

Secosud

Establishment of a Plant Resources Regional Network in the SADC Region

- ▶ CAPACITY BUILDING
- ▶ DECISION SUPPORT SYSTEM
- ▶ ECONOMIC DEVELOPMENT
- ▶ ENVIRONMENTAL SUSTAINABILITY
- ▶ TRANS-NATIONALITY



Background and rationale

Biological diversity is a crucial resource for sustainable development, both in developing and in industrialised countries, where industrial and agricultural pollution trigger major environmental problems and farming systems show decreasing resilience and lower yielding capacity. It is widely acknowledged that biological diversity, together with the extremely valuable relevant traditional knowledge, is decreasing at an alarming rate. This is occurring to some extent through the actual extinction of animal and plant species, but mostly through the reduction of the number of species per unit area of the biosphere.

This is mainly due to ecosystem fragmentation produced by human activities. In many cases, existing biological diversity is not properly utilised as a resource for sustainable development due to the lack of appropriate strategies. However, to use biodiversity in a sustainable way, it is necessary to study it, assess its economic value, and develop a global strategy and a global network to monitor its status in the biosphere. The Southern African Development Community

(SADC) region is one of the richest areas in the world in terms of biological diversity and ecological complexity. Vegetation, natural or artificial, constitutes one of the most important renewable resources in the region. The population obtains about 80% of its income from spontaneous or cultivated plants, both directly (agricultural products, timber, medicines etc.) and indirectly (meat, pelts etc.).

SADC countries are also equipped with significant botanical collections,

gradually built up over the last century. These collections, which have unfortunately deteriorated over time, are a precious heritage of knowledge about biodiversity. On the other hand, the application of unwieldy methodologies, together with differences in approaches and languages, have often made access to and use of this knowledge difficult. Therefore, institutions which are the basic infrastructures for dealing with biological diversity, such as herbaria, parks and natural reserves, as well as germo-plasm banks, face many problems in developing their role and becoming fully able to offer a service to other potential end-users of biodiversity. Furthermore, all regional institutions are dispersing their limited resources in building up general collections, which do not have any comparative added value and do not meet present standards and "market" requirements of national ministries of agriculture, forestry and health, nor those of pharmaceutical companies and tourism operators. As a consequence, they depend on scarce governmental financial support. This prevents their potential diversification and specialisation in some specific aspect of biodiversity use, and makes it extremely difficult for them to build up a network of "centres of excellence".

All SADC countries have signed the international Convention on Biological Diversity (CBD) and are committed to the conservation and protection of biodiversity in their respective countries. During the annual conference of SADC member countries which took place in Maputo in January 1992, the Italian Cooperation announced a new financial pledge of 25 million US\$ to fund projects included in the SADC investment programme, a part of which to be specifically focused on environmental conservation. Following discussions between Italian and SADC representatives, a number of measures were identified which could help tackle regional problems.



It was agreed that synergies must be developed and that the positive impact of some current bilateral projects should be increased. In this context, the present Project aims at strengthening the capacities of institutions responsible for botanical collections under the umbrella of the SADC-Forestry Sector Technical Coordination Unit (SADC-FSTCU). Support is provided by organising the data in Geographic Information Systems (GIS) to be used for supporting biodiversity conservation, agriculture and industry development plans. Particular reference is made to the pharmaceutical sector, and trade development of plant material. The Department of Biology at the University of Trieste was appointed as the executing and implementing agency of the Project, in close collaboration with SADC and national institutions. The total budget amounts to approximately 800,000 euros.

Goal, objectives and expected outputs

The development goal of the Project is to contribute to stop biodiversity loss by supporting the development of conservation strategies, which enhance the sustainable utilisation of economically useful plant resources through sound conservation measures.



Specific objectives are the following.

- ❶ Consolidate existing collections and facilitate the access of conservation-oriented institutions and market-oriented users to them.
- ❷ Boost the sustainability of the existing herbaria and improve their capacity to meet the highly refined market demand, by moving toward more specialised collections as well as developing effective networking among themselves.

Expected outputs are as follows.

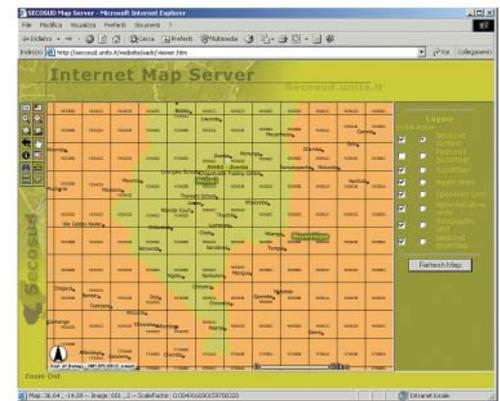
- ❶ An information service established as support for planning nature conservation actions and utilisation of economically useful plant resources; the service will also facilitate detection and prompt management to counter the risk of floral entities disappearing entirely.
- ❷ National repositories of plant material strengthened via the creation and activation of national GIS, to gather, analyse and represent the distribution of taxonomic entities of the SADC region's flora.
- ❸ National databases of dry specimens established, with information on the possible uses of plant species, methods of preparation, part(s) used, date of collection and conservation status.
- ❹ A regional information centre established in Malawi to coordinate plant resources management in the SADC region, integrate data stored in the national institutions and facilitate exchanges between the centres.
- ❺ Traditional knowledge (in many cases owned only by healers) of curative uses of plant resources preserved.
- ❻ Models and procedures designed, for the assessment of environmental value and vulnerability of different areas on the basis of geographical,

ecological and economic information related to individual species.

Main activities are: train personnel in the design, implementation and management of digital inventories of natural resources; set-up a GIS network for storage and distribution of information on plant resources within the SADC region; design and implement GIS enabled services in support of decision-making in planning biodiversity conservation and sustainable use, at both national and regional levels.

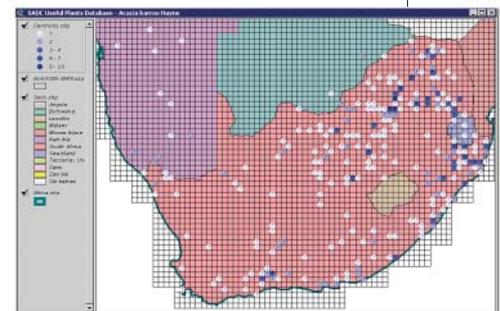
Implementation and results

The Project started in October 1998 and Phase I will be completed by the end of 2002. Strengthening of local institutions was addressed by employing personnel in every SADC country. Technicians and researchers were appointed by the national centres to bring the GIS technology skills into the daily working practice of herbaria. People were hired locally and have been working full time for this Project since its inception. Capacity building and training in GIS and databases, one of the key objectives of the Project, rank first among the fundamental tasks and responsibilities of the Department of Biology. Training courses were carried out on the links between databases and GIS. At least 30 people have been repeatedly trained on GIS, database, spatial analysis and geographic information management concepts. The National Botanical Institute of South Africa hosted the database course for all Secosud personnel. Given the vast amount of raw data, it was decided to focus on economically useful plant species. Uses range from medicines to food, horticulture for ornamental and erosion control, forage and fodder, timber, fuel, fibre,



Internet mapping application available in the Project Web-site

Distribution of Acacia karroo in South Africa



oil, agro-forestry and aromas. A regional common list of three hundred economically useful plants was then prepared jointly by experts of the 11 national centres. Secosud has been linked with the data base PRECIS that is used by SABONET regional project (see below). Three main databases are connected through the front-end and represent the storage mechanism of herbaria collections. The databases store plant taxonomy (Taxon database), dry specimen information found on the labels (Specimen database) and the economic or medicinal uses of 300 regional species (Plant uses databases). An integrated GIS database system has been designed to allow dynamic mapping and analysis of herbaria collections. The applications such a system allows span from classic GIS functionality, such as mapping flora distribution at various hierarchical levels (species, genus, family) to advanced spatial integration and



analysis for revealing biodiversity hot-spots. The system helps define the niche of key plant species, share knowledge of plant uses and plan future field surveys.

Another example of data retrievable from the system is the list of Herbaria/Botanic gardens where plants are stored, in the form of dried and live specimen, and their conservation status to help in specimen determination. An underlying principle of Secosud is to build a cooperative network between the centres (and countries) involved. It is therefore crucial to provide the centres with a common set of geographic data for the whole of Southern Africa, which can be further enriched with national data available in each country. This shared geographic framework is fundamental to facilitate the exchange of information between the centres and to create a common basis for the representation of specimen data that typically have a regional distribution.

A key issue in the Secosud project was to develop synergies and to avoid overlapping with other existing programmes in the region. Over the past two years, several contacts and links have been established with research and development institutions and with projects in the SADC Region and in Europe. Among these, the most important connection was established with the Southern African Botanical Diversity Network (SABONET), a regional capacity-building programme co-founded by GEF, UNDP, USAID and IUCN/Regional Office for Southern Africa, through the Networking and Capacity-Building Initiative for Southern Africa (NETCAB, 1995-2001). SABONET's main objective is to develop, through training and local capacity building, a strong core of professional botanists, taxonomists, horticulturists and plant diversity specialists. They will inventory, monitor, evaluate and conserve the botanical diversity of the region in the

face of specific development challenges, and will be capable to respond to the technical and scientific needs of the Convention on Biological Diversity.

At a national level, the centres participating in the Secosud Project are collaborating with other national or university institutions through local steering committees. Other projects complementing the activities of the Secosud Project are the SADC Plant Genetic Resources Centres (SPGRC) and the Southern Africa Biodiversity Support Program (SABSP). The SPGRC is funded by the Nordic countries and aims at promoting and coordinating a regional network of plant genetic resources management. The SABSP is a GEF project with much broader objectives, involving all types of animal and plant diversity issues, which aims to improve the availability and accessibility of biodiversity information and its application to conservation planning and management. Secosud has made arrangements to collaborate with all these projects to promote synergies and minimize overlaps, and will benefit from the ongoing activities in the region, especially in terms of their biological aspects.

At the same time, Secosud provides these projects with a consistent geographically-oriented knowledge through GIS technology transfer and support. In this regard, Secosud plays an important regional role: it is adding value to other SADC biodiversity regional projects by extending activities to countries such as the Democratic Republic of Congo, Mauritius, Seychelles and Tanzania, not included in SABONET; it is introducing and/or reinforcing in such projects the technology needed to get information on spatial environmental aspects of plant distribution and on plant uses that are fundamental for sustainable development.

A significant contribution to the success and future sustainability of the Project was offered by the Environmental Systems Research

Institute (ESRI). Since the Project was launched, several contacts were made with ESRI staff and the grant request submitted to ESRI Conservation Programme in 2000 was approved. All ESRI GIS software, digital data sets and publications were donated and delivered to each center. ESRI products are also powering the Secosud Web site that acts as the networking facility for communication, information exchange, technical support and knowledge-base repository connecting the national centers, the regional coordination unit based in Malawi and the Italian institutions involved in the programme. The Italian Cooperation and SADC-FSTCU are now exploring the possibility to launch a second project phase soon, in the wake of the above mentioned positive achievements and of the potential for their consolidation. The following considerations have been taken into account:

- the need to consolidate the achievement of Phase I by further developing the GIS that was established at herbaria institutions into a Decision Support System (DSS) that will be used by administrators and policy-makers;
- the need for such a DSS to facilitate interaction among botanical institutions, SADC Government agencies, NGOs and other related programmes;
- the need to accommodate the enlargement of SADC by involving the new member countries that did not participate in the Project first phase, and provide them with skills and expertise in GIS technology and in DSS applications.

Finally, a Type II Partnership is under preparation with basis on Secosud achievements.

