HOW WET IS WATER FOOTPRINT?

STRATEGIES FOR URBAN-REGIONAL WATER MANAGEMENT

Water is a prime natural resource, a basic need and a precious national asset. Monitoring and regulating the use of water is therefore essential for sustainable development of cities and regions.

The water footprint of an individual, community or business is defined as the total volume of freshwater used to produce the goods and services consumed by the the individual, the community or the business. This includes the direct and indirect water use.

Water cannot only be understood as an object of utility for human settlements. A considerable amount of water has to be available for the environmental sector to ensure healthy and sustainable ecosystems in all kind of water bodies.

The Example: Pune region

Pune is facing acute shortage of water. From last few years, during the month of April, city and region are turning in a 'water crisis' mode. Pune has five rivers and four dams that supply more than enough water to meet the city's needs. A considerable amount of water is wasted by inhabitants of Pune city and farmers of the region and there is an unequal distribution of water between Pune city and neighbouring agriculture areas.

Wasting water or polluting water in a certain water-rich geographic area is a concern just like wasting energy in oil-rich countries. Use of water in water-rich areas to produce water-intensive commodities reduces the need to use water for producing those commodities in water-scarce areas.

There is no comprehensive authority, which has a holistic view and planning strategies for water use in the city and the region. Environment doesn't follow administrative boundaries so water must be looked at regional level with natural boundaries, e.g. Watershed level.

The water footprint assessment of this study focuses on the region according to watershed and Pune municipal area. Water availability in the region is calculated by understanding physical features (rainfall, soil type, land cover etc.).



Water Footprint of Study Area

In the region:

- **Afforestation** Reduces runoff and increases availability of water.
- The scrub area and degraded vegetative covered areas need to be afforested with indigenous plants. The present area under scrub is 433.74 sq.kms. Around 200 sq.kms is to be planted in the first phase in catchment areas of reservoirs. If by 2031, we are able to bring 200 sq.kms of area under forest, the runoff in upper area shall decrease.
- Change in irrigation pattern and use of recycled water
- Agricultural productivity could be improved by integrating a number of measures such as: Crop diversification, adopting various combinations of intercrops, applying nutrient-rich organic fertilizer as vermicompost for improving the physical structure of soil while increasing its water holding capacity.
- Adopting sprinkler and drip irrigation techniques, managing irrigation according to plant growth stage.



RAINFALL COUNTER MA RELIEF MAP ETTLEMANT PATTERN LAND COVER MAP Velles Tank A Land Cover SOIL MAP TOTAL IRRIGATION 400, Cover A Solt Yours Characterisitc Maps of study area Water Resource (Annual) Total(MCM) Total Rainfall received 1273.30 nfiltration Evaporation 157.27

One of the watershed of study area (red) is falling under critical watershed, means is exploiting more water than it recharges.

Then direct and indirect water consumption pattern of area is analysed and loopholes in existing water management pattern have been identified.

Pune region started facing water scarcity because of

- Cropping pattern norms are not being followed. • The region invested in the establishment of dozens of water-theme entertainment parks. Yet there is no awareness for the causal relationship between swimming pools and drying lakes.
- This is a region where we've seen the water soaked up by private projects like Lavasa, a privately planned and built city.
- Unchecked exploitation of groundwater. • Lack of control mechanisms on water pollution.

169.4

905.7

96.00

220.63

- Change in land cover affecting the run off.
- There is no comprehensive authority which can look at water from the city to village, industry to ecosystem, recreation to livestock.

In the city:

Evaportraspiration

Water released from dams

Water already stored in Reservoirs as a dead stock

Distribution of Rainwater received in Study Area

- The demand for irrigation will be met by recycling waste water generated from urban area. 271.56 MCM water from the
 - municipal area will be recycled for further use. • Recycling of water reduces river pollution and saves fresh water from reservoirs that will be provided for the environmental sector.
 - Urban area Rainwater harvesting Most of the rain water, which falls in the urban area, goes to the river without utilization. Rainwater harvesting technique helps in accumulation and deposition of rainwater for reuse.

• Avoid polluting water bodies.

Mutha River is facing severe problems of untreated waste water and consequences of immersing idols in the river. Measures for decreasing water pollution due to daily and ceremonial activities in the city have to be developed.



The efforts and strategies of responsible authorities like the Pune Municipal Corporation (PMC) and the Irrigation Department have to be connected. Strategies for managing urban waste water have to put into a framework with analsysis of groundwater contamination due to agricultural activities. The connection between spatial analysis and planning documents for different sectors must be strengthened. The Environmental Status Report (ESR), which Pune produces is already in place as a planning and management tool and could be extended to cover water management in the Pune Region. Water management needs to be understood as distribution, use and pollution of water. NGOs can play vital role in research and management.

In the household:

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Using less water in and around the house reduces pressure on our sewage treatment facilities, saves energy and protects our environment by reducing chemical impact on our rivers, lakes and ground water. By saving water and by reducing the amount of contaminants you add to it, you're supporting healthy lakes and streams and preserving Pune's most vital natural resource

Water footprint reduction doesn't need much of technical knowledge. Each of us can reduce water footprint by making wise choices everyday as well as making long term changes in water consumption pattern.



Create guidelines for integrated and holistic water management at regional level.













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• At present there are at least 62 species of fish in the Mula-Mutha rivers flowing through Pune. Pune Municipal Corporation is currently supplying water sufficient for the projected conulation in the year 2050.



Distribution of Rainwater received in Study Area

