A Sustainable Desert-collective in a Global Context

Gaining drinking-water from sea-water and using sustainable energy sources

The unbalanced sharing of welfare on the earth is a very important aspect of today's life. Due to this big difference between the rich and the poor, together with the political conditions, the immigration has accelerated, the population of metropolitan cities is growing very fast and the doors of rich countries are more and more closing for economic immigrants.

On the other hand we notice that a great deal of the world (49.000.000 square kilometres) is desert and unused.
In Asia (Russia, Iran, Saudi Arabia, etc), America (Arizona etc.) and most parts of Africa deserts are not used mostly because of the lack of water and the high temperature.

The fossil energy is not infinite and the current energy sources cause pollution and greenhouse effect.
However there are alternative energy sources like the solar energy. The desert area is ideal for exploit solar energy.

It is interesting and important to investigate the possibilities and problems when designing and building a self-supporting collective in desert areas, for example Dashte Kavir and Kavire Lut (desert areas in Iran).

Two examples in the Persian Desert Area

The city Yazd is the centre of the province Yazd. It is located in the centre of Iran, between the latitudes 31 53' and 32 56' N. and longitudes 52 55' and 57 30' E.
Yazd is a city with 326.776 inhabitants who know the art of living in the desert very well.
They have very intelligent systems of badgir and ganaat to deal with the heat and shortage of water. They know very well that you have to understand the desert before the desert shares its sources with man.
There is a great understanding among the people of different religions but there is also apartheid towards religious minorities such as Zoroastrians and Jewish people.
In 1996 Yazd has been recognized as the second oldest city of the world by UNESCO. Citadel in Bam was one of the worlds monuments.

The city of Bam was situated 600 kilometers from Yazd and 300 kilometers from bandare Abbas (Golf of Oman) has the same Desert climate as Yazd. The Islamic character of the city is a little more traditional.
After the earth quake in 2002 the population has increased because of immigration from the villages and cities in the southern area of Iran.

We propose to research project possibilities in the mentioned region. It is very likely that results will also be applicable to many other desert areas.

In this project the following questions must be asked

- Should the city be reconstructed on the old location? In order to decide the exact situation and (seismic) maps are needed.
- Should the old way of city-planning and building be repeated or is it better to combine new technology and the traditions.
- Sand, sun, mud and palm leaves are available in the area and there is lack of water. How can we use the available energy sources and traditional/raw materials to create new materials or to gain water?
- Is the existing water system, ghanaat, sufficient or do we have to find new water sources?
- How does the ventilation system badgir work and why do people buy an electric ventilator as soon as they can afford one?
- In the process we will continuously look into the question, whether the traditional materials should be used or new advanced materials?
- How can we use the water from the Persian Golf without disturbing the coast ecological balance.
- What is the most ideal shape for a building in the desert?

Thinkable concepts

Because the new method of sweet water winning from the Persian Golf is a linear structure the basic form which will be studied. This is also an innovating way of dealing with the shortage of water in the desert.
(see map at bottom of this page).

The water can be pumped through a canal or underground pipe between the Persian Golf and the Caspian see. Pumping oil over long distances is very common, it can also be done with water.
The drinkable water can also be pumped to the Urumieh Lake which is drying now.

A historical collective, with the most advanced technology, and the most ancient history, will have a good start in tourism industry.

Because of the hot temperature and the sand storms we can conclude that a second skin structure and under ground building are the two alternatives which should be studied.
The factor of earthquakes should be considered in both cases.


Desert city has many layers

One of the characteristics of the cities of Bam and Yazd is that there are many layers of balconies, roofs and verandas. A second skin structure can meet this part of the tradition, which is very well. (see pictures)

The basic energy balance of the collective can be calculated on 0 energy usage. With today's technology it is possible to create buildings which can achieve almost zero energy level.
The modern transportation systems using on O2 instead of fuel, and floating railway systems the usage of fuel based energy sources will reduce and the loss of energy will also be much less then it is now.


Example: Eden project

The collective is self supporting in food production because there are farms in the collective for the production of vegetables, fruit and meat (also vegetarian).

For oil producing countries as Iran producing solar energy in the desert city could mean an extra income next to exporting oil and the possibility of making other products from fossil materials.
For Africa the solar energy could mean an end to the poverty and a solid income source.

Gaining water from the ocean and with the usage of solar and wind energy can mean the end of water-war threat.

Team


Realised project the city of the sun 0 energy houses.

The team of experts in solar energy: TNO Bouw Delft, light and safe building materials TU Delft, and The Netherlands water partnership NWP, nilofar urban | architectural | industrial design, Aqua-Aero Watersystems bv and industrialdesign.nl with years of experience are interested in working on this project.
Realized projects such as the city of the sun (a TNO project in the Netherlands, see photo) have shown the potential of sustainable design methods.

The teampartners are looking for financial support from governments, NGO´s and companies to further investigate and realize this project.

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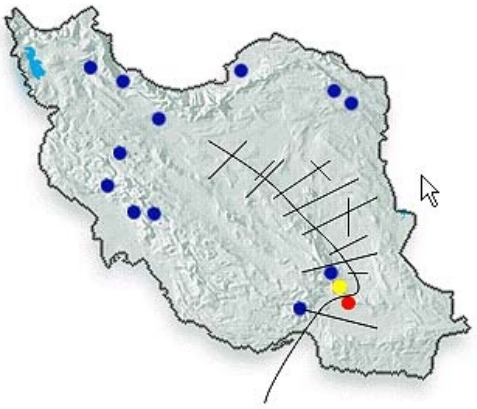
Map of Iran with the first suggestion for the water supply