


Integrated Water Management

Biome Environmental Solutions Pvt. Ltd. and the Biome Environmental Trust  

Biome develops, designs and implements ecologically and socially sustainable land-use change solutions. Biome's approach is to work with communities and relevant institutions to develop new ideas to jointly solve problems.

Launched in 2007, Hybrid (For-profit / Not-for-profit), Agricultural Water Management, Drinking Water, Sanitation, Waste Management & Disposal / Re-use, Cross-sector, Cross-sector: Climate / Energy, South Asia: India

Partners: Government institutions; CSR teams at corporations; other local, national & international development sector organisations; schools; and urban and rural communities.

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Problem Addressed

Biome endeavors to find and demonstrate solutions, and empower communities to adopt and innovate on them in the water and sanitation sectors. The solutions Biome offers address social and environmental issues, recognizing the links in the water-energy-food nexus.

Of equal importance in its work is that it recognizes that plumbers, well diggers, sanitation and health workers, and informal sector WASH enterprises are essential in implementing these solutions. Therefore, ensuring their well-being and ensuring their capacity and knowledge is built, and their innovations are incubated, is integral to Biome's work.

Further, Biome's work addresses the challenges of groundwater management (India is the world's largest groundwater user), sanitation and management of waste water and fecal sludge, resource recovery from wastes, water quality management, demand management, and equity and citizen water literacy education. Biome works on these issues in both urban and rural contexts. Biome's experience is very rich in the urban and peri-urban contexts. Biome sees itself as a "thoughtful do tank," acting as a practice to policy bridge.

India is heavily dependent on its groundwater and has the highest number of bore-wells in the world, numbering close to 30 million. More than 60% of India's water supply comes from these bore-wells, with more wells being dug every day. This places an unmanageable strain on the aquifer as it is being depleted at a much higher rate than can be naturally recharged. India is already on the brink of a full-blown water crisis, with cases of acute water shortages, fluoride poisoning and other forms of water pollution becoming common, forcing people to drill deeper (thus reducing the water quality). In addition, water sources are being contaminated by a failure to properly manage the disposal of wastewater. This situation will only worsen, with rapid urbanization, the lack of water literacy, the inefficient use of water, and the development of new industries with high demand for water placing a larger strain on water resources. In the city of Bangalore, for instance, depleting surface water availability has driven demand for groundwater, which has drawn down the city's water tables and left many bore wells dry. As a result, some residential communities across the city find themselves needing to purchase water from unregulated and expensive private entities to meet their basic needs.

Innovative Approach

Biome's programs provide hyperlocal, integrated and sustainable WASH solutions for individual buildings, thus reducing dependence on unsustainable city-wide utilities. In the process of doing so, Biome aims to educate the end user and service providers to the basic science of low-technology water conservation and waste management, and thus encourages the adoption of the process. This multistakeholder capacity-building approach thus drives innovation on the ground, as service providers and end users are able to problem solve and innovate at each project site. In this way, Biome acts as an incubator for innovation, and is able to create both, a demand for integrated water solutions and the market to satisfy that demand.

In addition to innovation around the services provided, Biome also adopts innovation in the program implementation process, by bringing basic knowledge around water use to the end user. They aim to answer questions about the quantity, availability and the quality of water needed, to empower communities with the knowledge necessary to solve their own problems.

Program Solution

Biome Environmental Solutions is a design firm focused on ecology, architecture and water. It designs and implements real estate development projects which are guided by ecological principles, integrating sound water, energy and land-use thinking into design. It operates in tandem with the Biome Environmental Trust, that works to promote sustainable water use and advocates with the Karnataka government to shape policy surrounding the issue of water and waste management.

Biome's WASH team aims to provide solutions to Bangalore's water crisis by integrating sustainable WASH solutions into the design of the buildings, with the aim of creating customized hyper-local solutions for larger problems. These solutions include:

Rainwater Harvesting: RWH helps its users secure their water supply, reduce their dependence on piped/tanker/bore well water and to reduce the intensity of monsoon flooding. An average household in Bangalore can sustain itself on rainwater for 3-4 months a year. This process also helps in recharging the bore wells for future use.

Composting Toilets and Wastewater Treatment through DEWATS: The most popular form of waste treatment is to send waste into the city sewers for treatment. However, it is possible to treat and reuse wastewater (such as bathwater and water used in washing machines) and sewage from toilets, at the building level itself, by using simple, natural, and low-energy DEWAT systems. Adoption of such systems not only reduces waste generation but also contributes towards providing water security to cities, and reduces the burden on treatment plants.

In addition to these solutions, Biome's nonprofit projects include water audits to ensure the sustainable use of water, advocacy with the Karnataka State Government to shape water policy, and groundwater management efforts such as participatory aquifer mapping. Biome Environmental Trust also works in partnership with local municipalities, academics and medical professionals to design and implement the Sanitation Safety Plan which aims to implement the WHO Guidelines for Safe Use of Wastewater, Excreta and Greywater in Agriculture and Aquaculture, currently being implemented in four cities worldwide.