES)



**WATER BODIES ExNoRa**

**VISIT OUR WEBSITE**

**[www.exnora.website/water](http://www.exnora.website/water)**



## 2. LEAKAGE STOPPAGE

**VISIT OUR WEBSITE**

**LEAKAGE STOPPAGE**  
**AVOID WATER**  
**WASTAGE by LEAKAGE**

**WATER BODIES ExNoRa**

**VISIT OUR WEBSITE**

**Water Carriage**  
**Stop**  
**Water Leakage**  
(Water Distributors by Storm  
Water Drainage & Pipes )

**VISIT OUR WEBSITE**

**WATER USAGE**  
**Stop**  
**WATER LEAKAGE**  
(consumers seal leaks)

**[www.exnora.website/water](http://www.exnora.website/water)**

**VISIT OUR WEBSITE**

**Water Storage stop**  
**Water Leakage**  
**& Seepage**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**3.**

# **WASTAGE DISCOURAGE**

**(Storage, Carriage and Usage  
WASTAGES )**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

### 3. **WASTAGE DISCOURAGE**

**VISIT OUR WEBSITE**

**WASTAGE DISCOURAGE**  
**AVOID WATER**  
**WASTAGE**

**WATER BODIES ExNoRa**

**VISIT OUR WEBSITE**

**20 Ways to**  
**Conserve Water at**  
**Home**

**VISIT OUR WEBSITE**

**25 Things You Can Do**  
**To Prevent Water**  
**Waste**

**[www.exnora.website/water](http://www.exnora.website/water)**

**VISIT OUR WEBSITE**

**Ten ways to prevent**  
**water waste**

### 3. WASTAGE DISCOURAGE

(Storage, Carriage and Usage WASTAGES )



**Hulimavu Lake bund breach,  
several houses flooded in  
Bengaluru**

**STOP TANK OVERFLOW**  
**AUTOMATIC PUMP CONTROLLER**  
**Save Water**

An advertisement for an automatic pump controller. It features a yellow water tank with a pump and a control unit. The text reads "STOP TANK OVERFLOW", "AUTOMATIC PUMP CONTROLLER", and "Save Water". There is also a small logo for "MS EXPERIMENTS" with a wrench and a screwdriver.

**Don't give anyone a full tumbler of water.  
Give a water bottle and an empty tumbler to  
avoid waste**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**4.**

**RESTORE  
& STORE**

Restore water bodies by removing encroachments, preventing pollutions and desilting

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**



# RESTORE & STORE

**VISIT OUR WEBSITE**

**RESTORE & STORE**  
**RESTORE WATER**  
**SOURCES**

TYPES of WATER SOURCES

**WATER BODIES ExNoRa**

**VISIT OUR WEBSITE**

Repair Renovate & Restore  
[5 Simple Steps to a](#)  
[Healthy Pond](#)

**VISIT OUR WEBSITE**

How **ExNoRa** restored  
40 water bodies and  
stored water !

[www.exnora.website/water](http://www.exnora.website/water)

**VISIT OUR WEBSITE**

Lake Restoration  
& Cleaning

From **DEAD WATER BODIES** to **LIVE WATER BASINS** KOVALAM

**BEFORE**



**DEAD POND**



**WORK BEGINS**

**DURING**

**Kovalam**



**CHILDREN JOIN**

**DURING**



**REVIVED POND**

**AFTER**

# Pammal Thirupananthal Lake

**BEFORE**



**AFTER**



Pammal Lake Walking path

# Thirupanthaal Lake Close up look



**AFTER**



*Pammal Lake after ExNoRa Involvement & support of Mr Ambuj Sharma IAS & Volunteering by Exn. Indra Kumar*

# RESTORE & STORE

**A small pond created in his Farm House by Sen. Natesan,  
Director , ExNoRa Environmental Research Institute  
in March 1992 &the picture was taken in August 1992.**

**BEFORE**



# RESTORE & STORE

The same pond in 1999

**AFTER**





**& 150 more water  
bodies restored  
(Please see **ExNoRa**,  
the **TRENDSETTER**  
in **WATER BODIES**  
**RESTORATION**)**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**5.**  
**RAIN  
GAIN**

**A RHYME-MATIC name for Rain Water  
Harvesting (Source, Carriage & Water Body)**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# RAIN GAIN

Wherever water stagnates , make inexpensive **HAND-BORES**. We make bores to take water. Why not we make bores to give back water to **WATER-TABLE** ?

**RAIN PAIN** due to  
Water Stagnation



**CONCEPT**  
7<sup>th</sup> Sense  
Master

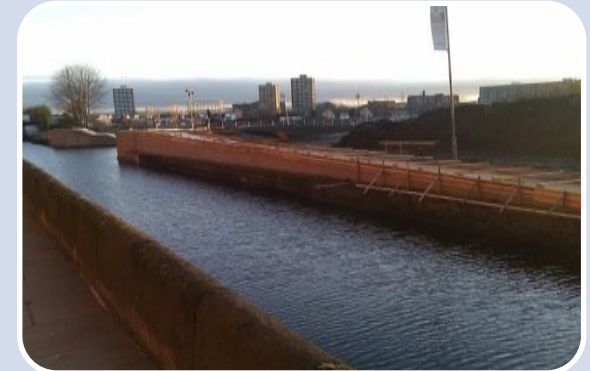
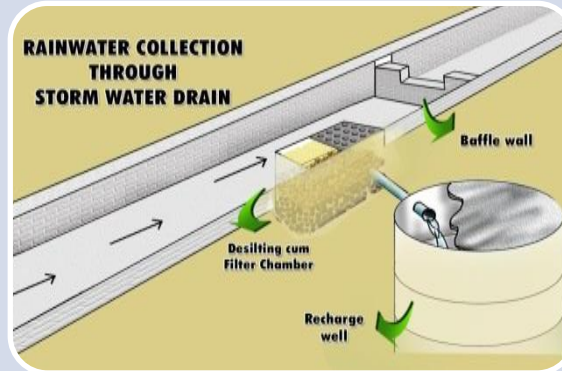
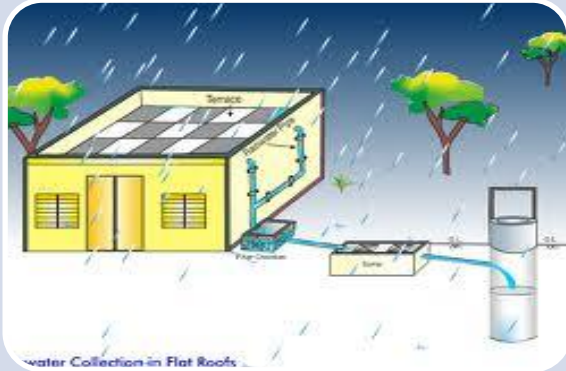


**RAIN GAIN** ©

Rain Water Harvesting in streets  
& open spaces



# RAIN GAIN



RaGa stands for Rain Gain @ 3 LEVELS

SoRaGa ©  
Source  
Rain  
Gain  
in Your Building

DeRaGa ©  
Decentralised  
Rain  
Gain  
in the Street  
Storm Drainage

CeRaGa ©  
Centralised  
Rain  
Gain  
in the Pond &  
Lake



**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**



# SoRaGa © Source Rain Gain can be introduced also in the following places



**Empty Plots where water stagnates**



**Play ground where water stagnates**



**Layout where water stagnates**



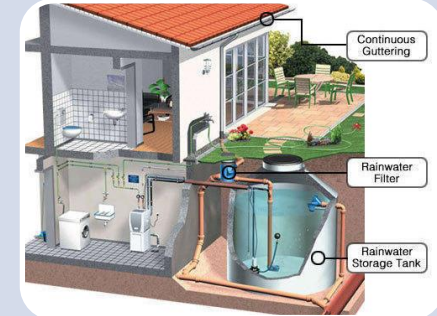
**Stockyard where water stagnates**



**RaGa** stands for

**Rain Gain**

@ 3 methods in your premises



**Recharge  
Well  
& Shafts**

**Recharge  
Pits &  
Trenches**

**Recharge  
Bore Well**

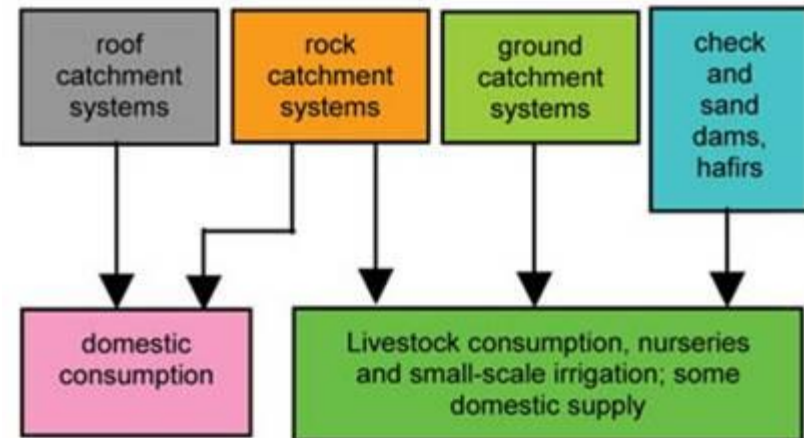
**Refill Storage  
Tank /  
Receptacle**

# Concept

Rainwater harvesting means capturing the rain where it falls or capturing the runoff and taking measures to store that water and keep it clean.

Rainwater harvesting can be undertaken through a variety of ways:

- capturing run-off from roof tops
- capturing run-off from local catchments
- capturing seasonal floodwater from local streams
- conserving water through watershed management



Rainwater harvesting systems and uses

*Source: unknown*

# WATERBUTT



**Whitefurze® WATERBUTT, STAND & TAP**

**100L**

**150L**

**230L**

**250L**



## How to Install a Water Butt

A water butt is used to store rainwater collected by your gutters. Use this guide to help you install your own water butt at home.





# UNDERGROUND TANK



# RAIN WATER WAY POND RAIN GAIN



# DETENTION POND



# RETENTION POND



# ‘Temple tanks once played well the role of water harvesters for the people’

**Chithra Madhavan gave a little bit of history behind the construction of the Veeranam Eri by the soldiers of Veera Narayana Parantaka Cholan.**

Rapid urbanisation has ensured that water bodies in the city have all but vanished. While the city had copious rainfall in 2015 to quench the thirst of the residents for several years, the encroachments and poor maintenance of water bodies and temple tanks brought us to a water shortage situation within a few years, said historian Chithra Madhavan.

Giving a talk on 'The Role of Temple Tanks in South India's water management' organised by Smithsonian Institution and Water Matters held in the city on



**WATER BODIES ExNoRa**

**RAIN GAIN**

**VISIT OUR WEBSITE**

**[www.exnora.website/water](http://www.exnora.website/water)**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

நிலத்தடி நீர்மட்டம்

6.

**WATER TABLE**

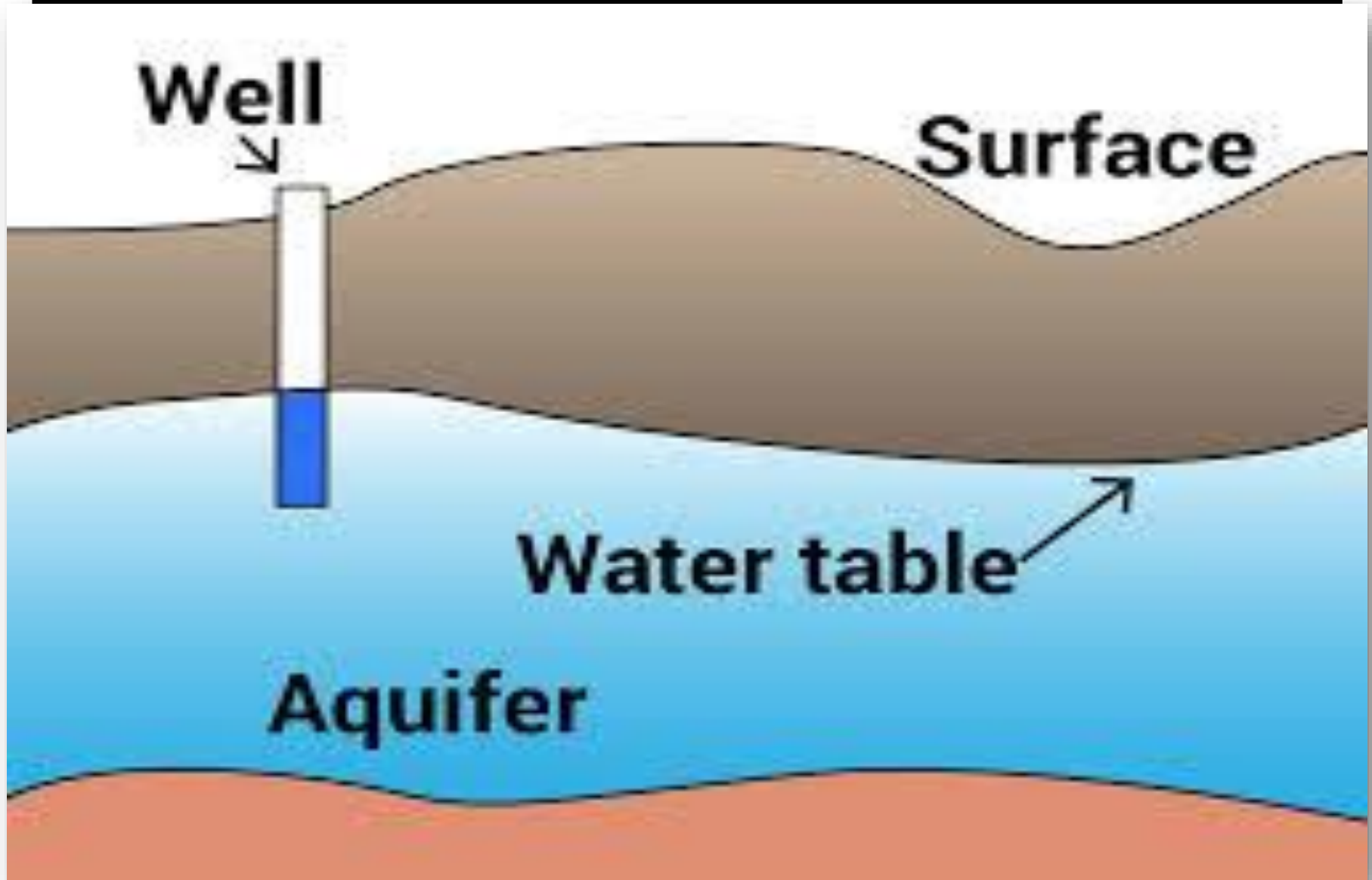
**ABLE**

**WATERTABLE ABLE**

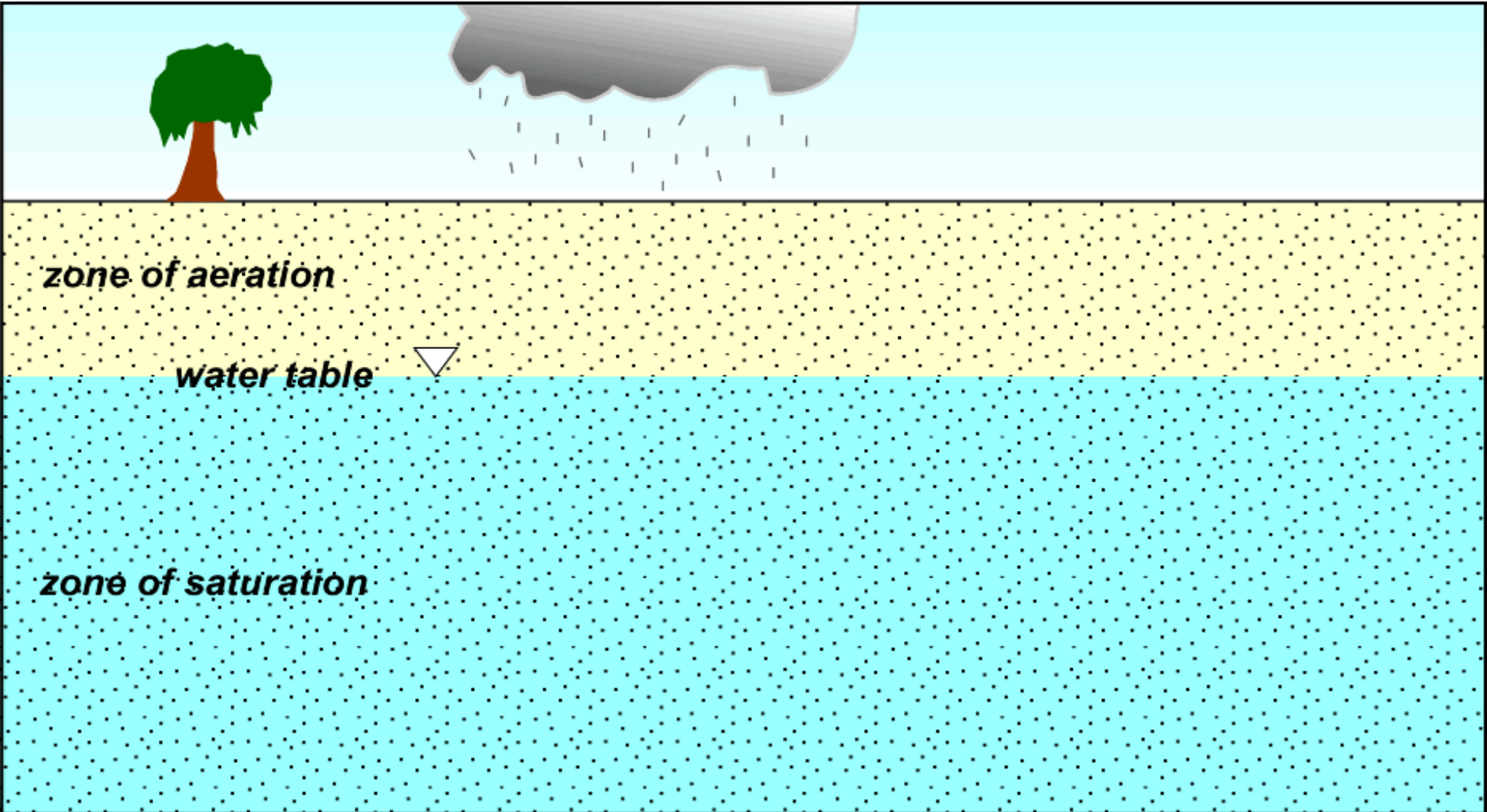
**By not  
overexploiting  
&  
recharging it**



# WATER TABLE



# WATER TABLE



# WATER TABLE

The **water table** is the upper surface of the zone of saturation. The zone of saturation is where the pores and fractures of the ground are saturated with water. It can also be simply explained as the depth below which the ground is saturated.

The water table is the surface where the water pressure head is equal to the atmospheric pressure (where gauge pressure = 0). It may be visualized as the "surface" of the subsurface materials that are saturated with groundwater in a given vicinity.



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**7.**

# **WASTE WATER CHASTE WATER**

**Make Liquid Waste as useful water (Source,  
Carriage & Centralised Treatment Plant)**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# WASTE WATER CHASTE WASTER

TREAT WASTE WATER

Liquid **W**aste **M**anagement  
( **LiWaM** )

BETTER WORDS

Liquid **W**ealth **M**anagement  
( **LiWeaM** )

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

Your **CHAPTER** of **ExNoRa** INNOVATORS CLUB through its  
**DIRECTOR : ENVIRONMENT**  
with your cooperation will **GUIDE**

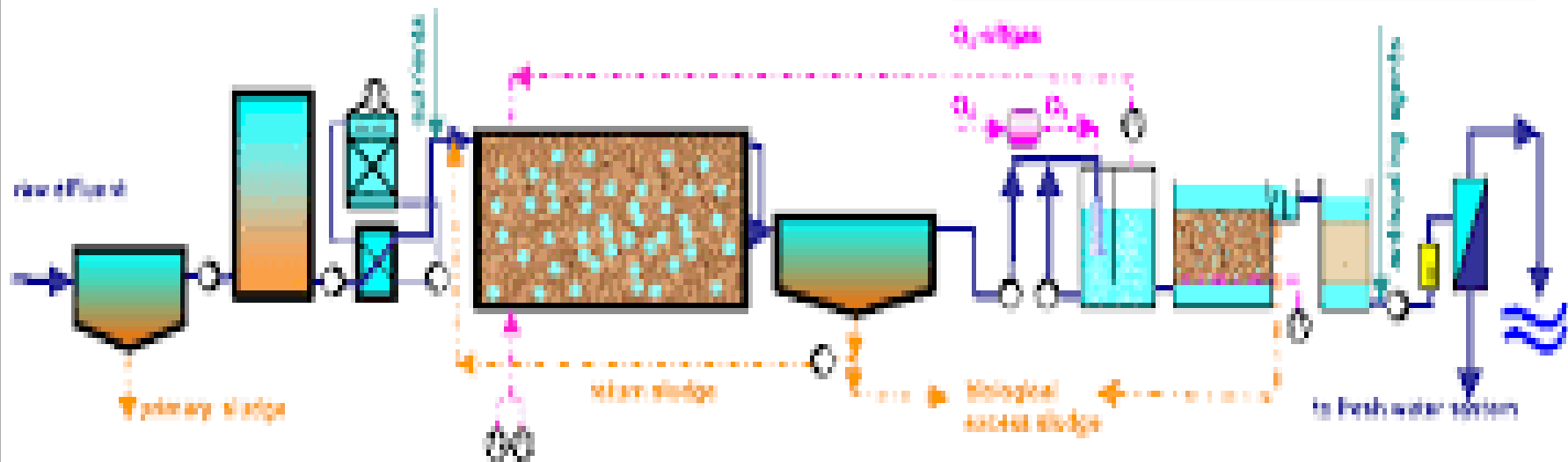
[www.7thsense.guru](http://www.7thsense.guru)



primary  
treatment

secondary  
treatment

tertiary treatment  
chemical- biochemical oxidation +  
(partial) desalination



primary  
clarifier

buffer

cooling  
tower

conventional  
activated sludge

secondary  
clarifier

ozone (O<sub>3</sub>) +  
biofilter

sandfilter/  
particle  
filter

NF

# Waste Water Treatment

- **Treatment Steps**
- Step 1: Screening and Pumping. ...
- Step 2: Grit Removal. ...
- Step 3: Primary Settling. ...
- Step 4: Aeration / Activated Sludge. ...
- Step 5: Secondary Settling. ...
- Step 6: Filtration. ...
- Step 7: Disinfection. ...
- Step 8: Oxygen Uptake.

# **What is primary wastewater treatment?**

- **During primary treatment, wastewater is temporarily held in a settling tank where heavier solids sink to the bottom while lighter solids float to the surface.**
- **Once settled, these materials are held back while the remaining liquid is discharged or moved through to the more rigorous secondary phase of wastewater treatment.**
- **These large tanks are also often equipped with mechanical scrapers that continually drive collected sludge in the base of the tank to a hopper which pumps it to sludge treatment facilities.**



# Primary Wastewater Treatment



# WHAT IS SECONDARY WASTEWATER TREATMENT?

- Secondary treatment of wastewater works on a deeper level than primary and is designed to substantially degrade the biological content of the waste through aerobic biological processes.
- Completing secondary wastewater treatment allows for safer release into the local environment, reducing common biodegradable contaminants down to safe levels.

# SECONDARY WASTEWATER TREATMENT.

It is done in one of three ways

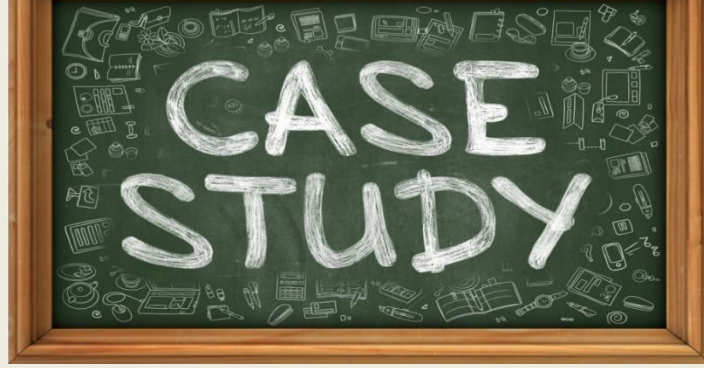
1. **Biofiltration:** Biofiltration uses sand filters, contact filters or trickling filters to ensure that any additional sediment is removed from the wastewater.
2. **Aeration:** Aeration is a lengthy process which increases oxygen saturation by introducing air to wastewater. Typically, the aeration process can last for up to 30 hours, but it is very effective.
3. **Oxidation ponds** Typically used in warmer climates, this method utilises natural bodies of water such as lagoons, allowing wastewater to pass through for a set period before being retained for two to three weeks.

# WHAT IS TERTIARY WASTEWATER TREATMENT?

- The aim of tertiary wastewater treatment is to raise the quality of the water to domestic and industrial standards, or to meet specific requirements around the safe discharge of water. In the case of water treated by municipalities, tertiary treatment also involves the removal of pathogens, which ensures that water is safe for drinking purposes.
- At Arvia Technology, we specialise in industrial tertiary and quaternary wastewater treatment, with our specialist solution targeting the hardest-to-treat contaminants to ensure regulations are met for safe discharge or reuse of water.
- We work across a range of industries, including: **life sciences, chemical, agrochemical and specialty chemical**. The Nyex™ systems can be used as a standalone treatment or be bolted on to an existing treatment train to provide more advanced, targeted treatment where required.

# TERTIARY WASTEWATER TREATMENT





**TRILet: The solid, liquid  
& gaseous wastes  
(stool) become  
resource and wealth**

# Trichy Devathanam Village Toilet an **ExNoRa** Borda Project



**Public Toilet  
Outside before  
**ExNoRa****



**Public Toilet After  
**ExNoRa****

# Trichy Devathanam Village Toilet an **ExNoRa** Borda Project



**Public Toilet  
Outside before  
**ExNoRa****



**Public Toilet  
Outside after  
**ExNoRa****



# Trichy Devathanam Village Toilet an **ExNoRa** Borda Project



Toilet inside  
Before **ExNoRa**



Toilet outside  
After **ExNoRa**

# **Tri-Let** 1. TOILET WASTE WATER

**bacterially treated and sent to Toilet farm**



**Treatment of Toilet Waste Water**



**Toilet Farm**

**Treated water is also used for flushing the toilet**

# Tri-Let 2. TOILET GAS WASTE BIO GAS TRAPPED and sent to Canteen



**Biogas out of Toilet gas waste is generated**



BGS pressure testing preparatory work by Mr.Manickam and Mr.KMS on July 3rd 2005

**BGS pressure testing**

# Tri-Let 2.a. TOILET GAS WASTE BIO GAS used in the canteen for cooking



a. Food is prepared using biogas

Food is ready

# **Tri-Let** 2.b. TOILET GAS WASTE BIO GAS used in the canteen for lighting



b. Light is burning thanks  
to gas from Toilet

# **Tri-Let 3. TOILET HUMAN WASTE** **composted and sent to Toilet farm**



**Human Excreta minus Methane is composted  
and sent as Manure to FARM**

# The compost and treated water are used for Toilet Garden and Farm



Toilet Lawn



Toilet Farm

The compost and treated water are used for farming and agri-products are harvested



**Toilet Farm**



members of East Devadhanam Farm with their produce

**Agriculture products  
are harvested**





**Toilet Inside before**



**Toilet inside after**



**Public Toilet Before**



**Same now as  
People's Toilet**

## **Energy Synergy Toilet**



**Toilet Liquid Waste  
Treated**



**Toilet Balance Solid  
Waste Composted**



BGS pressure testing preparatory work by Mr.Manickam  
nd Mr.KMS on July 3rd 2005

**Toilet Gas Waste  
captured**



**Toilet Gas Waste  
generated and  
conducted**



**The treated water is  
used to irrigate the  
farm**



**Garden grown out of  
compost out of  
human excreta**



**Gas used for  
lighting**



**Used canteen for  
cooking**

**Credit Borda- ExNoRa Dewats Toilets in many places in Tamilnadu**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**8.**

**WATREAT**

**WATER is a TREAT  
-TREAT IT**

# WATREAT

Make Liquid Waste as useful water  
(Source, Decenralised &  
Centralised Water Treatment)

**WATER** is a **TREAT ! TREAT IT** (**WATREAT**)

**VISIT OUR WEBSITE**

**1. WATER  
TREATMENT 3 tier  
WATREAT**

**WATER BODIES ExNoRa**

**VISIT OUR WEBSITE**

**DEWATREAT  
(Decentralised Water  
Treatment )**

**VISIT OUR WEBSITE**

**SOWATREAT (Source  
Water Treatment )**

**[www.exnora.website/water](http://www.exnora.website/water)**

**VISIT OUR WEBSITE**

**CEWATREAT  
(Centralised Water  
Treatment)**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# Water Treatment

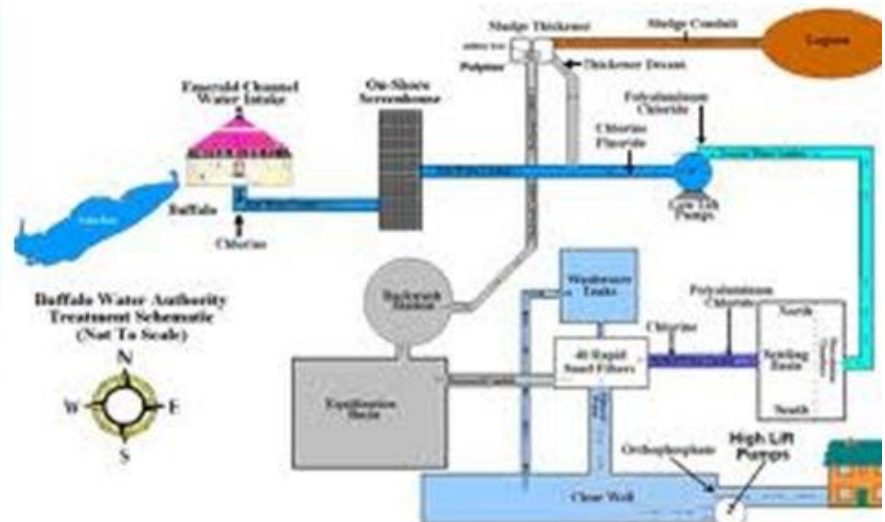
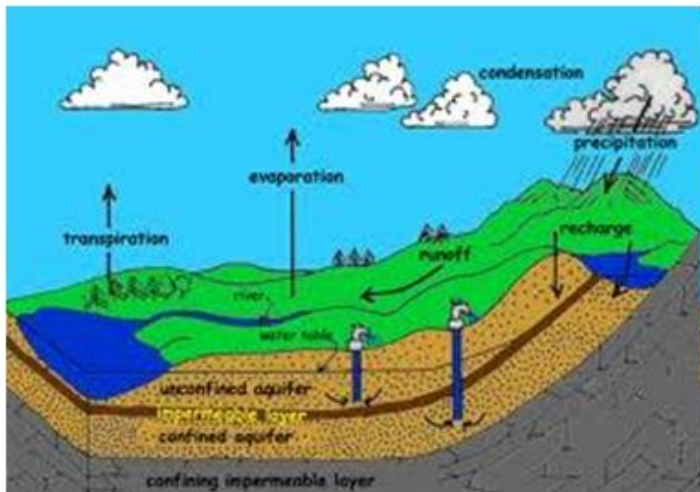
They typically consist of several steps in the treatment process. These include:

- (1) Collection ;
- (2) Screening and Straining ;**
- (3) Chemical Addition ;
- (4) Coagulation and Flocculation ;
- (5) Sedimentation and Clarification ;
- (6) Filtration ;
- (7) Disinfection ;
- (8) Storage ; and finally
- (9) Distribution.

# WATER is a TREAT -TREAT IT (WATREAT)

## *Water Purification and Treatment*

Natural and Municipal



# CEWATREAT

(Centralised Water Treatment)



# DEWATREAT

## Decentralised Water Treatment for RESIDENTIAL FLAT COMPLEX





**SOWATREAT**  
**Source Water Treatment**  
**in homes**



---

**BOREWELL  
TREATMENT  
PLANT  
IN  
CHENNAI**

---



# WATREAT

## Brackish Water, Polish & Flourish

**Advanced water treatment technologies** are needed for the purifying and desalinating to make these water sources safe for human consumption. Some of the current technologies that are used in the water purification process include: **Reverse Osmosis (RO)**, **Ultrafiltration**, and other filtration technologies (membrane water filtration).





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

9.

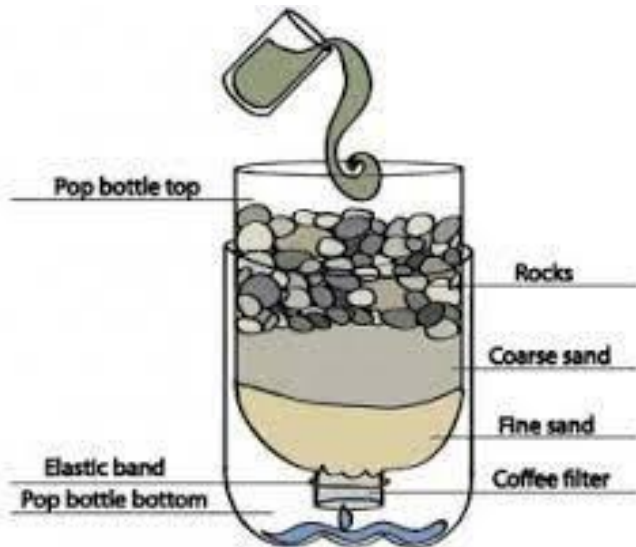
**FILTER BOLSTER**

Create **NATURAL WATER FILTER**

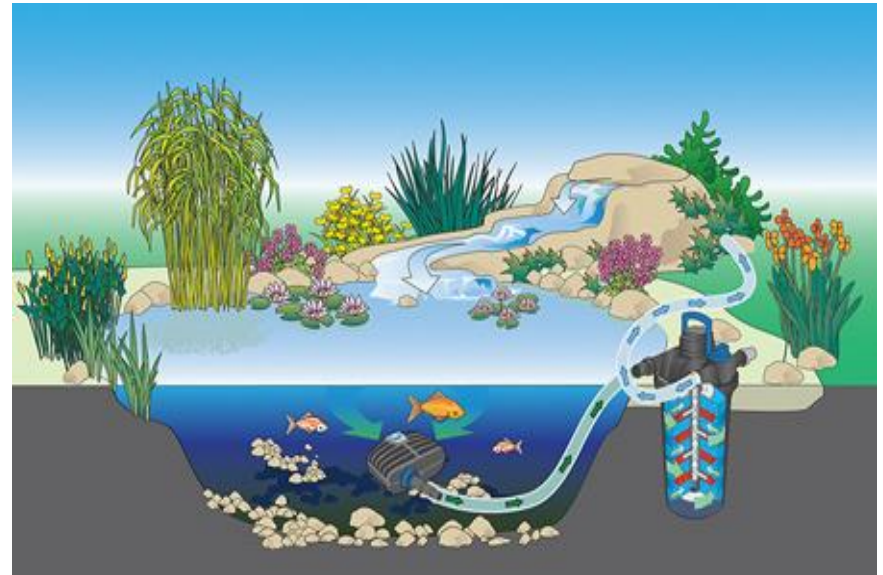
# FILTER BOLSTER

Create **NATURAL WATER FILTER**

## MICRO



## MACRO





THE WATER IN YOUR VILLAGE  
MAY CONTAIN DEADLY DISEASES  
BUT EACH PAGE OF THIS BOOK IS  
A PAPER WATER FILTER THAT  
WILL MAKE IT SAFE TO DRINK

THE WATER IN YOUR VILLAGE  
MAY CONTAIN DEADLY DISEASES  
BUT EACH PAGE OF THIS BOOK IS  
A PAPER WATER FILTER THAT  
WILL MAKE IT SAFE TO DRINK

# Drinkable Book

- In partnership with non-profit **Water is Life**, researchers at Carnegie Mellon University developed this education and filtration tool. Each page of the book provides basic water and sanitation advice, such as the importance of keeping contaminants like rubbish and faeces away from water, often unknown in developing countries.
- Perhaps more novel is that the advice is printed on “scientific coffee filter” paper that can be used to purify drinking water and reduce 99.9% of bacteria. Each book has enough filtration sheets to provide its reader with clean water for four years. It’s being distributed in Ghana, Kenya, Haiti, Ethiopia, India and Tanzania, and a Farsi version of the book is in development.

# Graphene filters

- **Desalination, converting saltwater into freshwater, has historically been too expensive and energy-intensive to serve as a widespread solution for improving access.**

**However, Lockheed Martin has developed and patented a Perforene graphene filter which it claims would reduce the energy cost of conventional reverse osmosis desalination by 20%, while withstanding higher pressure and temperatures. The perforated, hyper-permeable filter is one atom thick and is said to improve the flow of water compared to conventional methods by 500%. While the technology would be hugely beneficial to the oil and gas sector, which reportedly produces 18bn gallons of wastewater each year, the company is also researching other applications for the technology, including in food and energy generation.**





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**10.**

# **NUTRIENTS INGREDIENTS**

# NUTRIENTS INGREDIENTS

Essential Minerals Found in Drinking Water and their Benefit



# **NUTRIENTS INGREDIENTS** Easy ways to Enrich Your Drinking Water with Minerals for Better Health



**1. Add trace mineral drops to your water**



**2. Add a mineral-rich sea salt to your water**



**3. Use a water bottle that filters and infuses your water with ionic minerals**



**4. Use an alkaline pitcher to add minerals back in**



**5. Make spa water**



**6. Add a greens blend to your water**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**11.**

**ENCROACHMENT**  
**EVICT**

**REMOVAL is REQUIREMENT**

**Remove Encroachments**

# ENCROACHMENT EVICT

## Remove Encroachments

### SHRINKING WATERBODIES

District	Lakes	Area (in acres)	Extent of encroachment
Bengaluru Urban	837	27,899	4,533
Bengaluru Rural	710	30,032	6,252
<b>Total</b>	<b>1,547</b>	<b>57,932</b>	<b>10,785</b>

(Only 158 lakes in both the districts are free of encroachments)



# WATER BODY ENCROACHMENTS



# Madras High Court Order on Illegal Encroachments

Delivered by a bench comprising Chief Justice Sanjay Kishan Kaul and Justice J Pushpa Sathyanarayana

"At this juncture, this Court, taking judicial notice of the fact that even during the hearing of this case, the State of Tamil Nadu is seriously affected by unprecedented floods, that is, during November 2015, and because of that, number of people were dead and many people lost their property, (and) is compelled to put its views that the entire loss due to the flood was due to maladministration and the prevailing practices by the authorities as almost all the water bodies and water courses were allowed to be encroached upon resulting in reduction in their

flood storing and carrying capacity, forcing the water to deviate from its regular course and enter the residential areas causing devastating effects. The authorities have permitted construction of houses in the water bodies. This resulted in inundation of these areas during flood and all these houses submerged under the flood water. This shows that despite the orders of the Court, the authorities pretend to act swiftly in removing encroachments but only in a selective manner and not in a planned and determined manner.

It has become inevitable for this Court to put on record that the authorities in power cannot de-

stroy the water bodies or water courses formed naturally for the benefit of mankind forever and it

is beyond the power of the State to alienate or re-classify the water bodies for some other purposes without compensating the effect of such water bodies... Having regard to the acute water scarcity recurring in Tamil Nadu as a whole, we feel that a time has come where the State has to take some definite measures to restore the already earmarked water storage tanks, ponds

and lakes, to its original status as part of its rain water harvesting scheme, which has already been initiated." - November 27, 2015

*The entire loss was due to maladministration and the prevailing practices by the authorities as almost all the water bodies were allowed to be encroached upon*

A large, polluted lake with industrial smokestacks in the background. The water is dark and murky, and the sky is overcast. The smokestacks are tall and thin, with some emitting smoke.

# Vanishing

# Lakes

A Tale  
of Chennai  
Lake





# ENCROACHMENT



**Drainage  
encroachment**

# **ENCROACHMENT EVICT**

**Remove Encroachments**

**There are water properties that are encroached, by different kinds of encroachments and different kinds of people.**

# Water properties encroachments by different kinds of encroachments

## ENCROACHMENTS of

- **Water Body itself**
- **Its Bunds**
- **Inlets**
- **Outlets**
- **Catchment areas**

## Encroachments by

- **Buildings / huts**
- **Storage place**
- **Garbage & Sewage dump**
- **Converting it as Sports Ground**
- **Making it as a Burial Ground / Crematorium**
- **Cattle rearing**
- **As meeting square to hold public meetings**

# SAVING WATER BODIES PROPERTIES need PROPER-TIES

HOME | NEWS | CHENNAI

## PWD to prevent sand smuggling from lakes

Published:  May 01, 2017  01:21 AM

 Share  Tweet  Comments (0)

*At a time when all the major reservoirs in the region have gone dry, the Public Works Depa has formed a team to monitor sand theft from the water bodies. Officials have warned of se against offenders.*



**Chennai:** Acc a recent inci persons stole lake and a rev the theft, was incidents, the team. Sand in smuggled for said.

“It has becom practices. We revenue depa the main lake: and Cholavar: smuggling is :

# RIVER PROTECTION & CONSERVATION from SAND QUARRRYING



## ILLEGAL SAND EVERYWHERE

However much the brazen acts of the sand mafia outrages the nation, truth is what they extract is used for all types of construction and is a countrywide problem.

**RAKE-UP CALL | 2009**  
 He took up to hundreds of  
 ed mining in 2009, after  
 site of cases of bones, river  
 Ch, groundwater  
 dig after illegal  
 ed mining

**In 2009, a joint  
 military report  
 recommended:  
 No digging  
 below 5m.  
 Minimum  
 100m-5 years  
 & 100m-10  
 clearance must  
 for over 5ha**

The  
 committee  
 ed make  
 ee plans  
 eulatory  
 or sand  
 mining

Recommended that  
 the military and police  
 erial of Mining Ministry  
 eadmission of major  
 ed mining interests, inclu-  
 ing the river country to  
 Karnataka

**1000 countries have  
 100m rules for all  
 mining- India should  
 be a suit**

**LAWS AND INACTION**

**Mineral & Minerals Act, 1951**  
 States make rules for mining, especially  
 Bypass | Rules ignored with periodic  
 irregularity. For instance, 18 March  
 2013, BJP government's mining  
 term: several clearance

**Environmental Assessment  
 Notification, 2006** | Mining projects  
 above 5 ha need green  
 clearance. Up to 50 ha  
 state clear, above 50 ha  
 Central nodal min

**Bypass** | M&T mines

**Forget it,  
 N&S's  
 HC's point  
 that state  
 giving short-term  
 permits by dividing mining area into  
 smaller zones dividing  
 green zone**

**NOT  
 reforms (Aug  
 2013) no sand  
 mining from rivers  
 anywhere without  
 green nod**

**SC's Feb 2012 & green mining  
 will make green nod  
 mandatory irrespective of  
 size of lease. States scamp  
 to amend laws**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**12.**

# **DISTRIBUTE DISTRIBUTION**

**(Source, Decentralised  
& Centralised Water  
Distribution )**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# Climate Change Age

Travel causes cost and pollution , so  
also water

# WATER : DISTRIBUTE DISTRIBUTION

**VISIT OUR WEBSITE**

WaDiS

**Water Distribution  
System Innovation in  
water distribution**

**WATER BODIES ExNoRa**

**VISIT OUR WEBSITE**

DeWaDiS

**Decentralised Water  
Distribution System (PURE  
INNOVATION 2)**

**VISIT OUR WEBSITE**

SoWaDiS

**Source Water Distribution  
System (PURE INNOVATION 1)**

[www.exnora.website/water](http://www.exnora.website/water)

**VISIT OUR WEBSITE**

CeWaDiS

**Centralised Water  
Distribution System  
(FARE INNOVATION)**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**



## WaDiS Water Distribution System



## DeWaDiS Decentralised Water Distribution



## SoWaDiS Source Water Distribution System



## CeWaDiS Centralised Water Distribution



## Three TIER Water Distribute Distribution

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

13.

# EVAPORATION PREVENTION

(Stop Evaporation of water stored in  
water bodies as guided)

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**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

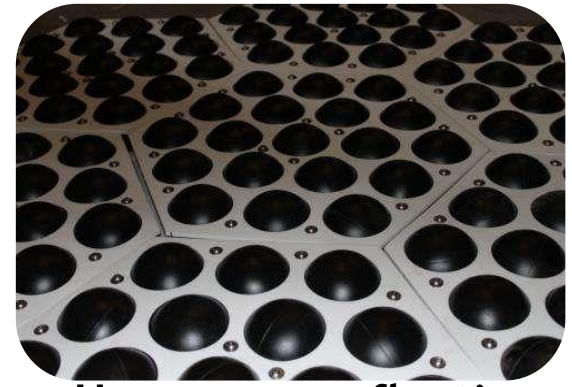
# EVAPORATION PREVENTION (Stop Evaporation )



Drop Shade Balls



Place old tyres



Hexocover, floating hexagonal plastic panels



AQUACAP



Floating Solar Power Panels



Grow trees which will act barrier to wind to stop evaporation



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**EVAPORATION  
PREVENTION  
(Stop Evaporation)**

**VISIT OUR WEBSITE**

**[www.exnora.website/water](http://www.exnora.website/water)**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**VISIT OUR WEBSITE**

**[www.exnora.website/water](http://www.exnora.website/water)**

**14.**  
**USE**  
**USED**

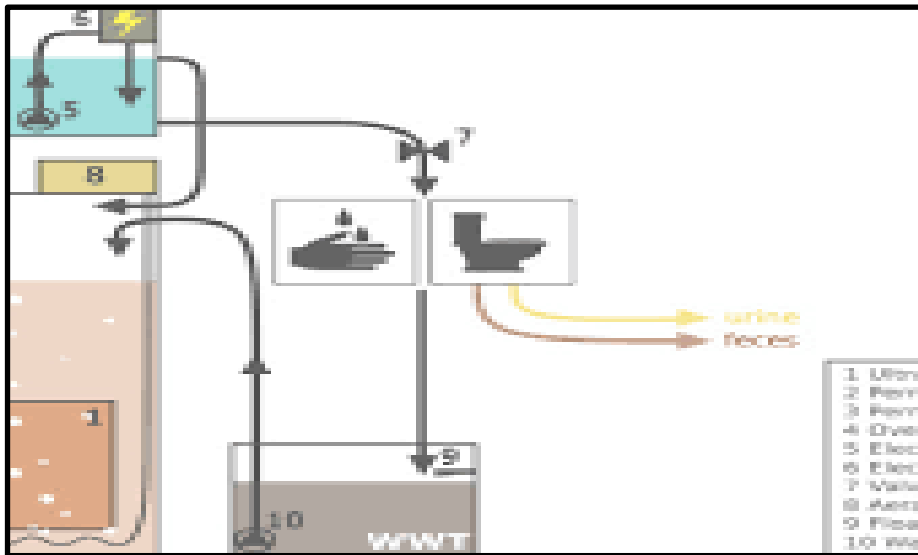
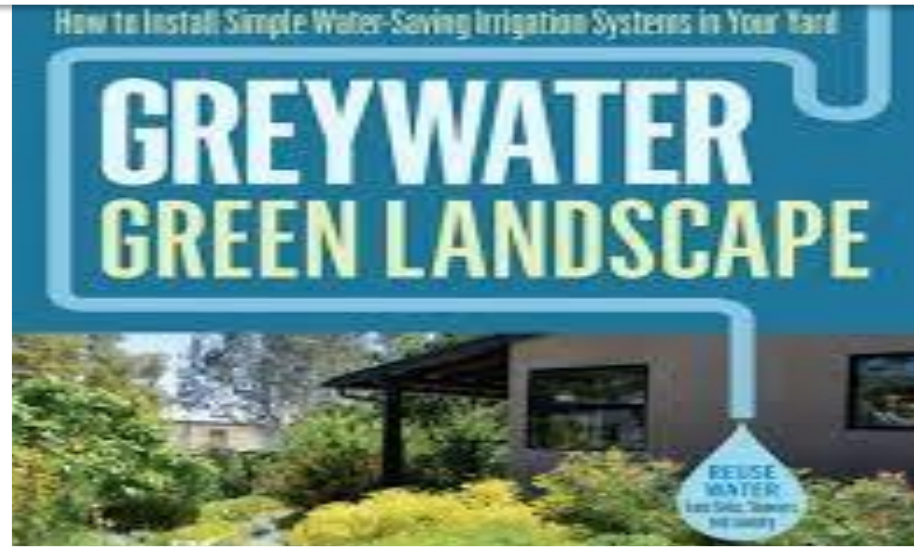
**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**USE USED** (e.g. HOME WASH BASIN WATER to FLUSH TANK & Area Treated sewage for several uses & purposes ). In ExNoRa water parlance two words are not there. They are “ Waste Water”. Instead ExNoRans use two words, “Used Water”

# USE USED (e.g. HOME WASH BASIN WATER to FLUSH TANK & Area Treated sewage for several uses & purposes )



**USE  
USED**

# Water Reclamation and Reuse

Reusing treated wastewater has numerous environmental benefits.







**WATER  
ASSETS**

**WATER  
STATIONARY**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**15.**

**LAKE-POND  
GODSEND**

**(COMPOUNDING/ INCREASING  
WATER)**

**VISIT OUR WEBSITE**

**[www.exnora.website/water](http://www.exnora.website/water)**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# LAKE-POND

**Make NON-IRRIGATION LAKES as LAKE-PONDS by deepening even much below the surface level and using the excavated to raise the bunds. Farmers' rights are not involved**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# LAKE-POND

## Future ready

Chennai Corporation has decided to improve the storage capacity of 210 waterbodies

- The storage capacity of the waterbodies will increase to 1.041 thousand million cubic feet (TMC) from the existing 0.312 TMC

- Work on eco-restoration and surveys of encroachments are on across the 210 waterbodies

- Work on eco-restoration

■ K. PICHUMANI



into the stormwater drains in residential areas, polluting the



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**VISIT OUR WEBSITE**

**[www.exnora.website/water](http://www.exnora.website/water)**

**16.**

**POND-WELL  
BOND WELL**

**Digging well/ wells inside the  
pond to increase the storage**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# POND-WELL

**Dig inside ponds well  
to increase water  
storage and get more  
water**

# POND-WELL

Before - work just commenced



# POND-WELL

Work in progress

A photograph showing the construction of a pond-well. In the foreground, a large, shallow, muddy pond is visible. In the center of the pond, a concrete structure is being built, consisting of several vertical pillars and a circular top. The background shows a residential area with buildings and a white van. The text "Work in progress" is overlaid on the image.



# From **DEAD WATER BODIES**

**BEFORE**



# POND-WELL



**AFTER**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**VISIT OUR WEBSITE**

**[www.exnora.website/water](http://www.exnora.website/water)**

**17.**

**WELL**

**in a WELL**

1. Baby well inside the well
2. BORE WELL in a DRIED  
CONVENTIONAL WELL

17.a . Deepening well by digging  
**BABY WELL** at the BOTTOM

# WELL RING WORKS



# WELL in a WELL

## 17. B. BORE WELL in a DRIED CONVENTIONAL WELL

- **Can borewells be drilled inside an existing well?**
- Dry wells can be brought to use by drilling borewells inside them. It is mostly done in large wells used for irrigation purposes. Flexible rigs which have separate tripod and drilling head, can be used for drilled a borewell inside an existing well if it is above 3m x 3m size to accommodate size of the rig and working space. These rigs are capable of drilling up to a depth of around 300 feet.





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

[www.exnora.website/water](http://www.exnora.website/water)

**VISIT OUR WEBSITE**

**18.**

**LAKEs & LINKs**

**(Link Lakes)**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# **WATER BODIES ExNoRa**

## **Lake & lake, Link & Link-**

### **Interlinking Lakes.**

We talk about linking rivers. The paradox is the lakes were originally interconnected. We disturbed and destroyed the connections. We should now connect at least through pipes

# Lake & lake, Link & Link- Interlinking Lakes

HOME | NEWS

## Build channel connecting lakes to prevent flooding in Chitlapakkam, urge activists

Published: Jul 04, 2021 05:30 AM

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[Mail](#) [Print](#)

[A](#) [A](#)

*Eco Society India, an NGO that took part in the cleaning of Selaiyur Lake, has urged the State government to construct a surplus channel and operationalise sluice gates to prevent flooding in Chitlapakkam.*



**Chennai:** In a representation to the chief engineer of the Water Resources department, Darwin Annadurai, founder and managing trustee of Eco Society India, pointed out that with the help of several organisations, residents welfare associations and employees of IT firms, regular cleanup drives were conducted in the lake to clear unwanted vegetation along the bund.

“During 2019-2020, we have removed 12 tonnes of garbage dumped by the residents in the lakeshore. Due to our sustained outreach campaigns, people have stopped dumping on

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**19.**

# **DISCHARGE CONVERGE**

**One lake's outflow should  
become another lake's  
inflow as well as fill lakes  
& Ponds**

# LAKE OUTLET



# Supply Canal from Lake outlet



# DICHARGE CHARGE



**POONDI LAKE  
surplus water  
discharge  
(outflow)**



**Charges (inflow)  
PUZHAL LAKE  
surplus water  
discharge**

# Surplus water Outlets of Lake reach via inlet of other lakes and ponds





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**OPTION**  
**1**

**INNOVATIONS  
GALORE**

**20.**  
**OWN  
ONE**

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**[www.exnora.website/water](http://www.exnora.website/water)**

**WATER BODY**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# OWN ONE – a WATER BODY

1. Individually in Homes.
2. Independently in Houses shared by Co-occupiers/ Co-tenants.
3. Separately in Mansions, Hotel, Hostel & Hospital campuses.
4. Cooperatively in Residential Flat, Office, Commercial Complexes, Market Complexes
5. Collectively in the Villas / Gated Communities/ Residential Areas / Ward/ Neighborhood

# Swimming Pools are there. Then why not a water pond?



**Homes**



**Apartments**



**Flat Complex**



**Hotels**



**Schools /  
colleges**



**Social Clubs**



Can't it be drinking water pond instead of swimming pools? Or Can there be additional space for a pond (water body)?





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

## **OWN ONE**

**Create one mini water body per layout , flat complex and Institution. The City Development Authorities insist the layout developers to provide space for / create parks, playgrounds, community hall, school, OSR etc. They must also include a water body per layout. Same rule for construction buildings for Educational / Residential / Commercial purposes**

# OWN ONE

Create one mini water body per layout , flat complex and Institution

Layout developers should also allot land for a pond and make drinking water pond in their layout. Flat complex, Industries, Educational Institutions too should do it



**OWN ONE**



**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

A property developer who creates a layout and promotes plots provides in his layout a PARK, Playground, school , community hall , etc. Why not he earmark three grounds plot for a water body and constructs a water pond ?



Park



Playground



School



Community Hall



Place of Worship



Then why not a water pond ?

# OWN ONE

Create one mini water body per layout , flat complex and Institution

Flat complex, Industries, Educational Institutions too should do it



OWN ONE



**Those who already**

**OWN ONE**

# INDUSTRY WATER BODY

**OWN ONE**



# Flat Complex Water Body

**OWN ONE**



YOGA  
CABANAS



# A Pond in a Private Garden

**OWN ONE**



# An ARTIFICIAL LAKE in A PARK

# OWN ONE



# Flat Complex features / amenities



**Club House**



**Swimming  
Pool**



**Indoor Sports  
Courts**



**Theatre**



**Gym**



**Community  
Hall**



**Eatery /  
Canteen**



**Terrace  
Garden**

# See the features

## PROPERTY FEATURES

- ✓ Water Treatment Plant
- ✓ 100 % Power Back-Up For Common Areas & Apartments
- ✓ Association Office Room
- ✓ Rain Water Harvesting
- ✓ Swimming Pool
- ✓ Sewage Treatment Plant
- ✓ Lifts With V3F & ARD
- ✓ Reticulated Gas
- ✓ Color Video Door Phone
- ✓ Solar Lighting For Common Areas
- ✓ Garbage Collection Room
- ✓ Drivers Waiting Room With Fittings
- ✓ Access Controlled Doors
- ✓ Elevators In Each Block
- ✓ Clubhouse
- ✓ Reticulated Gas
- ✓ Indoor Games
- ✓ Fire Alarm & Wet Riser System
- ✓ Landscaped Garden
- ✓ Water Meters For All Apartments (Digital)
- ✓ Toilets For Drivers & Domestic Help
- ✓ DTH Provision
- ✓ Fire Fighting Sprinkler System
- ✓ Hydro Pneumatic System
- ✓ Motion Sensor Lighting System In Club House
- ✓ CCTV Surveillance

# Why not ?

- Flat Complex also provide a water body, complete in all respects with safety measures as a feature / amenity?
- Why not the prospective buyers insist the Property seller to add water body as an amenity?
- Why not the Government enact law needing the Flat Complex / Layout developers to include a water body as a basic amenity?



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

OPTION

2

**INNOVATIONS  
GALORE**

**Well  
“Well”**

**COMMUNITY WELL / WELL**

20.  
**OWN  
ONE**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

OWN  
ONE

WELL\* “WELL\*\*”

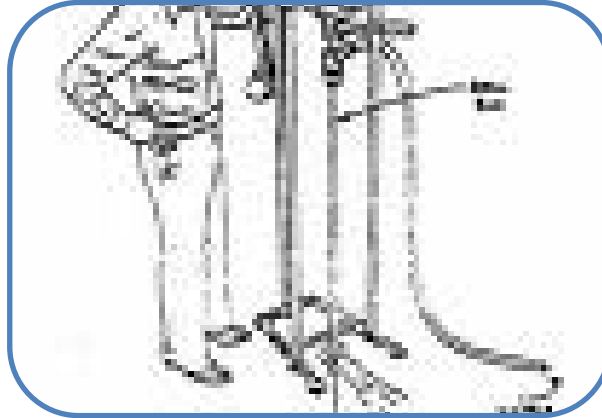
WELL\* : to come to the surface

(மேற்பரப்புக்கு வா; பொங்கி வா.)

WELL\*\* : கிணறு

A deep hole or shaft sunk into the earth to obtain water,

# Three Kinds of Wells



**1. DRILLED WELLS.** Drilled wells are constructed by either cable tool (percussion) or rotary-drilling machines. Drilled wells that penetrate unconsolidated material require installation of casing and a screen to prevent inflow of sediment and collapse. They can be drilled more than 1,000 feet deep. The space around the casing must be sealed with grouting material of either neat cement or bentonite clay to prevent contamination by water draining from the surface downward around the outside of the casing.

**2. DRIVEN WELLS.** Driven wells are constructed by driving a small-diameter pipe into shallow water-bearing sand or gravel. Usually a screened well point is attached to the bottom of the casing before driving. These wells are relatively simple and economical to construct, but they can tap only shallow water and are easily contaminated from nearby surface sources because they are not sealed with grouting material. Hand-driven wells usually are only around 30 feet deep; machine-driven wells can be 50 feet deep or more.

**3. DUG WELLS.** Historically, dug wells were excavated by hand shovel to below the water table until incoming water exceeded the digger's bailing rate. The well was lined with stones, bricks, tile, or other material to prevent collapse, and was covered with a cap of wood, stone, or concrete tile. Because of the type of construction, bored wells can go deeper beneath the water table than can hand-dug wells. Dug and bored wells have a large diameter and expose a large area to the aquifer. These wells are able to obtain water from less-permeable materials such as very fine sand, silt, or clay.



# 1. DOMESTIC WELL



# 2. CONVENTIONAL WELL



# 3. BORE WELL



# 4. PUBLIC WELL



# 5. LARGE FARM WELL



# 6. SANDY-WELL



# OPTION 2

**Why not the Flat Complex / Layout developers at least include a Public Well as a basic amenity?**



# **Wells in every HOUSE with a well dug inside the COMPOUND with rain Harvesting a Bore inside**







**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**BOREWELL UNWELL**

**TUBE WELL**

**&**

**PIPEDWELL**

**ஆழ் துளை கிணறு**

**21.**

**BORE**

**FOUR**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# BOOR FOUR



**BORE  
CORE**

**BORE  
FORE**

**BORE  
POUR**

**BORE  
DOOR**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**BOREWELL UNWELL**

**TUBE WELL**

**&**

**PIPEDWELL**

**ஆழ் துளை கிணறு**

**21.**

**BORE**

**CORE**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# **BOREWELLS & TUBEWELLS**

**A bore well is drilled with casing pipe put only up to the soil-rock boundary, which is done mainly for shallow depths in hard rock or in crystalline rock. However, in the case of a tube well, the casing pipes are put up to the bottom of the bore well with screen in the pipes at some levels.**



**BOREWELL**



**TUBEWELL**

# The Difference Between Bore Well & Tube Well?

## BORE WELL

- A bore well is drilled with casing pipe put only up to the soil-rock boundary, which is done mainly for shallow depths in hard rock or in crystalline rock.



## TUBE WELL

- However, in the case of a tube well, the casing pipes are put up to the bottom of the bore well with screen in the pipes at some





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**BORE not for SUCKING WATER but for  
AUTO-RECHARGING during RAINS**

Excessive drilling of borewells has led to exploitation of groundwater at higher rates than the rate of water recharge and caused depletion of the groundwater levels.

Therefore drill Bores only for natural recharge of the ground water and not for tapping ground water. Normally a borewell is a deep, narrow hole drilled into the ground from which water is drawn through a pipe and pump. Bore Fore (Fore meaning:-toward a position of prominence) . These bores are intended to give water to water table

# BORE CORE

- India being an agrarian country, our farmers depend mainly on groundwater for irrigation. With increasing population, lesser land holdings and urbanisation, deeper borewells are dug for groundwater abstraction. Borewells & tube wells, are very similar. Both are basically vertical drilled wells, bored into an underground aquifer in the earth's surface, to extract water for various purposes. The difference in the two lies in the type of casing used, the depth of this casing and the type of soil where they are drilled. Casing to support the external surfaces of the borehole against collapse may be needed at certain depths, and usually is made up of PVC pipes



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**22.**

**VISIT OUR WEBSITE**

**[www.exnora.website/water](http://www.exnora.website/water)**

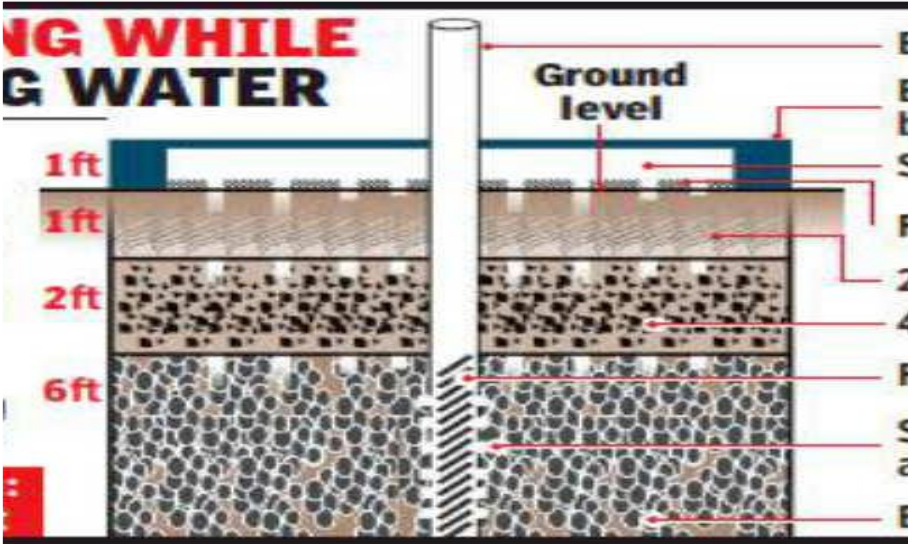
**BORE  
FORE**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**



# BORE FORE

PUT Bores only for natural recharge of the ground water and not for tapping ground water



**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# BORE FORE

PUT Bores only for natural recharge of the ground water and not for tapping ground water

**PROPOSAL**





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**VISIT OUR WEBSITE**

**[www.exnora.website/water](http://www.exnora.website/water)**

**INNOVATIONS  
GALORE**

**23.**

**BORE  
POUR**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

## **BORE POUR**

**Put BORES not for tapping water but to mechanically inject or pour recycled water as well as automatic water recharge**

# BORE POUR

Put BORES not for tapping water but to mechanically inject recycled water as well as automatic water recharge

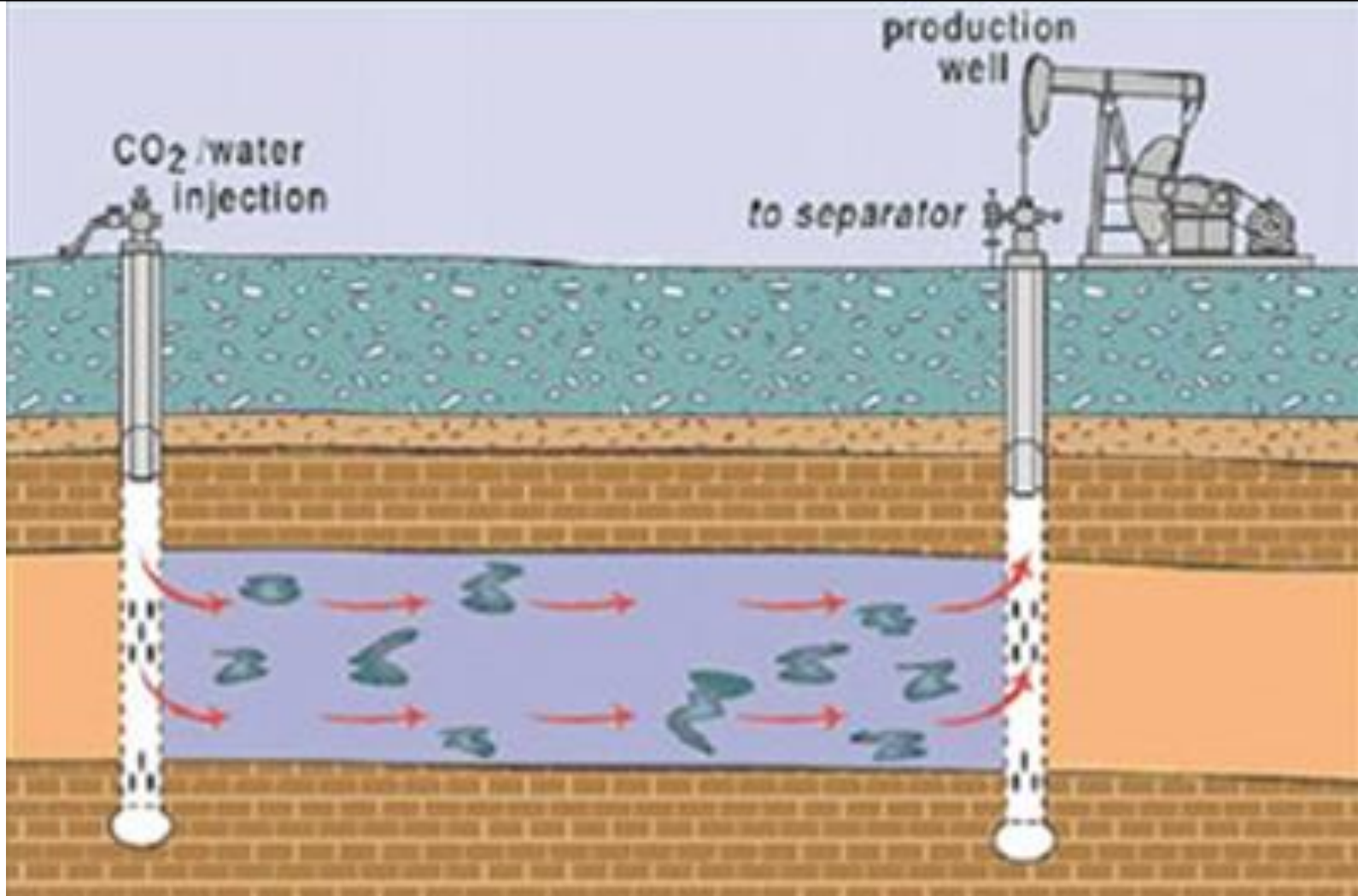
## What Is ASR?

### Aquifer Storage and Retrieval

- Injection of water into an aquifer through a well bore for temporary storage and, subsequently, recovering the water through the same or an other well bore.
- Hybrid – using a settling basin to allow the water to percolate into the aquifer for temporary storage and, subsequently, recovering the water through a well bore.

# BORE POUR

Put BORES not for tapping water but to mechanically inject recycled water as well as for automatic water recharge





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**SAFETY  
FIRST**

**INNOVATIONS  
GALORE**

**VISIT OUR WEBSITE**

**[www.exnora.website/water](http://www.exnora.website/water)**

**BORE  
DOOR**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# BORE DOOR

## (Cap for Borewell for safety)

The capping of the wells with bolts and nuts, the filling up of mud pits and channels on completion of the work and the restoration of the ground to its original condition were the other requirements





An abandoned borwell being sealed in Kaatinyanapalli panchayat in Krishnagiri on October 28, 2019. | Photo Credit: [N. Bashkaran](#)



# BORE WORLD



**BORE WORLD**



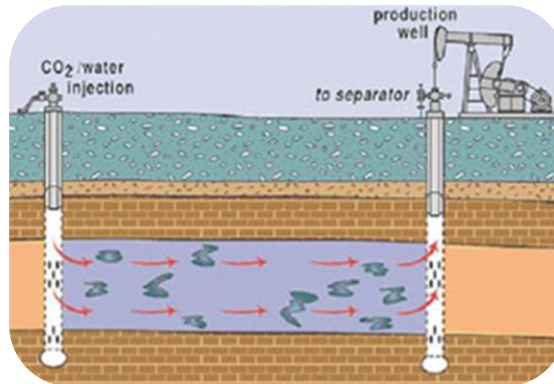
**BORE FAMILIAR  
(BOREWELL)**



**BORE CORE (TUBEWELL)**



**BORE FORE**  
(made only for auto-rechargeResourceF during rains)



**BORE POUR**  
(Water injected through jets)



**BORE DOOR**  
(Cap for Borewell for safety)



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**VISIT OUR WEBSITE**

**[www.exnora.website/water](http://www.exnora.website/water)**

**INNOVATIONS  
GALORE**

குழைவான ஈரமண் பகுதி;  
சதுப்பு நிலம்.

**24 .**

**MARSH  
NOURISH**

**& not MARSH  
HARSH**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

## **MARSH NOURISH** **& not MARSH HARSH**

### Marshland -

lowlying wet land with grassy vegetation; usually is a transition zone between land and water; The three main types of marsh are salt marshes, freshwater tidal marshes, and freshwater marshes. These three can be found worldwide and each contains a different set of organisms.

# MARSH



# MARSH NOURISH & not MARSH HARSH

It is easy to revive this once marsh , but now a garbage dump by moving the waste to one spot and create a hillock so that major part of the MARSH can be revived

**MARSH HARSH**  
**NO**



**MARSH NOURISH**  
**YES**



**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**25.**

**IDEATE  
& CREATE**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

## **IDEATE & CREATE**

Water bodies have to be planned created in unforeseen places like barren lands, Industrial Estates, Theme Parks, abandoned sites,

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**



# IDEATE & CREATE

Water bodies have to be planned & created in unforeseen places



Barren Lands

BREATHING LIFE  
INTO BARREN LAND



Industrial  
Estates



Forests



Theme  
Parks

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**VISIT OUR WEBSITE**

**[www.exnora.website/water](http://www.exnora.website/water)**

**26. BANK**

**on WATER BANK**

**(WATER RESERVE SERVE)**

**Surplus**

**Super-plus**

**INNOVATIONS  
GALORE**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

## **BANK on WATER BANK**

**(WATER RESERVE: SERVE)**

**Surplus Super-plus . Certain Residents Welfare Association ExNoRa Branches have a system of water sharing. Those who have surplus water due to more secretion in their domestic wells, voluntarily supply water through pipe those who need it badly.**

# **BANK on WATER BANK (WATER RESERVE: SERVE)**

# **ANECDOTE?**



**Houses, buildings, compounds & Empty lands will have perennial water Reserve They can give water free or against actual charges to FELLOW residents / poor who have water shortage**





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

ஈ.ரநிலம்

27.

**WETLAND**

**WATER-LAND**

# **WETLAND is WATER-LAND**

**Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season. Water saturation (hydrology) largely determines how the soil develops and the types of plant and animal communities living in and on the soil. Wetlands may support both aquatic and terrestrial species. The prolonged presence of water creates conditions that favor the growth of specially adapted plants (hydrophytes) and promote the development of characteristic wetland (hydric) soils. Two general categories of wetlands are recognized: coastal or tidal wetlands and inland or non-tidal wetlands.**

# WETLAND is WATER-LAND



# WET LAND WATER LAND



**World  
Wetlands Day**

2 February 2021

Wetlands and water







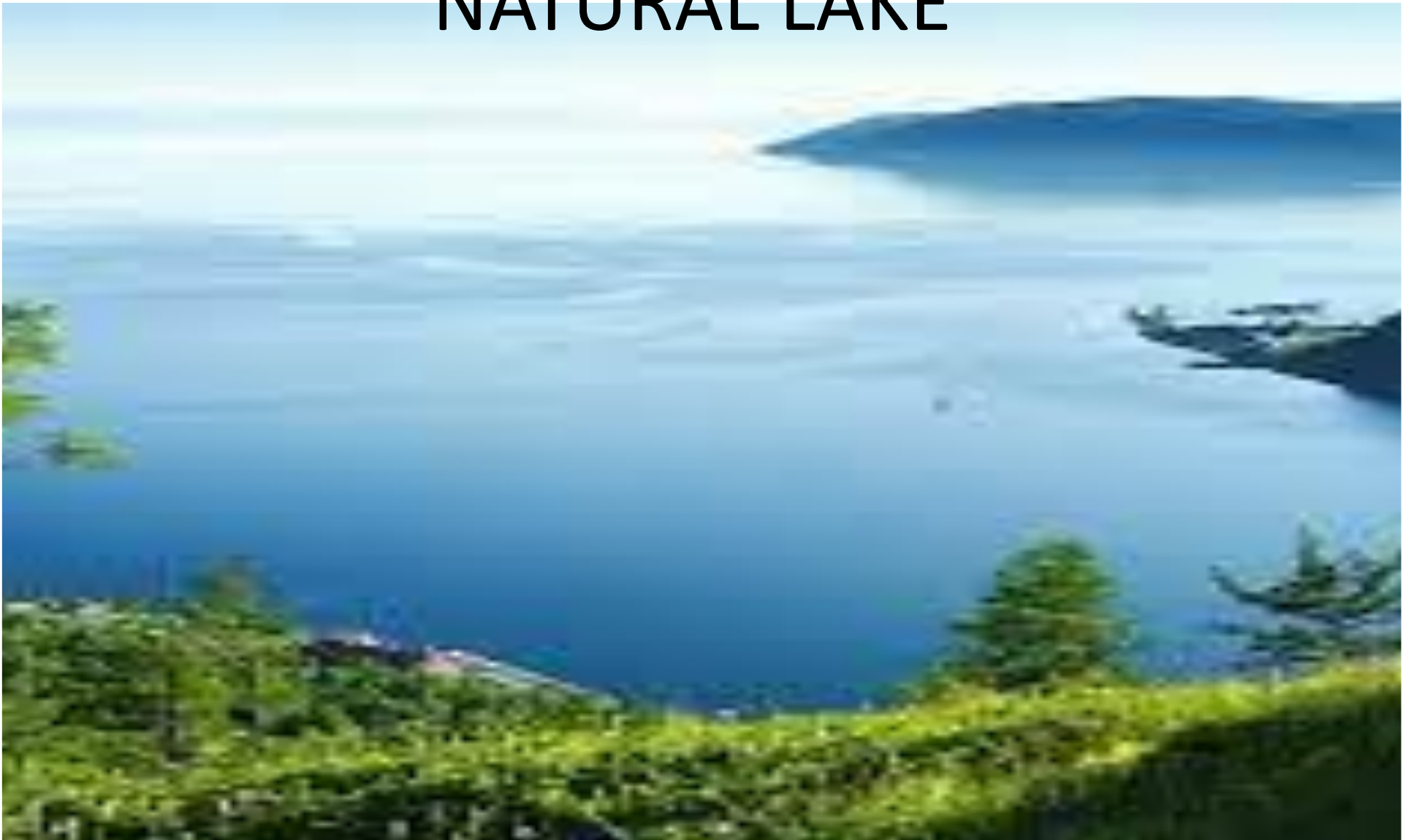
**WATER ASSETS ExNoRa**  
**WATER FOREVER**

இயற்கை ஏரி

28.

**NATURAL LAKE**  
**PROTECT as you can't MAKE**

# NATURAL LAKE





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

गरी

29.

**LAKE  
PARTAKE**

# Lake : How to partake ?

**SHRAMADHAN,  
Physical Volunteering &  
e Volunteering, Social Media**

**EXPERTISE  
SHARING**

**Serving as a  
SERVICE TORCH-BEARER  
in your  
“WATER BODY ExNoRa”  
CHAPTER**

**Starting  
“COMPANION WATER-BODY  
ExNoRa”  
chapter in all other places  
including abroad**

**SHRAMADHAN, PHYSICAL  
VOLUNTEERING LIKE**

**DESILTING,  
CLEANING,  
CREATING AWARENESS,  
ENROLLING MEMBERS**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

## **LAKE PARTAKE**

**Take part in the conservation and upgradation of lakes. ExNoRa has been successful in restoration several water bodies, by enlisting People's Participation**

# LAKE PARTAKE

Take part in the conservation and upgradation of lakes

**BEFORE**



**DURING**



**DURING**

**AFTER**



# LAKE PARTAKE

Take part in the conservation and upgradation of

**BEFORE**

**From DEAD WATER BODIES**





# **LAKE PARTAKE** Take part in the conservation and upgradation of lakes

**AFTER**

to **LIVE WATER BASINS**



# SMALL LAKE



# LARGE LAKE



# The difference between a LAKE & a POND

LAKE	POND
Large / Very Large	Small
Above ground level	Beneath surface
Will be outside the village / town	Will be inside the village / town
Constructed on ground	Dug beneath ground
Created essentially for farm land irrigation	Created essentially for people to meet their drinking water needs
When the sluices (sliding gates ) opened water will automatically flow out	Water has to be lifted physically, manually , by Etaram or by MOTOR
You cannot and should not dig an irrigation lake beneath surface.	You can increase the depth of a pond and even dig wells
Flood risk is there when not properly managed when it is full	Flood risk is not there, but people do get drowned



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

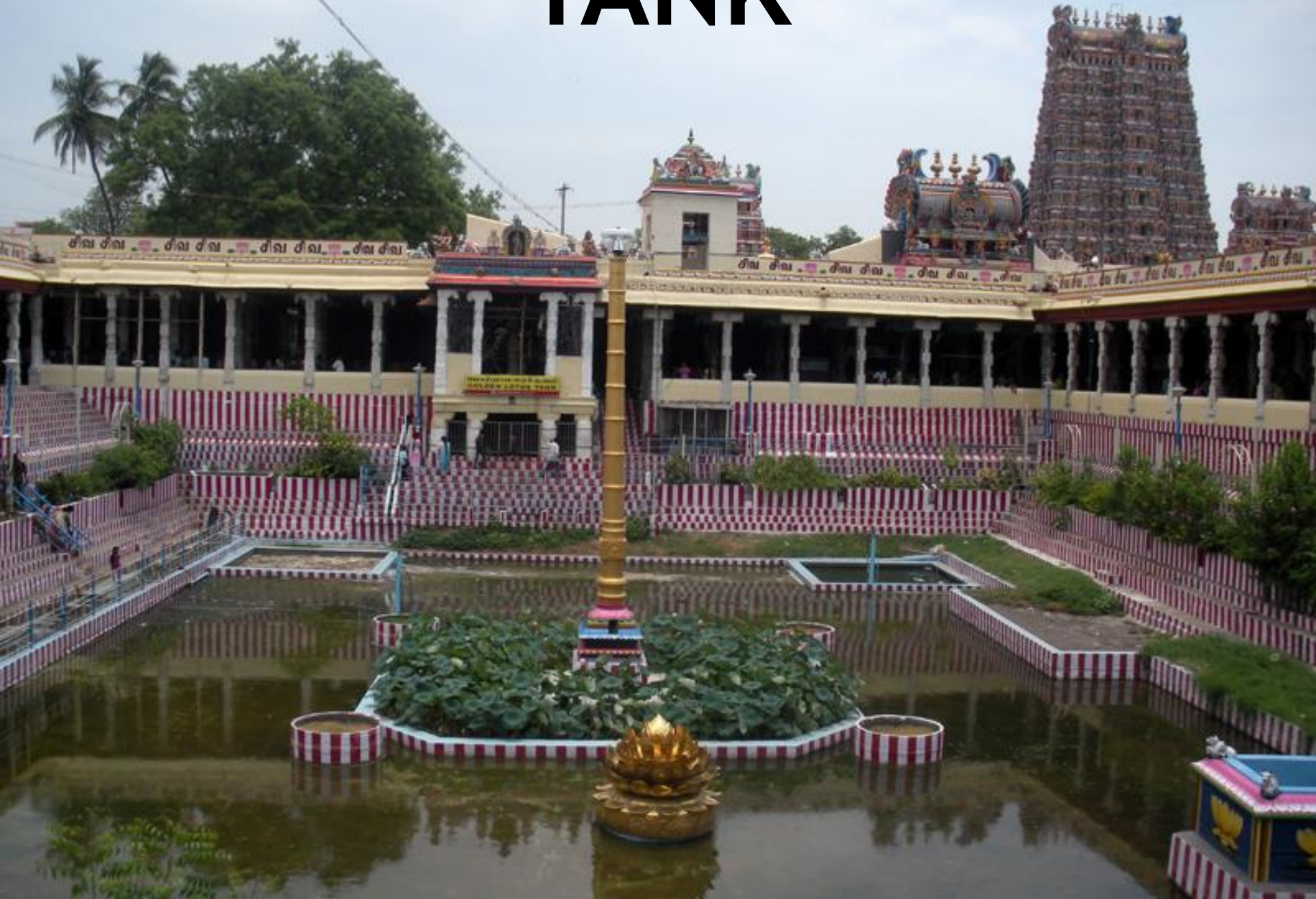
**30.**

**TEMPLE**

**TANK**

**THANK**

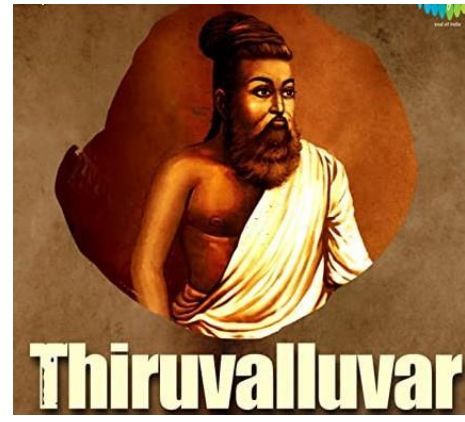
# TANK



# LARGE TANK

Our FOREFATHERS had wisdom . They knew





நீர்இன்று அமையாது  
உலகெனின் யார்யார்க்கும்  
வான்இன்று அமையாது  
ஒழுக்கு.

## பொருள்

உலகில் மழையே  
இல்லையென்றால்  
ஒழுக்கமே கெடக்கூடும்  
என்ற நிலை இருப்பதால்,  
நீரின்  
இன்றியமையாமையை  
உணர்ந்து செயல்பட



# TEMPLE TANK THANK

From **DEAD WATER BODIES**

**BEFORE**



**Jeevan Vigyan, the Life Science, for LIVING as Human Being**

# TEMPLE TANK THANK

**AFTER**

to **LIVE WATER BASINS**



**Jeevan Vigyan**, the **Life Science**, for **LIVING** as Human Being

# TEMPLE TANK THANK

BEFORE

ANOTHER VIEW

PAMMAL TANK

BEFORE PEOPLE'S PARTICIPATION

*SoWaM  
Nirmal*

# TEMPLE TANK THANK

**AFTER**



**Jeevan Vigyan, the Life Science, for LIVING as Human Being**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

குளம்

31.

**POND**  
**BOND**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

# **POND BOND**

A lake is an area filled with water, localized in a basin, surrounded by land, apart from any river or other outlet that serves to feed or drain the lake.

# POND BOND

BEFORE



DEAD POND



WORK BEGINS

DURING

**Kovalam**



CHILDREN JOIN

DURING



REVIVED POND

AFTER



Papathi Kuttai Work in Progress





**Papathi Kuttai with Water**

# Detention ponds 1



Detention ponds are best used in areas with plenty of land and usually use a very small slope to divert the water. Water is accumulated in a large collection area and then slowly drains through the outlet. In some cases, concrete blocks are put in place to slow water flow and collect debris. Dry detention basins are great for the surrounding areas because they have a vegetative buffer that can deal with dry or wet conditions. These basins are usually more cost-effective but they also require a large amount of space that could take away property value and attract mosquitoes.

# DETENTION PONDS 2



a. A detention pond, designed to capture and temporarily store runoff from the adjacent residential development before releasing the water to the downstream channel

# Retention Ponds



Retention ponds are stormwater control structures that help retain the water and treat contaminated storm runoff. Retention ponds remove pollutants and should be surrounded by natural vegetation to improve stability and essentially improve the overall look of the basin. Water is sent to the pool using an underground network of pipes and released through outlets to maintain the desired water level. The biggest advantages to using a retention pond are that they are simple to put in, the water quality is improved, and new habitats are created. On the other hand, these pools can be a drowning hazard and if not designed properly can have a negative effect on the water quality. Regardless of the basin type, the systems should be maintained and should never become blocked or clogged

# TEMPLE POND



# POND



# Private Garden Pond



# LARGE POND





# DRINKING WATER POND



# ARTIFICIAL POND



# RAIN WATER STORAGE PONDS





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

குடில்

**32.**

**PUDDLE**

**HUDDLE**

**WATER ACTIVISTS HUDDLE**

**& make it ideal water  
harvesting opportunity**

# PUDDLE



# **PUDDLE HUDDLE : WATER ACTIVISTS**

## **HUDDLE & make it ideal water harvesting opportunity**

A puddle is a small accumulation of liquid, usually water, on a surface. It can form either by pooling in a depression on the surface, or by surface tension upon a flat surface. A puddle is generally shallow enough to walk through, and too small to traverse with a boat or raft.





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

குடில்

33.

**POOL**  
**COOL**

**Pools meet immediate  
water need of people**

# POOL

## inside an Industry







**WATER ASSETS ExNoRa**  
**WATER FOREVER**

குடம்

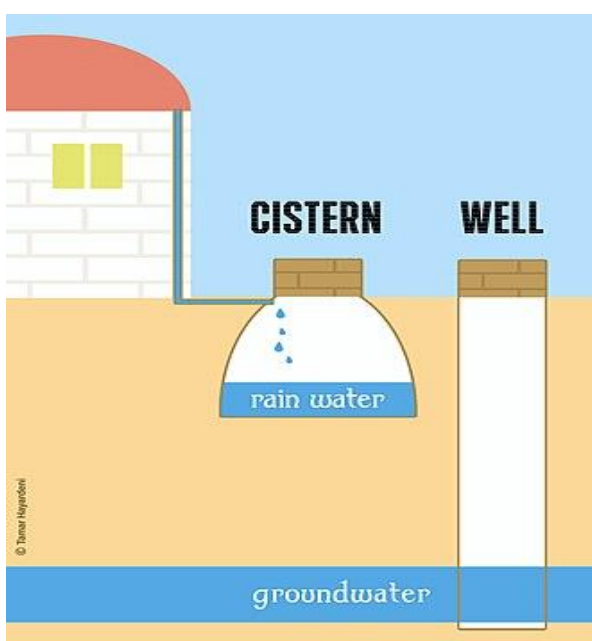
34.

**CISTERN**  
**GOVERN**

**Pools meet immediate  
water need of people**

# CISTERN

- CISTERN is a waterproof receptacle for holding liquids, usually water.
- Cisterns are often built to catch and store rainwater. Cisterns are distinguished from wells by their waterproof linings.
- Modern cisterns range in capacity from a few litres to thousands of cubic metres, effectively forming covered reservoirs



**Ancient Buddhist rock-hewn cistern  
at Pavurallakonda in India**



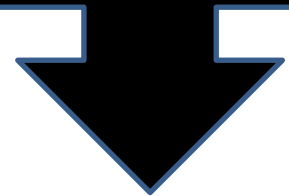
**PORTUGUESE CISTERN**



**CONCRETE CISTERN**



Not to be  
confused with  
bathroom CISTERN



# PUBLIC WATER CISTERN



# PUBLIC WATER CISTERN

*Rainwater is collected from the roof of this rural health post and stored in a covered, watertight cistern.*





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

சுகதி

36.

**BOG**

**BELONG**

**Conserve and allow  
free flow**

# What's so special about bogs?

- They improve air quality, provide a unique habitat, and help combat climate change.
- Besides providing a habitat for rare plants, birds, and mammals, these threatened wetlands have a profound effect on our health by improving air quality.



# BOG UNCLOG

## Conserve and allow free flow

A bog or bogland is a **wetland that accumulates peat**, a deposit of dead plant material—often mosses, and in a majority of cases, sphagnum moss.



# BOG or BOGLAND

- A **bog** or **bogland** is a wetland that accumulates peat a deposit of dead plant material—often mosses, and in a majority of cases, sphagnum moss.
- It is one of the four main types of wetlands Other names for bogs include mire, mosses, quagmire, and muskeg; alkaline mires are called fens. A baygall is another type of bog found in the forest of the Gulf Coast states in the United States. They are often covered in heath or heather shrubs rooted in the sphagnum moss and peat. The gradual accumulation of decayed plant material in a bog functions as a carbon sink
- Bogs occur where the water at the ground surface is acidic and low in nutrients In contrast to fens, they derive most of their water from precipitation rather than mineral-rich ground or surface water. Water flowing out of bogs has a characteristic brown colour, which comes from dissolved peat tannins In general, the low fertility and cool climate result in relatively slow plant growth, but decay is even slower due to low oxygen levels in saturated bog soils. Hence, peat accumulates. Large areas of the landscape can be covered many meters deep in peat.
- Bogs have distinctive assemblages of animal, fungal and plant species, and are of high importance for biodiversity, particularly in landscapes that are otherwise settled and farmed.

**Water**

**Sources not  
tapped so far**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

Desilt and MOAT's depth can be increased so that more water bore can be saved .  
Bore can be created on the MOAT for water table recharging

அகழி

37.

**MOAT**  
**PROMOTE**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

## **MOAT PROMOTE**

There are forts in many towns in which one can always see water quite conspicuous.

Moats are indeed good source of water. Why it not be used?

# MOAT PROMOTE



MOAT served when they were created to safeguard from INVADERS.

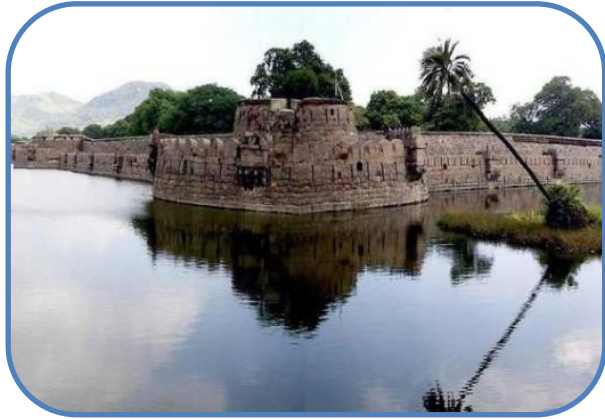
Now it is tourist attraction and water sports particularly boating .

The MOATS have depth a minimum of 20 feet.

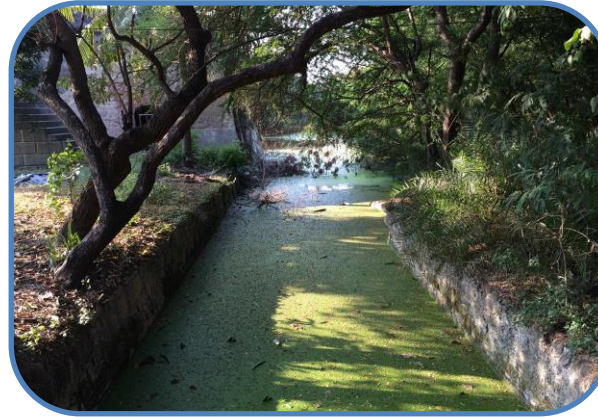
Governments should consider of making moats as water source.

**The stagnant water has to be flushed out followed by Desilting.  
The water withholding capacity can be increased by digging deeper  
and excavating the earth. Rain Water Harvesting must be introduced.  
People should not be allowed to litter or dirty the water.  
Their safety must be ensured from getting drowned .**

# MOAT PROMOTE



Vellore Fort  
Moat



Fort ST George  
Moat



Gingee Fort  
Moat



Tippu Fort  
Moat Mysore

There are a number of forts with moats, a wonder source for water. Desilt and MOAT's depth can be increased so that more water bore can be saved . Bores can be created for water table recharging



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**38.**

**MINE,**  
**“MINE”**

**MINE WATER from**  
**abandoned COAL MINES**



# MINE, “MINES”

## MINE WATER from COAL MINES

NEWS / CITY NEWS / CHENNAI NEWS / Chennai To Get 30MLD Water From Neyveli Lignite Corporation Mines

THIS STORY IS FROM JULY 22, 2019

### Chennai to get 30MLD water from Neyveli Lignite Corporation mines

P Oppili / TNN / Jul 22, 2019, 09:29 IST




#### ARTICLES

 Chennai to get 30MLD water from Neyveli Lignite...

 Train-18 tussle: Railway Board defines roles of departments

 Here's your one-stop solution to low internet bandwidth and...

 Chennai: AAI meets stakeholders to discuss opening...



#### SPOTLIGHT

1 Paying rent with credit card can be...

# **MINE, “MINES”**

CHENNAI: City will get 30 million litres more of water every day, thanks to the Neyveli Lignite Corporation (NLC) mines. Water from the mines will be routed to the Wallajah river, from where it will be pumped into the treatment plant near Veeranam before being supplied to the city through existing pipes.



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**39.**

**QUARRY**

**- “QUERY”**

**USE WATER THERE**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

## **QUARRY, QUARRY**

(from blue metal quarries, quarry water). Both are same words. The 1<sup>st</sup> **QUARRY** is a verb and the 2<sup>nd</sup> **QUARRY** is a noun. Tap the rain water that flowed into the defunct blue-metal quarry cavities, for human use.

# ABANDONED QUARRIES



# QUARRY, QUARRY

(from blue metal quarries, quarry water)





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

40.

**GEO THERMAL**

**GEO-MARVEL**

**Get hot water straight  
without use of electricity  
& heater**

# **GEOHERMAL GEO-MARVEL**

**Get hot water straight without use of electricity & heater**





# Geothermal Geo-marvel

Geothermal resources are **reservoirs of hot water that exist at varying temperatures and depths below the Earth's surface.** Wells can be drilled into these underground reservoirs to tap steam and very hot water that can be brought to the surface for a variety of uses.



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

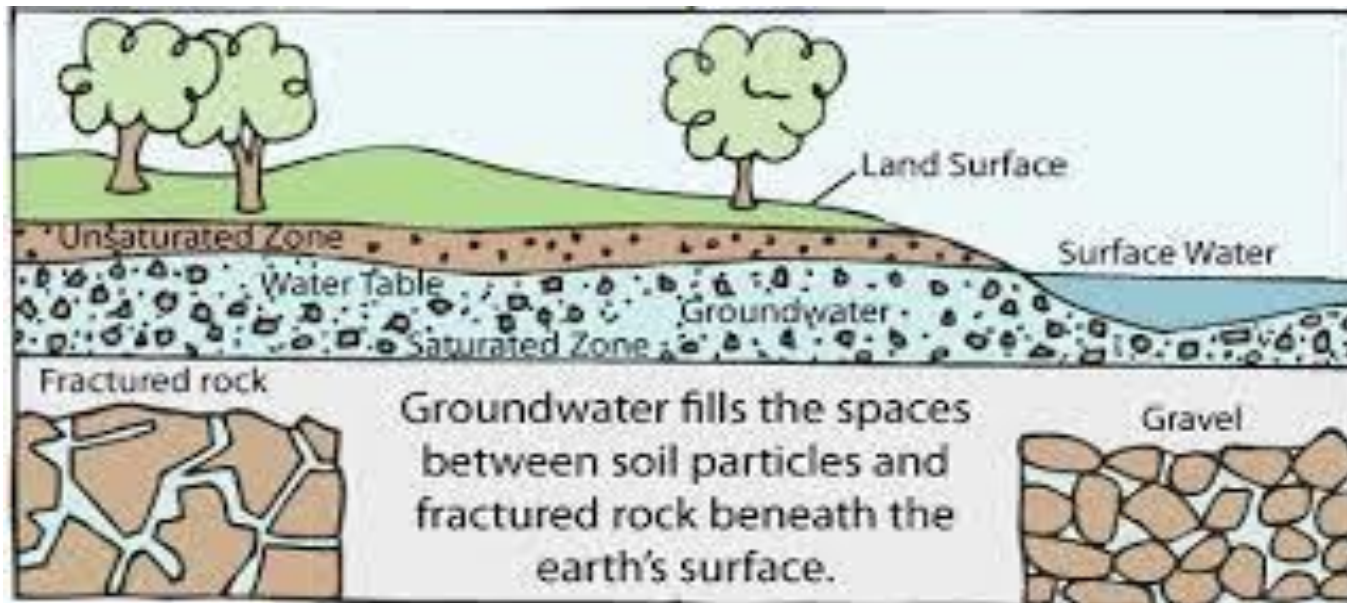
**41.**

நிலத்தடி நீர்

**Ground Water**  
**Abound Water**  
**Hound it not**

# Ground Water Around Water

**Groundwater** is the water found underground in the cracks and spaces in soil, sand and rock. It is stored in and moves slowly through geologic formations of soil, sand and rocks called aquifers





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

ഥശല കുശെ

42.

**WATER TRAPPED**  
**BETWEEN ROCKS TAPPED**

# WATER TRAPPED BETWEEN ROCKS TAPPED



# SUNAI MOUNTAIN WATER

Suna is one of the natural water bodies. This is the type of water body commonly found in the mountains. It is the spring water that appears to the eye of the mountains . It also looks like a small pond. Sunais have been a source of water for wildlife in the mountains. The hill people use them as drinking water





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

43.

நீர்த்தேக்கம்

**RESERVOIR with  
RESERVE POOLS**

**ReSERVE**voir.

# **RESERVOIR with RESERVE POOLS**

## **ReSERVEvoir**

**Yes Reservoir is more than what we think. There are 5 layers of pools, 1. Surcharge Pool, 2. Flood Pool 3. Conservation Pool 4. Buffer Pool 5. Dead / Inactive Pool. If we understand this Reservoir water storage and usage can be improved**

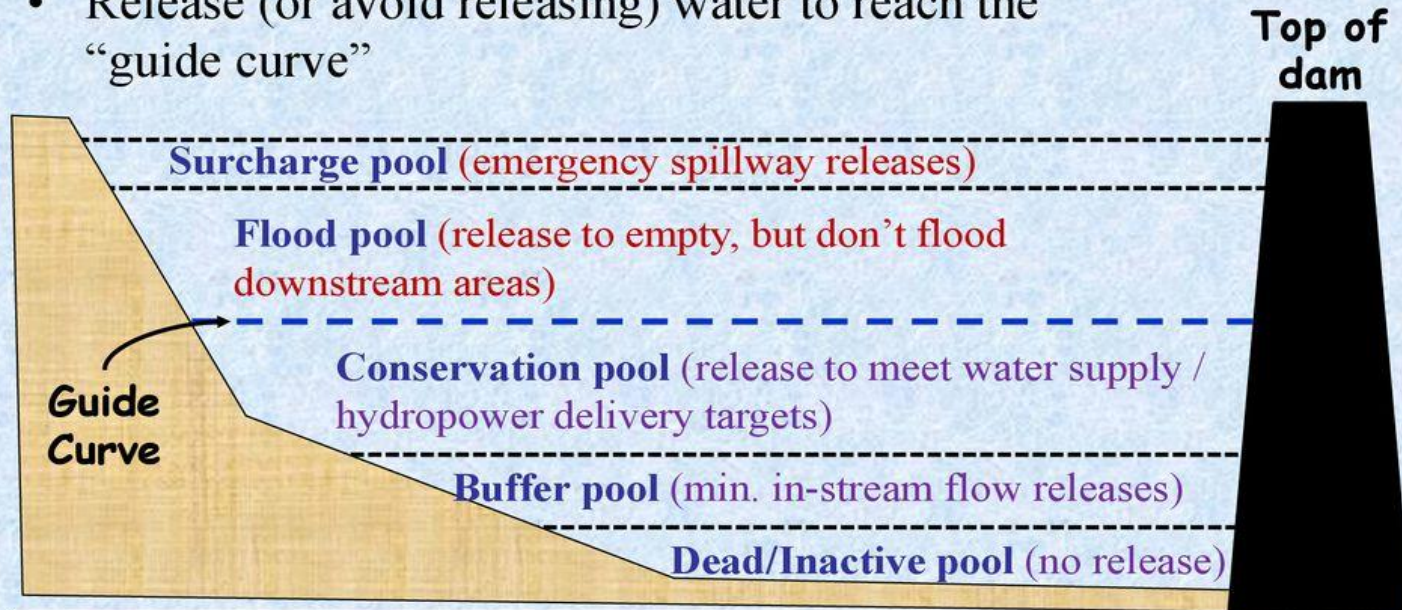


# RESERVOIR with RESERVE POOLS

## ReSERVEvoir

### Multi-purpose Reservoir Operations

- Partition reservoir storage into “pools”
- Each pool has a separate purpose
- Release (or avoid releasing) water to reach the “guide curve”



# RESERVOIR with POOLS

## ReSERVEvoir

### Multi-Purpose Reservoir Planning

- Sediment design life (typically 50 or 100 years)
  - Estimate the reservoir sedimentation volume and spatial distribution over the sediment design life
  - Design the dam outlet to be above the reservoir sedimentation level over the sediment design life



# NATURAL RESERVOIR



# MANMADE RESERVOIR





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

இயற்கை  
அணை

44.

**NATURAL DAM**  
**DON'T DAMN**

# Natural Dam



**MANMADE**

**DAMS**

# **Man Made Dam- Indigenous**





# MANMADE DAM MODERN





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

இயற்கை  
அணை

45.

**Don't cave in, in water.**  
**Go for water in Cave.**

Don't cave in in water.  
Go for water in Cave.



**FLOWING**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

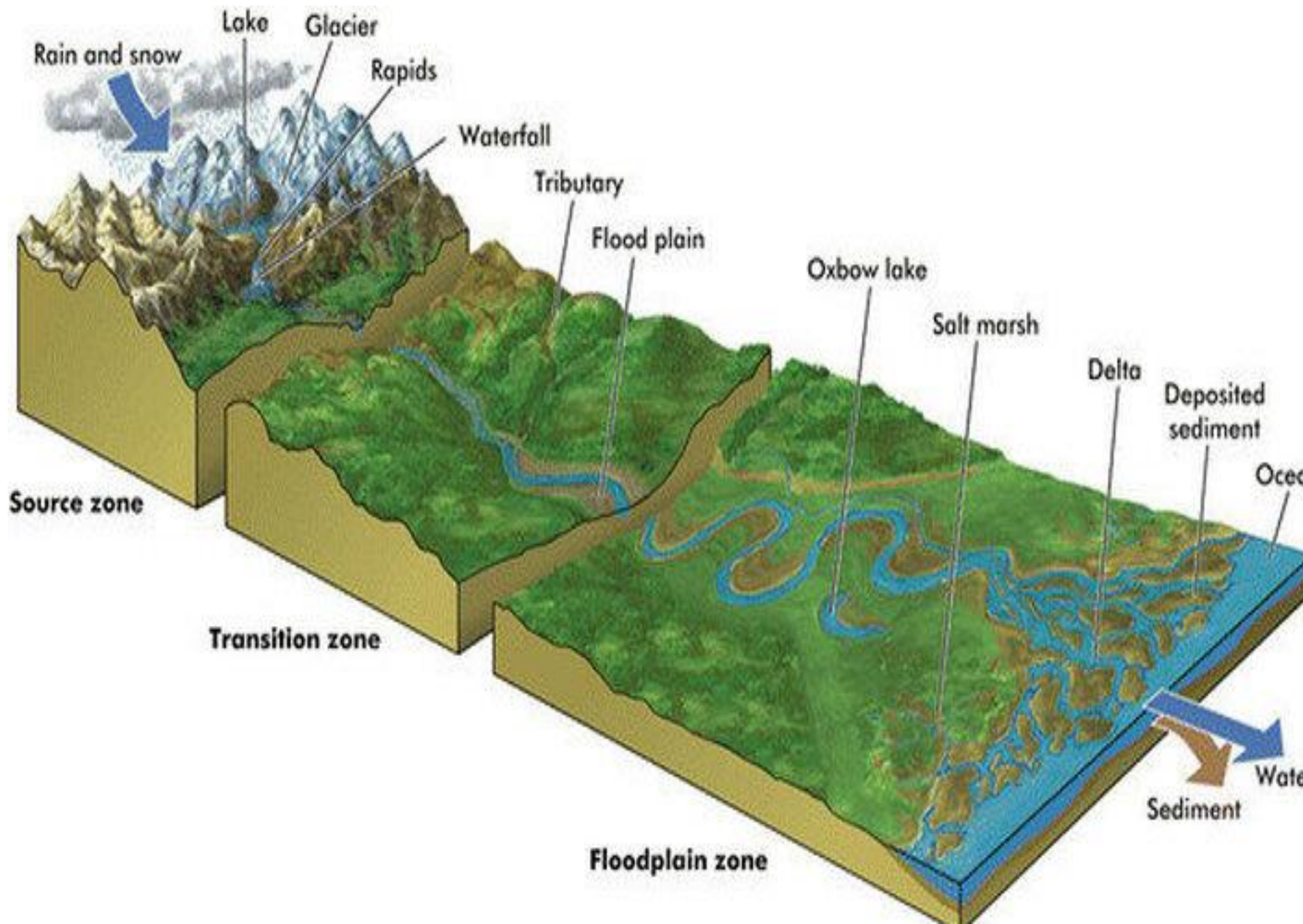
ஆறுகள்

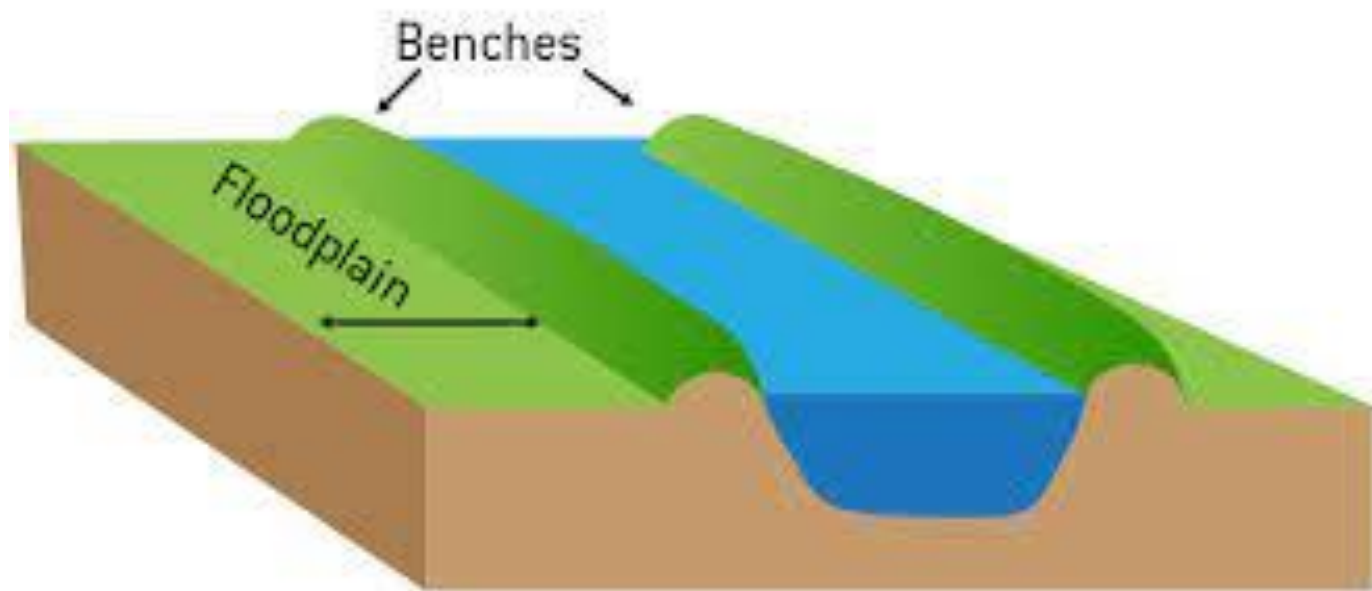
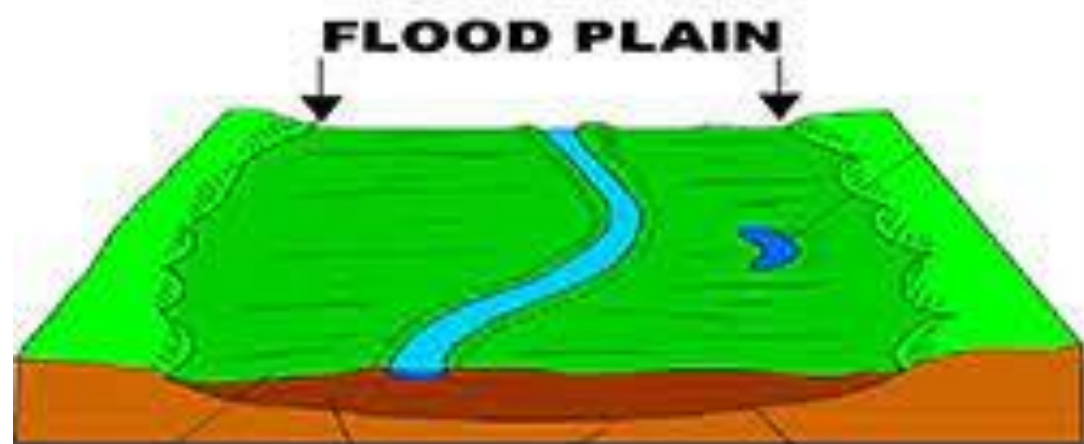
46.

**RIVER  
REVERE**

# Modelling Rivers - The Bradshaw Model

- A river at its source is very different from the river when it enters the sea (the mouth).
- There are generally huge changes that apply to every river on planet earth, whether it be the mighty River Nile or your local stream.









**WATER ASSETS ExNoRa**  
**WATER FOREVER**

ஆறுகள்

47

**RIVERS' FLOOD PLAIN**  
**LEAVE them PLAIN**

# **A floodplain or flood**

## **plain or bottomlands or River Flood**

**Bank** is an area of land adjacent to a river which stretches from the banks of its channel to the base of the enclosing valley walls, and which experiences flooding during periods of high discharge. The soils usually consist of clays, silts, sands, and gravels deposited during floods.

# Encroachment on River Floodplain



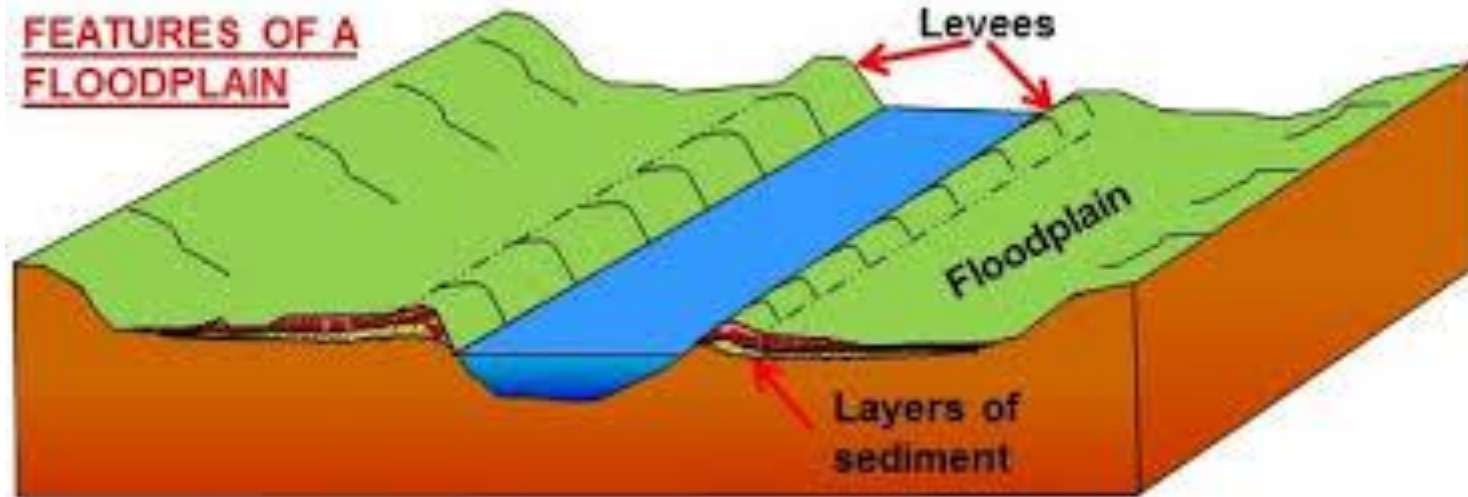
# Encroachment on RIVER PLAINS



# **Encroachment on RIVER PLAINS. Dumping Debris**



181 Now & 263 12 noon





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

ஆறுகள்

48.

**RIVERS**

**MEANDERS**

**– Not MEND HER**





# 1. PREVENT POLLUTANT POLLUTION PREVENTION

## CHEMICAL POLLUTION

The most common type of water pollution, chemicals can infiltrate both underground water sources and those sitting on the Earth's surface. As an integral component of the agricultural industry, it's unsurprising that much of chemical contamination comes from the pesticides and fungicides used in farming, but metals and solvents from industrial sites are also leading contributors.

## GROUNDWATER POLLUTION

As mentioned above, agriculture is a key source of water pollution, especially for groundwater. Fertilisers and pesticides applied to crops can seep into the ground and contaminate underwater rivers and waterbeds, thus compromising the quality of wells, boreholes and other places from which groundwater is extracted

[www.exnora.website/zerowaste](http://www.exnora.website/zerowaste)

## MICROBIOLOGICAL POLLUTION

Unlike most others on this list, microbiological pollution is a naturally occurring form of water contamination. Microorganisms such as bacteria, protozoa and viruses can infiltrate water supplies, causing diseases such as bilharzia and cholera. Humans are most susceptible to this kind of pollution in places where adequate water treatment systems are not yet in place.

## NUTRIENT POLLUTION

While they're vital for underwater flora and fauna to flourish, an excess of nutrients can upset the delicate imbalance of water-based ecosystems. Fertilisers contain a high concentration of nutrients which, if they contaminate rivers, lakes and coastal areas, can cause algal blooming that can block out sunlight and inhibit the growth of other organisms.

# 1. PREVENT POLLUTANT POLLUTION PREVENTION

## OXYGEN-DEPLETION POLLUTION

Another consequence of algal blooms is their consumption of oxygen supplies. This means that those species which depend upon oxygen to survive are killed off, while anaerobic ones thrive. Some anaerobic microorganisms are capable of producing ammonia, sulphides and other harmful toxins, which can make the water even more dangerous to animals (and humans, too).

## SURFACE WATER POLLUTION

Referring to all water sources above ground, such as rivers, lakes, seas and oceans, surface water pollution can occur both naturally, accidentally and intentionally. For example, monitoring has an all-important role in natural flood management, which can lead to poor water quality, while accidental oil spills and negligent industries emptying waste into water bodies are also key contributors.

[www.exnora.website/zerowaste](http://www.exnora.website/zerowaste)

## SUSPENDED MATTER

Improperly discarded waste, such as fragments of plastic, rubber or other manmade materials, can find themselves into water sources and persist for a long time. Because they are too robust to dissolve in the water and too big to mix effectively with the molecules, they simply float on its surface and prevent oxygen and sunlight from penetrating below.

## WASTES POLLUTION MUNICIPAL SOLID & LIQUID WASTES POLLUTIONS

**Jeevan Vigyan, Life Science, for Living as Human Being**

# Rivers are Worshiped in only one NATION, i.e. Bharat, India

**But this is only country where are RIVERS are**

<b>Abused</b>	<b>Misused</b>	<b>Mishandled</b>
<b>Exploited</b>	<b>Illtreated</b>	<b>Water wasted</b>

## **POLLUTED BY**

<b>CHEMICAL POLLUTION</b>	<b>MICROBIOLOGICAL POLLUTION</b>	<b>NUTRIENT POLLUTION</b>
<b>SUSPENDED MATTER</b>	<b>Oxygen-depletion pollution due to algal blooms</b>	<b>Garbage Pollution &amp; Sewage Pollution</b>

## **WE DUMP**

<b>Garbage</b>	<b>Sewage</b>	<b>Medical Waste</b>
<b>Toxic Waste</b>	<b>Arsenic Waste</b>	<b>Debris &amp; Rubble</b>
<b>Dead Bodies</b>	<b>Animal Corpses</b>	<b>Corona affected dead bodies</b>

**We call ourselves highly civilized with longest history of culture**

# **WATER BODIES ExNoRa**

## **Revere River**

### **RIVER PROTECTION & CONSERVATION.**

**Rivers die due to sand quarrying, blockages in its tributaries, etc. It is the duty everyone to protect rivers**



# River Flood banks encroached



# MEANDERING RIVERS



# Three Ways to Protect Your Rivers and Streams

- 
- 1. **Create riparian buffers:** These fringes of grass, shrubs, and trees planted along the stream / river banks are one of the BEST ways to protect a water source. Buffers improve water quality by filtering sediment and pollutants from soil runoff and providing shade to keep water cool. They combat erosion by stabilizing banks and regulating stream flow, and they offer habitats to many plant and wildlife species. Riparian buffers vary in width, depending on how the adjacent land is being used, but should be a minimum of 25 to 50 feet. Wider buffers are best for improving water quality and attracting wildlife.
- 2. **Remove barriers to fish migration:** Interrupting a stream's flow with bridges and culverts can damage the health of the system by changing stream conditions and preventing the migration of fish and other aquatic species. Build bridges and culverts that are at least 1.25 times the normal width of the streambed, and place them where the stream is straight and flat. You will need to get a permit to construct most stream crossings. Before you start, be sure to check with your state's natural resource agency to learn what is required.
- 3. **Minimize runoff from forest roads:** Most of the sediment from forested land is due to runoff from poorly designed and maintained forest roads. When planning roads, think about how you can reduce their number, width, and length, decrease maintenance requirements, and limit your roads' visual and physical impacts. Regularly inspect and repair your roads by filling wet spots, grading to maintain proper drainage, and ensuring ditches and culverts are free of debris



# We named rivers after women. Both Rivers and women are the worst victims. Both are rapped.



Ganges  
2,510 km



Brahmaputra  
3,848 km



Godavari  
River  
1,465 km



Yamuna River  
1,376 km



Kaveri River  
805 km



Narmada  
River  
1,312 km



Krishna River  
1,400 km



Tungabhadra  
531 km



Bhagirathi  
River



Vaigai River  
258 km

# **Ganges Pollution. Only one answer to make Ganges clean. Don't pollute her.**



**GANGES**

**AGES**

**‘CLEAN GANGES RIVER’  
is simple**

**Don't try to clean GANGES.  
But Don't Pollute her.  
She know how to clean herself**

**“We TALK of the  
CONSEQUENCES,  
not the CAUSES”**

**“We treat the SYMPTOMS,  
not the DISEASE”**

**7<sup>th</sup> SENSE MASTER**

# Ganges & most rives in India are polluted with

Garbage	Sewage	Industrial Waste
Hospitals amputated organs & Hospital Waste	Dead Bodies including Corona Dead Bodies	Pharmaceuticals waste
E waste	Chemical Waste	Slaughter House Waste
Plastics	Temple Waste	Dyeing Industry Waste
Mining Waste	Toilet Waste Human excreta	

# GANGES MANAGES

- Lucknow
- Banaras
- Allahabad
- Kanpur

# **UNDERWATER RIVER / SUBTERRANEAN RIVER**

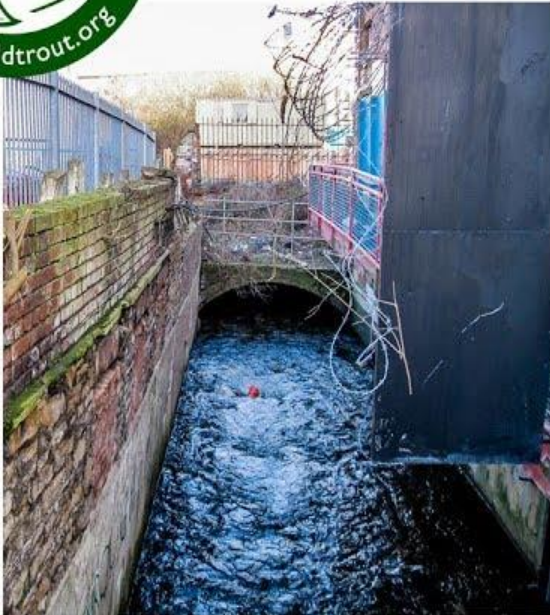
- A **subterranean river** is a river that runs wholly or partly beneath the ground surface – one where the riverbed does not represent the surface of the Earth. It is distinct from an aquifer, which may flow like a river but is contained within a permeable layer of rock or other unconsolidated materials.





# BURIED RIVER (Buried by Nature or Mankind)

## Buried Rivers - Back to Life



Porter Brook at Matilda Street: A Sheffield Success Story

# BURIED RIVER HURRY to BRING BACK



## The Buried River

Mill Creek was buried in a sewer in the 1880s, and its valley was filled in to make way for new homes. People forgot the buried river, but its force endures. Cave-ins along the buried river's floodplain and polluted water downstream are the result. But vacant land on the buried floodplain affords an opportunity to restore nature and rebuild neighborhoods. (2014)

# RAPIDS

A part of a river where the water flows very fast over rocks.





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**VISIT OUR WEBSITE**

[www.exnora.website/water](http://www.exnora.website/water)

தடுப்பு  
அணை

**INNOVATIONS  
GALORE**

**49. CHECK-DAMS**  
**= CHEQUE-DAMS**  
(valuable)

one per one town/ village

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# **CHECK DAMS = CHEQUE DAMS (valuable)**

**for storage of water and prevent erosion. Get local CSR Sponsorship create one. If a number of check dams are constructed across river, each check-dam will become a water body for the people of that area. e.g. Palar.**

# CHECK DAM



Three days flood and the water went as waste to Bay of Bengal, can quench the thirst of Chennai people for 5 years.



தந்த

**FLOOD ALERT ISSUED ACROSS KOSASTHALAIYAR**



## Human chain for protection of ground water

By Saptarshi Bhattacharya

CHENNAI, SEPT. 25. Hundreds of villagers in Tiruvallur district, on Chennai's northern fringes, today formed a human chain across the dry Koratalaiyar near the Karanodai bridge demanding construction of checkdams on the river for replenishing groundwater in surrounding areas.

They raised slogans demanding that checkdams be constructed at intervals of 2 km and that deep borewells be sunk to tap groundwater.

The residents criticised large-scale drawal of water from wellfields in these villages by Metrowater and private tankers. They said the water level receded to over 150 feet from 50 feet a few years ago. Once the yield went down, Metrowater and the tankers would forsake the area and the residents would be left with depleted or no resource, they argued.

Hundreds of lorryloads of water were drawn everyday from Janapanchatram, Alinjivakkam, Irulippattu, Kannigaipper, Manjankaranai, Periyapalayam, Kavarapettai and Gummidipoondi, said Suresh Kumar of Alinjivakkam.

As groundwater in several villages turned saline, a checkdam, if constructed at Idaiyan Chavadi, could prevent further degradation in quality.

The villagers from 39 panchayats under the Cholavaram panchayat union said the Government should desilt and deepen the 77 lakes and restore the inlet channels within the block.

Most of the protesters were agriculturists hit by the drop in the groundwater level and quality. It was difficult for them to raise three crops a year.



**Villagers from Tiruvallur district staging a protest on the Koratalaiyar river bed for construction of a checkdam. —**

**Photo: K. Pichumani**

G. Vasudeva Naidu, State vice-president, Tamil Nadu Farmers' Association, led the demonstration.

**Sand quarrying**

**M.B. Nirmal, founder-chairman, Exnora International, raised the issue of illegal sand quarrying from the riverbed. He recalled that in 1993, the Karanadoi bridge gave way because of indiscriminate quarrying.**



# ACTION Neer ExNoRa



**“Human Check Dam” got a real Check Dam  
– Kosathalayaru. The news papers carried  
the novel protest & the Government  
sanctioned a real check dam.**

# CHECK DAMS = CHEQUE DAMS (valuable)



A check dam is a small, sometimes temporary, dam constructed across a waterway to counteract erosion by reducing water flow velocity and store water

[Click here](#)  
**CHECK DAMS  
= CHEQUE DAMS  
( & REGULAR DAMS )  
STOP RUN-OFF of WATER  
to SEA**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**50.**

**COMPARTMENT  
COMPLIANT**

**VISIT OUR WEBSITE**

**[www.exnora.website/water](http://www.exnora.website/water)**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# **WATER BODIES ExNoRa**

## **COMPARTMENT COMPLIANT**

**Make compartment in WATERWAYS flowing inside the city for water storage.**

**For example Adyar river flows via Pammal, Guindy, Saidapet, etc. Like check dam, partition / compartment walls should be constructed for storage of water for each area. Surplus water will flow over. The water compartments must be kept always clean**

# COMPARTMENT COMPLIANT

Make compartment in WATERWAYS flowing inside the city for water storage

ABC



Adyar



Buckingham



Coovam



Otteri Nullah



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

ஓடை  
நீரோடை

**51.**

**STREAM  
REDEEM**

## **STREAM REDEEM**

**CONSERVE & ALLOW FREE FLOW.** Technically speaking, streams are formed by the convergence of surface water and groundwater into the lowest topographic area of a valley which sustains a current and is confined within narrow beds and steep banks. Every individual stream is part of a larger system (watershed) of waterbodies which are all connected, much like the circulatory system in the human body.

## **STREAM REDEEM Contd.**

### **CONSERVE & ALLOW FREE FLOW.**

Technically speaking, streams are formed by the convergence of surface water and groundwater into the lowest topographic area of a valley which sustains a current and is confined within narrow beds and steep banks. Every individual stream is part of a larger system (watershed) of waterbodies which are all connected, much like the circulatory system in the human body.



## **STREAM REDEEM Contd.**

Streams supply drinking water and irrigation for growing food. Your local stream is a part of a larger watershed, draining into larger rivers, lakes, and reservoirs. These larger waterbodies are the main source of municipal drinking water, a food source, and provide critical recreation opportunities to fisherman, boaters and beach-goers

# STREAM



# **STREAM REDEEM**

## **CONSERVE & ALLOW FREE FLOW**





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**52.**

**NULLAH**

**WATER WALLAH**

# NULLAH WATER WALLAH

## A WATERCOURSE,



# Otteri Nullah



Pitiful state: Garbage makes the canal a breeding ground for mosquitoes. | Photo Credit: [V. Ganesan](#)





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**53.**

**BROOK**

**TRACK RELOOK**



# BROOK RELOOK





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**54.**

**RIVER BASIN**  
**RIVER BASIS**

# RIVER BASIN RIVER BASE IN



A top



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**55.**

**RAVINE**

**RECREATION**

# **RAVINE RECREATION**

a narrow deep valley with steep sides.





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

காயல்

56.

**LAGOON**  
**BOON**

# LAGOON BOON



A lagoon is a **body of water separated from larger bodies of water by a natural barrier**. ... Lagoons are separated from larger bodies of water by sandbars, barrier reefs, coral reefs, or other natural barriers. The word "lagoon" derives from the Italian word laguna, which means "pond" or "lake".



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**CATCHMENTS of RAIN WATER**  
**three categories**

1. Around four walls
2. Open spaces everywhere  
e.g. road, ground, park, OSR
3. Conduits bringing water to  
water bodies

**57.**

**CATHMENT**  
**AUGMENT**

**Clear encroachments**  
**and obstructions**

**நீர்ப்பிடிப்பு**

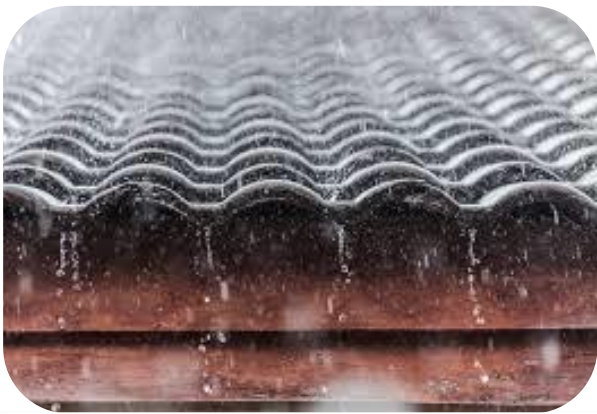


# **CATCHMENTS of RAIN WATER**

## **three categories**

- 1. Around four walls including terrace**
- 2. Open spaces everywhere e.g. road, ground, park, OSR**
- 3. Conduits bringing water to water bodies**

# Catch Catchments of RAIN WATER



**Around four walls  
including terrace &  
roof**



**Open spaces  
everywhere e.g. road,  
ground, park, OSR**



**Conduits bringing  
water to water bodies**

# LAKE CATCHMENT



# CATHMENT AUGMENT

## Clear encroachments and obstructions



## **CATHMENT AUGMENT**

- 1. An area from which surface runoff is carried away by a single drainage system.**
- 2. The area of land bounded by watersheds draining into a river, basin or reservoir.**

# **CATCHMENT, AUGMENT WATER**

- **Water Catchment Scale Planning and Conservation**
- **Water catchments are widely recognized as the most effective management unit for the protection of water resources, both water quality and supply. A water catchment (commonly referred to as a “watershed”) is an area of land where all water flows to a single stream, river, lake or even ocean. Natural boundaries of water catchments can be very small for a single creek or stream or quite large—the Colorado River basin for example. HCA encourages the use of the term “water catchment” over “watershed.” A water catchment area is home to a complete water-cycle system. In order to manage these systems for a healthy future, we must learn to catch, conserve and make wise use of all water in the system, rather than “shed” that water away as the term “watershed” implies.**
- **The concept of “Water Catchment” is common around the globe**
- **“A catchment is an area where water is collected by the natural landscape. In a catchment, all rain and run-off water eventually flows to a creek, river, lake or ocean, or into the groundwater system. Natural and human systems such as rivers, bushland, farms, dams, homes, plants, animals and people can co-exist in a catchment.” –**

# Healthy catchments provide:

- **A source of clean drinking water**
- **Unspoiled natural areas for recreation**
- **Habitat for plants and animals**
- **Healthy vegetation and waterways**
- **Reliable and clean water for stock and irrigation**
- **Opportunities for sustainable agriculture and industry.**

**Our daily activities affect the health of our catchments. The first step to protect our catchments is to better understand our impact on them.**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

கிளையா

58.

**TRIBUTARIES**  
**give TRIBUTES**

**Clear encroachments and  
obstructions**



# SUPPLY CANALS OF RIVERS



# Water supply system to rivers




# RIVER TRIBUTARY



# TRIBUTARIES give TRIBUTES

Clear encroachments and obstructions



tributary

A stream that flows into a larger stream or river.

# TRIBUTARIES give TRIBUTES

- A **tributary** or **affluent** is a stream or river that flows into a larger stream or main stem (or parent) river or a lake. A tributary does not flow directly into a sea or ocean. Tributaries and the main stem river drain the surrounding drainage basin of its surface water and groundwater, leading the water out into an ocean. The **Irtys** is a chief tributary of the Ob river and is also the longest tributary river in the world with a length of 4,248 km (2,640 mi). The **Madeira** river is the largest tributary river by volume in the world with an average discharge of 31,200 m<sup>3</sup>/s (1,100,000 cu ft/s).
- A confluence, where two or more bodies of water meet together, usually refers to the joining of tributaries.
- The opposite to a tributary is a distributary, a river or stream that branches off from and flows away from the main stream. Distributaries are most often found in river deltas.



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

கழிமுகம்,  
முகத்துவா  
ரம்

59.

**ESTUARY**

**ETRENITY**

**Prevent threats**

# ESTUARY ETRENTITY

Prevent threats



# ESTUARY ETRENTITY

- An **estuary** is a partially enclosed coastal body of brackish water with one or more rivers or streams flowing into it, and with a free connection to the open sea. Estuaries form a transition zone between river environments and maritime environments and are an example of an ecotone. Estuaries are subject both to marine influences such as tides, waves, and the influx of saline water and to fluvial influences such as flows of freshwater and sediment. The mixing of seawater and freshwater provides high levels of nutrients both in the water column and in sediment, making estuaries among the most productive natural habitats in the world.



# Common threats to estuaries

- increased nutrients and algal blooms.
- loss of habitat and biodiversity.
- contaminants and pollutants.
- accelerated rates of sedimentation.
- disturbance of acid sulfate soils.
- changes to freshwater and tidal flows.
- invasive species.
- climate change.



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

கடற்கழி

60.

**CREEK  
GREET**

**Care creeks**

**CREEK GREET**

**Care creeks**



# CREEK GREET

# Care creeks

- This is a word that is used differently in different regions. In some regions, a “creek” is a small freshwater stream. In other regions, a “creek” is a coastal inlet that looks similar to a river but has salt water with little or no freshwater inflow. Either way, a creek is shallow and surrounded on two sides by land.
- A marine ecosystem, on the other hand, is unambiguously at sea. It might be a coastal system not much influenced by fresh water (perhaps a bay but not an estuary), or a continental shelf ecosystem, or a deep-sea ecosystem.
- What do all of these ecosystems have in common?
- They contain aquatic plants, animals and microbes, all interacting to form an ecosystem.
- They have both benthic (i.e. at the bottom) and pelagic (i.e. in the water) communities.
- The interactions of light, nitrogen and phosphorus supply, and movements of water are critical in determining what type of animals and plants will thrive, and the overall health of that ecosystem.



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

நீர்வீழ்ச்சி,  
அருவி

61.  
**FALL**  
**for ALL**  
**WATER FALLS**

# Hogenekal Water Fall



# Fall of Fall by Pollution like littering and taking oil bath





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

நீர்நற்று

62.

**NATURAL FOUNTAIN**  
**REGAIN**



# 40. NATURAL FOUNTAIN

# REGAIN



# NATURAL FOUNTAIN





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**63.**

**MAKE PUBLIC DRINKING  
WATER FOUNTAINS  
like DECORATIVE  
FOUNTAINS**

# **MAINTAIN PUBLIC DRINKING WATER FOUNTAIN (like DECORATIVE FOUNTAINS)**



# PUBLIC FOUNTAIN PEOPLE SUSTAIN



**BEFORE**



**AFTER**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

நீளற்று

60.

**SPRING**

**- SWING**

**into action**

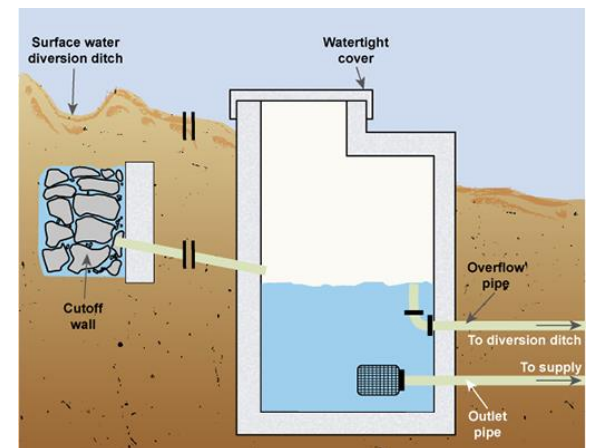
**(to conserve)**

# SPRING



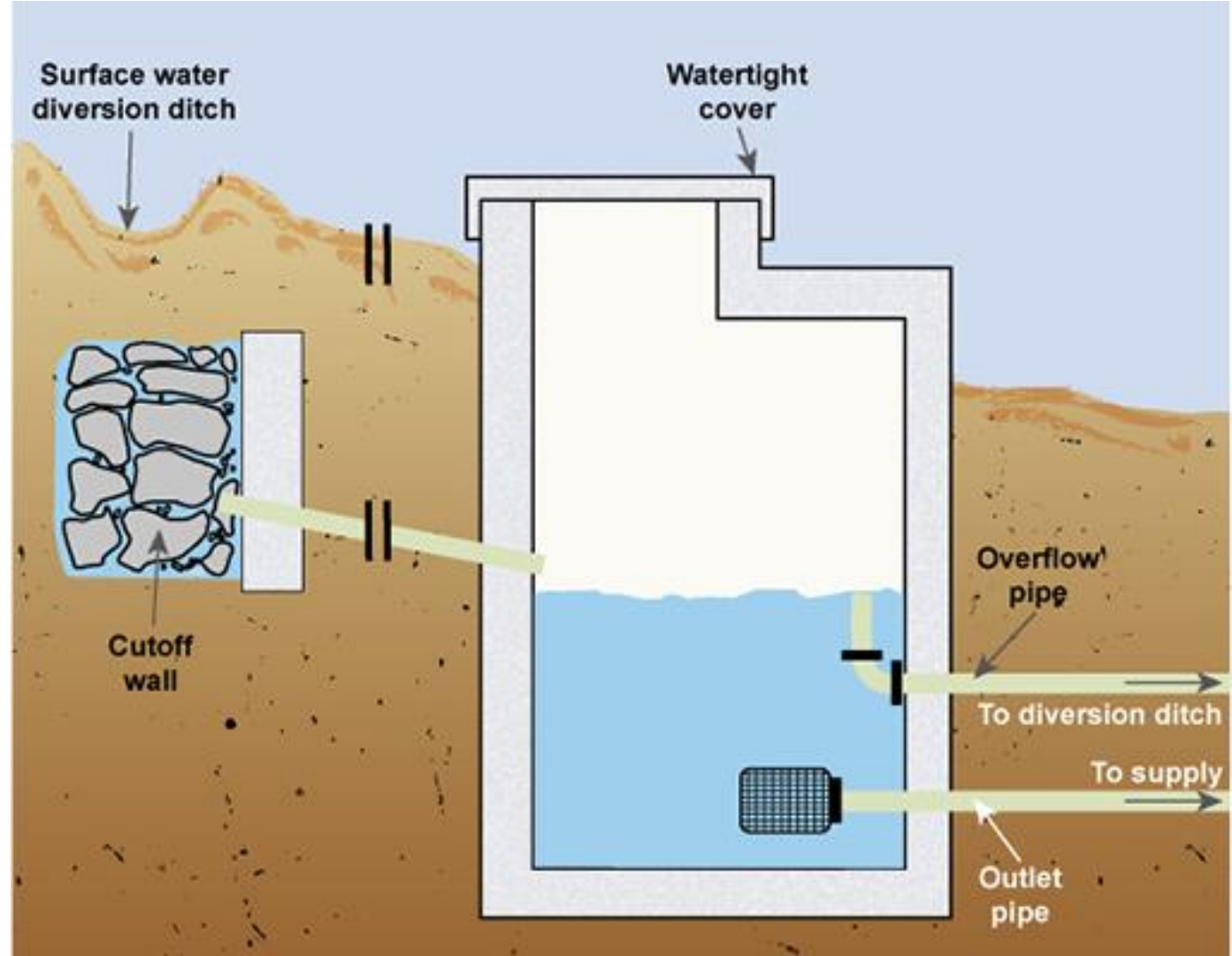
# SPRING BOX

Small springs are typically protected by a ‘spring box’, which is constructed of brick, masonry or concrete, and is built around the spring so that water flows directly out of the box into a pipe or cistern, without being exposed to outside pollution such as run-off, bird droppings and animals. The spring box should have a watertight cover with a lock. Larger springs serving towns are protected in a similar way.





# A spring box.



# HOT WATER SPRING



# **SPRING** -SWING (to conserve)





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

சதுப்புநிலம்

64.

**SWAMP**

**REWAMP**

# SWAMP



# SWAMP REWAMP

A swamp is a forested wetland. Swamps are considered to be transition zones because both land and water play a role in creating this environment. Swamps vary in size and are located all around the world. The water of a swamp may be fresh water, brackish water, or seawater.



# SWAMP REWAMP

- A **swamp** is a forested wetland. Swamps are considered to be transition zones because both land and water play a role in creating this environment. Swamps vary in size and are located all around the world. The water of a swamp may be fresh water brackish water, or seawater.
- **Freshwater swamps** form along large rivers or lakes where they are critically dependent upon rainwater and seasonal flooding to maintain natural water level fluctuations.
- **Saltwater swamps** are found along tropical and subtropical coastlines. Some swamps have hammocks, or dry-land protrusions, covered by aquatic vegetation, or vegetation that tolerates periodic inundation<sup>l</sup> or soil saturation.
- The two main types of swamp are "true" or swamp forests and "transitional" or shrub swamps



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

வடிகால்

65.

**WATER going in DRAIN  
REGAIN**

**DRAIN WATER HARVESTING**

at three levels 1. Source (e.g.  
Water Sink) 2. Storm Water

Drainage 3. Water Drained out of  
water bodies

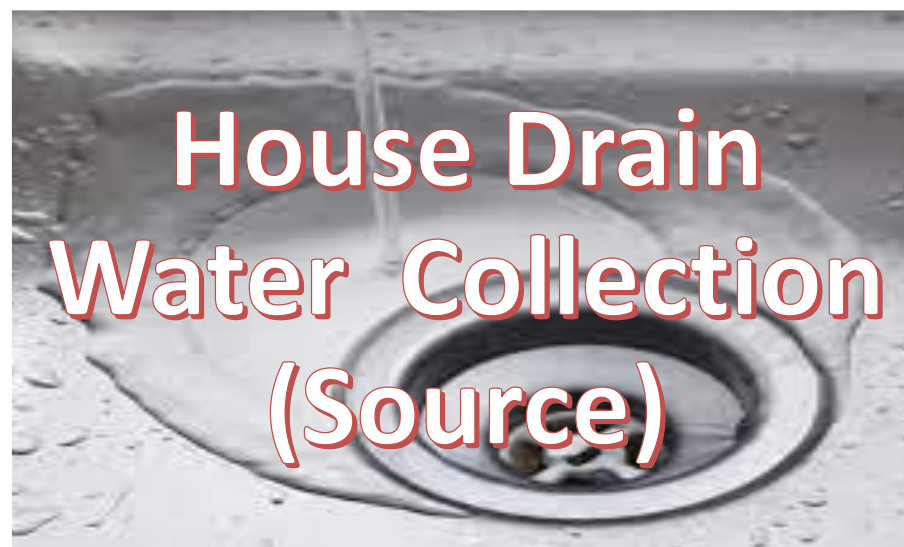


# **DRAIN** WATER REGAIN DRAIN WATER HARVESTING



Sink Drain Water  
Collection  
(Source)

A close-up photograph of a white sink drain with a circular metal grate. The drain is set into a light-colored countertop. The text is overlaid in a red, outlined font.



House Drain  
Water Collection  
(Source)

A close-up photograph of a white house drain with a circular metal grate. The drain is set into a light-colored floor. The text is overlaid in a red, outlined font.



Sink Drain Water  
Collection  
(Decentralised)

A close-up photograph of a white sink drain with a circular metal grate. The drain is set into a light-colored countertop. The text is overlaid in a red, outlined font.



Lake Drain Water  
Collection  
(Centralised)

A wide-angle photograph of a large, circular, shallow concrete basin filled with water, situated in a natural landscape with trees and hills in the background. The text is overlaid in a red, outlined font.

# STORM WATER DRAIN LAKES & PONDS GAIN





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

66.

**CROPS IRRIGATE**

**not IRRITATE**

# **CROPS IRRIGATE NOT IRRITATE**

The farm sector gets maximum water and it should get. The farm sector gets maximum water and it should get. But the irrigation methods are outmoded.

They should learn to use less water and get maximum yield like Israeli

Farmers

# IRRIGATE, not IRRITATE the CROPS



# IRRIGATE, not IRRITATE the CROPS

Flood irrigation, the conventional method of irrigation in NW India, can be highly inefficient where flow rates are inadequate to complete the irrigation quickly (a couple of hours). The inefficiency is due to deep drainage below the rootzone. Flood irrigation also causes temporary waterlogging, with adverse effects on crops like wheat, maize, and legumes. Waterlogging is more prolonged and more severe on heavy textured soils, and on soils used for rice culture because of the well-developed, shallow, hard pan (slowly permeable) as a result of puddling. This leads to aeration stress in upland crops, especially in wheat (Kukul and Aggarwal, 2003). Modern, pressurized irrigation systems (center pivot and lateral move sprinkler, micro-sprinklers, surface drip and subsurface drip) have the potential to increase irrigation water use efficiency by providing water to match crop requirements, reducing runoff and deep drainage, and generally keeping the root zone drier. Drier soil also means less waterlogging, lower soil evaporation, and increased capacity to capture rainfall, further reducing runoff and deep drainage

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**

# Canal & Channel, the difference

The main difference between canal and channel is that **canals usually refer to artificial waterways** while channels refer to natural waterways. ...

But a channel is a natural waterway between two landmasses that lie close to each other



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

கால்வாய்

67.

**CHANNEL**

**CHISEL**



# CHANNEL CHISEL

A channel is a **wide strait or waterway between two landmasses that lie close to each other**. A channel can also be the deepest part of a waterway, or a narrow body of water that connects two larger bodies of water. Some channels were created by glaciers that carved out deep canyons between two landmasses.





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**68.**

**CANAL**

**-CARDINAL**

# **CANAL -CARDINAL**

**A canal is a human-made waterway that allows boats and ships to pass from one body of water to another.**



# CANAL



# IRRIGATION CANAL





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

சுற்ற  
லை

69.

**RIVULET**  
**RADIANT**

# RIVULET RADIANT





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

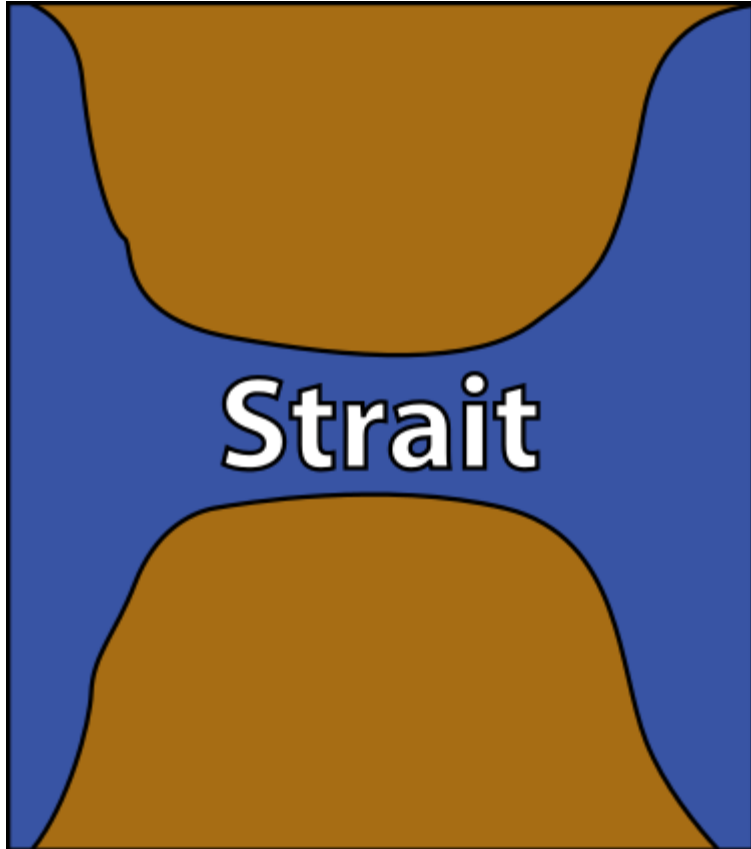
**70.**

**STRAIT**

**WATER STRAIGHT**



A **strait** is a naturally formed, narrowing, typically **navigable** waterway that connects two larger bodies of water.



A **strait** is a naturally formed, narrowing, typically **navigable** waterway that connects two larger bodies of water.





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

சங்கமம்

71.

**CONFLUENCE**  
**NONINFLUENCE**

# CONFLUENCE, noninfluence

- In geography, a **confluence** (also: *conflux*) occurs where two or more flowing bodies of water join together to form a single channel.
- A confluence can occur in several configurations: at the point where a tributary joins a larger river (main stem); or where two streams meet to become the source of a river of a new name (such as the confluence of the Monongahela and Allegheny rivers at Pittsburgh, forming the Ohio); or where two separated channels of a river (forming a river island) rejoin at the downstream end.



**Confluence of 6 rivers**



**Confluence of three great lakes Lakes Superior, Michigan and Huron**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**72.**

**DESALINATE  
BUT DON'T ALIENATE  
NATURE /ENVIRONMENT**

**DESALINATE –BUT DON'T ALIENATE  
NATURE /ENVIRONMENT**

**MAKE SEA WATER as DRINKING  
WATER,**

**without Alienating Nature**

**/Environment , with caution &**

**less damage to Nature /environment.**

# SEA

## by SEA WATER DESALINATION







# GRAPHENE FILTERS

- Desalination, converting saltwater into freshwater, has historically been too expensive and energy-intensive to serve as a widespread solution for improving access. However, Lockheed Martin has developed and patented a Perforene graphene filter which it claims would reduce the energy cost of conventional reverse osmosis desalination by 20%, while withstanding higher pressure and temperatures. The perforated, hyper-permeable filter is one atom thick and is said to improve the flow of water compared to conventional methods by 500%. While the technology would be hugely beneficial to the oil and gas sector, which reportedly produces 18bn gallons of wastewater each year, the company is also researching other applications for the technology, including in food and energy generation.



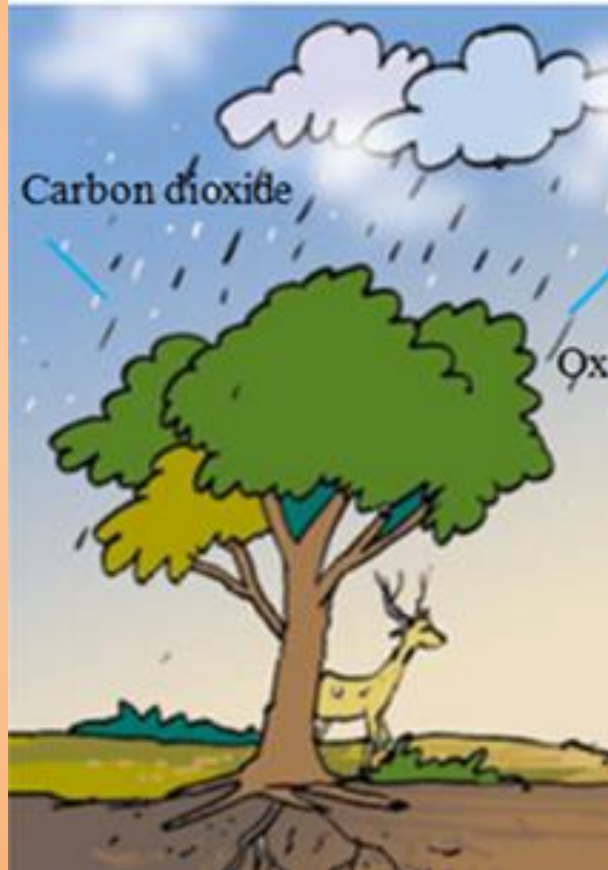
**WATER ASSETS ExNoRa**  
**WATER FOREVER**

73.

**CLOUD**

**-THINK ALOUD**

# CLOUD, THINK ALOUD





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

நீர்வழி

74.

**WATERWAYS**

**what a way to WATER's WAYS**

**-WATER for Consumption, Transport  
& Sports / entertainment**

# **WATERWAYS**

- Best drainage for the rain caused flood
- Transport of humans, animals & goods easily at less cost
- Water for consumption for all living species
- Water Farming
- Water for Farming
- Water for Industries
- Water for sports
- Water for pastime
- Water for entertainment

# WATER WAYS what a way to WATER & WATER TRANSPORT



# Water Transport

## \* *Advantages*

- Cheapest Mode of Transport.
- Large Carrying Capacity.
- Safety.
- Protection to Goods.
- Flexibility.



# **Buckingham Canal much before so called development was used as a water way for transport particularly commercial**





# WATER COURSE



The image features a vibrant background of a tomato soup with yellow pasta rings. In the center, there is a rounded rectangular orange box containing the word "incredible" in a white, bold, sans-serif font.

**incredible**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

நீர்வழி

75.

**WATER SHED**  
**WATER LAND**

## 4. Watershed management

### Contour trenches



Contour trenches trap rain water, enable it to percolate to underground aquifers and break the speed of fast moving water

*Source: WOTR n.y.*

## 4. Watershed management

### Contour trenches



Stone bunds across the slope to arrest the flow of water and control erosion in areas where soil work is not possible

*Source: WOTR n.y.*

## 4. Watershed management

### Afforestation & field bunds



Afforestation and pasture development on barren wastelands (top) and field bunds (bottom)

*Source: WOTR n.y.*

## 4. Watershed management

### Gully plugs and nala bunds



Gully plugs and nala bunds help to control the flow of water, sedimentation and recharge ground water  
aquifers

Source: WOTR n.y.

## 4. Watershed management

### Check dams and percolation tanks



Check dams and percolation tanks at the lowest end of the drainage outlet

*Source: WOTR n.y.*



# Watershed Waterland

- A watershed is **an area of land that drains or “sheds” water into a specific waterbody**. ... Watersheds drain rainfall and snowmelt into streams and rivers. These smaller bodies of water flow into larger ones, including lakes, bays, and oceans.

# TYPES OF WATERSHED

- Watersheds is classified depending upon the size, drainage, shape and land use pattern.
- Macro watershed (> 50,000 Hect)
- Sub-watershed (10,000 to 50,000 Hect)
- Milli-watershed (1000 to 10000 Hect)
- Micro watershed (100 to 1000 Hect)
- Mini watershed (1-100 Hect)

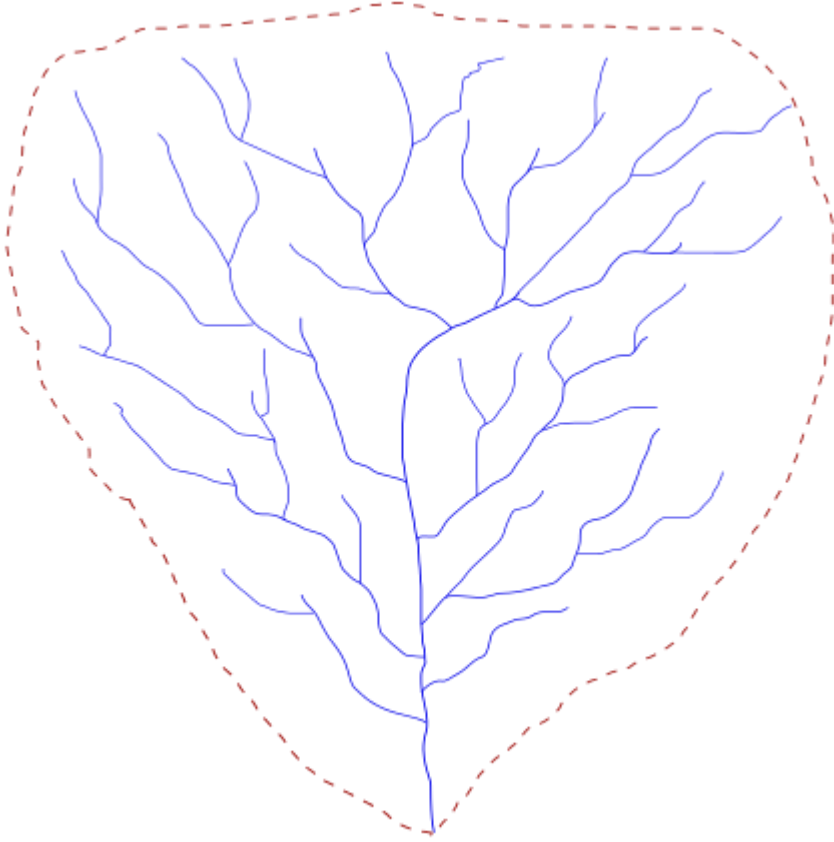
# நீரேந்து பிரதேசம்

- A watershed is an area of land that drains all the streams and rainfall to a common outlet such as the outflow of a [reservoir](#), mouth of a bay, or any point along a [stream](#) channel. Watersheds can be as small as a footprint or large enough to encompass all the land that drains water into rivers that drain into Chesapeake Bay, where it enters the Atlantic Ocean. This map shows one set of watershed boundaries in the continental United States; these are known as National hydrologic units (watersheds).
- The word "watershed" is sometimes used interchangeably with drainage basin or catchment. Ridges and hills that separate two watersheds are called the drainage divide. The watershed consists of [surface water](#)--lakes, streams, reservoirs, and [wetlands](#)--and all the underlying [groundwater](#). Larger watersheds contain many smaller watersheds. It all depends on the outflow point; all of the land that drains water to the outflow point is the watershed for that outflow location. Watersheds are important because the streamflow and the [water quality](#) of a river are affected by things, human-induced or not, happening in the land area "above" the river-outflow point.

# நீரேந்து பிரதேசம் (WATERSHED)

- **வடிநிலம்** (Drainage basin) என்பது, மழை அல்லது உருகும் பனி போன்றவற்றை ஏந்தி, ஆறு, ஏரி, கடல், ஈரநிலங்கள் போன்ற நீர்த்தேக்கங்களுள் வடிந்தோடச் செய்வதற்கான நிலப்பகுதி ஆகும். வடிநிலம் என்பது, நீரைக் காவிச்சென்று மேற்படி நீர்த்தேக்கங்களுக்குள் செலுத்தும் **சிற்பாறுகள்**, **ஆறுகள்** போன்றவற்றையும், இத்தகைய நீர் வழிகளுக்குள் நீரை வடியவிடும் நிலப்பகுதிகளையும் ஒருங்கே குறிக்கிறது. **நீரேந்து பகுதி** என்பதுவும் இதே கருத்துருவை விளக்கும் சொல்லே.
- நீர் நிலை ஒன்றுக்கான நீர் வடிந்துவந்து சேரக்கூடியவகையில் **மழைவீழ்ச்சி** மற்றும் பனிப்பொழிவைப் பெறும் பிரதேசம் அதன் **நீரேந்து பிரதேசம்** எனப்படும். வழமையாக நீரேந்து பிரதேசத்தின் வெளிச்செல்லும் பாதை **ஆறு**, **ஏரி**, **ஓடை**, **கடல்**, **பெருங்கடல்** மற்றும் **ஈரநிலம்** போன்றவையாகக் காணப்படும். மூடப்பட்ட நீரேந்து பிரதேசங்களில், ஒன்றுசேரும் நீர் நீரேந்து பிரதேசத்தினுள்ளேயே ஒரு தனிவடிச்சலாக

வடிநிலம். புள்ளிக் கோடு நீரேந்து பிரதேசத்திலிருந்து நீர் வடியும் பாதையை, நீரேந்து பகுதிகளுக்கு இடையிலான பிரி கோட்டைக் குறிக்கின்றது.



வடிநிலம்.  
புள்ளிக் கோடு  
நீரேந்து  
பிரதேசத்திலிரு  
ந்து நீர் வடியும்  
பாதையை,  
நீரேந்து  
பகுதிகளுக்கு  
இடையிலான  
பிரி கோட்டைக்  
குறிக்கின்றது.

# First rain on world's largest artificial manmade watershed

- Manmade hillsides inside the University of Arizona's Biosphere 2 provide researchers with the first opportunity to study how water, microbes, soil and plants interact in a setting realistic enough to improve global climate models for years to come.
- Rain in Southern Arizona is scarce and precious to begin with, but the afternoon shower that soaked the soil 25 miles north of Tucson on Nov. 29 was unusual in several ways.
- Spouting from a network of pipes, thousands of gallons of water drizzled down onto the world's only and largest manmade experimental watershed
- Six-hundred tons of ground-up volcanic rocks blanket a giant steel tub resting at an incline to form an artificial hillslope. Three identical such hillslopes, each measuring 100 feet long and 40 feet wide, were constructed side by side to form the Landscape Evolution Observatory, or LEO, with the first now fully functional.

# First rain on world's largest artificial watershed

by University of Arizona



Once completed, three hillslopes side by side will make up the Landscape Evol...

Manmade hillsides inside the University of Arizona's Biosphere 2 provide researchers with the first opportunity to study how water, microbes, soil and plants interact in a setting realistic enough to improve global climate models for years to come.

# First rain on world's largest artificial manmade watershed

Once completed, three hillslopes side by side will make up the Landscape Evolution





- The backwaters have a unique ecosystem: freshwater from the rivers meets the seawater from the Arabian Sea. A [barrage](#) has been built near [Thanneermukkom](#), so salt water from the sea is prevented from entering the deep inside, keeping the fresh water intact. Such fresh water is extensively used for [irrigation](#) purposes.<sup>[6][7]</sup> Many unique species of aquatic life including [crabs](#), [frogs](#) and [mudskippers](#), water birds such as [terns](#), [kingfishers](#), [darters](#) and [cormorants](#), and animals such as [otters](#) and [turtles](#) live in and alongside the backwaters. [Palm](#) trees, [pandanus](#) shrubs, various leafy plants, and bushes grow alongside the backwaters, providing a green hue to th





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

ಕರ್ನಾಟಕದ  
ಕುಡಿಯುವ  
ನೀರು

76.

**BACKWATERS**

**back us with WATER**

- **Sponge Cities: Revolutionizing Surface Water Management in Urban Environments**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

ಕರ್ನಾಟಕ ಸರ್ಕಾರ

77.

**BACKWATERS**

**back us with WATER**

# The Allepey backwaters have a unique ecosystem:

The backwaters have a unique ecosystem: freshwater from the rivers meets the seawater from the Arabian Sea. A **barrage** has been built near **Thanneermukkom**, so salt water from the sea is prevented from entering the deep inside, keeping the fresh water intact. Such fresh water is extensively used for **irrigation** purposes. Many unique species of aquatic life including **crabs**, **frogs** and **mudskippers**, water birds such as **terns**, **kingfishers**, **darters** and **cormorants**, and animals such as **otters** and **turtles** live in and alongside the backwaters. **Palm** trees, **pandanus** shrubs, various leafy plants, and bushes grow alongside the backwaters, providing a green hue to the surrounding landscape.





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

78

**FOG CATCHER**  
**WATER CAPTURE**



M

**FOG CATCHING**

**NETS**

# FOG CATCHERS

- VAST MESH NETS CAPTURE MOISTURE FROM FOG, WHICH DRIPS INTO COLLECTION TRAYS AFTER CONDENSATION. THE LARGEST OF THESE PROJECTS IS **ON THE SLOPES OF MOUNT BOUTMEZGUIDA**, A MICROCLIMATE IN MOROCCO WHERE 6,300 LITRES OF WATER CAN BE HARVESTED PER DAY. THE WATER IS CLEAN, FREE AND INSTANT, WHICH IS PERHAPS WHY **DAR SI HMAD** – THE NON-PROFIT RESPONSIBLE FOR THE PROJECT – WAS AWARDED THE UN'S 2016 **MOMENTUM FOR CHANGE** AWARD. FIRST DEVELOPED IN SOUTH AMERICA, FOG CATCHING SYSTEMS ALSO EXIST IN CHILE, **PERU**, GHANA, ERITREA, SOUTH AFRICA AND CALIFORNIA.





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

79

**SEA WATER**

**SEE WATER**

# SEA SALTY WATER

## SEE DRINKING WATER x 3

1. DESALINATION
2. BORE WATER
3. GESTURE by NATURE

Bore water, even near the sea, will be excellent water for drinking.

Not very long. The people will soon see BORE WATER has become SALINE.

There is a simple solution. The people must also give back water via the very same BORE WELL. The two practices they must start are 1. BORE FORE & 2. BORE POUR, This is also giving back water a. the water drawing bore. b, Bore fore. That is putting additional simple BORES for only recharge. 3. They can inject water via exclusive simple recharge bores (BORE POUR). The people must also give back instead of only TAKING from GROUND. Excessive taking/tapping water from the GROUND is called an EXPLOITATION. PEOPLE SUCK WATER by BORE (BORE CORE). If all residents living along the seashore and a minimum of 10 square kilometers area do 1. BORE FORE & 2. BORE POUR, they can enjoy excellent bore water lifelong. In Nature, it can never be one-way traffic, but two-way traffic.

# BORE WATER

Bore water, even near the sea, will be excellent water for drinking. Not very long. The people will soon see BORE WATER has become SALINE.

There is a simple solution. The people must also give back water via the very same BORE WELL.

The two practices they must start are

1. BORE FORE &
2. BORE POUR
3. This is also giving back water
  - a. Existing Bore. i.e. the water drawing bore already in use.
  - b. Bore fore. That is putting additional simple BORES for only recharge.
  - c. They can inject water via exclusive simple recharge bores (BORE POUR).

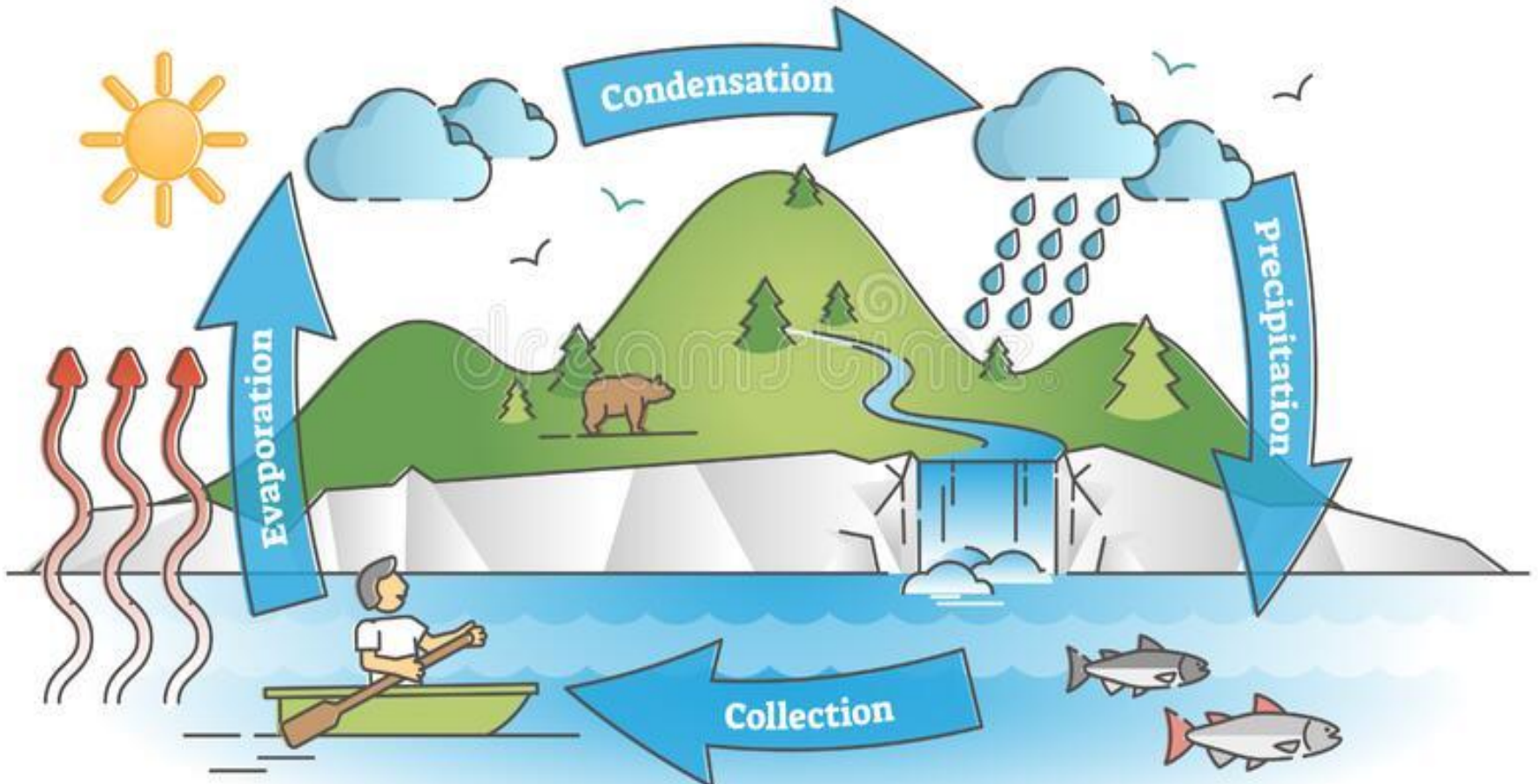
# BORE WATER after BORE FORE & BORE POUR



- The people must also give back instead of only TAKING from GROUND.
- Excessive taking/tapping water from the GROUND is called an EXPLOITATION.
- PEOPLE SUCK WATER by BORE (BORE CORE).
- If all residents living along the seashore and a minimum of 10 square kilometers area do
  1. BORE FORE &
  2. BORE POUR, they can enjoy excellent bore water lifelong without salinity
- In Nature, it can never be one-way traffic, but two-way traffic.

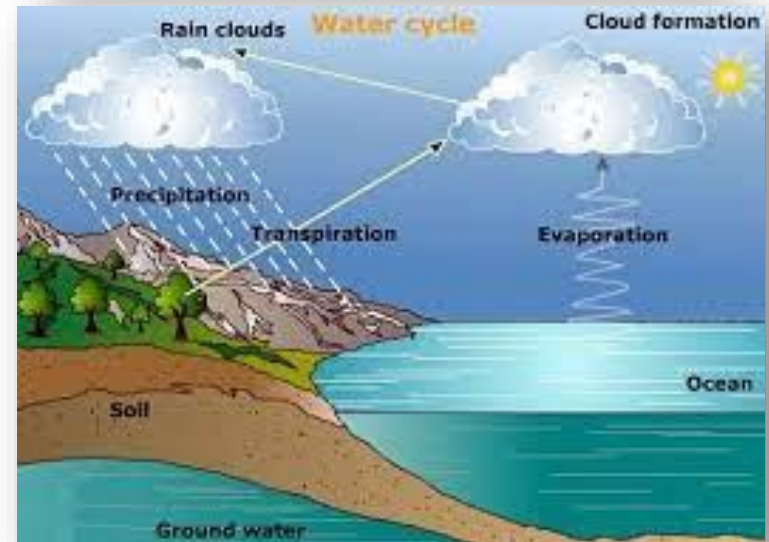
# GESTURE by NATURE

## WATER CYCLE



# Sea water evaporation Nearness of SEA is an advantage

- Oceanic water is **saturated with salt**. ...
- This creates evaporation of the water.
- The water is evaporated into the air, forms or goes into clouds, and then returns in the form of precipitation.
- This is what is called the water cycle.
- When ocean saltwater evaporates, the salt in the water is left in the water (sea).
- Definitely the rain is more in places near the sea shore





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

80

**FLOATING ICEBERG**

**UNPLUG**

# Iceberg

- An iceberg is a **piece of freshwater ice more than 15 m long that has broken off a glacier or an ice shelf** and is floating freely in open (salt) water







# 3. Ice Berg TAG



UAE billionaire plans to ease dr...  
dkoding.in



Plan unveiled to tow icebergs fr...  
arabianbusiness.com



A company's wild plan to tow a...  
pnj.com



Dubai wants to drag icebergs fr...  
nypost.com



INCREDIBLE!!!! -- UAE is bringin...  
youtube.com



Indian Ocean  
ukmto.org



UAE-iceberg - Al Bilad English D...  
albiladdailyeng.com



A United Arab Emirates company plans to tow an iceberg from Antarctica to the UAE to fight drought and supply 1 million people with 5 years of water.



Bizarre plot to 'save Antarctica' ...  
thesun.co.uk

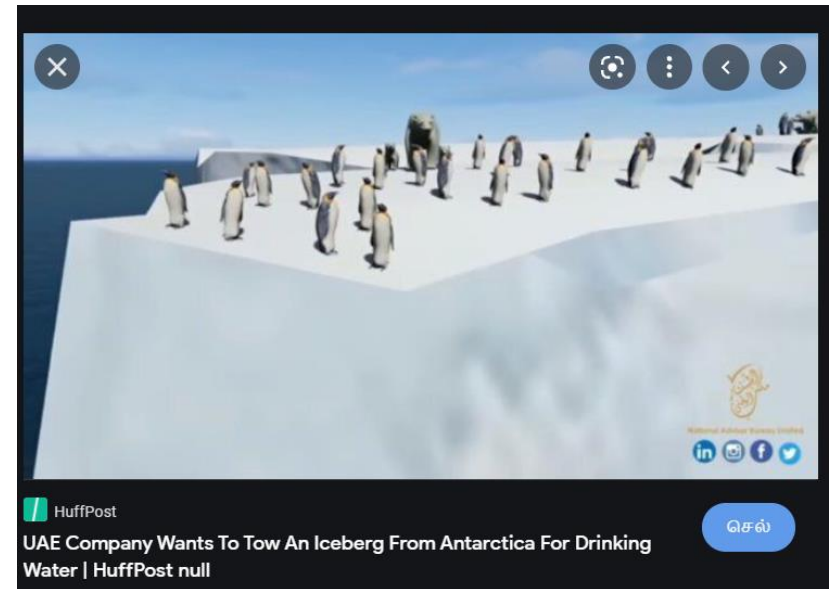


Woah! Towing an ice berg for fr...  
steemit.com



# UAE plans to drag an ICEBERG from Antarctica to provide drinking water for millions

- The UAE is at serious risk of droughts over the next 25 years due to its climate
- One iceberg could provide enough for one million people over five years
- An eco-firm plans to tow them around 5,500 miles (8,800 km) to harvest water



- What really is the difference between glaciers and icebergs?
- No, it's not a Seinfeld bit. It's actually a very common question.
- Glaciers are large sheets of ice that can extend for miles. Larger glaciers are referred to as continental glaciers, which start at a central point and spread out as they accumulate more ice and other debris like dirt and rock. Glaciers are located in the Arctic and Antarctica, with the largest glaciers appearing in Antarctica.
- Icebergs, on the other hand, are smaller pieces of ice that have broken off (or calved) from glaciers and now drift with the ocean currents. Icebergs calve from glaciers when direct sunlight or rising air temperature cause the glacier's surface ice to become more brittle. Only the larger continental glaciers create icebergs, as it typically does not happen that a mountain glacier releases an iceberg into the sea.



**Bloomberg**  
320 x 180

**A PLAN TO BRING WATER TO 4 MILLION PEOPLE**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

81

**GLACIER**

**SAVIOUR**

**If it melts we will not be  
there**

# GLACIER



# FROZEN WATER







**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**INNOVATIONS  
GALORE**

**82.**

# **DIVERT & CONVERT**

**Divert raw sewage to barren land and see what happens there after a couple of years**

**CONCEPT & NOMENCLATURE: Exn. M B NIRMAL**





**BREATHING LIFE  
INTO BARREN LAND**

# Water Body Protection & its conservation



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**83.**

**ZERO  
HERO**

**Zero Waste management is a must  
in the residential homes and  
streets in the area /  
neighbourhood of the water body**

# **ZERO HERO** Zero Waste management is a must in the residential homes and streets in the area / neighbourhood of the water body

**ZW**  
recycler

## Zero Waste Segregation and Management

Days Churni & Company is manufacturing Waste Segregation Plant and other MSW Plants and Machinery Zero Waste is a set of principles focused on waste prevention that encourages the redesign of resource life cycles so that all products are reused.

Solid Waste Management is carried through various Waste Segregation equipment like Zero Waste Recycler Machine, MSW Plants and Machinery, Rotating Separator, Municipal Solid Waste Segregation Plant, Trainers and other zero waste technology, Waste Recycler Technique.

PLASTIC ORGANIC GLASS  
E-WASTE GREEN METAL

**ZERO WASTE**





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

84.

**LAWN  
LESSON**

# LAWN LESSON-

LAWN are **BANE** or **BOON**





# LAWN LESSON-

## BANE

- Lawns take the space that could be used for TREES
- Lawns need a lot of water which is already scarce
- Lawn-growers use chemical fertilisers which pollute groundwater
- Lawns need pesticides again a polluter
- Lawn needs fuel operated Lawn mowers which pollute
- Lawns unlike trees deprive Habitat for Birds, reptiles, insects and wildlife

## BOON

- Lawns are treat to eyes
- Place to sit and relax/ meditate & Space for people to gather
- Lawns clean the air and trap CO<sub>2</sub>.
- Lawns trap stormwater runoff.
- Lawns improve the soil structure.
- Lawns reduce noise pollution.
- Lawns keep you cooler and may save you money.



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**85.**

**GOLF**

**OFF**

# GOLF OFF



- THE ANTI-GOLF movement is gaining momentum almost in tandem with the game's popularity. Anti-golf activists see the sport as "the most serious environmental problem in the world". Tricia Barnett, a British conservationist and supporter of the Global Anti-Golf Movement (GAGM) (Down To Earth, August 15, 1993), thinks the campaign has struck a raw nerve because of "the horror of thinking that something that's for leisure and pleasure is really destructive".

Environmentalists say the rapid growth of the sport is harmful to nature because golf courses take up farm and forest land, destroy natural landscapes, cause erosion, disrupt drainage patterns, consume and pollute scarce water supplies and kill wildlife through excessive chemical use.

Japan -- a nation of avid golfers -- has led to very high club membership fees and long waiting lists. To solve the crisis, Japanese course developers and golfers have headed abroad. Japanese money has helped build many golf courses in Queensland, Australia.

# TREE SPREE

**TREES** play an important role  
in getting us **RAIN**.





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**86.**

**PARK  
REWORLD**

# PARK REWORK



**PARK with LAWN**



**NO**



**PARK with TREES**



**YES**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**87.**

**ExNoRa Tree  
Challenge**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**88.**

**Amazon in my  
BACKYARD**





**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**89.**

**Responsibility**

**Nobility**

**CSER for Tree planting**

# RESPONSIBILITY NOBILITY

Everyone Focus: **CSE****R** x 3

**C**ONSUMERS ,

**C**ITIZENS &

**C**CORPORATES

**S**OCCIAL &

**E**NVIRONMENTAL

**R**ESPONSIBILITY

The logo consists of the letters 'CSER' in a bold, white, sans-serif font. The letters are set against a dark red, textured rectangular background.



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**90.**

**MOTHER  
EARTH  
PLEDGE**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**91.**

**BROTHER SISTER**  
**TREE PLEDGE**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**via**

**5<sup>th</sup> PILLAR**

[www.5thPillar.in](http://www.5thPillar.in)

**92.**

**Eruption against  
Corruption  
(in Water Issues)**

# Map App

**EVERYONE'S ROLE**

**ERUPTION**

**against**

**CORRUPT**

**(End Water Corruption)**

**via**

**5<sup>th</sup> Pillar**

**Service to your  
ORGANISATION  
WATER BODIES ExNoRa**



# **WATER BODIES ExNoRa for WATER RESOURCE**

## **ORGANISATIONAL MECHANISM & SERVICE TORCH-BEARERS**

**PRESIDENT**

**VICE  
PRESIDENT  
COMPANION  
CHAPTERS**

**GENERAL  
SECRETARY**

**JOINT GENERAL  
SECRETARY  
TALENT BANK:  
PATENT LATENT  
POTENT TALENT**

**FINACIAL  
CONTOLLER  
FINANCIAL  
MANAGEMENT**

**JOINT FINACIAL  
CONTOLLER  
FUNDS MOBILISATION  
(Funds Endless)**

# **WATER BODIES ExNoRa** for **WATER RESOURCE**

## **ORGANISATIONAL MECHANISM & SERVICE TORCH-BEARERS**

### **DIRECTOR MEMBERSHIP**

**& Human Resource  
Mobilisation, Volunteer  
Induction**

### **DIRECTOR TRAINING**

**WATER MANAGEMENT &  
MAN MANAGEMENT  
(HR)**

**DIRECTOR  
WATER QUANTITY  
/ QUALITY &  
UPGRADE BRIGADE  
(e.g. Lake Ponds)**

**DIRECTOR  
ENVIRONMENT  
(WATER BODY TREE  
PLANTING, GARDENING  
& COMPOSTING)**

**DIRECTOR  
SAFETY  
of WATER BODIES,  
WATER, USERS & PEOPLE**

**DIRECTOR  
EVENTS, PROJECTS  
& ACTIVITIES  
(Invent Event)**

**DIRECTOR  
PEOPLE'S WORLD  
(People's Integration)  
FITNESS, INDIVIDUAL  
DEVELOPMENT &  
ENTERTAINMENT (Marina  
Beach of each place)**

**DIRECTOR  
ExNoRa WORLD  
Home ExNoRa, RWA  
ExNoRa, Student  
ExNoRa, Office ExNoRa,  
etc. to control waste.**

**DIRECTOR  
PUBLIC RELATIONS  
(Government, Media,  
Service Clubs & People)**



**WATER ASSETS ExNoRa**  
**WATER FOREVER**

**Gift**

**1. BEACH  
within your REACH**

**YOUR PLEASURE**

# **BEACH within your REACH**

**WATER ASSETS ExNoRa .**

**Cities along the sea-shore have Beaches having different attractions. For the people, who don't have a beach, their water body can be made their BEACH. Their water body will become their meeting place, walking track, yoga spot and place for relaxation**

# BEACH within your REACH

Integrate people with Water Body. Each WATER BODY is MARINA BEACH for the people of the area, Public Speaking , Yoga, children playground , Gym , etc.



**Walking on  
walking track**



**Yoga**



**Group  
Laughter**



**GYM**



**Children Play  
Ground**



**Benches to  
sit**

# BEACH within your REACH



**Toilet**



**Water Booth**



**Rain Shelter**



**LAKE BOATING**



**ExNoRa Speak  
& Peak**



**Tuition ExNoRa  
Teach Reach**

Map Ap

# Human Resource Mobilisation

LATENT

PATENT

POTENT

TALENT



Data Stata

Inventory

Greenary

# Waste Management

# RESPONSIBILITY NOBILITY

Everyone Focus: **CSER** x 3

**C**ONSUMERS ,  
**C**ITIZENS &  
**C**CORPORATES  
**S**OCCIAL &  
**E**NVIRONMENTAL  
**R**ESPONSIBILITY

The logo for CSER, consisting of the letters 'C', 'S', 'E', and 'R' in a bold, white, sans-serif font. The letters are set against a dark red, textured background that resembles a brick wall or a similar pattern.

# Water Conservation

**WEBSITES**  
will have

**PPTs**

**E BOOKS &  
E BROCHURES**

**BLOGS**

**Videos  
Corner**

**ONLINE  
COMMUNITIES'  
LINKS**

**Live  
Chat**

**Live  
Telecasts**

**facebook**

**twitter™**



**Instagram**

**Linked in®**

Nostradamus Nirmal  
[www.facebook.com/Garbageologist](http://www.facebook.com/Garbageologist)

[@mbnirmal](https://twitter.com/mbnirmal)

[exnora\\_nirmal](https://www.instagram.com/exnora_nirmal)

[www.linkedin.com/in/mbnirmal](http://www.linkedin.com/in/mbnirmal)

**CONTACT DETAILS :**

**Exn Dr. Nirmal Basu GPian**

**(The following tributes given by News Media & Service Organisations)**

**7<sup>th</sup> SENSE MASTER**

**METAPHYSICIST**

**ONENESS MESSIAH**

**WORDSMITH (NEO-LEXIAN)**

**GARBAGELOGIST**

**ENVIRONMENTALIST**

**SOCIAL ACTIVIST**

**ORATOR, AUTHOR, WRITER**

**INTERNATIONAL HUMAN WEALTH DEVELOPMENT TRAINER**

**INNOVENTOR (INNOVATOR + INVENTOR)**

**& Founder, ExNoRa INNNOVATORS INTERNATIONAL & 5<sup>th</sup> PILLAR & 50 ORGANISATIONS (see the website list)**

**CONCEPT  
7<sup>th</sup> Sense  
Master**



**A TEDx SPEAKER**

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