Rainwater Harvesting Design: Aakash Ganga, "River From the Sky"

Aakash Ganga, River from Sky, is a domestic rainwater harvesting system. It channels rooftop rainwater from every house in a community, through gutters and pipes, to a network of multi-tier underground reservoirs as shown below.

Aakash Ganga's strategy is to form public-private-community partnership or social enterprise to provide drinking water to the people. It rents roofs from home owners or acquires rights to harvest their rooftop rainwater. The local government or Panchayati Raj Institution (PRI) leases, at no cost, about 10,000 M2 land next to the shared community reservoir. A social takes care of the post-implementation upkeep and holistic sustainability — social, cultural, economic, institutional, political, operational, and ecological. One half of the harvested rooftop rainwater is stored in the reservoir attached to the house for the exclusive use of the home owner. The other half flows to the shared community reservoir. People who live under thatched roofs or who cannot afford to have their own reservoirs take water from the shared reservoir.

Aakash Ganga is a bundle of innovations. Some of these innovations are summarized below:
Economics: Aakash Ganga replicates utility industry model: Minimizes capital layout per liter of harvested rainwater; acquires rainwater harvesting rights for a fee; and institutes a village committee, analogous to the public-utility-commission, to safeguard community interests.

Social Innovation: Aakash Ganga has set a new dimension of performance by converting cultural traditions and social bonds into "social capital." We do not view the traditions as agents of inertia that restrict community's agility or as anchors that keep a society tied to the past. Instead, we view them as asset that can be economized for cost savings or transformed into revenue stream. For specificity, Jalwa Puja, the local tradition of well worship on child birth, and strong familial or social bonds were transformed into cost savers. Age commands respect. Heritage is valued. AG wins communities by bestowing the pride of laying foundation on the eldest and the youngest citizens – symbolizing passing of a heritage from one generation to another.

Engineering Innovation: The BITS engineering team automated the design of Aakash Ganga network using satellite image, information technology, and geographical information system. The design for a village is captured below. The automation eliminated surveys, shortened design time to a few weeks, and pinpointed the locations for reservoirs. Benefits: Minimized earthwork, ensured water flow by gravity; and reduced material cost — materials account for 70 – 80% of the cost. The Red dot is a house reservoir (Griha Tanka). Green or pink dot is a community reservoir (Gram Tanka). The red, pink, and green dots are connected through underground blue pipes.

Numbering Plan: Streets are not named and houses are not numbered. In absence of names and numbers, it is virtually impossible to assign physical location to any reservoir. (Think of monitoring and maintaining 100,000 or more water reservoirs!) Aakash Ganga devised a numbering scheme to assign unique number. This numbering plan converts the longitude and latitude coordinates of a reservoir into a number that is unique throughout India.

http://si-usa.org/projects/rainwater-harvesting/

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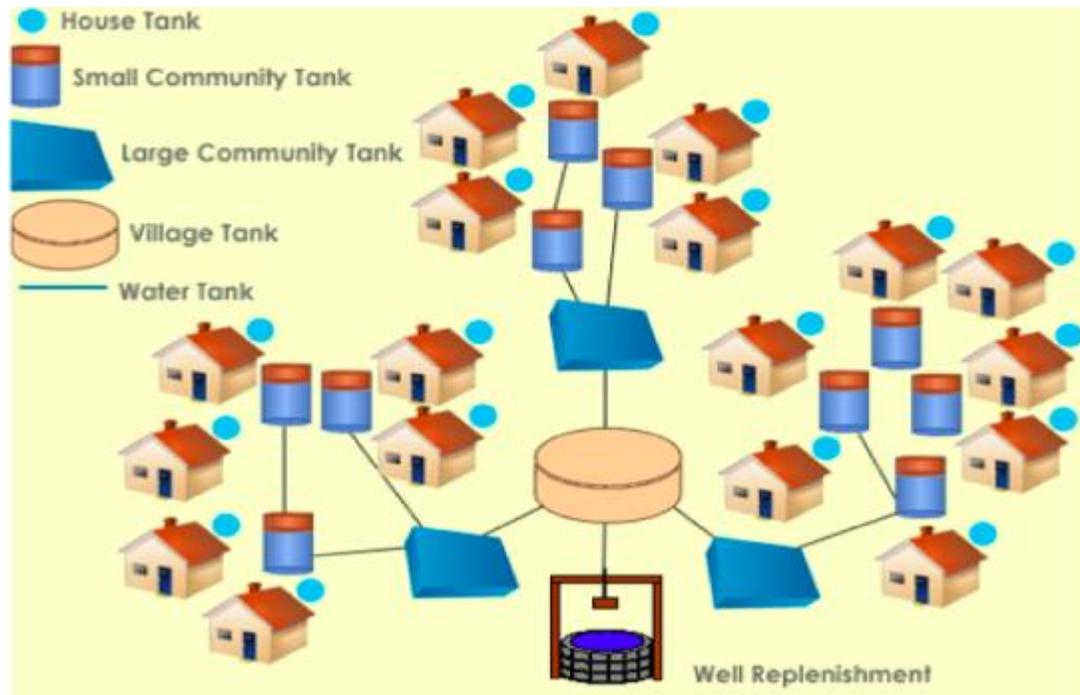
Aakash Ganga domestic rainwater harvesting system