Regenerating Homestead Water Services through Ecorestoration

- **Addressing the "issue of water resources" more than the "water supply problem" in wetlands and coastal areas**
- **Enriching people's art and science of water management through local actions**
- **Knowledge participation of local communities towards regaining right, access and control over water and natural systems**

PLANET Kerala is facilitating a Participatory Action Learning for evolving appropriate approaches and technologies for sustainable management of water resources by the user communities *(people who suffer)* laying thrust on eco-restoration dynamics.

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Background

Wetlands and coastal areas, an abode for over 17 million people in the state of Kerala, India is witnessing explosive population pressure (>1500 persons per Sq. Km.). The settlements are facing major issues linked with water supply (in terms of both quality and quantity) causing long-term health, financial, economic, social and environmental problems.

Traditionally, shallow open wells and ponds have been serving the domestic water needs of the communities for centuries in the state. By now these domestic water sources are non-potable with high levels of dissolved solids, turbidity, salinity, acidity and presence of faecal colliforms.

The most severely affected communities need water not just for their domestic use but also for meeting livelihood too. The entire livelihood of these relatively poor communities *(the weakest and the largest stakeholder)* is depended on fish catch, sand mining, shell collection, farming, fiber craft etc. All these livelihood activities are correlated to water quality dynamics as indicated by health of the immediate ecosystem. Conventional water schemes address just the water supply problem to certain extend and ignore to address the core water issue - ie. Depletion of fresh water resources.

Moreover, there is no liquid waste water treatment facility at any point and simply drained to the rive/sea, adding mosquito menaces and sporadic attack of communicable diseases.

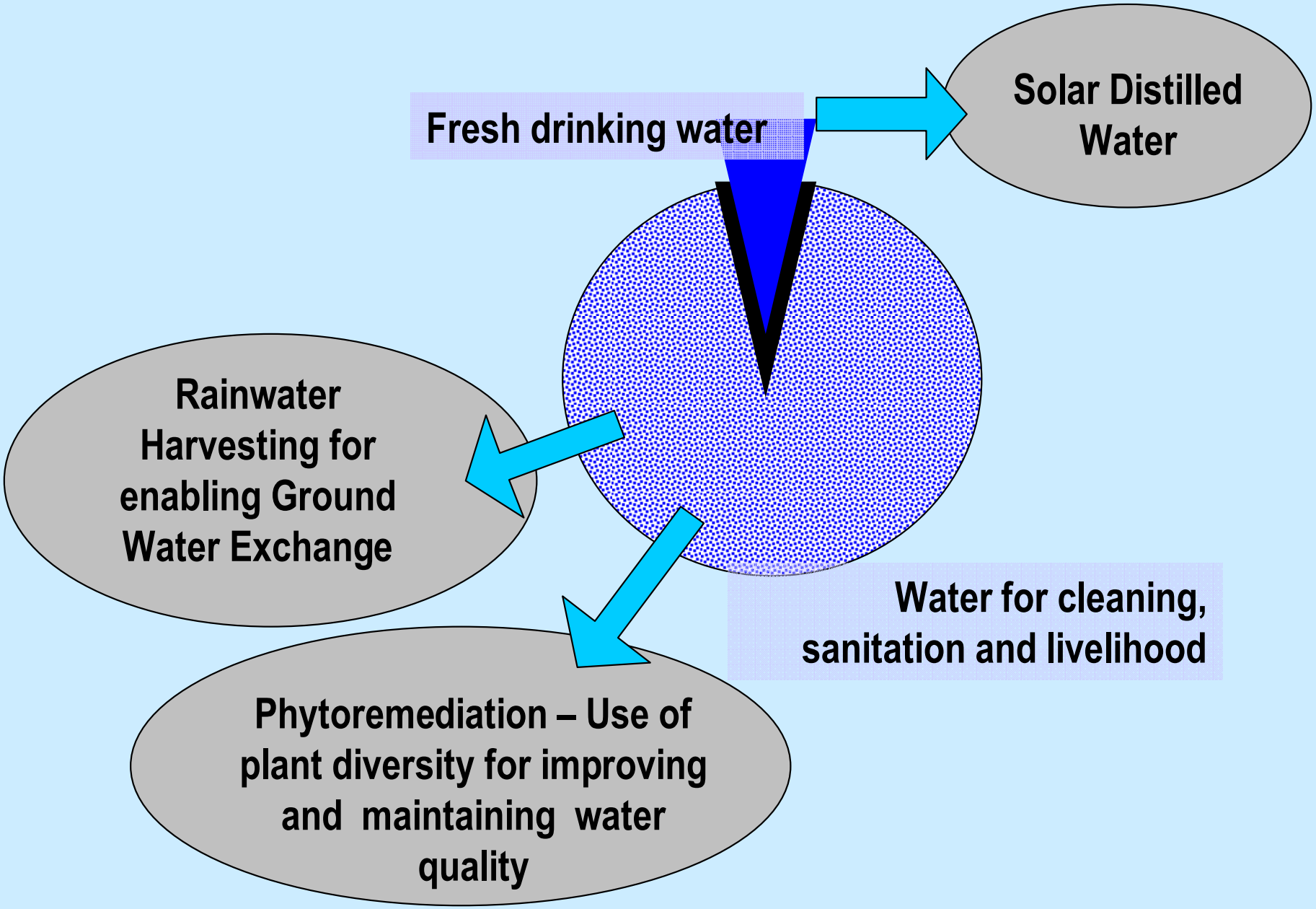
Exploring Ecosystem options for addressing “water resources issue”

Sunlight - Lying in the tropics, close to the equator, receives more than 200 sunny days with high intensity, temperature is 28-35degrees Cel. during most part of the year and high evapotranspiration rate- 4mm per day

Rainwater - Receives over 3500 mm of rainfall in 120 days, mainly between July - December and even summer showers during March -April. The rainwater is much pure with TDS ranging from 0-4ppm

Biodiversity - Wide distribution of a number of species, many with proven properties in contaminant absorption and medicinal nature, easy to propagate and high survival rate

Segmenting domestic water needs and strategizing options



1. Solar distillation for potable water

Solar distillation process utilizes any poor quality water

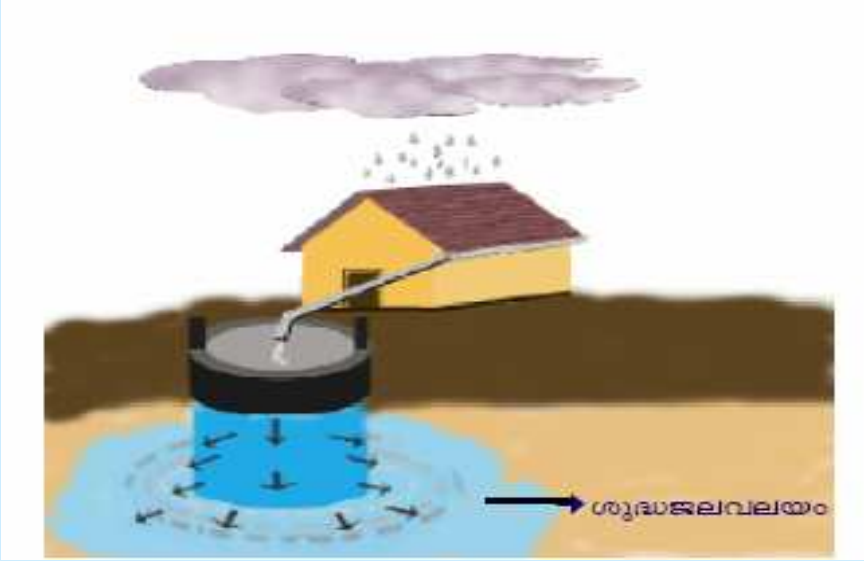
Solar distillation still can be easily placed on roof tops, where maximum sunlight falls, can be easily fabricated anywhere and durable

Water is evaporated and condensed. The distilled water leaves behind all the harmful salts and bacteria, giving out **100% germ free water**

Each still of 0.7 sq.m area produces 2.5 to 3 liters of water per day, catering need for each person, hence a family of four needs 4 stills and each still costs Rs. 800. and no further operating costs

2. “Backwashing” or Injection of Rainwater into water bodies

Enabling collection of rainwater from household rooftops and feeding directly to open wells



The rise in water level causes seepage into the surrounding aquifer thus replacing the existing high dissolved solids contained water with soft rainwater

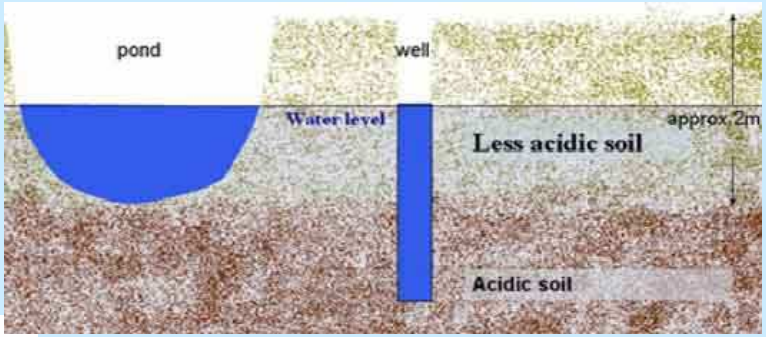
This ground water exchange process removes excess physical and chemical accumulation in the water bearing soil surrounding the well and improves water quality

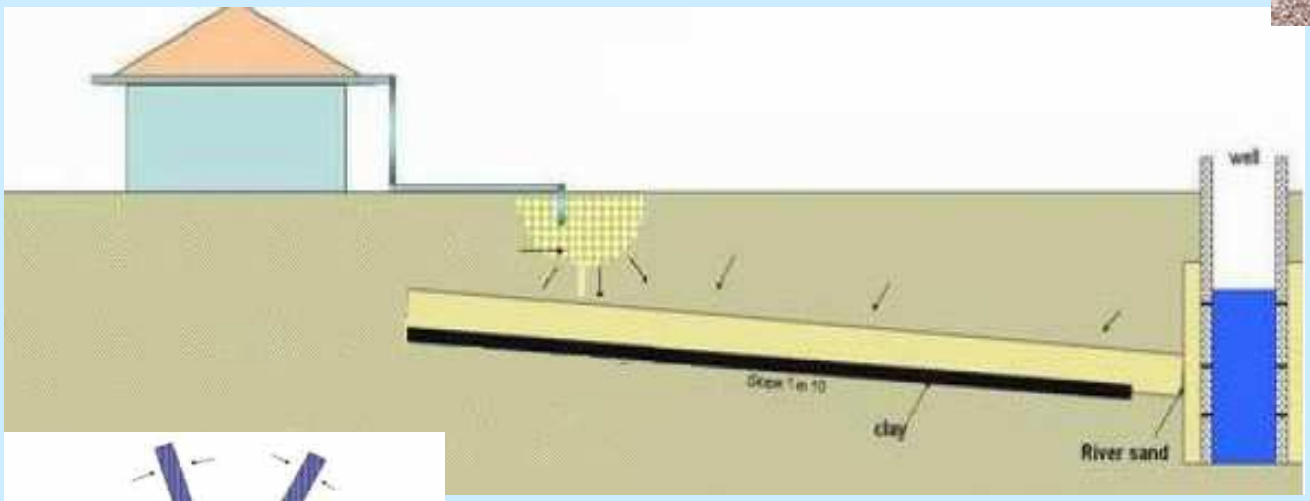
40 Sq.m. roof area will feed 130 m3 of rainwater a year, much above normal withdrawal rate

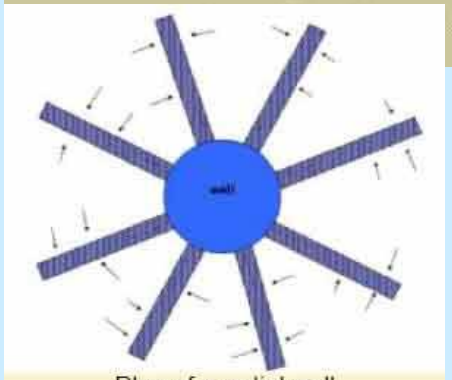
Depending on roof type, one time installation cost range from Rs. 300 - 1500 only, no operating costs

3. Radial Wells for maximising surface water yield

Radial wells enable tapping of good quality water from the shallow subsurface soil. It is done by extending the lateral storage and collection of water from the subsurface soil






Plan of a radial well

Trenches are dug at summer water table level(50-60 cm below surface) and the ends are fed with rainwater from rooftops

Sand filled radials (5-8 arms) serve as earthen sponges which absorb rainwater and thus improve the fresh water zone of the area

Radial wells enable to achieve the functionality of ponds where open space is limited

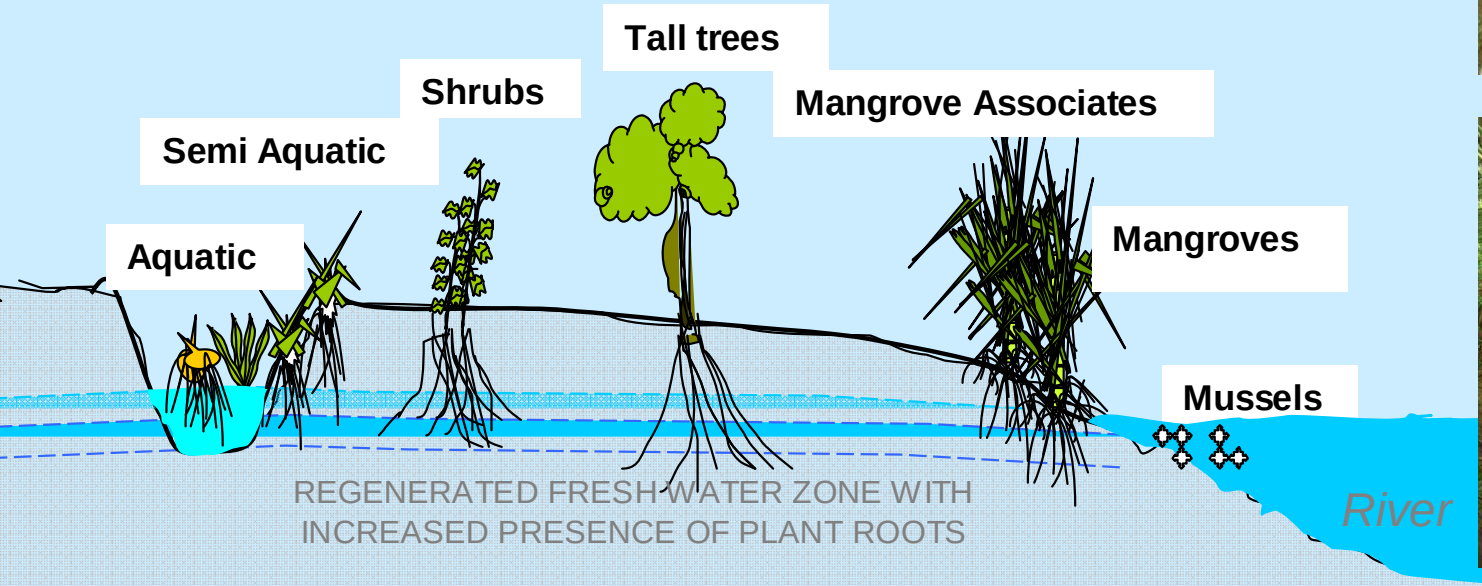
4. Role of Biodiversity in controlling Water Quality

Most common contaminants found in water and waste water are excess of Phosphate, Sulphate, Iron, Chloride and Nitrate

Almost all plants absorb nutrients needed for their growth from soil. This principle is adopted for improving and maintaining surface water quality

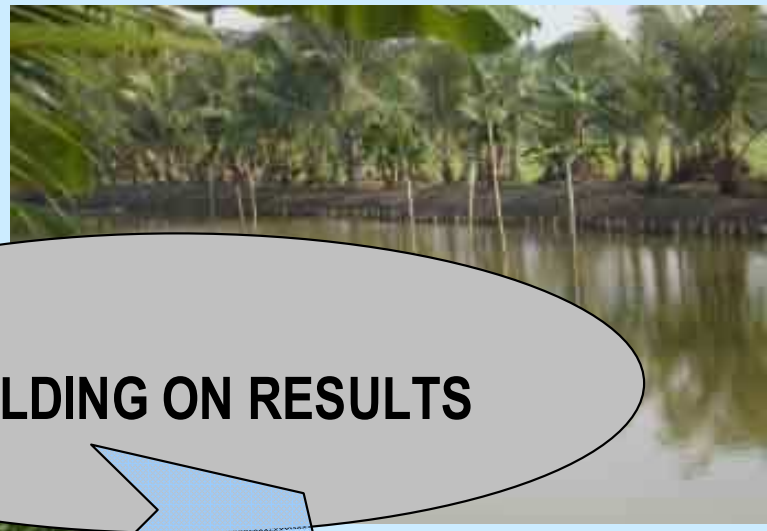
Phytoremediation incorporates a mix of species all around the radius of influence of the well / pond, including pollution threats

Increasing presence of plant roots in the pollution zone brings about absorption of excess contaminants



5. Knowledge based participation of user communities

Continuous local action based iterative processes, involving communities "knowledge based participation" and thus enhancing their experiential knowledge base towards addressing water and environmental issues



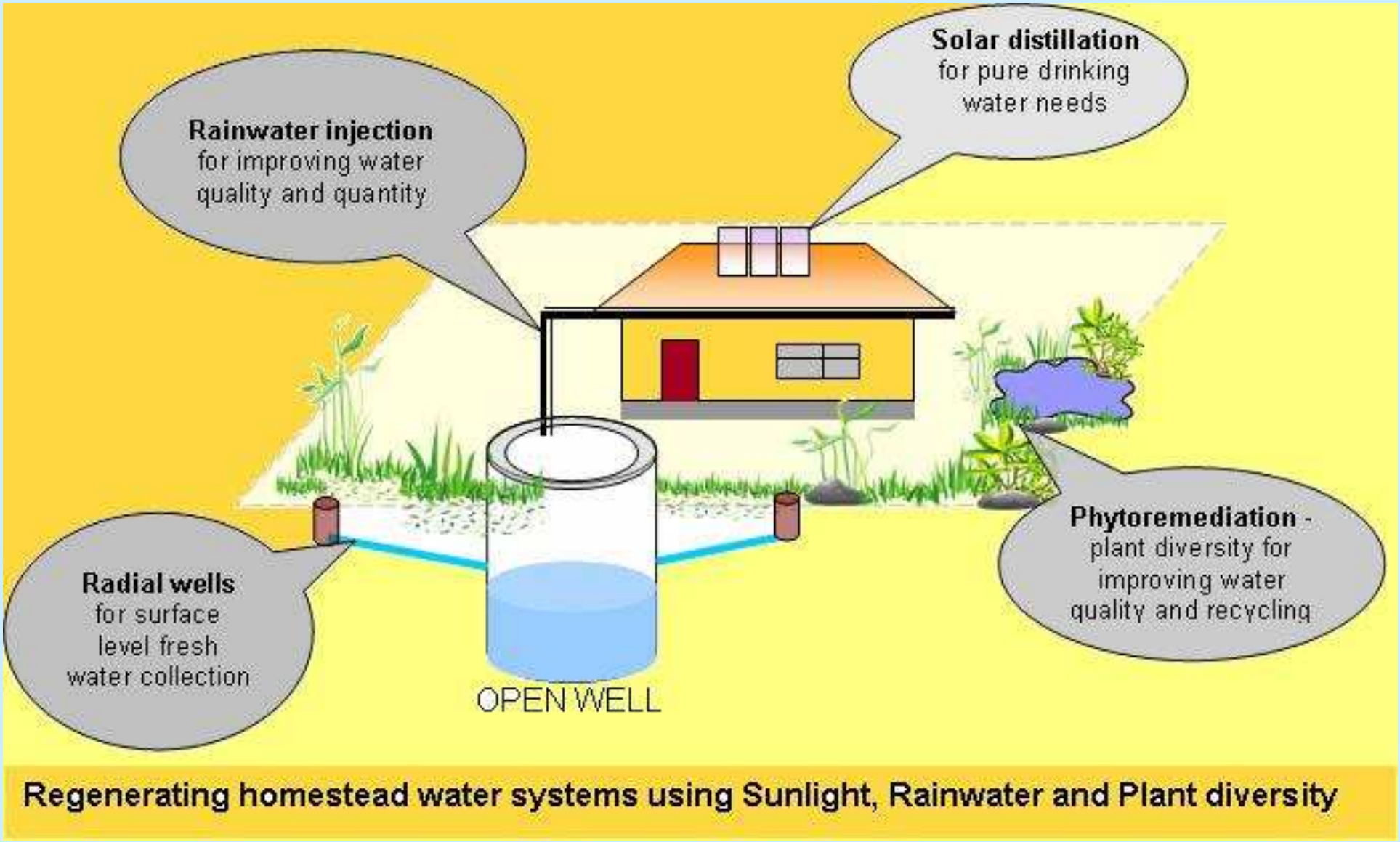
BUILDING ON RESULTS

BUILDING ON ACTIONS

BUILDING ON ISSUES

Regenerating the physical, biological and chemical processes that interconnect the dynamics of biodiversity, soil and water resources is the approach evolved

Finally scaling up from “Homestead to Watershed”



Replicable in most wetlands and coastal areas

The approach and technologies evolved are neither fragmented nor isolated in nature. Sustainable solution for the problem can only be achieved through the integration of all these technologies that ultimately orient towards creating a strong ecological base, which interconnects the dynamics of biodiversity, soil water resources and the local community.

Hence, a strong linkage among multiple technologies is essential within the system boundary contexts. The local communities who have the potential for undertaking the tasks of regenerating this resource base through ecorestoration processes are further capacitated to ensure sustainability.

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