

# PARK?

or  
Purification Plant ■

Melting glaciers and irregular rainfall are threatening the supply of drinking water in Ecuador. According to several studies, Quito, the capital city, may run out of fresh water supply in about 20 years. In a world bearing the brunt of climate change, this may soon be the story every where.

How can one prepare for water running out? Can nature help man subvert this calamitous possibility? A recent study, *Fields of Metabolic Cleansers*, attempts to put landscape to a new use – it researches how a park can function as a ‘urban metabolic cleanser’, taking in black water and pumping out potable water.

The city of Quito, located in a valley, is sited between two volcanoes. It functions primarily as a water catchment basin for its immediate context. The scheme proposes to utilise the natural slope of the terrain to navigate rainwater runoff, black water and sewage into the site, purify it and later re-inject it into the city.

Quito receives its water supply primarily from two sources – a glacier on a nearby mountain and an underground water reserve. Unknown to the general population, the city is rapidly exhausting its natural water supply, with the water level of the reservoir falling by more than 5m every year. If the current rate of depletion continues, the city will run out of its fresh water supply by 2030. Clearly, preventive methods and/or alternate means of water supply (either by new infrastructure or by ecological recycling) are the need of the hour.

The FoMC study envisions the material conditions of the site of the park as “infrastructure”, subtly calibrated to suit the physicalities of the Root Zone Treatments.



About the Study

The study attempts to use the landscape, taken in its totality and working through its embedded materiality and physical conditions, as the primary instigator of design, in opposition to the conventional treatment of landscape as an afterthought. Appropriating fitness as the material relation between distribution, form and programme, Fields of Metabolic Cleansers structures a mutated morphological condition within the existing urban fabric that is adaptable to allow for varied multiplicities and adjacencies, while breeding hybrid typologies.

The study proposes to striate the function of the park with that of an "urban metabolic cleanser". The literal and figurative incubator thus collects black water and sewage from the immediate context and purifies it through ecological means, utilising the process of Root Zone Treatments, into usable water. The process employs only natural means in all but the last step, which, by regulation, requires the use of chemicals to make the water potable.

The Prototype

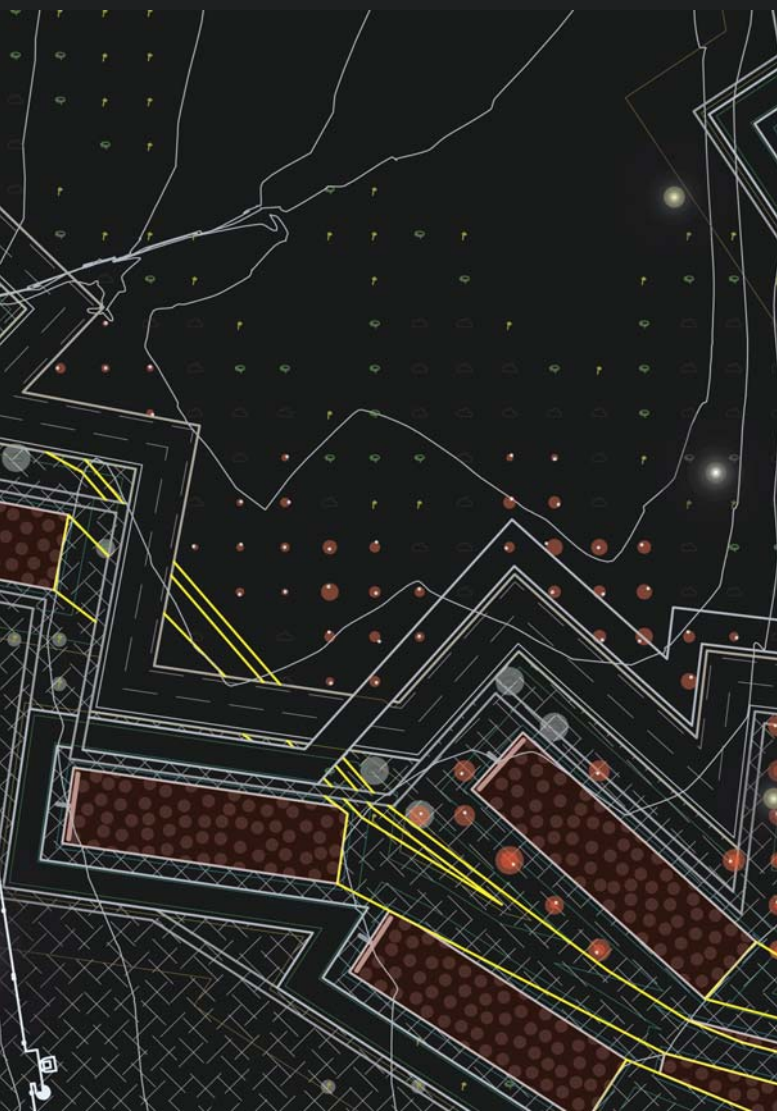
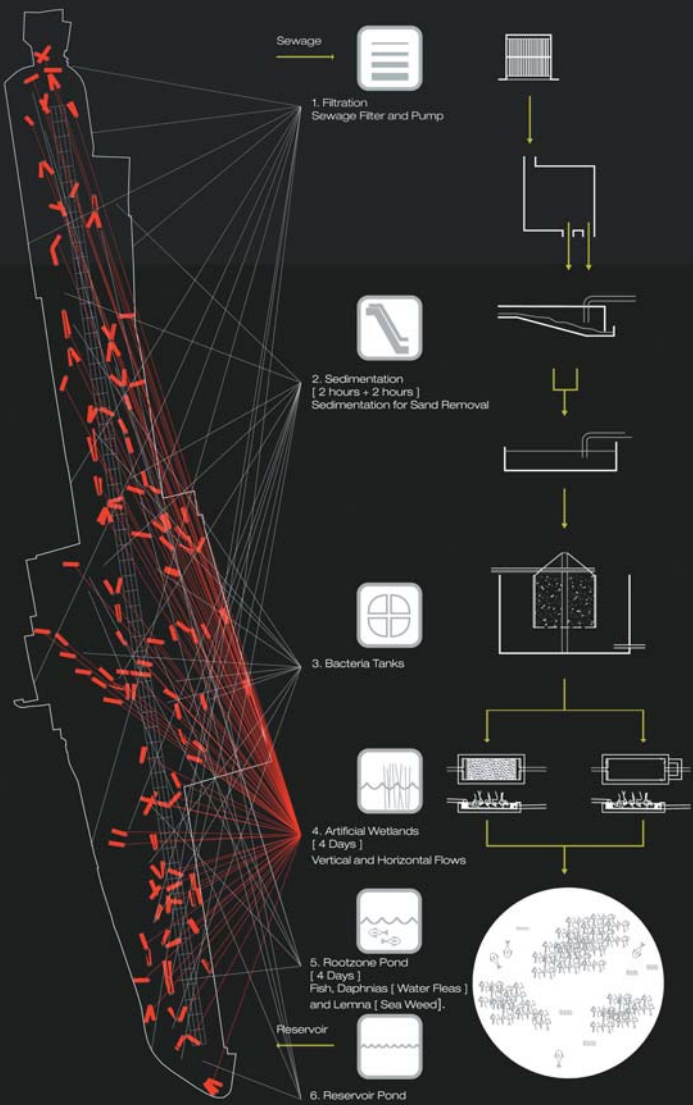
The scheme uses an all-natural ecologically sensitive wetland as the primary cleansing prototype. The prototype, with a performative capacity of accommodating for 60,000 litres per day, transforms into the dominant global ordering element for macro distribution across the site. About 146 such prototypical wetlands are proliferated across the site in regions that accommodate for the natural tendency of each of the steps of the purification system and cleansing process. In totality, the prototypes administer the purification of approximately 9 million litres of sewage a day, which is roughly 5 per cent of the total sewage production of Quito.

In distributing the prototypes, with their individual sub parts across the site, each revealing in their own distinct sensibility of scale and materiality, the site inherits a skeletal armature; a structure that is performative in its nature and intrinsic to the terrain of existing ground conditions. Using this distribution array as the defining framework, the site is then infused with additive functions of the park, complete with unprogrammed open greens, multiple accessibility paths for different user groups crossing the site, defined play areas for various usages, hard landscaping, dense greens, helipads, etc. The allotment of the wetlands distributed across the site allows for a variegated field condition that endorses families of multiple programmatic instances to emerge.

The Performance

At the larger contextual level, the park functions experientially and performatively as the lungs of the city, offering much-needed release from the dense existing fabric while also taking in sewage and releasing it back into the city as clean potable water. The resultant landscape arising out of such a system merges seamlessly with the immediate context, allowing for multiple access points into and through the park, with a different set of pathways and routes, each burdened with its own determined adjacencies, fine-tuned to be conducive to multiple target-user groups, be it for walks, jogging, cycling or vehicular passage.

An emergent by-product of the system is the appearance of a bicycle path that pulls into the site the existing route of the Ciclopaseo (a yearly festival revolving around a bicycling



ritual through the heart of the city), cutting through the entire length of the site, before releasing it to rejoin its original route to the north of the city.

### The Methodology

The site is sliced into multiple packets by the flows of water that branch out into small resting ponds, ultimately culminating into large reservoirs. The field is then proliferated with multiple types of trees, each infused with their own performative capacities and powdered with bacteria tanks while being dissected into multiple transportation routes. The resultant residual space is then separated into multiple regions of differential landscapes, each of which allow both for a different genre of mutated uses while catering to a different set of user groups.

While tending to emerge in low-lying areas of the site, the reservoirs work performatively in the capacity of incubators, inherently possessing the ability to absorb, grow and shrink in unison with the immediate context, as the case might be.

These emergent water ponds maintain the purity of the water through metabolic reactions, opportunistically using products as biohaven floating islands. In totality, the reservoirs have a holding capacity of close to 300 million litres, which is approximately 30 days worth of sewage purification.

### Wetland Distribution

Using the material, found within the runway of the pre-existing airport as a measure of calibration, the system maximises the magnitude of sewage treatment micro-breweries. The total area of the runway is divided into 146 segments — equal in number to the identifiable areas within the site that possess a natural gradient of 1 per cent, this gradient being the optimal slope requirement for the performance of the wetland. Based on the identifiable number, a width for the average wetland is calculated.

These packets of 15m X 50m that form the individual breweries, are then proliferated across the site, allowing for an unequal albeit performative distribution of the wetlands.

### Waterflows/Reservoirs

Taking clues from the existing slope of the terrain, natural water flow paths



### Cleansing Capacity

Number of Wetlands	: 146
Cleansing Capacity per Wetland per day	: 60m <sup>3</sup>
Total Cleansing Capacity per day	: 8,760m <sup>3</sup>
Total Cleansing Capacity per day	: 9 million litres
Average Daily Waste Water Generation per person per day	: 200 litres

The park is each day able to clean waste water produced by 45,000 people, which is approximately 5 per cent of the total population of Quito.

are mapped out from the discharge exit of each of the wetlands. These flows tend to collect in the low-lying areas of the site, allowing for the emergence of reservoirs that collect water until it is discharged back into the city.

### Site Connectivity

Integration of the site within its immediate context is achieved through seepage of contextual circulatory paths within, with the instrument of regulation being the relationship between that particular path and the proliferated wetlands. Paths for multiple user groups are thus forged — seating, jogging, walking, bicycling, primary and secondary vehicular traffic, the cumulative of which allows for varied inter-relationships between them to emerge.

### The Process

Using existing contours to map out regions within the site that exhibit a slope of 1 per cent, a requirement condition for the creation of wetlands, general areas for the wetlands are identified, making note of the direction of the slope of the terrain.

Mapping out water flows across the site, an undifferentiated field of nodes that would allow for water seepage directly into the wetlands, emerge. Dependant on their size and proximity to the wetlands, each of the points is given a function as specified vegetation or bacteria tanks. The bacteria tanks are used to supply water to the wetlands, with the vegetation tending to be near the ponds, thus absorbing and cleansing soil contaminants that the sewage water purification process tends to percolate in its proximity. 