Creating Egypt’s Seventh Oasis

Areas Below Sea Level

The position of the Qattara basin below the Mediterranean sea level is the key factor enabling a sustainable desalination system. The difference in height makes it possible to extract and distribute freshwater with no additional energy input. The Qattara basin is only one of many depressions around the globe that can be revitalized by freshwater extracted from salt areas. Other examples are; Badwater (USA), Louize (Bolivia), Lake Enriquillo (Dominican Republic), Laguna del Carbon (Argentina), The Netherlands, Salska-polje Tab (Bosnia), Chett Mekhir (Egypt), Solkhet Ghamiyd (Libya), Alan Triangle (Ethiopia), Dead Sea, Rya Desert (Kazakhstan), Turpan Pond (China), Ryde Basin (Australia).

A Network City of Villages

The construction of the oasis can begin when the Qattara depression has a steady stream of freshwater coming from the pipeline. There will be no large scale construction of the whole oasis at once – instead there will only be one village (app. 25 000 inhabitants) built around the first freshwater spring. This village will then grow in such a way that its water travel through sandstone aquifers. The same applies to a variety of crops such as cotton, rice, beans, grapes, figs, olives, dates, citrus fruits, and sugarcane. The livestock kept is mainly goats, sheep and camels. But one depression, the Qattara, is uninhabited without freshwater, and agriculture. The depression is made up by salt below and salt marls. The Qattara depression covers a 20 000 square km area situated 6 km from the Mediterranean coast and 200 km from Cairo. What if this area could become Egypt’s seventh oasis?

The Missing Oasis

In Egypt, fresh water springs (as Soviets) are situated in six areas, mostly in depressions. The water sources can be up to 800 km away and the water travels through sandstone aquifers. The same applies to a variety of crops such as cotton, rice, beans, grapes, figs, olives, dates, citrus fruits, and sugarcane. The livestock kept is mainly goats, sheep and camels. But one depression, the Qattara, is uninhabited without freshwater, and agriculture. The depression is made up by salt below and salt marls. The Qattara depression covers a 20 000 square km area situated 6 km from the Mediterranean coast and 200 km from Cairo. What if this area could become Egypt’s seventh oasis?

Cellular Replication Villages

Each village will have its own resource base in form of production, service facilities, energy production, people and homes. What unifies all the villages is the mutual water and communication network. The villages self-replication follows the replication cycle of a cell; initially grows (1) – more people and more production occur in the core, which eventually leads to the creation of a peripheral middle ring of the core (2) – it could be a resort or a place for special events. A keeping growing (3), and finally make the split when the resource are divided between the two cores (4). The village will then repeat the cycle or turn into a hibernation stage (5) – hibernation will be the rational choice when the village is surrounded by replicated villages.

Dense Village Core – Vast Green Periphery

Each village contributes to the whole city with some specific services (CBD, Hospital or University) but there are some general design features:

- A high density village with a radius of 500 m makes it easy to walk anywhere for the 45 000 inhabitants and visitors.
- Outside the dense village core is a vast agriculture landscape also used for recreation.
- Heavy production/waste treatment/transport are located around the dense village.
- Heavy transport roads of the village ring to smaller units before entering the dense village.
- Shape and small scale production are found along the main streets leading from the ring towards the center.
- Heavy evil metrics connects the village centers and the surrounding rings. Light evil metrics runs along the rings.

Private Houses Connected to the Whole

The buildings are constructed in the local architectural tradition; courtyard houses with stone walls and small bricks made in the salt marsh. The windows of clay pole trencane as houses can be expanded by pre-cut concrete beams. The roof is made for solar power production during the day and recreation at night. The kitchen garden is located at the lower level using the household grey-water for irrigation. The solar power connected to a village solar system with its network of fresh water (also used for cooling), black water, garbage and garbage disposal. The culverts follows the street pattern and connects to the outer ring with its waste treatment facilities and continues to the irrigated food production fields outside the village ring.

Water Pipeline

The freshwater will be transported 100 km from the desalination plant to the Qattara Oasis via thermal isolated pipeline. The pipeline, starting the initial village, will have a diameter of 2.000 meter with the capacity of 45 000 cubic meters per second at a speed of 8 meters per second.

The pipeline has to rise from the sea bed (+200 m) to the plains north of Qattara (+200 m) and then drop 300 m – the energy difference powered by the height difference (converted by a conventional hydro power aggregate) will be used in the desalination plant and the initial pumping.

By preserving the water initial temperature at 30°C, the cold water can be used in cooling homes in the Qattara Oasis.

Deep Sea Desalination

The salt water intake and desalination will take place 6 km outside of the coast of Egypt (not to the city of El Alamein) (+200 m below sea level. On this depth the recovered osmosis will be sold for three factors; high water pressure (38.0 kPa), low and stable water temperature (16°C) and relative salinity (36.0 per mille). The initial plant will produce 500 million cubic meter of fresh-water per year. This can be compared to the largest desalination plant in the world,侯利尔 Desalination Plant in Saudi Arabia produces 1.50 million cubic meters of water per year). With the expansion of the QO new plants will be opened.

Desalination Plant in Saudi Arabia produces 1.50 million cubic meters of water per year. By using the gravitational forces in water, one of the world’s most uninhitable places can be transformed into a thriving and growing oasis.

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