Project : World Garden of Trees

Step-by-step re-naturization of Zaamar area

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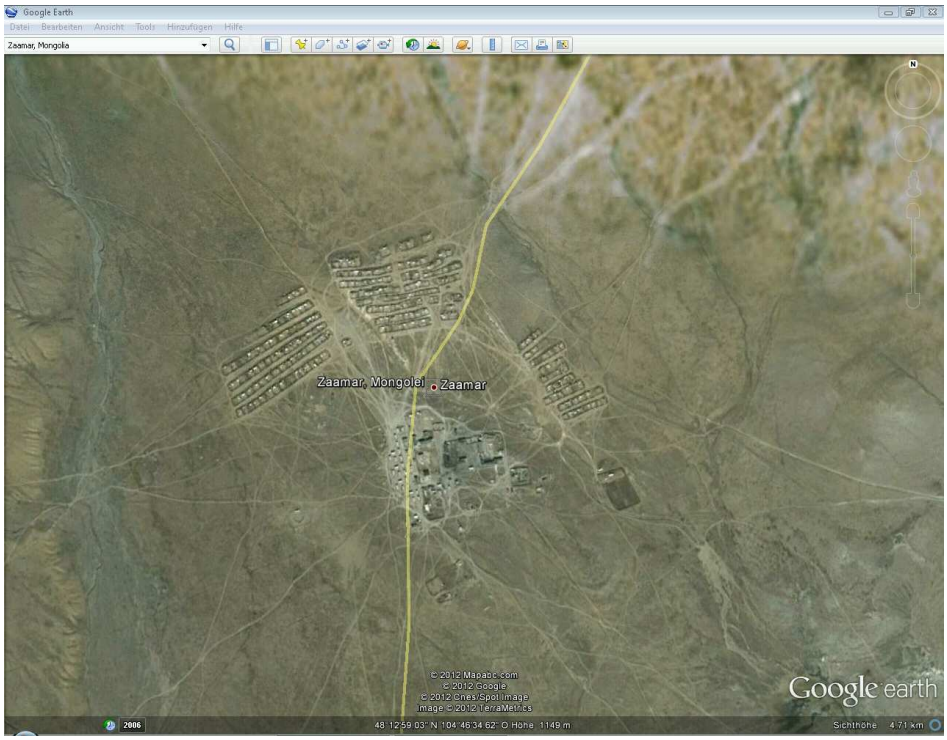
Short description of the recent situation



The Tuul river is well known in Mongolia, because it flows about 820 km across Mongolia, starting in the North, passing Ulaan Bataar, the capital up to Lake Baikal. He circles the field of Zaamar in Tov Aimag.

Zaamar Sum is about 180 km north-west of Ulaanbaatar in Tov Aimag and the Tuul is on the west side border. Its riverbed is rich in ores and gold.

As part of the gold-program awarded from the government in 1993, in about one third of the Zaamar Sum territory the mineral rights were given for gold-mining. This led to an ecological disaster in the region, in local and bilateral levels. Many of the smaller rivers and lakes dried up because of the excessive and inefficient use of water for mining and the lack of rehabilitation measures after the end of degradation.

Simultaneously, the soil and the water of the river and its environment has been contaminated with heavy metals like mercury. The steep slopes and cleared areas around the river banks suffered wind erosion and desertification.

Through the use of antiquated mining methods and technologies, the river Tuul, Orkhon and Selenge were heavily polluted. Since these rivers are important tributaries of Lake Baikal (Russia), the world's largest freshwater reservoir has experienced a significant pollution. A redevelopment is urgent not only for Zaamar Sum, Mongolia and Russia, but is an important international ecological problem that requires a prompt and comprehensive solution.

In Mongolia, there are operating more than 250 large and small gold mines. In the period from 1993 to 2003, according to official figures, about 35 mines were active in Zaamar. 29 of these companies have left about 2215 hectares of digged land in an absolute state of disrepair and without any attempt of restoration.

Any recultivation of the mine is a complex operation and requires large investments of money and a lot of time. Scientists came to the conclusion that a full restoration of nature needs at least 10 to 15 years and is very difficult, especially considering the low rainfall in the affected area.

Many of these renaturization measures, for which the mining companies had even made a budget available, were unsuccessful because they were not

carried out conceptually. Furthermore, no concrete steps have been taken to establish appropriate administrative structures to enforce the performance of biological remediation technologies for advanced environmental standards and requirements. As a result, not only local people leaved the area, there were also plenty of opposition initiatives against redevelopments.

The "Toson Zaamar" NGO initiated a project "Nogoon Tugul" (Green Garden) and asked for the support of Parliament, the mongolian government and the competent ministries and authorities, but without result. There were only promises, but no support.

A redevelopment of the area is due to the progressive destruction of the livelihoods of many people but urgently needed.

We present here in short form a concept, that allows a relatively little expense for a successful and complete renovation and re-naturization and simultaneously provide the affected population a new livelihood.

Topics

1. Social and Organisational

- Collaboration with government agencies and authorities.
- Integration of the population in each step of the remedial measures.
- Creation of appropriate residential.
- Creation of jobs, the income situation of the population must be improved, so that no more illegal digging happens.
- Creation of grazing land parallel to the rehabilitation of the areas around the Tuul river.
- Informing the public about the different stages and progress of the project (transparency) and its prospects, and training in ecological contexts (sustainability).
- Search for international support.
- Integration of national and international NGOs into the project (eg, Rotary Club of Ulaanbaatar and Korea).
- Opening of the project for the global participation of individuals and businesses (**World** Garden of Trees).

2. Procedures

Starting from a narrow central core area, the following actions are performed:

- Rehabilitation of the soil
- Restoration of a continuous river
- Leveling of pits and dumps
- Filling up of holes and tunnels
- Along with the renovation and leveling of the soil: put in soil improvers
- Provide people and animals with clean drinking water
- Water treatment: filter out mercury, arsenic and other heavy metals with condensation processes.
- Restoration of natural water balance, including restoration of the aquifer
- Construction of fenced pastures by usage of out soil improvers
- Establishment of small houses per family on a modular basis from recycled material. The houses meet the requirements of low energy buildings.
- Firewood is replaced by the use of vegetable oil burners in order to avoid future deforestation
- Selection of suitable plant species for planting the river banks and adjacent arid areas. Newly planted trees, shrubs and grasses are initially fenced in to protect against grazing.
- Starting from the central core zone of the re-cultivation, the area will be extended after completion of the various stages of planning and measures continuously until the maximum of available area is re-greened and planted again.

- Implementation of appropriate marketing strategies for the region and the project nationally and internationally to make it known and to use it for agriculture and tourism.
- Planning of suitable tourist attractions in collaboration with local and higher authorities and mayors, in cooperation with the local population.
- Granting licenses.
- Establishing of a tourism industry.

3. Technical Measures

Sustainable and systemic consideration of the overall problem with the selection of such methods, which have a long-term effect, preserving by itself, and allowing a harmonizing solution with people and nature.

This includes:

- Selection of appropriate crops (fruit trees, deciduous and coniferous wood), deep-rooted shrubs and bushes that get along well with a dry environment and can be used to build a local economy.

- Selection of appropriate soil conditioners that ensure the continuous supply of plant roots with moisture / water, making irrigation largely or completely unnecessary.

- Selection of suitable soil improvers, which ensure a long-term supply of nutrients to plant roots.

- Selection of appropriate root symbionts that enhance root growth and additionally reduce soil erosion by wind, and water storage in the soil.

- Water treatment of river water / groundwater with German technology WITHOUT filter (condensation principle). The technique works particularly cost effective when waste heat is available. It is integrated into a container, with modular technique, can also be operated with heat pumps, solar panels, diesel or gas turbines or other CHPs.

• Decentralised drinking water for humans and animals with water-from- air. The plants can be almost fully scaled and produce condense water from air humidity.

• Building ecological energy systems (biogas, PV, solar thermal, small windpower plants).

- Electricity from organic waste: straw, grass, leaves, silage, cattle manure (pigs, cattle, poultry), manure, sewage sludge, fruit residues, kitchen waste, etc.

- **All technical solutions for the construction of ecological components form a closed circuit. It is used exclusively Green / Clean Technology.**