

REPORT BY AUSTRIA

**ON MEASURES TAKEN TO SUPPORT THE IMPLEMENTATION OF
THE CONVENTION TO COMBAT DESERTIFICATION IN AFFECTED
AFRICAN COUNTRY PARTIES**

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1 Summary

Pursuant to Article 26 of the UN Convention to Combat Desertification and according to para. 3 of Decision 11/COP 1, Austria submits this national report on measures taken to support the implementation of the Convention to Combat Desertification (CCD) in affected African Country Parties and other affected countries. Above that a general overview of other desertification-related projects is given. An address is appended at the end of each description and interested readers are encouraged to contact Austrian partners.

1.1 Outline of Austria's strategy and overview

The Republic of Austria regards it as essential to adopt an integrated approach addressing the physical, biological and socio-economic aspects of the processes of drought in general and desertification in particular. This integrated approach implies activities which fall under the broad ambit of combating desertification, particularly activities in the field of soil erosion and reforestation. It is Austria's firm view that the priority in combating desertification should be the implementation of preventive measures for lands that are not yet degraded, or which are only slightly degraded. However, Austria is equally aware of the fact that severely degraded areas should not be neglected. It follows logically that in order to give due attention to the situation of affected (developing) countries, it is necessary to pursue a broad strategy including such diverse measures as for example support of sustainable agricultural land use, or research in silicate technology for optimising water and air storage capacity in problematic soils. Thus, Austria is actively engaged in various modes and methods of combating the problem of desertification and mitigating the effects of drought, each of them varying in form, degree and content.

The measures taken by Austria in implementing the UN Convention to Combat Desertification are carried out in different regions affected by desertification. As envisaged in Article 7 UNCCD, however, affected countries in Africa are the main focus of the Austrian strategy in combating desertification. The measures undertaken can generally be classified as follows:

First, Austria supports measures in the framework of official development cooperation (ODC) with particular focus on the Sahel. In the field of ODC, Austria's

integrated approach is reflected in its development policy which, in general, stresses the need for sustainable development and, in particular, follows the principles and approaches contained in the Rio Declaration; this policy is furthermore guided by Agenda 21.

Second, Austria is actively engaged in research in the broad field of desertification (including soil erosion and soil degradation, reforestation, etc.) carried out by State universities and other research institutions not only in Austria but also, and more importantly, in countries and areas threatened, or already affected, by desertification and soil erosion. Moreover, Austria promotes the close scientific cooperation between research institutions in Austria and research institutions particularly in affected countries.

Third, Austria encourages the mobilization of funding from the private sector and other non-governmental sources; this makes it possible to implement specific measures and projects in combating desertification.

And fourth, Austria undertakes various activities in order to raise general public awareness of both the problem of desertification and the effects of drought as well as of the importance, the content and the objectives of the UNCCD.

1.2 Measures in the framework of official development cooperation

1.2.1 General development policy

In promoting sustainable development in accordance with the Rio Declaration and with Agenda 21, Austrian ODC adheres to the chapters of Agenda 21 devoted to the so-called sectoral cluster (land, mountain, forests, desertification and biodiversity; Chapters 10-14 of Agenda 21). The application of the relevant chapter depends on the geographic conditions of the respective selected region. Due to the increasing importance of environmental aspects within international development cooperation, all projects supported by Austrian ODC are subject to a process of environmental screening, *i.e.* an *ex ante* environmental impact assessment.

Austria recognises the significance of capacity-building and holds the view that both the participation and capacity-building of local communities and rural organisations are essential, and even indispensable, for successfully preventing or combating desertification and for mitigating the effects of drought. This participation

of directly affected local people must, in Austria's opinion, be accomplished at all levels, starting from the process in which the projects are planned; and it must be maintained during the entire implementation phase of the projects. Capacity-building furthermore consists *i.a.* in strengthening training and research capacity as well as in the dissemination and transfer of relevant technology, knowledge, know-how and practice in the field of desertification.

1.2.2 Development projects in the broad context of desertification supported by ODC/ODA

Several projects of ODC which are aimed at combating desertification in a broad sense, *i.e.* projects including the prevention of soil erosion or degradation, are carried out by Austrian NGOs in Burkina Faso, Senegal, Mali, Cape Verde, Kenya, Uganda, Bhutan, Brazil and Guatemala. They all pursue the goal of sustainable and locally equitable agricultural management and production which takes into account the preservation of natural resources. Among the activities to achieve this overall objective are the following:

- Measures of soil protection and amelioration and measures to prevent soil erosion;
- Support, development and promotion of ecologically sound land-use systems with focus on agro-forestry, designed and implemented in cooperation with the affected population;
- Preservation and sustainable use of forestry resources and reforestation;
- Promotion of sustainable water management, in particular well rehabilitation, protection of soil from erosion, etc.;
- Promotion of women;
- Support of rural infrastructure.

1.3 Research

Austria believes that the starting point of effective preventive measures to combat desertification is to support research activities in order to better understand the problem of desertification. Furthermore, scientific research is an adequate means to promote technical and scientific cooperation in the fields of combating desertification and mitigating the effects of drought. In particular, these activities shall contribute to increased knowledge of the processes leading to desertification and drought and the impact of, and distinction between, causal factors - both natural and human - with a view to achieving *i.a.* improved productivity as well as sustainable use and management of resources, especially water and land resources. Furthermore, in

order to employ any new technology relevant to combating desertification as efficiently as possible, in Austria's view it is necessary to enable and facilitate the financing of the transfer, acquisition, and adaptation of such new technology. Finally, an integrated approach as is favoured by Austria calls for effective scientific cooperation between research institutions in developed countries on the one hand, and research institutions in affected and/or developing countries on the other. Such cooperation should also be designed to foster capacity-building on all levels. Besides, it should not be ignored that research and technology is only effective if it is adapted to the locally prevailing conditions of the population and the environment. Therefore it is necessary that the new technology is adequately combined with the traditional knowledge of the local population.

1.4 Private and other non-governmental activities (including funding)

Besides the projects and research actively supported by Austria in financial terms, Austria also encourages private and other non-governmental activities engaged in combating desertification and mitigating the effects of drought. This also includes measures to encourage the mobilization of funding from the private sector and other non-governmental sources pursuant to Article 6 para. (d) UNCCD.

1.5 Public awareness and information

Finally, Austria undertakes measures to promote awareness for the problem of desertification and soil erosion not only in Austria but, more importantly, in affected countries.

2 Measures in the framework of official development cooperation

2.1 Protection and sustainable management of the natural resources water, soil and vegetation - Entwicklungswerkstatt Austria

Entwicklungswerkstatt Austria - Development Workshop Austria (EWA) is a Salzburg-based non-governmental organization which has carried out development projects in rural areas in Senegal and Burkina Faso for 10 years. EWA has specialised in regional development programs in the Sahel in West Africa. The projects are planned and carried out in cooperation with grass-root organisations, farmer and artisan cooperatives, and other NGOs. The main focus of EWA's work

lies on sustainable use of natural resources, conservation of the ecological equilibrium, diversification of income generation and the promotion of “rural artisans”. The overall objective of EWA’s commitment is the support of self-help activities through the provision and transfer of know-how and methods for personal and vocational development and the support of project partners and the local population in order to develop financial instruments and management capacities.

The concept of protection and sustainable use of natural resources, combined with the promotion of capacities of the rural population to realise their personal and economic potentials in a participatory manner, is the core aspect of both EWA’s development philosophy and of the UN Convention to Combat Desertification.

EWA is currently involved in the implementation of a total of 10 projects in Burkina Faso and in Senegal. In general, two different project types are implemented, *i.e.* promotion of artisans and appropriate technology on the one hand, and protection and sustainable management of the natural resources water, soil and vegetation on the other hand. In the context of desertification the sustainable use of water, soil and vegetation is of particular importance and therefore the EWA carries out *i.a.* the following programs:

- Support, development and promotion of ecologically sound land-use systems with focus on agro-forestry, designed and implemented in cooperation with the affected population;
- Promotion of sustainable water management, in particular well rehabilitation, erosion protection, etc.;
- Support of rural infrastructure.

Address: Entwicklungswerkstatt Austria, Entwicklungswerkstatt Austria, Thunstrasse 16, A-5400 Hallein; Tel: 06245/70077, Fax: 15

2.2 Austroprojekt, Agency for Technical Cooperation, Ltd., Vienna

Austroprojekt is an independent Austrian consulting company with branches in Tunisia, East Africa and Central America. In cooperation with local project partners (NGOs, clerical institutions, research institutes), *Austroprojekt* is specialised in the planning, implementation and evaluation of long-term projects in the field of bilateral technical cooperation and currently administers about 20 development projects. A total sum of approximately 75 such long-term projects have already been accomplished.

Austroprojekt is currently carrying out a project on sustainable and locally equitable agricultural management in Burkina Faso in cooperation with the *Ministère de l'Agriculture et des Ressources Animales*. The project is locally limited to the province of Kouritenga (with its main village Koupela) and is designed to cover all aspects of the promotion of agricultural development and to focus on the preservation of natural resources. The area is characterised by the highest non-urban population density in the country, which entails probable detrimental effects to the natural resources. On the other hand, the affected area offers a considerable potential for the commercialization of agricultural production, especially by its favourable location in terms of traffic and communications policy. The objective of the project in Kouritenga is to increase sustainable and locally equitable agricultural production taking into account the preservation of natural resources. Among the activities to achieve this objective are measures of soil amelioration and measures to prevent soil erosion.

Furthermore, *Austroprojekt* is carrying out reforestation measures in Morocco in collaboration with Dr. Badawy of the Vienna *University of Agriculture and Renewable Resources*, the *Institut Agronomique et Vétérinaire Hassan II*, Morocco, as well as *Sanoway Corp.* and Mr. Martin Zumtobel as private financiers, see *infra* 4.

Address: Austroprojekt, Agency for Technical Cooperation, Ltd., Springergasse 3, A-1020 Vienna, Phone: +43-1-2189025, Fax: +43-1-2189025-25, email: ap.wien@austroprojekt.com

2.3 Caritas Austria, Innsbruck branch

Project: "Integrated management of water resources and promotion of women in the diocese of Dakar, Senegal"

a. General overview

Since the 1970s when Senegal was affected by severe drought, Austrian *Caritas* has helped its partner, *Caritas* Senegal, especially the Diocese of Dakar, with water supply. The decentralised structures of *Caritas* Senegal and the experience with certain ongoing projects favour a participatory approach on a scale of activities in the fields of administration of water resources, environmental protection and the improvement of labour conditions of women. Some activities, like drilling operations, are already well mastered but necessitate a system of monitoring the ground water levels. Other parts of the program, like the management of surface waters and

combating erosion are still in an experimental phase. The project employs two collaborators situated in Mbour. They examine the demands of the villages, organise the necessary activities and coordinate the studies. The management and administration of the project remains with the diocese of Dakar. The *Caritas* of the diocese of Innsbruck is involved in every stage of the project and assists the diocese of Dakar in the administration. The project is financed by *Caritas* Austria, the Austrian Government and the European Union with a total sum of ECU 693,974.

b. Objectives and activities

- Installation of an office which is in charge of planning and supervising hydraulic activities and the promotion of women;
- Equipping a deep drill hole with a water tank and pipes for supplying areas totally lacking freshwater wells;
- To supply the supervisory office with materials and equipment for deepening the wells in those areas where the potable groundwater is threatened by drying up;
- Training of persons who are in charge of digging wells;
- Creation of irrigated gardens surrounding the wells and water drill holes to facilitate economic activities as well as self-supply and self-sufficiency with food;
- To carry out studies for constructing water reservoirs and dikes to prevent soil erosion and salination as well as to protect pluvial cultures;
- Construction of pilot dikes with local materials;
- Promotion of female participation in activities surrounding the hydraulic projects concerning hygiene and water management and other activities (mills, grain silos and grain banks).

The studies and seminars shall contribute to the establishment of communal committees which manage the wells, drills and reservoirs as well as the mills and grain banks. The realisation of an appropriate water price would facilitate the management of the hydraulic equipment and its amortisation.

Project: "Integrated management of water resources and promotion of women in the diocese of Thies, Senegal"

a. General overview

Similar to the aforementioned program this project aims at reducing the water shortage in an area severely affected by drought. It envisages the alleviation of female labour and would promote the development of irrigated gardens and fruit plants by constructing deep wells and improving existing drill holes. As a corollary, the project would contribute to mitigating environmental problems, in particular soil

erosion. The project is located in the regions of Thies (Thies and Tivavouane) and Djourbel (Bambey and Djourbel).

b. Objectives

- Reducing the water scarcity of the population;
- Combating environmental degradation and poverty of the rural population;
- Alleviating female labour;
- Improving the capacity of action of the Caritas in all these different fields.

c. Measures envisaged

- Sinking and equipping of wells in 24 villages;
- Combating soil erosion by erecting fascines and dikes;
- Planting 10 ha of forest to be utilised by the local population;
- Adequate equipping of the well drills.

Project “One village, 1000 trees” in Dagana, Senegal

This project, which is located in Dagana at the Senegal River, aims at providing sufficient access to freshwater for approximately 34,000 people and at establishing the basis for an independent management of agricultural activities. Among other activities, *Caritas* Austria erects natural barriers and fencing installations by applying biological water-storing substances in order to prevent dune encroachment and shifting sand. This project is financially supported by the Austrian Federal Government and the Provincial Government of Styria with a total sum of ATS 1,414,530.00.

Dam project in Yimjougo, Burkina Faso

In the framework of the bilateral cooperation with Burkina Faso as a focal country, Austrian development cooperation supports the promotion of the local water supply and distribution. The recurring drought in the Sahel region, especially north of the capital Ougadougou, calls for measures to retain the annual quantities of precipitation for irrigation purposes. *Caritas* Austria in cooperation with the local *Caritas* branch of Burkinabé, along with several NGOs (*Association Internationale des Volontaires Laics*, *Sahel Solidarité*) and with representatives of the national Ministry of Hydraulic Construction (*Ministère de l'Eau*), has erected a dam at Yimjougo; it serves the purposes of irrigation, refill of groundwater reservoirs, afforestation and erosion protection. This project is financially supported by the Austrian Government with a total sum of ATS 7.5 Mio.

For details on the close cooperation between Caritas Austria, Dr. Badawy of the Vienna *University of Agriculture and Natural Resources* and *Sanoway Corp.* in Senegal, see *infra* 3.3.

Address: Caritas Austria, Erlenstrasse 12, A-6020 Innsbruck, Tel. +43-512-7270-27, Fax: +43-512-7270-5.

2.4 Institute for International Cooperation

The Institute for International Cooperation (Institut für Internationale Zusammenarbeit - IIZ) is an organisation specialised in participative preparation, planning, implementation and evaluation of development programs. The fields of operation of IIZ include rural development, agriculture, forestry and environmental protection. The geographical focus of its work lies in Eastern and Western Africa and in Central and South America. Among the various projects and programs carried out by IIZ, the following projects are concerned with combating desertification and soil erosion:

- Program de Développement Durable Communautaire, in cooperation with Actions en Casamance (ACAS), Senegal:

In Senegal, IIZ cooperates with ACAS, an autonomous regional program of the international NGO "ENDA-TM". In the Basse Casamance in the regions of Bandjal, Kalounayes and in Kolda, IIZ supports several activities carried out by ACAS. Among other concerns, these activities are aimed at soil protection and forest conservation. In particular, it is planned to erect dikes and dams, to establish specific plans of soil exploitation and to employ organic methods of agriculture. The project is financed by IIZ with a total sum of ATS 22,592,880.

- Development of a system of sustainable agriculture and of workable organisational structures in rural communities in North Brazil, in cooperation with the Centro de Assessoria de Assiriá (CAA):

The main focus of this program is the improvement of agricultural methods and conservation of resources, in particular combating soil erosion. The project is financed with a total sum of ATS 6,748,449 by IIZ, the European Union and the Diocese Graz-Seckau of the Catholic Church in Austria.

- Agricultural centre of training and research (Centro de Capacitación Campesina - CCIC) in Guatemala, in cooperation with the Arch Diocese Quetzaltenango:

Among other aspects the project emphasises sustainable use of forestry, reforestation and protection from soil erosion. The project is financed with a total sum of ATS 2,207,831.

- Program for small agricultural units in Huehuetenango, Guatemala, in cooperation with the diocese Huehuetenango:

This program (Programa de Pequeños Productores de Huehuetenango - PROPEPH) is an umbrella organisation for small producers designed to support common production and marketing of agricultural products. Among the activities carried out are reforestation, the erection of tree nurseries and measures of soil protection. The project is financed with ATS 2,286,119.

- Sustainable use of indigenous community forests (Cooperación para el Desarrollo rural de Occidente - CDRO):

CDRO is an organisational network of 28 rural communities which was founded in 1984. It carries out projects that promote the standard of living of the various indigenous peoples in the area on the basis of local self-determination. This project is primarily concerned with the conservation of forestry resources and undertakes measures of reforestation including the founding of tree nurseries. The project is financed with a total sum of ATS 1,426,784.

- Agro-ecology and economic development, in cooperation with the Instituto para el Desarrollo de la Democracia (IPADE), Nicaragua:

This project is aimed at improving the ecological methods of utilising land resources. In particular, the techniques of soil conservation (including anti-erosion measures) which have been tested over years are being increasingly applied by the local agricultural producers. The project is financed with a total sum of ATS 2,482,316.00.

Address: Institut für Internationale Zusammenarbeit (Institute for International Cooperation), Wipplingerstrasse 32, A-1010 Vienna; Phone: +43-1-5334786-0, Fax: +43-1-5334786-39.

3 Research

3.1 State Research Institute of Silicate Technology, Vienna: Optimising water and air storage capacity in problematic soils by applying Sanoplant

State Research Institute of Silicate Technology, Vienna, Prof. Dr. Hugo Hubacek and his team, in cooperation with the University for Agriculture, Forestry and Renewable Resources Vienna, and with the University of Cairo, Desert Research Center.

Prof. Hubacek, Head of the State Research Institute of Silicate Technology in Vienna, Austria, is a world-wide leader in silicate technology and has played a major role in the restoration of the Sphinx and the Chephren Pyramid as well as other historic or cultural sites in Egypt by applying “*Sanotec*”, a liquid substance invented by Prof. Hubacek which is to be added to ordinary water and cement.

Currently, Prof. Hubacek is working on the improvement of “*Sanoplant*”, a totally new silicate complexer. *Sanoplant* is a natural, non-polluting, primarily mineral powder that allows trees, grass and other plants to grow using only 20 per cent of the normal water quantities. This new silicate technology was invented by Prof. Hubacek in cooperation with Dr. Nabeel Badawy of the *University for Agriculture, Forestry and Renewable Resources*, Vienna. The research leading to this technology was co-financed by the Austrian *Funds for the Promotion of Scientific Research (FFF)*.

Research carried out by Prof. Hubacek and his team in Austria has revealed that *Sanoplant*-treated soils need watering just once in 10 days, which even reduces the required water quantity to 10 per cent. Once watered, the *Sanoplant*-treated soil acts like a sponge, soaking up and absorbing the moisture, which it retains, preventing water evaporation. Experimental application of *Sanoplant* under normal watering conditions resulted in two to three times larger size of crop. In general, one kilogram of *Sanoplant* powder stores up to 50 litres of water and nutrients. Besides the economic advantage of water and nutrient reduction, *Sanoplant* also contributes to the protection of ground waters in that it retains the nitrates contained in the fertilisers. The *Sanoplant* additive has also proven to be successful in stemming soil erosion, even under driest and windiest conditions. The preparation requires the product be mixed with gravel or stones and the usual soil, which instantly adheres to the powder. *Sanoplant* is not a hydrogel and, as it is an inert substance, it does not form a chemical compound; thus it is an ecologically sound material. Since

Sanoplant may be blended with available local resources (e.g. desert sand in the Sahel, volcanic rock in Iceland), it may be independently produced in the affected areas. The procedure provides for adequate soil aeration so that root-rot does not occur. It also allows for the gradual development of a natural humus layer, even in stony or sandy soils.

Over 1,500 citrus and date palms have already been planted in Abu Dhabi. The short-term objective of blending *Sanoplant* with desert sand is to plant and grow shade-providing trees which, in turn, allow food plants to grow in normally infertile desert areas. This technique has also been tested in Egypt and is currently being applied to desert management projects for the control of erosion and stabilisation in Senegal. In this connection, recent field tests have revealed that *Sanoplant*-treated plants already show significantly increased growth after a period of four months. Thus, mango and citrus trees treated with *Sanoplant* were twice as tall as plants not treated with *Sanoplant* despite the reference plants having been watered twice as much. In Mauritania, *Sanoplant* is currently being tested for reforestation purposes.

In implementing these projects, Prof. Hubacek also cooperates with Caritas Austria (Innsbruck branch, see *supra* 2.3).

Large-scale experiments in South Africa have revealed the suitability of *Sanoplant* in agricultural production, especially in the cultivation of oats and other cereals.

Address: Prof. Dr. Hugo Hubacek, Institut für Silikattechnik, TGM, Wexstrasse 19-23, A-1200 Vienna, Austria, Phone: +43-1-33126480, Fax: +43-1-33126680

3.2 University for Agriculture, Forestry and Renewable Resources/Institute for Soil Research, Vienna

The *Institute for Soil Research* of the *University of Agriculture, Forestry and Renewable Resources*, Vienna, carries out several projects in the field of soil research which are directly connected to the problem of desertification. Project leader is Prof. Dr. Winfried Blum.

Project: "the assessment of the sustainable productivity potential of important agriculturally exploited soils in West Africa as exemplified by Guinea"

University for Agriculture, Forestry and Renewable Resources/Institute for Soil Research, Vienna/Austria, Prof. Winfried Blum and Dr. Axel Mentler, in cooperation with the Federal Authority of Economics of Water Supply and Distribution/Institute for Cultural Technology and Soil Water Balance, Vienna/Austria, Dr. Peter Strauss and the Ministère de l'Agriculture, des Eaux et Forêts/Institut de Recherche Agronomique de Guinée/Service National des Sols (SENASOL), Guinea, Dr. Momo Soumah.

a. Description:

The main focus of the research activity currently carried out by SENASOL is the assessment of the potential of soil productivity by employing organic fertilisers. The underlying reason is that the prevailing socio-economic conditions in Guinea prohibit the employment of mineral fertilisers by the vast majority of farmers. Studies on the productivity of agricultural soils with regard to mineral fertilisers in Guinea have been carried out only to a very limited extent. In order to provide recommendations for a locally equitable agricultural exploitation of the productivity potential, knowledge of the potential soil productivity is essential. An important instrument for such an assessment is the establishment of a pilot system for reference soils with known data on the potential of the location. SENASOL is in possession of a loose collection of location-related soil data which - due to their uniqueness - are of fundamental importance for the development of agriculture and environmental protection in Guinea. To date, however, these data have only partially or insufficiently been evaluated. The danger of losing these data is significant because the conservation conditions of the topographic maps and laboratory assessment sheets are poor.

Consequently, the establishment of a "Pilot System for Reference Soils" is necessary for disclosing, securing and utilising the currently available data. In order to be able to employ these reference soils for agricultural framework planning it is indispensable to ascertain their productivity potential as related to their location.

b. Objectives

The main objectives of the project are as follows:

- Determination of the local productivity potential as exemplified by selected plots of land in Guinea;
- Establishment of a pilot system for reference soils as an advisory tool in the field of soil research.

Long-term objectives of the project are furthermore:

- Contribution to sustainable soil protection in Guinea;
- Improving the advisory function of SENASOL;
- Improving the opportunities to independent approaches to solving edaphological problems;
- Improving the scientific standards of SENASOL as an institution. This would ultimately lead to an increased willingness by other research institutions in Guinea and abroad to cooperate.

c. Relevance of the project in terms of development policy and anticipated benefit to the developing country

In subtropical and tropical countries, soil protection is a crucial problem with regard to protection of agricultural resources. In order to secure sustainable agricultural production in these countries it is necessary to adopt effective measures of soil protection. This requires comprehensive edaphological training of agricultural engineers and advisers, which includes practical knowledge of the different types of soil and their ecological workability. By installing a pilot system for reference soils which encompasses the knowledge of the local productivity of the guiding profiles, it will be possible to establish a framework for implementing the following measures:

- Adapted soil exploitation and functional employment of fertilisers;
- Increase in yield and improving the conditions of life of the rural population;
- Optimising the planning and administration of land resources;
- Improving the methods of collecting edaphological data;
- Stemming the migration of the rural population to the towns;
- Conservation and augmentation of soil fertility;
- Preparing measures of soil and environmental protection.

Project: "Contribution to the assessment of inflow of diffuse substances in the drainage basin of Lake Managua, Nicaragua"

Participating Institutions:

- University for Agriculture, Forestry and Renewable Resources/Institute for Soil Research, Vienna/Austria
- Centro de Investigaciones de Recursos Acuaticos, Nicaragua
- Universidad Nacional Agraria, Nicaragua
- Ministerio de Recursos Naturales y del Ambiente, Nicaragua

The objective of this project, which is financed by the Austrian Academy of Sciences (Commission for Development Issues) with a total sum of 1.2 Mio. ATS and which extends over a period of four years, is to lay the foundation for research in Nicaragua in the field of soil erosion in general and the protection of erosion in particular. The aim of this project is two-fold: On the one hand, scientific evidence on individual influential factors, model conceptions and their application to the conditions prevailing in Nicaragua shall be elaborated by drawing up plots for erosion measuring. On the other hand, edaphological knowledge and awareness for the problematic nature of erosion shall be implemented on various social levels by cooperating with several Nicaraguan research institutes (Centro para la Investigacion en Recursos Acuaticos de Nicaragua, Instituto de Recursos Naturales y Medio Ambiente and Universidad Nacional Agraria as well as the Rio San Juan Co-operative of Farmers).

Project: "Soil productivity indices and their erosion sensitivity (SPIES)"

Participating Institutions:

- University for Agriculture, Forestry and Renewable Resources, Institute for Soil Research, Institute for Open Space Planning and Landscape Conservation, Vienna/Austria
- Silsoe College, University of Cranfield, United Kingdom
- Universidad Nacional Agraria, Facultad de Recursos Naturales Y del Ambiente (FARENA), Managua, Nicaragua
- Universidad Autonoma Chapinga (UAC), Departamento de Suelos, Chapingo, Mexico
- Centro de Investigaciones Agronomicas (CIA), Universidad de Costa Rica, Facultad de Agronomia, San José, Costa Rica

The objectives of this study, which is financed by the European Union (in the framework of INCO-DC) with a total sum of 12,000 ECU, are as follows:

- Testing of the applicability of existing PI models for Central America - Improvement of selected modelling relationships between soil loss and soil functions based on process-orientated factors;
- Development of an extended soil productivity index with special reference to application for countries of Central America;
- Testing and modification of the European Soil Erosion Model (EUROSEM) for tropical environments;
- Application of the extended productivity index for selected watersheds;
- Linkage of EUROSEM to the extended PI-model to produce a physically-based approach to modelling erosion:soil productivity relationships;
- Application of the SPIES model on catchment scale in Central America using GIS;
- Simulation of change of distributed soil sustainability through application of a soil erosion model (European Soil Erosion Model) and the developed soil productivity index using different scenarios of management.

Address: Dr. Axel Mentler, Universität für Bodenkultur, Institut für Bodenforschung, Gregor Mendelstrasse 33, 1180 Vienna, Tel. +43-1-47654-3100, Fax: +43-1-3106027, email: h310t@edv.boku.ac.at

3.3 University for Agriculture, Forestry and Renewable Resources/Institute for Open Space Planning and Landscape Conservation, Division of Landscape Controlling

Dr. Nabeel Badawy is currently working on a project aimed at stabilising sand dunes in Mauritania. In collaboration with the Mauritanian Ministries of Fishery and Construction, the *Institut de Recherche et d'Application (Departement Afrique)* and UNEP, Dr. Badawy is testing Sanoplant for the purpose of stabilising sand dunes 600 km along the coast at Nouakchott. The required Sanoplant material has been provided by *Sanoway Corp.* free of charge. Dr. Badawy was on site in December 1998 to supervise and carry out plantation measures as well as to submit presentations on the best suitable method of applying Sanoplant in the reafforestation process.

Furthermore Dr. Badawy is carrying out a research project in Ouneine, Morocco in collaboration with *Austroprojekt* and the *Institut Agronomique et Vétérinaire Hassan II* (see *supra* 2.2). The objective of this project is to examine how the water storage capacity of Sanoplant may serve the processes of plant rooting and growth as well as how Sanoplant may protect the plants during the dry season.

Finally, Dr. Badawy supervises a project on the application of Sanoplant as a “storage device” for retaining water in Senegal. These activities are supplemented by preliminary afforestation measures. Various kinds of fruit and vegetable plants (mango, citrus, banana, cassava, egg plant and tomato) are being planted and their growth under different circumstances studied. For these purposes *Sanoway Corp.* has again provided the *Sanoplant* material free of charge. The *Sanoplant* powder will be blended on the spot with local material in order to reduce transport costs and to create new jobs. In addition, Dr. Badawy also organises seminars which aim at adapting traditional knowledge to the requirements of this new and innovative technique in general. In particular, the local population is trained in the application of the *Sanoplant* technology.

All these projects are co-financed by Mr. Zumtobel, an Austrian private businessman who is actively engaged in supporting the fight against desertification and promoting reforestation programs.

3.4 University for Agriculture, Forestry and Renewable Resources/Institute of Silviculture

Prof. Alfred Pitterle, deputy head of the *Institute of Silviculture* of the Vienna *University for Agriculture, Forestry and Renewable Resources*, has been cooperating with several Chinese institutions since 1985.

Scientific-technical cooperation

Since 1989 Prof. Pitterle, in cooperation with the *University for Forestry Yangling-Shaanxi*, China, is working on the establishment of a model business unit in forest economics in the mountains of Qin Ling in the area of Shaanxi, China. The activities undertaken in the framework of this scientific cooperation project includes student exchange programs, field excursions, supervision of PhD students, training of scientists and the conclusion of a formal cooperation agreement.

Furthermore, a project on the analysis of satellite images as a basis for scientific expert systems for a sustainable utilisation of land resources - with particular regard to forest management in China - is being carried out since 1997. Participating Chinese institutions are the *Academia Sinica/Institute of Remote Sensing Application*, Beijing, the *Academy of Forestry Wan Shou Shan*, Beijing, and

the *University of Forestry Yangling/Shaanxi*. The objectives to be achieved by this project are:

- a methodology of assessing the potential of sustainable utilisation of land resources depending on the category of utilisation and property;
- attaining a degree of long-term earning capability;
- reducing erosion.

Field projects

Prof. Pitterle manages two different afforestation projects in China. The objectives of both projects are:

- Decrease erosion
- Increase biodiversity
- Increase the productivity of agricultural soils
- Increase the income of the rural population
- Introduce a locally sustainable form of soil management
- Increase the multiple utilisation of forests
- Increase the protection of forests.

The first project addresses the process of silting in the province of Shaanxi and covers an area of 30,000 ha. The financial support amounts to ATS 130 Mio.

The second project aims at combating soil erosion caused by severe deforestation carried out over the last forty years. The main focus of this reforestation project, which is supported with a total sum of ATS 800 Mio., is twelve provinces; in 6 Chinese provinces (Yunnan, Sichuan, Hubei, Hunan, Jiangxi, Anhui) along the Yangtse River, 180,000 hectares of woods are to be reforested.

Address: Prof. Dr. Alfred Pitterle, Universität für Bodenkultur, Institut für Waldbau, Peter Jordan-Strasse 70, A-1190 Vienna, Tel. +43-1-47654-4055 or 4066, Fax: +43-1-47654-4069 or 4092,

3.5 Museum of Natural History, Botanic Department: Research project on the problem of desertification in Southwest Asia and North Africa

Prof. Dr. Harald Riedl and Dr. Zwiauer of the Botanic Department of the Museum of Natural History in Vienna have recently completed a pilot project in Balochistan, Pakistan, which was carried out in collaboration with Dr. Rubina Rafiq of the National Herbarium of Pakistan in Islamabad. The overall objective of the project was to ascertain under what circumstances areas threatened or already affected by

desertification may successfully be rehabilitated and by which means such rehabilitation may be achieved.

The underlying scientific consideration of the project was that under natural and fairly constant climatic conditions, vegetation develops progressively towards a more and more complex plant biome. Negative climate changes may regressively reduce the complexity of the vegetation and ultimately result in desertification. Thus, rehabilitation can only be achieved by reverting from regressive to progressive development of vegetation, taking into account prevailing local conditions. In general, desert plants are the remains of earlier and more abundant vegetation which might be restored. In order to ascertain the affiliation to a certain type of vegetation it is necessary to have exact knowledge of the involved plant species and of their accurate geographic distribution. For these reasons, the Botanic Department of the Museum of Natural History Vienna, which works in the field of botanic systematics and possesses a very rich botanic collection, is highly qualified for this task.

The pilot project, which was co-financed by the Austrian National Bank, served the purpose of applying the proposed methods in the province of Balochistan in South Pakistan. It was demonstrated that the starting point of regressive development of vegetation in the area under scrutiny involved at least two, if not three, completely different formations, *i.e.* savannah, heaths of Mediterranean dwarf shrub and probably wormwood steppes. Comparative studies have been carried out in Punjab, Pakistan, and in the Southern Sahara, Republic of Niger, and the results were also compared to those reached in the course of earlier studies made by Prof. Riedl in East Iran. In short, the result of the project was that afforestation is pointless in areas where forests have never existed or disappeared a long time ago. The project furthermore revealed that plants, mainly grasses, present in the last stages of regressive development of vegetation may be harmful in themselves for any attempt to reverse current processes.

Besides this pilot project, preliminary studies have been conducted in the Southern Sahara, Republic of Niger; they focus on systematic, ecological, biogeographic, ethnobotanic and ethnomedical aspects and are carried out under participation of the local Tuareg population. Address: Harald Riedl, Naturhistorisches Museum, Botanische Abteilung, Burgring 7, 1014 Wien, Phone: +43-1-52177-243, Fax: +43-1-52177-229, email: harald.riedl@nhm-wien-ac.at

3.6 Provincial Government of Lower Austria/Department of Environmental Protection: Sand dunes in Lower Austria

In the context of research in the field of desertification it shall also be noted that Austria undertakes research directed towards the preservation of specific deserted areas. Although such measures appear to be in contrast, or even opposed, to the objectives of the UNCCD, the fact that sand dunes are a valuable natural habitat that offers excellent living conditions for rare species requires their protection and preservation. Therefore, the Provincial Government of Lower Austria funded a comprehensive study and research project on the fauna and flora of the dune and drift-sand regions in Lower Austria. From the data gained, future measures for the management and preservation of sand habitats can be determined.

The dune and shift-sand regions of Lower Austria are considered to be among the most arid locations in the Austrian cultural landscape. On the one hand, this is caused by the pannonian influence on the climate of the area, on the other hand by the low capacity for water-storage of the sand. As the water supply is quickly exhausted after short periods without rainfall, predominantly drought-resistant plants which can also survive extreme heat, strong radiation and loose sand are able to thrive. Today, the characteristic grass biome of the sand regions is considered to be one of the rarest and most endangered types of vegetation in Austria as well as in Central Europe. Similarly, a high percentage of *aculeate hymenopterans* found in the area are threatened by extinction throughout Europe.

The sand dunes have for a long time been seen as a threat to agricultural development. As valuable sand habitats continue to be destroyed by afforestation and intensive agricultural usage, the situation - in view of environmental protection and the preservation of (endangered) species - calls for action. The study concludes that in order to prevent the extinction of species in dune regions in Austria several actions should be taken, among them increasing areas of open sand regions, converting particularly valuable sand regions that are currently being used for agricultural purposes or for logging into sand-grass land, reducing the supply of nutrients into the soil, or the possibility of letting sediments shift in small areas.

Contact address: Amt der Niederoesterreichischen Landesregierung, Naturschutzabteilung (Provincial Government of Lower Austria, Department for the Environment), Landhausplatz 1, A-3109 St. Poelten, Tel. +43-1-2742/200-5235.

4 Private and other non-governmental activities

Several private persons are financing or even planning and implementing activities and projects that are closely connected with combating desertification.

Thus, a project which aims at stabilising sand dunes in Mauritania has been initialised and financed by Mr. Martin Zumtobel, an Austrian businessman, with a total sum of ATS 250,000. He also holds interests in *Sanoway Corp.*, which supports numerous projects and activities that combat desertification and soil erosion in Burkina Faso, Canada, Chile, Iceland, Japan, Morocco, Mauritania, Senegal and South Africa (Contact address: F.M. Zumtobel Holding & Consulting Ltd., Zollgasse 10, A-6850 Dornbirn, Austria; phone: +43-5572-26227-0; fax: +43-5572-262227-6;)

Another project is working on the creation of an *Austrian Desert Center* as part of the *Jacob Blaustein Institute for Desert Research* of the *Ben Gurion University* in Israel. The objective of this project is to establish close cooperation with Austrian research facilities and institutions and, furthermore, to promote joint capacity-building in affected developing countries (see also *supra* 3.1); Contact address: Leon Widetzky, c/o Haslinger-Keck, Wipplingerstrasse 24, A-1010 Vienna; phone: +43-1-5321189; fax: +43-1-5321189-11).

And finally, a private project called "Gardening in the Desert" is planning to erect barriers and fencing installations against dune encroachment and shifting sand in Sinai, Egypt. The overall objective of this project, which is financially supported by the Provincial Government of Styria with a preliminary sum of ATS 100,000, is to promote the food supply of the local Bedouin population by preserving land resources threatened by desertification and erosion. Contact address: Isabell Bayer, Ring 216, A-8230 Hartberg; phone: +43-3332-66164; fax: +43-3332-66164-4.

5 Public awareness

Austria considers it essential - for any policy or strategy aimed at combating desertification to be effective and successful - that the general public in affected as well as in non-affected countries be well aware of the problem of desertification and the effects of drought. This also includes informing the public about the content and objectives of the UNCCD.

In order to raise public awareness with regard to desertification, the Austrian *Ministry for the Environment* together with the *Austrian Ministry for Foreign Affairs* organised an information meeting on 17 June 1998, the World Day to Combat Desertification. This meeting served the purpose of informing the public on the objectives of the UNCCD, on the obligations that member states have to comply with under the Convention, and on the institutional framework established by the Convention. Individuals, organisations and institutions involved in activities to combat desertification, erosion, land degradation etc. were called upon to present their projects and activities in order to assess the measures being carried out and to promote an efficient nation-wide cooperation. This process should ultimately lead to a national networking in the field of desertification as stipulated in Article 25 UNCCD.

Furthermore, from 1 to 4 October 1998, the *Institute of Engineering Geology and Applied Mineralogy* of the *Graz University of Technology* hosted the meeting of the executive committee of the *European Society for Soil Conservation*, which was concerned with the issue of soil erosion within the European context. This meeting included a conference on the topic of "Mass movement and soil erosion in alpine areas".

Dr. Nabeel Badawy of the *Institute for Open Space Planning and Landscape Conservation* of the *Vienna University for Agriculture, Forestry and Renewable Resources* as well *Caritas Austria* organise seminars for local populations in order to inform them about ways to adequately adapt local traditional knowledge to the needs of new and innovative technologies (see also *supra* 3.3).

Furthermore, a documentary television report on desertification is being prepared for broadcast on a TV channel which is received in all German-speaking countries.