

Management of Drylands: Lessons Learned

D.M. Gabriels¹, D. Lobo²

Drylands can have between 35% and 95% of deficit of water in their soils. If a permanent pluviometric deficit occurs, this phenomenon is called ‘aridity’, while ‘drought’ is related to a temporary deficit. Drylands are also affected by several types of irregular droughts. Desertification is more related to drought than to aridity. Combating desertification is managing drylands in view of their preservation or restoration.

The SUMAMAD (Sustainable Management of Marginal Drylands) project was implemented by UNESCO’s Man and the Biosphere (MAB) Program together with the United Nations University - Institute for Water, Environment & Health (UNU-INWEH), and funded by Flanders, Belgium (2008-2014). The management of drylands was mainly performed at sites at UNESCO-MAB Reserves, and included:

- A solar desalinization plant was built in the Omayed Biosphere Reserve in Egypt.
- Chicken farming in compacted grassland was carried out in the Hunshandake sand area of China.
- Deficit irrigation for quinoa production was applied in the southern Bolivian Altiplano.
- Community based grazing was managed in the drylands of the Dana Biosphere Reserve in Jordan.
- Arabic gum was produced and composting techniques were applied in the arid western plain zone of the Thar Desert in India.
- Agroforestry and organic manure were used in the Mare aux Hippopotames Biosphere Reserve of Burkina Faso.
- Degraded dryland ranges were restored in the Lal Suhanra Biosphere of Pakistan.
- Because of the good results of the ‘chicken farming’ project on compacted grassland in China, the ‘chicken farming’ project was copied and applied in degraded areas in Pakistan.
- Flood water spreading was carried out in the Gareh Bygone Plain of Iran.
- Reforestation with Acacia trees was done in the Bou Hedma Reserve of Tunisia.

The projects will be described in this presentation, and the successful but also less successful results will be discussed. In the UNESCO IHP (International Hydrology Program) and under the UNESCO-Flanders (Belgium) Trust Fund, a project named COSWAND (Conservation of Soil and Water in the Andean countries of Latin America) was launched in 2006 as an activity of CAZALAC (Water Center for Arid and Semi-arid zones of Latin America and the Caribbean), based in La Serena, Chili.

The objective of COSWAND was focused on capacity building related to conservation of soil and water in Andean countries, and this was in cooperation with local communities, schools, farmers and their family members. Farmers need to ‘know’ the physical and fertility condition of their soils prior to taking measures to combat degradation.

COSWAND 2006 took place in Namza, Ecuador with PROMAS (Program on Soil and Water Conservation) of the University of Cuenca, Ecuador as local organizer in cooperation with

¹Donald M. Gabriels, Emeritus Professor, Department of Soil Management, Ghent University, Ghent, Belgium; ²Deyanira Lobo, Professor, Universidad Central de Venezuela (UCV), Instituto de Edafología, Maracay, Venezuela. Corresponding author: D. Gabriels, email: donauldabriels@gmail.com.

two local primary and secondary school teachers and children, and with local farmers and their family members.

COSWAND 2008 was organized in the parish of San Juan, Merida, Venezuela in cooperation with the University of Los Andes and with the Ministry of Environment. About 50 participants attended the two-day workshop; among them mainly farmers and their family members, local women's organizations and schoolchildren and teachers from local communities. The Universidad Mayor de San Andrés, La Paz, Bolivia organized COSWAND 2012 in Villa Patarani (Central Altiplano) with the majority of the participants being members of the female farmers union, other farmers coming from local communities, and the children from local schools.

In 2014, the Belgian group Solid International with its branch Solid Peru coordinated COSWAND 2014 in two locations in the region of Ayacucho, Peru. In one location (Wayta) the roses cultivated in greenhouses were sold at local markets. In the other location a dairy farm was exploited for milk production. Solutions were discussed with local farmers and their family members on how to cope with problems of overgrazing and excessive cattle manure production. Some lessons were learned from COSWAND on the knowledge of the physical and chemical fertility of local soils, on how to use water more efficiently under 'dry' soil conditions, and on how to combat soil structure degradation under local conditions.