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The total volume of water on Earth is about 1.4 trillion km³. The volume of freshwater resources is around 35 billion km³, or about 2.5 percent of the total volume. Source: United Nations Environment Programme (UNEP)

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GreenBee

A Milestone Ecofirst initiative

Milestone Ecofirst thought leader speak…..

We believe that the future will witness a shift towards achieving *"self-sufficiency"* in water at the community level - in other words, water will move from being a centralized infrastructure provided by the Public Utilities to a community infrastructure that is developed and managed privately.

PG Ganapathy
Director, Milestone Ecofirst Advisory Services (India) Pvt. Ltd.

Dear Readers,

This issue of Green Bee focuses on Water management in the context of our Built Environment. As we are all aware from our daily experience, Water management and related areas like Waste water management, Storm Water management (harvesting, flood control) and Waste water disposal are taking centre stage in our discussions. On the one side, regulatory pressures are mounting from the MoEF, CGWB, PCB and Local Authorities compelling developers to plan for water resources adequately, to harvest rain water and to safely dispose excess storm water or treated waste water. On the other side, consumers are also asking tough questions on water availability and water security.

We believe that the future will witness a shift towards achieving "self-sufficiency" in water at the community level - in other words, water will move from being a centralized infrastructure provided by the Public Utilities to a community infrastructure that is developed and managed privately. In a favourable location where the rainfall and ground water conditions are good, this self-sufficiency can reach even 100%. In most locations, we believe the community can meet at least 50% of its own fresh water requirements ONSITE. This requires appropriate planning and a WATER-CENTRIC approach to designing townships – we call this **Integrated Water Management** (IWM) at Ecofirst. IWM takes a Systems View, connecting **Water Management** (water resources, demand management, water treatment & distribution) with **Storm Water Management** (ground water recharge, flood control) and **Waste Water Management** (collection system, treatment, reuse and disposal), into a **Single Integrated System**. We believe communities should embrace this shift/ approach as it puts the ownership and control of water resources in their hands along with the responsibility to nurture and manage it. Developers need to rise to this challenge and make IWM an important part of their planning and design approach.

Finally, it all boils down to the value of water – how much value do people attach to water and how much are they willing to spend for it. Well, bottled water costs Rs. 10 per litre as against Rs. 10-25 per 1000 litres for piped water. This discrepancy has led to the unreliability and poor quality of piped water availability besides increasing wastage. The day we value water for what it is worth to us, most of our water problems will disappear!

Happy Reading.

PG Ganapathy
Director

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Milestone Ecofirst Buzz: Sustainable Options for Water Reuse in Townships

Water reuse has become an inevitable part of the water strategy for all developments in India due to the ever increasing scarcity and depletion of water resources all over India. In this article, I would like to focus on Sewage Treatment Plants (STP) relevant to a township context. STPs available today are of two types - those that are technology or equipment driven and those that use natural processes for treatment. Equipment based solutions like ASP, MBR, MBBR, SAFF, FAB, FBR, FMR, EO, RBC are compact systems that require less space (varying from 0.2 m^2/ KL/D - 1 m^2/KL/D) and are flexible to install. These options are very reliable and time tested. They also meet discharge standards of Biochemical Oxygen Demand (BOD) less than 30 mg/l BOD, practical reuse standards of less than 10 mg/l BOD and even BOD level of below 1-2 mg/l may be achieved by some of the systems.

On the other hand, there are natural solutions like Decentralized Waste Water Systems (DEWATS), Phyto-Remediation, Soil Biotechnology (SBT), root zone treatment processes and some culture media/ bacteria based solutions. Area footprints of these solutions are high in the range of 2 m^2/KL/D to 5 m^2/KL/D. Most of these solutions claim to bring down BOD below 20-30 mg/l except SBT where BOD levels can be reduced well below 10 mg/l. Installation costs of natural solutions are comparable with equipment based solutions; however, their operating costs are less making it a good choice in the long run. Typical energy consumption for conventional treatment plants vary from 0.3 kWh/KL/D to as high as 1.4 kWh/KL/D, in comparison to natural processes where it is 0.05 kWh/KL/D or even less in many cases. Moreover, natural systems need lesser spare inventory, lower skill levels to operate and are capable of handling variation in flows to some extent.

There is some apprehension from developers and project engineers about odor and breeding of insects/flies from these sites, but the same has been dealt with effectively in systems like SBT. Research in this field has been going on for many years and in recent times we are seeing better systems with reduced area footprint and improved treated water quality. The performance of these systems can further be improved if surface water features of the site can also be made part of the systems like providing polishing pond to increase oxygen supply and a further UV treatment of the water for disinfection purpose before reusing the same.

With an increase in the number of installation of natural solutions in projects by developers who are committed to sustainability, we will see a wider acceptance and awareness in the mainstream developer community, thereby making natural solutions an ideal choice for waste water reuse in townships.

Contributed by Chitranjan Kaushik, Senior Vice President and Water Expert at Milestone Ecofirst Advisory Services (I) Pvt. Ltd.

Quote:

Human beings are made up mostly of water, in roughly the same percentage as water is to the surface of the earth. Our tissues and membranes, our brains and hearts, our sweat and tears--all reflect the same recipe for life, in which efficient use is made of those ingredients available on the surface of the earth. We are 23 percent carbon, 2.6 percent nitrogen, 1.4 percent calcium, 1.1 percent phosphorous, with tiny amounts of roughly three dozen other elements. But above all we are oxygen (61 percent) and hydrogen (10 percent), fused together in the unique molecular combination known as water, which makesup 71 percent of the human body.

- Al Gore, Earth in the Balance

Milestone Eco-first Buzz – Water Supply Systems for Townships – a comparison

Water supply for any township can be achieved through the following systems: Gravity flow and pressure flow (hydro-pneumatic pump). The selection of the supply system depends on various parameters like quantity of water available , duration of the supply, availability of power, cost of the backup power and the project type (commercial or residential) etc.

Where water resources are stressed and it is supplied for a limited duration of the day at fixed time intervals, a gravity flow system with a centralized elevated reservoir is selected. Though elevated reservoirs add to the capital cost of the system, they can provide a source of secure water supply for the township.

Hydro pneumatic pressure flow systems are preferred in commercial installations like hotels, offices where a 24X7 water supply at proper pressure is to be maintained. In this case, assured water and power supply are a prerequisite. Additionally, provisions for air compressor, air tight pressure vessel and 100% backup system would be required.

For the residential use, it is cost effective to directly transfer the water from the UG tanks to the roof top tanks of the individual households/building and then through gravity flow provide water to the user

Contributed by Shailendra Solanki, Associate Vice President and Water Expert at Milestone Ecofirst Advisory Services (India) Pvt. Ltd.

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Cross Pollination: Hydroponics

Hydroponics is a method of growing plants using mineral nutrient solutions, in water, without soil. Terrestrial plants may be grown with their roots in the mineral nutrient solution only or in an inert medium, such as perlite, gravel, mineral wool, or coconut husk.

Hydroponic culture is an inherently attractive, often oversimplified technology, which is far easier to promote than to sustain. Unfortunately, failures far outnumber the successes, due to management inexperience or lack of scientific and engineering support. Thus, interest in hydroponics has followed a roller coaster ride since its conception. However, in recent years, extensive research and development programs in Europe have vastly improved hydroponic production systems. Today, these new technologies are being successfully transferred to the United States and even the Middle East, showcasing that hydroponics maybe the next technical realty waiting to prove its worth.

SOURCE:
- http://en.wikipedia.org/wiki/Hydroponics
- http://ag.arizona.edu/pls/faculty/MERLE.html
- http://www.wam.ae/servlet/Satellite?c=WamLocEnews&cid=1289830824781&pagename=WAM%2FWAM_E_ Layout&parent=Query&parentid=1135099399852

Straight From The Beehive

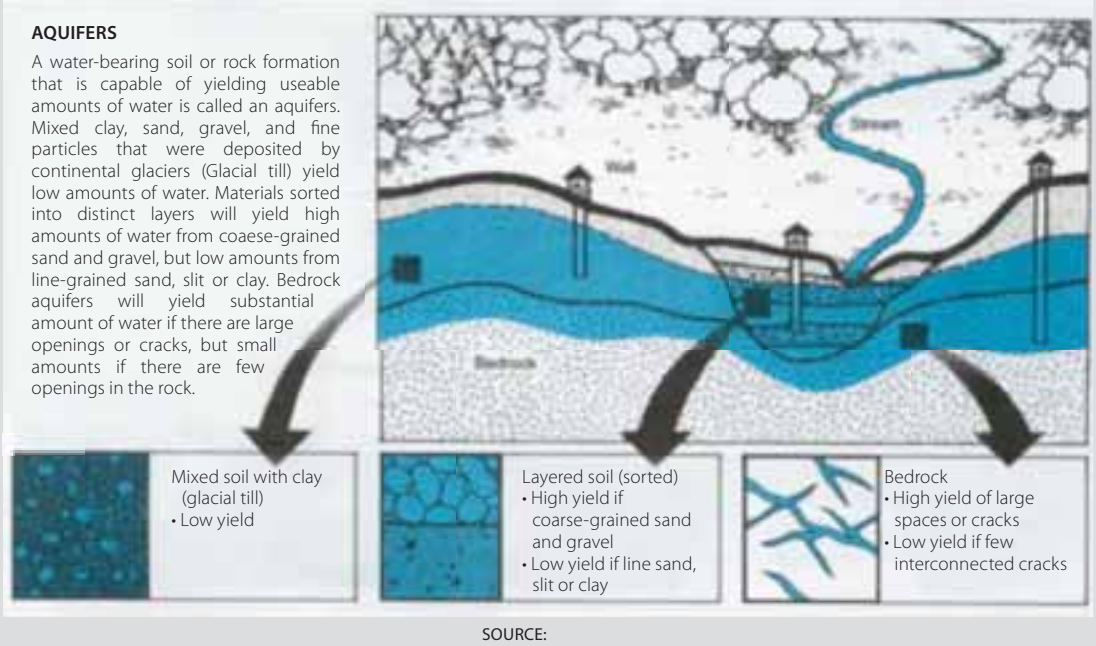
Aquifer/Aquifer System: A water-bearing layer (formation) of rock or sediment capable of holding water and yielding water to wells.

Aquifer Storage and Recovery (ASR) can mean artificial recharge, groundwater recharge; managed aquifer recharge, underground water storage, conjunctive use, or a combination thereof. ASR is a water management technique that encompasses the purposeful recharge and temporary storage of water in an aquifer with the intent to recover all or a portion of the water from the same aquifer in the future. Without the intent to, or act of, recovering recharged water, it is simply groundwater recharge.

ASR is thought to have originated several hundred years ago in the Kara Kum Plain of Turkmenistan and in Western India (Pyne, 1995), but is now conducted in some form on every continent except Antarctica. The motivators and potential benefits of ASR vary based on geography, hydrology, water chemistry, and water policies/laws. The capture and storage of water when it is available is critical to sustainable water management. The traditional approach has been to store water above ground by constructing dams and reservoirs. The benefits of aboveground storage include rapid fill and release, large storage capacities, straightforward measurement and management, and opportunities for recreation. However, escalating costs and environmental permitting requirements associated with surface reservoirs, as well as declining availability of land and suitable sites, has driven water professionals to explore ASR as an alternative.

AQUIFERS

A water-bearing soil or rock formation that is capable of yielding useable amounts of water is called an aquifers. Mixed clay, sand, gravel, and fine particles that were deposited by continental glaciers (Glacial till) yield low amounts of water. Materials sorted into distinct layers will yield high amounts of water from coaese-grained sand and gravel, but low amounts from line-grained sand, slit or clay. Bedrock aquifers will yield substantial amount of water if there are large openings or cracks, but small amounts if there are few openings in the rock.



SOURCE:
- May/June 2008 • Southwest Hydrology Magazine, An ASR Primer, Cortney C. Brand
- Michigan State University Extension Water Quality Bulletin # 35, August, 1991

Milestone Ecofirst ties up with Ashok B Lall Architects

MEAS has entered into a strategic partnership with the renowned architectural practice of Ashok B. Lall Architects from New Delhi, for providing "Integrated Sustainable Design" including Master Planning, Architecture, Landscape, Energy, Water, Waste Management, infrastructure and MEP services under one roof.

More about Ashok B Lall Architects (ABLA)

ABLA was established in the year 1980. The firm is one of the leading sustainable architects in India and has developed a portfolio of work that is recognized locally as well as internationally for its innovative contribution to affordable sustainable design at all scales of development - Township, Institutional Campuses, Housing and individual buildings. The firm's philosophy aims to integrate spatial, constructional & environmental services with climate & site to achieve high performance at low cost. The firm has won number of competitions and awards, most recently their project for Development Alternatives World Headquarters at New Delhi won the **'NDTV Greenies Award 2010'** award. **ASHOK B. LALL** has a Bachelors in Architecture & Fine Arts, U.K., 1968 and A.A. Diploma, London, 1970 and has worked for a decade in Singapore and with Joseph Allen Stein at Delhi before setting up private practice in 1980. He has been actively involved in academics, research and teaching besides being the principal of the architectural practice. He has presented many papers at national and international seminars, conferences and contributed regularly to national professional journals for architecture, engineering, and environment. He is currently a member of the Jury for Holcim Awards for Sustainable Construction, Asia Pacific Region.

Institute of Rural Research And Development (IRRAD)
– LEED Platinum rated building in Gurgaon, India

Proposed Master Plan for the 50 acre campus in Gandhinagar, Gujarat for **IIPH**

Milestone Ecofirst News

Dr. Manish Shakdwipee, *Senior Manager* at MEAS for Energy and Climate Change, and CMVP and Efficiency Valuation Organization (EVO) approved trainer made a presentation on "Monitoring and Evaluating Energy Efficiency Savings at an International Training Course organized by International Urban Training Centre (IUTC) in South Korea in collaboration with the United Nations Human Settlements Program (UN-HABITAT) and the United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP).

The Pune ASHRAE chapter invited **Rakesh Bhatia, *Vice President*** at MEAS to deliver a lecture on "Living Building Challenge" on 19th Nov 2010 at Hotel Le Meridien, Pune as part of the annual conference "PARC-10". Rakesh is a voluntary Ambassador for the Living Building Challenge program for the Cascadia Green Building council based out of Seattle, USA

Reach us at

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