

# From the home to the city Urban Permaculture ideas

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# Connections

- How does the part relate to the whole ?
- Can we have islands of excellence in a sea of mediocrity ?
- How do we build the people thing ?

Muniappa, the well digger who has dug more than 3000 recharge wells



# Learning skills have to be imparted to plumbers



# What is permaculture ?

- One definition (there are many )
- CREATING SUSTAINABLE HUMAN HABITATS BY FOLLOWING NATURE'S PATTERNS
- Comes from **permanent agriculture** and then **permanent culture**

# Who is it for ?

- It is for everyone wishing to live sustainable and tread more lightly on the Earth.

# Ethics

- **Earth care**  
respecting the earth the source of life
- **People care**  
Helping each other to live  
sustainably
- **Fair share**  
using the earths resource  
equitably

# Permaculture principles

- Work with nature not against
- See solutions not problems
- Seek diversity not monoculture
- Every element should serve many functions
- Yield is limited only by imagination
- Work in cycles and zones

– Source Permaculture a beginners guide –G.Burnett



# Build knowledge – take action

- The Ugly Indian model
- The Friends of Lakes model
- The schools model
- The Swachcha Bharat Abhiyan route
- The PIL route
- The RTI route
- The social media route

## We are a groundwater civilization

- Over 30 million wells and bore-wells
- Over 60 % of our total water requirements
- Over 85 % of our drinking water needs
  
- ..and the only source for recharge is RAIN
  
- How is groundwater managed in a city ?

# The open well is a great communicator

- Get back to the culture of the open well

# THE LIBERATOR – THE HOLE IN THE GROUND WHICH YIELDED PRECIOUS WATER







# At Sarnath



## ROCK EDICTS OF ASOKA

Discovered in the year 1837 by Lt. M. Kltton, the set of Rock Edicts contain eleven out of the well known fourteen Rock Edicts of Asoka (BC. 273-236). The language of the edicts is Magadhi Prakrita and the script being the early Brahmi. Here the omission of the thirteenth edict is deliberate as it describes Asoka's conquest of Kalinga involving a great carnage, captivity and misery of the people. The Kalinga war was the turning point in his career and he not only gave up his ambition of Digvijaya but also converted him into Dharmasoka from Chandasoka. In place of the eleventh, twelfth and thirteenth rock edicts, two special edicts known as Separate Rock Edicts or Kalinga Edicts have been incorporated here, which are conciliatory in nature and meant for the pacification of the newly conquered people of Kalinga.

On the rock above the inscription, is the sculpted forepart of an elephant carved out of live rock which symbolizes Buddha, the 'best of elephants' (Gajottama) as in this form he was believed to have entered his mother's womb in dream.

### SUMMARY OF THE CONTENTS OF THE ASOKAN EDICTS ARE AS FOLLOWS :

- R.E.I - Prohibition of killing of animal in the kingdom including his royal kitchen and imposition of restrictions on festive occasions (Samaja).
- R.E.II - Arrangements were made both for human and animal beings for medicinal treatments and plantation of medicinal herbs both in his and bordering kingdoms. Planted trees and dug wells on the road sides.
- R.E.III - Ordered his officials to set out on tour every five years to propagate moral codes among his subjects.
- R.E.IV - Ordered his officials to promote the practice of morality and compassion among his subjects and wished that these practice would be followed by his descendants.
- R.E.V - Appointed Mahamatras from all sects to establish and promote morality.
- R.E.VI - Ordered his officers to report him on matters of administration related to the affairs of the people at all times and at all places.
- R.E.VII - Self control and purity of mind are objects of attainment for all sects.
- R.E.VIII - On the tenth year of his anointment, he went out to Sambodhi which was followed by visit to the Brahmanas and Sramanas, helped the poor and propagate morality.
- R.E.IX - Recommended the practice of morality, consisting of courtesy to slaves and servants, reverence to elders, gentleness to animals and liberality to Brahmanas and Sramanas.
- R.E.X - Proclaimed that morality is the only act of fame and glory.
- R.E.XIV - Inscribed way of morality at various places in his vast empire according to the subject matter and places.

### SPECIAL ROCK EDICTS:

- S.R.E.I - Addressing the Mahamatras of Toshali, Asoka proclaims that all his subjects are just like his own children and he wishes their welfare and happiness both in this world and the other as he desires for his own children. He orders his officials to be free from anger and hurry so that no body will be punished without trial.
- S.R.E.II - He ordered the Mahamatras of Toshali to assure his piety to the unconquered border territories of forest region (Atavikas).



Handwritten text in a cursive script, likely a historical document or manuscript, written on aged, textured paper. The text is arranged in approximately 10 horizontal lines, though some are partially obscured by a diagonal crease or fold in the paper. The ink is dark and the paper shows signs of wear, including discoloration and a prominent diagonal crease running from the upper left towards the lower right. The script is dense and appears to be a form of historical shorthand or a specific regional dialect.











# Examples

- Belgaum city
- Rainbow Drive
- Classic Orchards
- Jakkur Lake

# Bangalore groundwater

- About 400,000 borewells
- About 400 MLD of water pumped out daily
- Falling groundwater table in the periphery
- Rising water table in the city centre
- Regulation and communitisation of groundwater a must.



# Rainbow Drive



- 37 acres on Sarjapur Road
- 360 plots
- No BWSSB supply
- Only groundwater as source.

# What Rainbow Drive did

- Banned private bore-wells
- Shared community bore-wells 3 numbers
- Made recharge as a community , over 260 recharge wells
- Put in a place a tariff system based on true cost
- Treated wastewater from WWTP being used for non-potable use
- Now completely self sufficient for water



# CLASSIC ORCHARDS

## -Phase 1 &-Phase 2

● THE ABOVE LAYOUT MAP IS NOT TO SCALE  
THIS MAP IS ONLY FOR DIRECTIONAL PURPOSE

- PARK
- WELL
- PATH WAY
- CLUB HOUSE
- COMMON AREA





















Adding beauty to utility . .





# SUCCESSFULLY COMPLETED PROJECTS

## WITH MINI FILTERS AND DOZING SYSTEMS

Sr. No.	Name of Work	Donated by	Water supplied to population
1	Mini filter units fitted to open well at veebhadra Nagar	Rotary Club Amwell England	12000
2	Mini filter units fitted to open well at Goodshed road Shashtri Nagar.	Indal Factory	10000
3	Mini filter units fitted to open well at Shetty Galli.		10000
4	Mini filter units fitted to open well at Navagraha Temple Kirloskar Road.		12000
5	Mini filter units fitted to open well at Shivaji Garden – Unit 1		5000
6	Mini filter units fitted to open well at Shivaji Garden Unit - II		5000
7	Mini filter units fitted to open well at Congress Well Tilakwadi.		10000
8	Mini filter units fitted to open well at Math Galli	}	12000
9	Mini filter units fitted to open well at Rayat Galli.		3000
10	Mini filter units fitted to open well at Polytechnic Compound Kakatives.		3000
11	Mini filter units fitted to open well near Darga @ Kamat Galli.		10000
12	Mini filter units fitted to open well at Khanjar Galli.		3000
13	Mini filter units fitted to open well at Tegg'in Galli, Vadagaon.		3000
14	Mini filter units fitted to open well at Konwal Galli		3000
15	Mini filter units fitted to open well at Nazar Camp, Vadagaon.		3000
16	Mini filter units fitted to open well at Joshi Mala		4000
17	Mini filter units fitted to open well at Samartha Nagar		3000
18	Mini filter units fitted to open well at PWD Quarters, Gandhi Nagar (2 Units)		10000
19	Mini filter units fitted to open well at Alwan Galli		3000

# SUCCESSFULLY COMPLETED PROJECTS

## WITHOUT MINI FILTERS AND DOZING SYSTEMS

Sr. No.	Name of the Work	Donated by	Benefited population
1	Open well project at Shivaji Nagar	Rotary Club South Belgaum	3000
2	Open well project at Khadak Galli	Rotary Club South Belgaum	2000
3	Open well project at Gondhali Galli		3000
4	Open well project at Kangral Galli		2500
5	Open well project at Yamanapur	Indal	3000
6	Open well project at Vantmuri Colony Mal Maruti.		1500
7	Open well project at Laxmi Galli, June Belgaum.		2000
8	Open well project Margai Galli, June Belgaum.		2500
9	Open well project at Harijan wada, Chavat Galli		3000
10	Open well project Kudchi.		3500
11	Open well project Bapat Galli		3000
12	Open well project Kamat Galli		2500
13	Open well project Subhash Nagar, Hindwadi		2000

**Total (B)**

**33500**

## Projects proposed and taken up during scarcity in the current year (2014-15)

Sr. No.	Name of Work	Population to be covered
1	Open well rejuvenation in Dwarka Nagar	8000
2	Open well rejuvenation in Vishwakarma Colony	500
3	Open well rejuvenation in Hulbatte Colony	5000
4	Open well rejuvenation in Sardar High School Premises	7000
5	Open well rejuvenation in Kakatives Road (Near Sardar High School)	1000
6	Open well rejuvenation in Ganapati Galli	6000
7	Open well rejuvenation in Mission Compound	4000
8	Open well rejuvenation in Jail Compound	4000
9	Open well rejuvenation in Vishnu Galli, Vadagaon.	1000
	Total (C)	36500

**Total A+B+C = 243000**



# Punar jeevan – A Rebirth

- Thus, the local **potable** water needs of as many as **1,73,000** citizens of Belgaum are now being supported through local resources - - the 15 revitalized communal wells.
- In addition, the local water needs of **33,500** citizens are being supported by the local resources available at 13 small, revitalized communal wells through public stand-posts.
- Belgaum City Corporation is the only Urban Local Body to have successfully implemented such a project, and to have supplemented the water needs of as many as **2,06,520** people out of its population of 5 lakh people, (almost 38% of its population).

# The Wider Picture

- **From the early 1990's, the 'Earth Summits' have emphasized the criticality of basic resources of our planet and the delicate balance of life forms and these resources. As a nation we are committed to reduce our 'Carbon Footprint'.**
- **Pumping urban water supply to Belgaum city from a source 52 kms away, up a steep incline to the purification works and then delivering it to various parts of the city is highly energy intensive.**
- **In contrast, lifting water from a local well just a few metres to the surface has reduced the carbon footprint of Belgaum's urban water supply considerably.**
- **We are evaluating the feasibility of installing Solar Pumps at these wells to reduce electricity consumption further.**

# **The Longer Term. Sustainability**

- **The sustainability of these wells comes from a simple hydrological fact that these wells are fed by ‘unconfined aquifers’ and a continuous flow is ensured by the excess recharge of ground water, (by rain water), percolating through the laterite layers and leading to a process called an ‘interflow’.**
- **The local office of the National Institute of Hydrology has certified that this will ensure the sustainability of these wells for at least the next 50 years.**

# Stake Holder Participation

- Recognising that the *'sine qua non'* (i.e., 'without which nothing') for the success of a community project is stake holder participation, it was decided to urge the local communities, through local leadership, to adopt the project.
- First, a house to house education campaign was undertaken to involve youth in cleaning the old wells of accumulated debris.
- **Housewives** were persuaded not to dump any more garbage in the wells and garbage collection points were established near the wells.
- **Alternate sites** were identified for **Ganesh Idol** immersion.
- **Local leaders** went from house to house to drink the first glass of water and assure the people of its potability.
- Today, there is wide spread acceptance of the Scheme because of the active involvement of the **local community**.

# ECONOMICS OF THE SCHEME

Mini filter plant with 50,000 LPH filtration capacity can supply 4 lakh litres of water per day. (8 hours pumping)

Expenditure for electricity Rs. 152 Per day.

Expenditure for chemicals Rs. 55 Per day.

Expenditure for labour Rs. 100 Per day.

**Total Rs. 307 Per Day.**

## **Cost of production :-**

$307 / 400000 \times 1000 = \text{Rs. } 0.76 / \text{ per 1000 liters}$

## **Cost of production of surface water :-**

**Rs. 10.50** per 1000 liters (Domestic Subsidized)

## **Cost of production through tanker :-**

$300 / 3000 \times 1000 = \text{Rs. } 100 / \text{ per 1000 liters}$

## **Recovery of Investment**

$4,00,000 \times 30 / 1000 \times 10.50 = \text{Rs. } 126000 \text{ per month}$

**Cost of Project : Rs. 5,00,000**

**Project Cost can be recovered within 4 Months**

# Comparative Cost

Name of the Project	Initial Cost of Project. (Rs.)	O & M cost of each unit/year (Rs.)	Benefited Population	Cost per head. (Rs.)	
				Initial O & M	
Open Well, Mini Filter Project	(19 * 5 ) 95 lakhs	1,10,520	1,56,000	60.89	13.46
Hidkal Surface Water Scheme	70 crores	29 crores	5,00,000	1,400	580

## **BENEFITS OF THE SCHEME AND SITUATION AFTER IMPLEMENTATION OF INITIATIVE**

**Ground water which is readily available locally in plenty can be utilized in a proper way.**

**Cost of production is very minimum compared to surface water supply and tanker water supply.**

**Savings in energy charges.**

**Wells and aquifers recharged due to regular use.**

**Underground water table remains clean.**

**Savings in amount spent by local body on drilling of bore wells and supply of water through tankers during scarcity.**



# Potential for replication

In the past townships used to be developed wherever there was plenty of ground water. People all over India used to crucially depend on open well water before Independence.

Unfortunately, the attention of Public Authorities shifted from these dependable, locally available sources of water to distant supplies of surface water which have proved to be seasonally variable, more expensive to harness and involve more energy consumption.

It now emerges from our efforts that those wells that had been abandoned after surface water schemes were implemented, could be rejuvenated, after conducting hydrological surveys and knowing the exact yield and sustainability. The benefits flowing from the rejuvenated wells could be passed on to succeeding generation and a clean natural resource harnessed for all time to come.

The local water needs of the people can, to some extent be met at a very reasonable cost.

However this source can only augment, not substitute, the main source of water supply to cities.

# What the city does

## The business of waste

- Sewage treatment insufficient and not all households are connected
- Untreated sewage is killing rivers though providing nutrients to farmers





# Vijayapura- falling groundwater tables



# Waste-water from the city



# Used productively

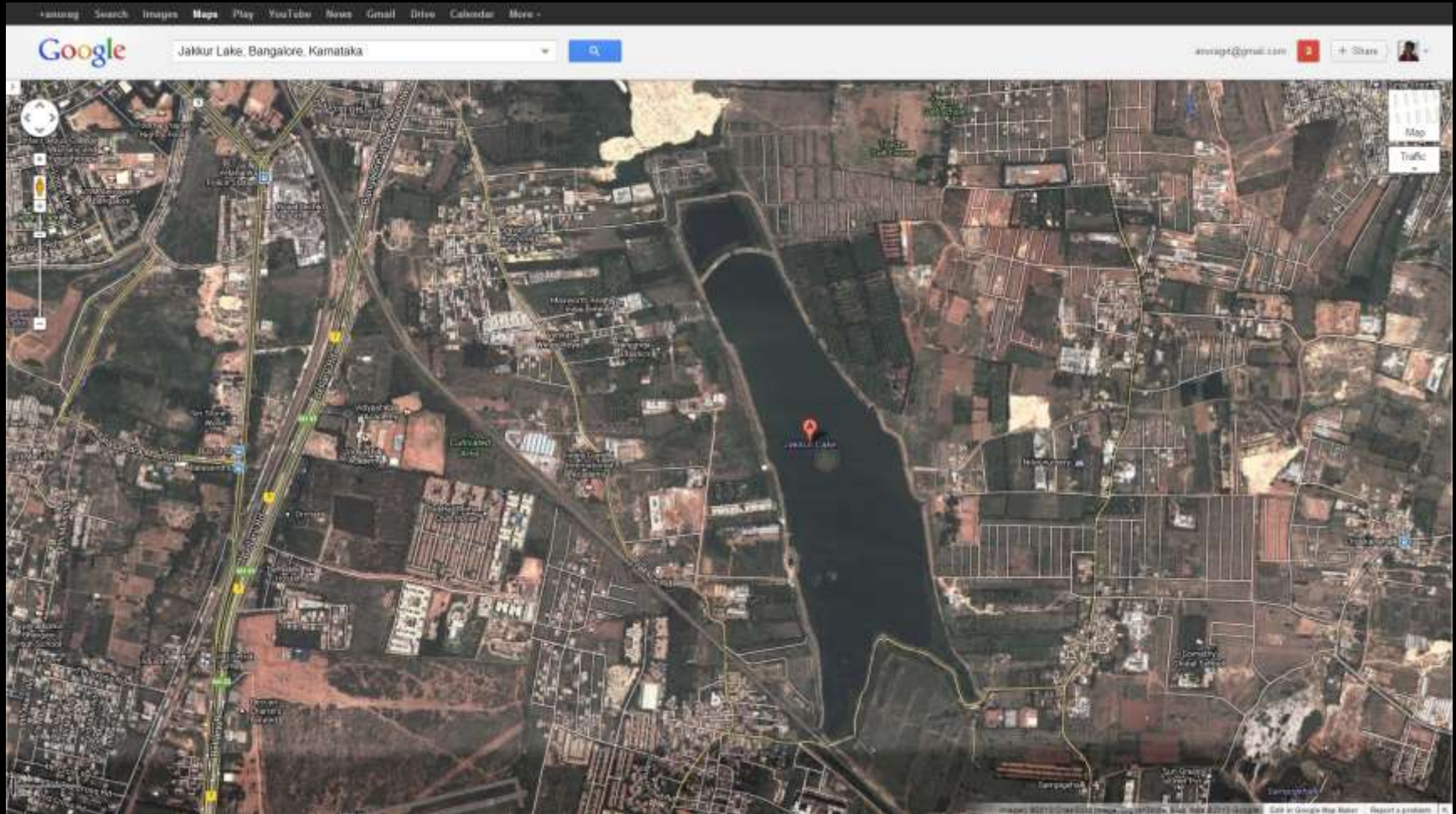


# Growing vegetables too





# STP's need to be linked to reuse



Jakkur Lake, Bangalore, Karnataka



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# Nature as treatment



# Lake ecosystem





