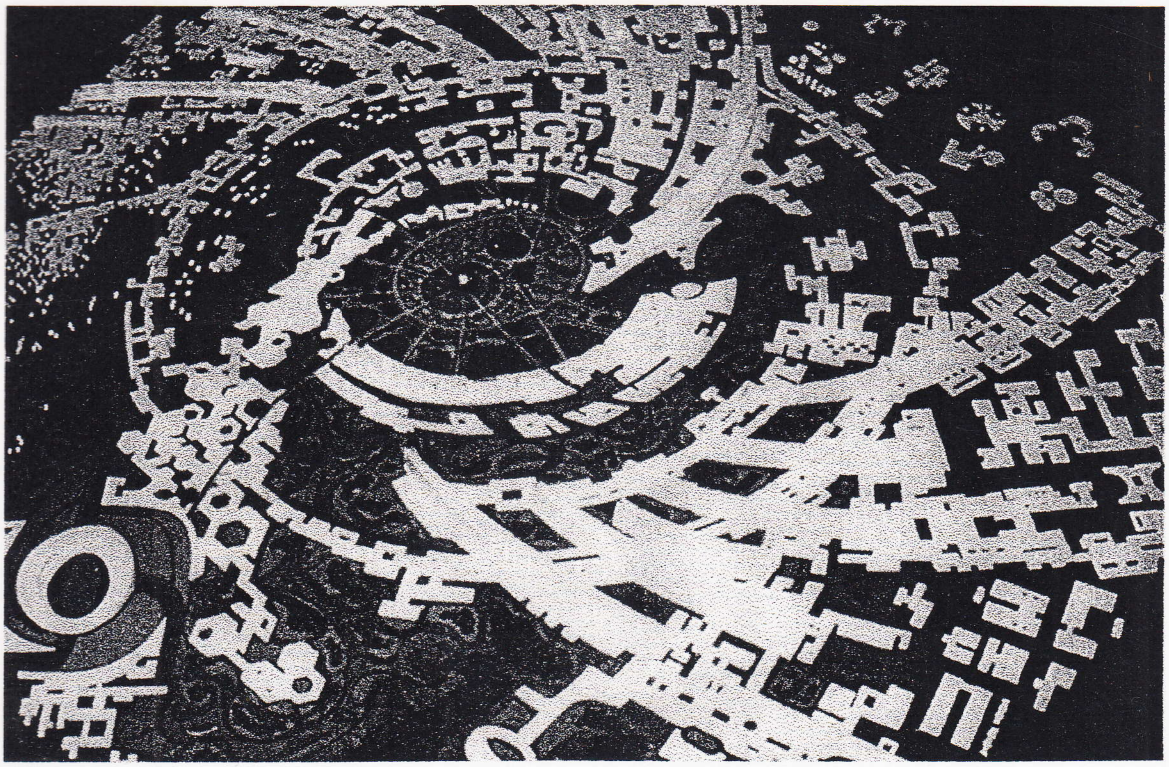
Concept for the Water Supply for the City of Auroville



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The Basis

City life will become possible on this spot only if the area can once more be made fit for human habitation.
The first step in this process is to protect the ground. The annual loss of soil and water can only be halted by creating "bunds" - banks and dykes to slow down and divert run-off, along with terracing and the strengthening of canyon-walls, and this has to be done for every square metre of the city area.

The second step is to cover the surface with a layer of vegetation that will hold the soil together and open it up so it can absorb the rainwater that falls on it.

The third step is to reforest the entire area. Pioneer plants which survive in extreme conditions will be plant first and later plants which recover the subtropical rainforest.

Over the last thirty years, this process of regenerating topsoil, retaining rain-water to renew the groundwater table, modifying the micro-climate by the provision of shade and moisture and protection from wind and rain, has gradually brought the land back to life. The diversity of insect, bird and animal species has increased at every stage, perceptibly supporting the process of renewal.

Water-supply: the conventional solution

Drinking water for the future city can be conventionally supplied by one or two central pumping-stations drawing groundwater from the acquifers at 100 to 300 m depths.

A large lake at the highest point of the city area seems to be contra-indicated, since it would have to be filled with groundwater drawn with much expense and energy from great depths.

To cover the other water needs of the city and its surrounding agricultural areas a separate irrigation system supplied by deep borewells will have to be provided.

The city area receives an average annual rainfall of 1200 - 1800 mm, in two rainy seasons, during which extreme downpours of up to 300 mm in 24 hours are not uncommon. Run-off will be channelled into the canyons. Sewage can be collected through a conventional drainage system, purified in a conventional sewage plant and carried away through the canyons to the sea.

The Need

The city is situated near the mouth of an underground river, before it runs into the sea. All the other users with access to the acquifers at 100 - 300 m depth have already taken what they need. With powerful pumps, at subsidised electricity rates, agricultural users in the surrounding area, even the narrow strip directly along the coast, are removing groundwater to cultivate crops with a high water consumption. Moreover a rapidly expanding industrial sector is making extravagant demands on the precious water-supply.

The first signs of salt-water intrusion into the acquifers are already evident. South of the city, many square kilometres of coastal land have become infertile through salination.

Providing for the water-needs of the city and its surrounding agricultural areas by desalinating sea-water is technically possible but too costly to be affordable by the residents.

Salination of the groundwater will mean the end of the city.

The recognition

What sense is there in building a city on a bare hill near the sea, on hard dry red earth, with a huge artificial lake at the highest point, and a grave risk that the groundwater beneath it will soon become saline?

What chance of survival is there for this city, when lack of awareness in the surrounding area, over which it has little influence, is leading to pollution of the drinking water supply?

The idea is that the food required by the city is to be provided from within its own greenbelt.

So why not its own water-supply too?

Even in drought years, precipitation over the city area corresponds to more than ten times the amount of drinking water needed. But the rainy season lasts only a few months. Collecting and storing all this rainwater would require huge tanks, that would be expensive to construct and take up a lot of space.

Unless we remember the vision, and turn the disadvantages of the site to use. The upper layer of relatively impermeable laterite, together with the uppermost aquifer, form the entire plateau on which the city stands, and both slope gently towards the sea. All the water that percolates within the city area moves gradually above sea-level towards the coast.

Here the disadvantage of the soil becomes a blessing for the city.

It prevents groundwater from flowing downwards or towards the sea too quickly. The difficulty is the slow rate of infiltration through the surface. The best place for surface water to infiltrate in order to increase the groundwater supply is at the highest point, the centre of the city. From this point of view the large lake can be seen as the ideal technical solution for this problem.
Rainwater falling on roofs can be collected in cisterns and used instead of drinking water for various household and gardening purposes.

The surface run-off from roads, tiled surfaces and open areas can be collected and stored in reservoirs in the greenbelt up to the city boundaries. After filtration, the stored rainwater can be slowly pumped up no more than 20-30m, using solar energy, into the big central lake, from where percolation into the groundwater table will take place. In this way the water-level of the lake will be kept constant, providing optimal conditions for high-quality landscaping, park areas and desirable climatic effects.

Sewage from the densely built-up areas can be centrally purified in the greenbelt, and then be re-used for irrigation purposes. In the less densely built-up areas sewage, and when necessary also secondary run-off, can be purified in root-zone treatment plants and reused on the spot for irrigation.

In this way the geological and geographical "disadvantages" of the city's site make possible a regime of rainwater conservation which would provide a plentiful water-supply for both drinking and irrigation, even if the underlying groundwater becomes completely salinated. The average rainfall is fully sufficient to support a vigorous tropical vegetation as well as supplying the surrounding area from the surplus.
This will however be successful only if the residents of the city protect the first aquifer from contamination.

The upper strata of earth beneath the city function as a reservoir, and must therefore be protected. Then drinking water can be obtained from wells in the greenbelt which tap the groundwater before it flows out of the city limits towards the sea.

Only the extreme degradation of the basis of life in this area through over-exploitation of its natural resources, has led us to recognise the perfection of the original Vision, which enables the residents of the city to live unaffected, even in the midst of a degraded environment, so long as they themselves avoid polluting the ground and the water that are the basis for their own survival.