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National Capacity Self Assessment

for compliance with the
Conventions on Climate Change,
Biological Diversity and
Desertification

URUGUAY



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National Capacity Self Assessment

for compliance with the
Conventions on Climate Change,
Biological Diversity and Desertification

URUGUAY

MINISTRY OF HOUSING, TERRITORIAL REGULATION
AND ENVIRONMENT
NATIONAL ENVIRONMENT DIRECTORATE

Project URU/03/G31 (Project of the Global Environment Facility, GEF, conducted by
the United Nations Development Programme, UNDP)



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PREFACE

This document has been prepared within the frame of the National Capacity Self-Assessment for the Global Environment Management Project (Project URU/03/G31). It presents the summary of documents that were prepared for such purpose in each of the three thematic areas being considered under each of the three Conventions related to the project: United Nations Framework Convention on Climate Change (UNFCCC), Convention on Biological Diversity (CBD) and United Nations Convention to Combat Desertification (UNCCD). In addition, contributions received at the National Consultation Workshops carried out for such purpose are also incorporated herein.

Since this is a summarized report, to facilitate its reading and to present its content as defined in the Guide provided by the Global Environment Facility (GEF), the contents of each thematic area are not described in detail. They are defined in the base documents (Thematic Profiles) of each one of the three Conventions available in www.cambioclimatico.gub.uy, for reference of the reader to have more knowledge on each of the thematic areas.

It is worth expressing a special appreciation to the different institutions and persons of diverse sectors within the country that participated and cooperated in this process, without which the present document would have been an unattainable achievement. The valuable assistance received for the development of this Program by the United Nations Development Program and the Global Environment Facility is also greatly appreciated.



Eng. Luis Santos
Project's Coordinator

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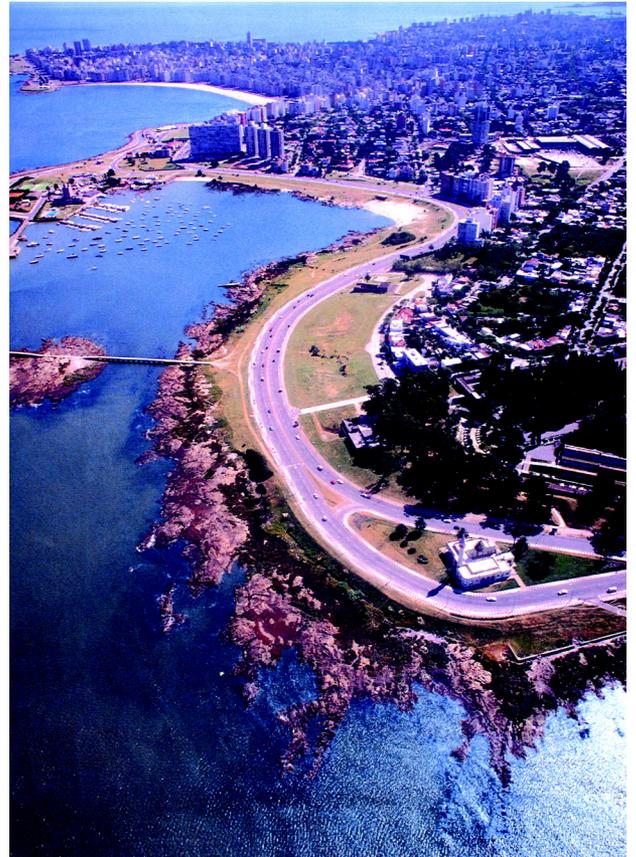
I. INTRODUCTION AND BACKGROUND

Over the last decade, Uruguay has developed a steady advance on environmental issues related to different areas, with the involvement of actors at different levels, not only at the governmental level but also the community of civil society, concerning the areas related to this project: Climate Change (UNFCCC), Biodiversity (CBD) and Desertification (UNCCD).

In accordance with the objectives established by the National Capacity Self-Assessment Project, they are focused in the identification of issues related to the existing capacities and/or the ones that are lacking, which are common issues under the international environmental Conventions related to Biodiversity, Desertification and Climate Change; and in the same way, strengths and weakness to identify synergies among them are analyzed.

Since the '90s, Uruguay has established institutional and legal structure and mechanisms of public participation in the related issues, which are evidenced by the policies, mechanisms for their implementation, and the national procedures performed in their different areas, as well as the supporting activities of research, basic related studies and mechanisms of diffusion and dissemination of the recommended practices.

Uruguay has demonstrated commitment with such issues with the establishment of the Ministry of Housing, Territorial Regulation and Environment (MVOTMA) with its National Environment Directorate, has also created the Technical Advisory Commission for Environmental Protection (COTAMA), has enacted the Law of General Protection of the Environment (LPGA), the Law of National System of Protected Areas (SNAP), the Law on Conservation of Soil and Water with its Decree for application, the Law of Environmental Impact Assessment, as well as the different research works that have been carried out by the education institutions of university level, and by the non governmental public entity like the National Agriculture Research Institute (INIA), which are the elements that support Uruguay's commitment.



Montevideo coast

During the last ten years, Uruguay took many actions for the implementation of different Conventions. Among others, the following can be mentioned: the National Strategy on Biodiversity (Estrategia Nacional de Biodiversidad), the Law of National System of Protected Areas (Ley del Sistema Nacional de Áreas Protegidas), the First and Second National Communication to the UNFCCC, the two National Communications submitted to the UNCCD and the recently initiating formulation of the National Action Plan (NAP) to Combat Desertification.

Programs and Projects related to the issues in question have been developed. In relation to UNFCCC, National Inventories of Greenhouse Gases, Vulnerability Assessments to Climate Change, Program of General Measures for the

Mitigation and Adaptation to Climate Change, and many assessment works under the Kyoto Protocol, pointing out the one related to the Clean Development Mechanism (CDM), in which the Criteria for Sustainable Development to assess CDM Projects were established, through a consultation process with wide participation of the Civil Society Organizations. This experience is a milestone in the region for its systematized methodology of conducting research and the level of participation of the different sectors of community being consulted: Academia, Private Companies, NGOs and Civil Society in general.

As regards CBD, it can be mentioned the existence of programs like Biodiversity Conservation and Sustainable Development of the Eastern Wetland (PROBIDES) and more recently, programs of Support to the Integral Management of the Uruguayan Coast Line of Rio de la Plata (ECOPLATA) and Environmental Protection of Plata's Maritime Front (FREPLATA), which are two experiences related to the issue of International Waters, but it is closely related to Biodiversity.

As for Desertification, the Second National Communication to UNCCD is pointed out, in which representation and participation from the departments in the consultation process were achieved. On the other hand, under the Ministry of Livestock, Agriculture and Fishery (MGAP), a Program for the Management of Natural Resources and Irrigation Development (PRENADER) was developed, which has the objective of development and implementation of a strategy concerning the management of soil and water resources focused on the development of irrigation, with the purpose of increasing and diversifying the exports for the agriculture sector.

More recently, specific undertakings are highlighted in which synergies have been focused.

In 2002, two Workshops were carried out: one was held in Montevideo related to "GEF Actions for the Promotion of Synergies in the application of Environmental Conventions", and the other in the department of Maldonado, about "GEF Projects" which was performed through a videoconference with Montevideo. The latter

served to launch the National Capacity Self-Assessment Project, in which the existing capacities of the nation were analyzed for the development of these actions. In both cases, it was possible to assess the experience of the country in this matter and analyze the strengths and weaknesses.

Prior to these actions, a Participation Group for the project was created within the Technical Advisory Commission for Environmental Protection (COTAMA). This Commission was created under the same law that established MVOTMA, which is integrated by representative members from all the Ministries, private sector, the University of the Republic and NGOs. Regular meetings are held with the purpose of collaborating with the Executive Power to define environmental policies, to cooperate with MVOTMA in the formulation, implementation, monitoring and follow up of the national plans to protect the environment. COTAMA is the coordinating body for such activities in which the governmental agencies interact with the private sector, in such areas related to the conservation of the environment.

At a regular meeting held by COTAMA, the official presentation of the proposal of the National Capacity Self-Assessment Project was carried out, with the purpose of introducing the proposal and receive suggestions and response from the stakeholders and incorporating their recommendations in the project. In such presentation, the Plenary of COTAMA approved the creation of a Participation Group for the Project, which initiated its activities at the same time with the project activities, with the purpose of ensuring a wide scope of consultation with all the stakeholders and to facilitate the provision of information to the project from all those that are connected with the members of the Group.

Several meetings were held for the coordination of the project by such Participation Group of COTAMA, prior to each of the National Workshops that were carried out under the project, with the purpose of establishing the objectives and the content of the Workshops, the manner and issues for discussion at the working group of such Workshops.

The first of the referred National Workshops was held on December 19, 2003, which had the objective to present the current situation regarding the existing capacity to deal with each one of the thematic areas related to the Conventions, which are the identification of the *priority issues in each thematic area*, as well as an advance over the *common priority issues to them*. As result of the Workshop, a list of common priorities was defined, identifying the following: I) *Information*; II) *Natural Resources*; III) *Education, Training and Awareness Raising*; IV) *Territorial approach*; V) *Research, Monitoring and Follow-up*.

At the Second National Workshop which was held on May 28, 2004, the common priority issues were defined, and a *Summary Document* was prepared in which the items were developed from the Thematic Profiles, stating the main points from the previous Workshop and a list of common capacity problems.

The list of common capacity problems that was presented for discussion was as follows:

1. Coordination difficulties within the institutions and among them.
2. Insufficient coordination and joint action with productive sectors and civil society organizations.
3. Difficulties in the access and share of information.
4. Insufficient level of awareness on the part of decision makers.
5. Dependence on the foreign financial resources.
6. Risk of losing the trained human resources.

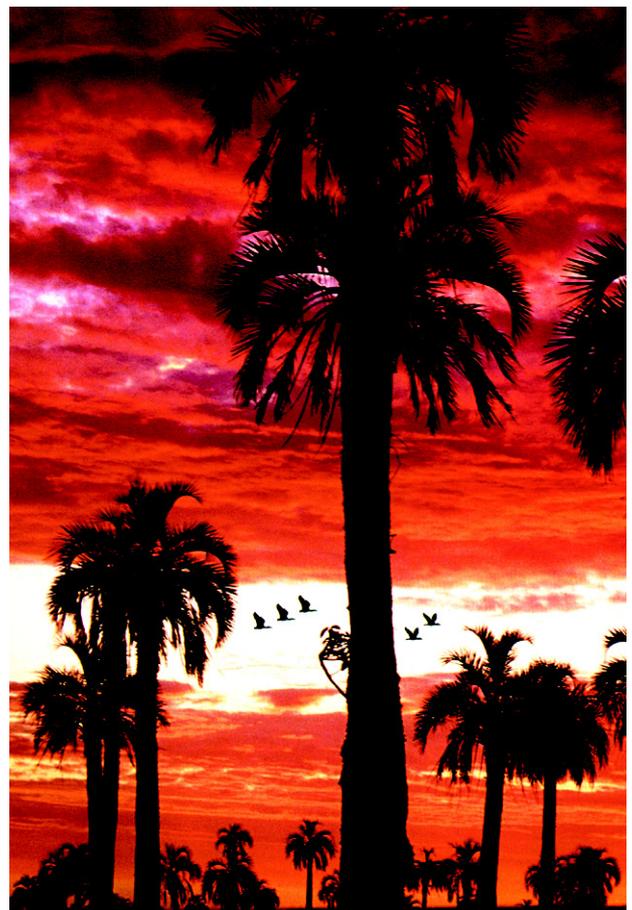
The activities developed by the working groups evidenced common elements, especially regarding the difficulties that were pointed out by many of them related to coordination. In the presentation of proposals, different viewpoints from each of the groups were stated, clearly evidencing the need to *coordinate actions among the decision makers of intermediate managing powers* in order to achieve the objective of raising the awareness at the higher level of decision making.

Two of the items to be pointed out are related to *territorial approach* of strategies and *training*, which were recommended as necessary for any project to be implemented.

Other significant components were related to the *education regarding environment*, although they were not analyzed in deep regarding programmatic measures, and to develop projects in a *sustainable manner*, so that they continue beyond the termination of the financed project. Regarding this latter point, the following solutions were proposed: i) to include in the budget of the respective counterparts of the State (political decision), and ii) to deepen the concept of project portfolio.

Lastly, the item of *environmental awareness* was pointed out, and the ways to involve the decision makers, since such aspects allow *national capacity building*, as a manner of taking into account the levels to achieve strengthening.

Palm grove in the east coast, Department of Rocha



II. PRIORITY ISSUES IDENTIFIED IN THE THEMATIC AREAS

A summarized report is presented below on the actual condition related to the thematic areas of the three Conventions and the identification of priority issues at the Workshops carried out in December 2003 and May 2004. Further on, concepts and assessment elements that were not wholly stated in such events but of great significance to be considered are incorporated in this document.

II.1. CLIMATE CHANGE

The priority issues that were identified are the outcome of a consultation process fulfilled within the frame of the National Capacity Self-Assessment Project, with the results obtained during the meetings held by representatives of different institutions for the preparation of the recently presented Second National Communication to the UNFCCC and data gathered at the First National Consultation Workshop, organized under the execution of said Project. Having identified the priority issues, the present condition has been reached which is stated as follows.

The fulfillment of the obligations assumed under the UNFCCC justifies the priority assigned, considering the need of knowing the current condition to face and resolve in an appropriate manner any problem faced by any person before this issue. However, it is important to point out what kind of information is regarded as priority in this matter.

On the one hand, it is important to gather the necessary information to prepare the National Inventory of Greenhouse Gases (GHG), the studies that are conducive to the assessment of Climate Change in Uruguay and the vulnerability of ecosystems, or to assess the adoption of measures concerning adaptation or mitigation of greenhouse gas net emissions. On the other hand, it is

important to make available the results of such studies, to know the progress reached at certain moment and continue working based on such results. Further on, it is also a priority issue to supply the results of the relevant research for the development of such Inventories or Studies, with the purpose of analyzing the emission factors, developing climate scenarios, or for the analysis of new technologies for the country. Based on such guidelines, the following assessments and activities have been carried out.

II.1.1. Vulnerability assessments to climate change.

Vulnerability assessments were carried out in the priority areas of Uruguay for its socio-economic significance. Thus, in first instance, vulnerability of Coastal Resources and in the Agriculture sector was assessed, with the assistance of the US Country Studies Program. Later on, under GEF assistance, vulnerability assessments of other sectors that are also important in Uruguay were carried out, namely: Water Resources, Fisheries Resources, Biodiversity and Human Health. However, due to limitation of time and resources, in this second assessment, application of the relevant software model was not possible in all the cases, and was mostly based on the expert judgement approach. From the results obtained, it is important to conduct vulnerability assessment in more sensitive areas of national territory, taking into account the socio-economic activities that are being developed in the relevant territorial area, and/or based on their exposure to the different impacts of climate change (changes in the average sea level, floods, and droughts). This approach coincides with one of the main contributions received in the consultation process – common in the three thematic areas- which refer to the territorial approach in the management of environmental issues.

II.1.2. GHG Inventories.

The GHG inventories are prepared by the UCC (“Unidad de Cambio Climático”, Climate Change Unit), with methodology which is internationally approved, and gathering information from other governmental institutions and from the private sector, and up to date, compilations of years 1990, 1994, 1998 and 2000 were completed; being the respective Reports available on the UCC web site. The calculation of emissions in such inventories are based on emission factors that were taken from the database of other countries, which may affect the results for not being fully appropriate to the technical, operational or climate conditions of this country, among others. It is identified as priority issue to continue completing the Inventories, based on the national emission factors, particularly in such sectors where emission or absorption are of high level (agriculture, forestry, livestock raising and transport). In this respect, it is noted the project executed by INIA on “Mitigation of methane emissions by ruminants in Uruguay”, shall allow the determination of factors related to methane emission from enteric fermentation of cattle manure.

II.1.3. Reduction of Greenhouse Gas net emissions.

Uruguay, as a signatory party of the UNFCCC, is committed to observe the objective of stabilizing the GHG concentrations in the atmosphere, and for this purpose, it has to adopt measures tending to reduce the emissions without limiting the development of the country and provide at the same time, local benefits. In this respect, significant efforts were made in the elaboration of the Program of General Measures for the Mitigation and Adaptation to Climate Change (PEMEGEMA), in which mitigation measures of GHG were identified by the different institutions involved, in the sectors of Energy, Transport, Agriculture and Waste Management. It is a priority issue to implement the identified measures, coordinating actions with the stakeholders, developing a mechanism of joint action and management on climate change, bringing together the capacities, contributions, interests and knowledge of the different sectors (governmental,

private, financial, civil society, academia) for the adoption of mitigation measures.

II.1.4. Training, education and raising public awareness.

To comply adequately with the obligations assumed under the UNFCCC, it is essential the existence of properly trained personnel that carry out the relevant activities. Moreover, it is important to educate and raise public awareness of the whole society, breaking cultural barriers and facilitating acceptance on the part of the society regarding the new practices or technologies that contribute to mitigate the problem of climate change. Particularly, addressing the political sector with clear and specific messages is most important, since the political will is an essential and necessary element for the adoption of measures giving response to climate change as well as the provision of necessary resources.

II.2. BIODIVERSITY

Concerns for the conservation of different elements comprising Biodiversity in our territory have increased during the last decades of the 20th Century, being contemplated by several environmental regulations tending to protect different species of flora and fauna and particular ecosystems, many of them under the competence of the Ministry of Livestock, Agriculture and Fishery (MGAP) such as: protection of wild woodland, rules on wild fauna, and also under the Ministry of the Interior or the Local Municipal Governments.

All this has been developed only recently with the approval of environmental laws ruling over a wider scope than the ones in force up to then, with the introduction of the concept of environmental protection as the main objective, with the establishment of a Ministry of Housing, Territorial Regulation and Environment (MVOTMA) in 1990, the approval of the Convention on Biological Diversity in 1993 and the approval of the law creating the National System of Protected Areas and the General Law

of Environmental Protection (Article 22 Biodiversity) in the application of article 47 of the Uruguayan Constitution which declares the protection of environment of general interest. Moreover, Uruguay has established under a Decree of the Executive Power, the National Committee on Phylogenetic Resources, integrated by members of the Ministry of Agriculture (MGAP), Ministry of Foreign Affairs, MVOTMA, INIA and the University of the Republic. The mandate established under Decree 65/99 (amending the Decree that established the Committee in 1995) advises the Executive Power, regarding:

- Strategies for the implementation in the country on the Global Action Plan for the Conservation and Sustainable use of Phylogenetic Resources for Food and Agriculture under FAO.
- Continuous updating of National Report on Phylogenetic Resources.
- Creation of a National System of Phylogenetic Resources and the mechanisms for its implementation.
- Propose legal frame in the country related to the access to National Phylogenetic Resources.
- The need of Uruguay to have common position in the issues related to phylogenetic resources at different instances, both in national and international forums, facilitating exchange of information and opinions among the different stakeholders.

However, Genetic Resources as component of the Biological Diversity (CBD Objectives and specially the Article 15), are most of the times overlooked or undervalued as issues of special relevance in the area of Conservation and Sustainable Use of Biological Diversity and environmental issues in general.

In general terms, and even taking into account the foregoing, in our country the outcomes are still limited and it was proposed to promote a deeper integration for the conservation of biological diversity in policies, programs and development plans in different sectors of the country. On the other hand, it is concluded that efficiency of the managing instruments for the

conservation of biological diversity is limited by factors such as the lack of coordination among the different institutions for its enforcement, lack of adequate control, lack of incentives for conservation (with the exception of provisions under the forest law related to the conservation of wild woodlands) and a loose control on the part of the public (although many organizations of the community appear to be active in this matter).

The management of biological diversity conservation is scattered over several institutions, and this fact limits efficiency and efficacy with overlapping competences. On the one hand, MVOTMA provides one of the main objectives, but the National Maritime Prefecture is in charge of control and vigilance of the coastal ecosystems, the Ministry of the Interior enforces hunting activities through its Rural Guard, the Ministry of Agriculture (MGAP) manages natural resources through its Division of Natural Renewable Resources, the wild woodland is supervised by the Forest Division and the Aquatic Resources by the National Division of Aquatic Resources. But apart from the question of efficiency of all these official bodies or the level of resources available for the fulfillment of their duties and willingness of enforcement, the limiting factor of biodiversity conservation is not the absence of institutions. The limiting factor lies on the insufficient interchange among the different institutions, particularly, those related with the academic sector or the ones that supply information and knowledge.

Below are some of the significant research and assessment works carried out on this thematic issue:

II.2.1. Biodiversity Assessment.

Inventories, diagnosis of species richness and biodiversity assessments at Son numerosas community level, with assessment of calculation of species richness and their relation with some measure of abundance were developed. Although within interspecific and biogeographical level, there are more recent assessments and there is lack of determination related to rates of biological diversity, it should be noted (at interspecific level)

that many institutions are conducting research on Genetic Resources (research groups at University, INIA, Institute of Biological Research Clemente Estable).

Many organizations have participated in several assessments in many ways, such as the University of the Republic, INIA, Clemente Estable Institute and many NGOs such as Vida Silvestre, Vida Marina, Aves Uruguay, Grupo Palmar and Ballena Franca. In addition, data based on projects related to biodiversity that were executed or under execution are available, some of them were already mentioned at the beginning of this report: Formulation on National Strategy on Biological Diversity, PROBIDES, ECOPLATA, FREPLATA, Biodiversity Vulnerability to Climate Change (within the frame of institutional strengthening under the UNFCCC) and the establishment of an Inter-American Biodiversity Information Network (IABIN). Further on, projects related to sustainable use of biological diversity were developed. It is noted that performance of research at national level is still limited. In spite of initiatives to raise public awareness on biodiversity conservation and data process to manage different ecosystems as well as formulation of management proposals, the concept of biodiversity in the community is still insufficient.

II.2.2. Information and database.

Many databases were developed under several ways and mechanisms, but in general, data on biological diversity are incomplete due to the limitation of production of the aforementioned data. Among the database containing relevant information for conservation of biodiversity, the following are mentioned: National Clearing House, database of the different Ministries involved, database maintained by the Local Municipal Governments, of the Geographical Information System of PROBIDES, ECOPLATA and FREPLATA, and also IABIN.

II.2.3. Technical Capacity.

Uruguay has developed sufficient technical capacity for the management of biodiversity, in particular in the academic and institutional sectors, and in some way the organized society, but still there is need to promote technical capacity at local level and better communication among experts of the different institutions.

II.2.4. Regulatory Frame.

Although there are many environmental laws, they must be updated and reviewed regarding the issue of biodiversity conservation *In Situ* outside the protected areas. It was already noted that there are two important tools to implement biodiversity conservation: the National Strategy for the Conservation and Sustainable Use of Biological Diversity which is an important generic tool in which guidelines are established, and the Law of Protected Areas, which establishes the legal frame for the implementation of a National System of Protected Areas. However, on the other hand, there is a significant limitation: this rule is not being enforced, limiting the effective application of the Strategy, which provides on the significance of protected areas, considered the main principles for the conservation. This enforcement is delayed over two years since the approval of the law, and this is a serious limitation for the effective application of the Strategy.

II. 3. Desertification

Regarding this thematic area, the following priority issues were identified, based on the documents that were previously elaborated and the activities performed at the Workshops. Some considerations are enumerated analyzing their respective significance.

II.3.1. Information Availability.

There is sufficient information available to perform in an immediate manner the management and conservation practice of soils for the sustainable use of resources, provided, however, the research activities that produced such information must not be discontinued, since knowledge dynamics and new technologies are very active, and the newly emerging issues –not usually anticipated by the same researchers– require the support of continuous programs related to creation and adaptation of knowledge and technologies of management and conservation. However, the limitation of resources requires the definition of priorities in the research programs, selecting the issues where new knowledge is of great significance. A good coordination among the institutions for the generation of knowledge, agencies related to management and administration of soil and the direct users of technology (producers and technicians in the productive sector) allow the establishment of priorities, considering in a balanced manner all the stakeholders in the thematic area under consideration. The information obtained from research on desertification is made available and easily accessible to users since it was published in national scientific publications (and foreign ones, in many cases), in brochures for diffusion presented in lectures, conferences and seminars held in the country or abroad and some of them are placed on the web sites of the respective organizations.

II.3.2. Relevant Legislation.

The currently effective legal framework is considered as appropriate or, in any event, it is not an obstacle for its implementation. It is noted that very recently a new Decree was approved for the enforcement of Law 15.239 (Law on Soil Conservation) which shall help to overcome some inconveniences that were stated above. This Decree has substituted –which contains more flexible wording– previous technical standards with updated standards, and without prejudice of considering agronomical practices, tends to promote for example, the reduction or elimination of tillage (art. 1^o) gathering the experimental

findings of the advantages of reduced tilling and mainly the direct sowing achieved in recent years.

II.3.3. Coordination of relevant institutions.

The competences of this thematic area are assigned to the different institutions with similar criteria of other countries, namely: research institutions (generation of knowledge), government bodies in charge of management (ministerial level) and institutions for technical assistance and transfer (public or private), although in this activity, participation is observed by the ones undertaking research. There is good or acceptable coordination among the institutions in charge of research, although it is not fully satisfactory among them and the managing bodies or among the different units having managing competence (Ministries). However, in this aspect, significant progress has been confirmed particularly as from year 2000, regarding the joint activities conducted by the Division of Natural Renewable Resources (MGAP) and the National Environment Directorate (MVOTMA) in the application of common Conventions (Desertification and Biological Diversity). In the specific case of UNCCD both institutions have elaborated together the two national reports submitted to date by Uruguay before the Convention, and in 2004, started the formulation of the National Action Plan.

II.3.4. Education and awareness campaign.

In this regard, there is consensus of the real needs and limitations at different levels of society, but it should be defined specifically in which sector of the people it is appropriate to train and educate, since it is doubtful that such terms have been used with the same scope and significance by the different participants at the Workshops that were carried out under this project. Related to this area of desertification, the following is pointed out:

- There is insufficient knowledge on the part of agronomists graduated from the University of the Republic, since the course Management and Conservation of Soil at the School of

Agronomy is not obligatory, and only about 20 or 25% of the graduate students complete such course.¹ As long as changes in the curriculum structure of such school are not introduced, only the complementary courses for graduate students shall improve this current condition. This year commenced some postgraduate courses including Management and Conservation of Soil which constitutes a significant contribution for the training of professionals and researchers.

- The training courses of Agriculture School at the Technical University of Uruguay (UTU) undergo the same limitation, and to improve this condition, training of the teaching staff is required, and in this regard, some actions have been confirmed. Such experiences shall allow the training of other teachers of UTU –in a multiplying process– and students of such institutions, and consequently, transference of knowledge shall be efficiently fulfilled in a generalized manner, reaching the end users, who are the significant parties in the productive process, both directly for their performance and as specialized operators of production.
- Many research conducted by the services under the University of the Republic have generated and continue generating relevant knowledge in the areas of management and conservation of soil, soil biology, quality of soil and environmental impacts that affect or threaten to affect this resource. All the relevant institutions (e.g. Schools of Agronomy, Sciences, Engineering, Institute of Biological

Research Clemente Estable) contribute with qualified human resources and knowledge, providing education, training and raising awareness. Although this issue was identified as limitation of capacity, at the same time it should be understood as an opportunity for its strengthening.

The issue of awareness, considered separately, is one of the concepts that at the Workshops were used with imprecise meaning. No doubt there is need to inform about desertification to different social sectors, but not particularly to technicians and medium level decision makers and representatives of Ministries, and less to researchers. The need of awareness or lack of compromise concerning the problem of soil degradation is attributed to producers that are unwilling to apply conservation practices, and to political decision makers of high level. In the case of producers, the mechanisms of technology transfer from the research centers to the producers sector have not operated adequately due to shortage of resources and lack of continuity of relevant programs of technical assistance. As for the political decision makers, the lack of awareness regarding this issue – where applicable– may be defined more precisely as political unwillingness or attributed to different visions regarding the role of the Government in this issue. The difference is significant, because in case this latter interpretation is appropriate, the mechanisms usually accepted as appropriate to raise awareness, are not suitable to correct such situations.

¹ Before 1992 the course of Management and Conservation of Soil did not exist in the curriculum. The incorporation of this subject as optional was a significant progress in the curriculum structure of the Plan of Studies.

III. SUMMARY OF CAPACITY LIMITATIONS AND OPPORTUNITIES OF STRENGTHENING

In this section, a summary on capacity limitations observed in each of the thematic areas shall be presented, although they were described under the respective thematic profiles, and more in detail, the opportunities identified to carry out thematic projects for the capacity strengthening shall be stated.

III. 1. CLIMATE CHANGE

Regarding the priority issues described under paragraph II, the following capacity limitations are analyzed for the consideration of such issues and about the possibilities of projects or actions for its strengthening.

III.1.1. Information Availability.

Information related to the application of UNFCCC in Uruguay has increased basically as a result of: i) the establishment and continuous updating of the web page of Climate Change Unit (UCC) of MVOTMA, ii) several activities of interchange among institutions (Workshops or Group Works), organized by UCC, and iii) distribution of publications carried out by UCC on the outcomes of the National Inventories of GHG Net Emissions and the identification assessments of mitigation and adaptation measures to climate change. However, there are information gaps and difficulties in the access to the database to carry out the assessments. Information is scattered among the different institutions having competence to conduct research by systematic observation of atmospheric variables or through a record of activity data (production, consumption). In most of the cases, this problem is due to the lack or shortage of

human and financial resources to obtain complete and reliable information. Accordingly, to improve the quality of findings of such research, it constitutes an opportunity for strengthening the institutions that provide the database, through the training of the existing human resources, incorporation of trained human resources and the assignment of material resources that shall enable a more efficient compilation, quality control and availability of information. Many institutions (e.g. University, INIA), have generated and are generating valuable findings through the research related to climate change, but these findings are not integrated in a single information reference center on climate change where other researchers or any person interested has direct access, without the need of calling upon each of such institutions or on the web sites. In this regard, one strengthening opportunity consists in the improvement through the integration of national information on climate change, incorporated in an integral manner, available and accessible to any person interested at a national reference center (either physical or virtual).

III.1.2. Assessment of vulnerability to climate change.

The tools to conduct research and assessments of vulnerability to climate change are changing over the time, therefore, the technicians or researchers that are in charge of such studies have to update their knowledge continuously. The economic and financial condition of Uruguay and the degree of academic development are limiting factors of capacity in this issue. Particularly, the assessment of vulnerability in the most sensible areas of national territory requires capacity building (equipment and technical training) to work with simulation models of weather conditions operated under small scale, adapted to the terri-

torial size of our country. The outcomes of such models would be very useful to feed simulation models of soil performance and about biodiversity at different climate scenario in the future. The capacity building developed up to date was closely related to the foreign technical and financial assistance, and as stated above, in order to maintain and improve the current condition, it is essential to continue with such undertakings. Accordingly, it is clear that strengthening opportunities of capacity building shall be based on financial efforts made by the country granting more resources to carry out research and assessments, complemented by external assistance. In the long term, once the climate change issue is consolidated as one of the subjects to be developed in the academic sector, foreign assistance should support national undertakings at the beginning to install on permanent basis by the national government. Up to date, the human resources assigned to the assessment of climate change funded by national government are completely insufficient.

III.1.3. Greenhouse Gas Inventory.

The main opportunities to develop GHG inventories reflecting adequately the national reality, are the projects that assess the emission factors of this country in particular, mainly related to activities that produce major emissions or absorption of greenhouse gases, and the projects related to create database, which is not being performed or is not updated. It is reasonable and cost-effective to assign the existing technical resources and institutions related to the University of the Republic and other research centers to undertake these kinds of projects, to be implemented with their own resources, or with foreign assistance or a combination of both. The inexistence of such resources or the uncertainty to obtain such resources are the weak points for the fulfillment of these priority activities.

III.1.4. Reduction of GHG net emissions.

In order to adopt measures for the reduction of greenhouse gases, a mechanism covering the interests of the different stakeholders is needed.

For the implementation of projects related to the reduction of GHG emission, Uruguay must first undertake actions for the transference of less emitting technologies, including the training of technicians to develop own technologies and adapt such technologies developed in other countries. Special attention must be placed in the incorporation of non-traditional renewable sources of energy for the production of heat and electricity. The lack of adequate mechanisms for such purpose is a limitation for the adoption of such measures and to achieve the desired reduction. In this regard, some progress is made as shall be described as follows, and the consolidation of such undertakings shall contribute to overcome such limitations. One of such opportunities is the participation in the CDM under the Kyoto Protocol, and it is noted that Uruguay has the necessary legal and institutional structure to participate in such mechanism, and possible CDM project portfolio has been developed.

III.1.5. Training, education and raising public awareness.

The topic of climate change has been introduced in elementary and secondary education, mainly as result of the awareness campaign to teachers and instructors who introduce this issue in their classrooms. Moreover, the activities of diffusion and awareness carried out by the UCC in the education sector since 1996, have contributed to raise awareness of a significant number of elementary and secondary school students regarding the climate change issue. However, the outcomes are not considered sufficient yet, and the lack of awareness on climate change of the people in general was defined as a limitation in this thematic issue (same as in the issue of CBD and UNCCD). However, this result is analyzed as an opportunity to develop a systematic education, introducing the climate change issue in the curriculum of formal education, and consequently, it is concluded in the first place that there is a need to strengthen the training of school teachers who are the future responsible persons of transferring knowledge to their students. This strengthening should be developed at the teachers training education

centers where new teachers are being trained, and also in such centers for the graduate teachers that are already practicing their profession to update their knowledge. Regarding the education at university level, the strategy should be concentrated in the introduction of the climate change issue in the current specialized courses and postgraduate courses related to environmental issues so as not to be always dependent on the foreign experts or taking courses in a foreign country for an appropriate training. An important experience to take into account is the incorporation of issues such as the use of non traditional renewable energy (solar and biogas) and the construction of cells for methane and hydrogen fuel in the termination project of the course of Chemical Engineering, under the Faculty of Industrial Project of the Institute of Chemical Engineering at the School of Engineering of the University of the Republic. As for the awareness campaign, apart from the awareness raising of the people in general, it is a priority in mainstreaming efforts on the decision makers of the public and private sectors, including the financial sector, and particularly, the political sector. Actions should be centered in the importance of considering the climate change variable in the activities developed by them within the frame of their competence or responsibilities.

III. 2. BIODIVERSITY

In the thematic issue of biodiversity, several weaknesses in the national capacity were identified for the fulfillment of objectives of conservation and development, which can be stated in three main items: the generation of knowledge, legal framework and management.

III.2.1. Capacity limitation to create knowledge.

Research carried out on biological diversity is incomplete and separated one from the others, using different definition scales (ecosystems, species, genes). The follow up of environmental variables in general, is limited due to the

dependence of funding from international organizations, and consequently, the progress is also limited both in physical space and time. In addition to this, there exist the difficulty of different territorial scale in which the information is produced with the population being quantified, constraining the possibilities of relating them with the biological data to find the impacts of the different human activities on biological diversity. Furthermore, the findings of research conducted and their significance in terms of territorial management are not adequately made available at national level, due to the fact that, in some circumstances, the study was not planned as applied research, but as base research. Lastly, it should be noted that Uruguay has not defined performance indicators, such as sustainable development rates, which would enable to know the advances in relation to the conservation criteria and sustainable use of biological diversity. Uruguay's own biological, landscape and cultural values constitute a sound basis to apply for international funding to implement projects related to biological diversity assessment, and in this sense, it is considered as significant that this year, the proposals for CONICYT projects have included biological diversity as one of the issues to be developed, which indicates that there is a need to build up knowledge regarding this issue.

III.2.2. Management Limitations.

The limitations of management being identified are related to cultural and institutional aspects, training of human resources and difficulties to internalize the thematic issue in the different sectoral policies and activities of territorial intervention. In defining the management limitation, the following three assessments were taken into account: a) assessment of discursive delimitations, b) assessment of the social placement of the problem, and c) assessment of the delimitation of the problem, to know if the applying strategies have been useful to reach the targets proposed. In Uruguay, the discursive delimitation presents a level of adequate concretion: territories to be assessed have been identified, there is legislation related to conservation of some ecosystems and species, and in general to prevent or mitigate impacts of

different activities. The social placement of the conservation issue on biodiversity and development is insufficient, which was noted repeatedly by the different social sectors, indicating that there is no awareness on the need of biodiversity conservation, even among the decision makers. Regarding the assessment of the effects related to strategies applied for the biodiversity conservation and sustainable development, it is not possible to apply since it is under the implementation stage of the main proposed strategies. The problem lies on the absence of an integral management following the environmental values, taking into account the vulnerability of different ecosystems, the perspectives of local stakeholders in relation to the development of the area and the compatibility of different activities. In addition, the overlapping of competences makes management and procedures difficult creating some times gaps of power. However, the main objectives of the management of biological diversity are stated in the National Strategy. There is little communication among the researchers, educators, experts creators of information, technicians and managers of the territory, decision makers and the common people, and this makes difficult the placement in society the issue of biodiversity conservation. In spite of this, the dialogue among the different stakeholders related to the sectors of production, education and academic, has improved to the extent of considering further development. On the other hand, it is perceived that the relationship between the decision makers and technicians and officers is not as symmetric as desirable, and between the decision makers and the people, even more asymmetric, and this asymmetry occurs among the different groups of interests of the civil society, in which there is no mechanism of participation, except for the ones that are merely of consultation, without a binding effect. And as for the relationship between technicians and civil officers, (of central and local administration, of different ministries, self governed entities and other agencies of the state), it was noted many times that the sectorization of actors, overlapping of competences and lack of adequate level of coordination represent significant limitations to achieve an efficient management regarding

biodiversity conservation. The needs for the improvement of management regarding conservation and sustainable use of biological diversity are mainly concentrated in the insufficient relationship among the different stakeholders and the institutional basis of the management process. As regards the relations among the managing sectors, it is noted the coordination activities performed by MVOTMA and MGAP several times: elaboration of the enforcement decree of the law of Natural Protected Areas, selection and delimitation of Natural Areas to incorporate in the future System of Protected Areas, definition of Ramsar Areas and coordination in the development of National Capacity Self-Assessment Project, under which this report is developed. This interministerial coordination is an important opportunity for the development of relations with other stakeholders for being the ministries that are most closely involved in the management of natural resources and biological diversity, making them possible to assume a leading role. The plan for a delimitation, zonification and application of a management strategy for the Reserva de Biosfera Bañados del Este under the MaB Committee, is another important undertaking in which biosphere reserves are forms of territorial management for the biological conservation, sustainable development and opportunities to build up information and make such information available, monitoring, training and educate on environment. The joint actions with some local administrations regarding environmental management, carried out under the frame of PROBIDES, formalized with the signature of an agreement of regional development, is another opportunity to undertake models of sustainable development. The joint implementation of development policies and conservation of biological diversity promoted by the National Strategy for the biodiversity conservation create opportunities within international context. One is the global trend towards tourism in natural spaces, and with the existing tourism infrastructure being developed in this country; this undertaking is a significant choice of sustainable development, based on natural and cultural values. It is expected that the relevant Ministries and Local Municipal Governments shall coordinate the policies and

plans for the promotion of tourism in natural spaces, which appears as a development opportunity consistent with the objectives of biodiversity conservation. The second opportunity to mention, which is also a global trend, is the differential price for eco-labeled products or products having certification of origin, offering an important possibility for Uruguay to develop such products, which not only are produced under conditions that are consistent with biodiversity conservation, but also offers economic benefits.

III.2.3. Weakness of legal framework.

There are many laws which refer to biological diversity conservation, such as the ones for the approval of International Conventions and to protect certain habitat or species. However, in spite of the formulation of a National Strategy for the Conservation and Sustainable Use of Biological Diversity, which is considered fundamental for the protected lands; there is no instrument to enforce the Law to create the National System of Protected Areas, although the law was passed more than four years ago, and this constitutes a limitation. Considering strengthening opportunities, there is abundant legislation, commencing with the Constitution, in its article 47 related to environment, the Law concerning environmental protection declaring it of general interest (Law N° 17.283), the Law of Environmental Impact Assessment (Ley N° 16.466 - Evaluación de Impacto Ambiental) and the Law of Protected Natural Areas (Ley N° 17.234 - Áreas Naturales Protegidas), being the enforcement of this law a significant opportunity for the de las principales conservation and sustainable development of biological diversity. The previous experience related to the application of the law on Environmental Impact Assessment may serve as a starting point to formulate a law on Strategic Environmental Assessment for the assessment of possible impacts, not of projects, but of policies and plans, and thus establishing an adequate legal frame for the conservation of biological diversity *in situ*, throughout the national territory.:

III.3. DESERTIFICATION

III.3.1. Availability of Information.

As it was stated above, in this thematic area of desertification, there is sufficient information available to implement the guidelines stipulated by UNCCD, to which Uruguay is committed to adhere and to apply at national territory a consistent policy related to prevention and control of degradation of soil. In this regard, it is noted that information and knowledge must be complemented, updated and deepened continuously without limitation. The first Workshop (December 2003) stated the need of performing permanent research programs and advised that the projects to be proposed for funding in this thematic area should be based on synergies of the three Conventions, centralizing the approval of funds, and that such projects should mainstream coordination among the institutions. No doubt any proposal related to the creation of new knowledge and information should involve the application of national policies under UNCCD² but the projects involving different institutions on specific issues represent an effective way to apply national policies through concrete actions. The national experience has demonstrated valuable outcomes in this regard. A joint action for the execution of a project by academic institutions and other organizations for the management and monitoring of resources (soil, water, atmosphere, biodiversity), would produce interesting synergy, taking into account the objectives and specific functions of the different institutions in their respective areas of competence. The approval of funds for this kind of project, which is highly feasible at present, constitutes an important opportunity to overcome the limitations regarding the availability of knowledge and information, encouraging synergies.

III.3.2. Limitations of Legal Frame.

A similar conclusion under paragraph III.3.1. above is stated herein. The legal and administrative instruments related to the use,

² The same is applied for the other two Conventions

management and conservation of soil are sufficient to implement the policy on the issue concerned, but at the previous Workshops some limitations and gaps that obstructed efficiency were identified. In this regard, the classification according to the qualification to use the land based on technical standards of conservation as provided in the Decree dated June 21, 1990, which enforced the law of conservation of soil, were out of date taking into account the available technology in this country, since the qualification to use land was based on the risk of erosion under conventional tilling. Many limitations related to soil management under traditional techniques were corrected with the introduction of direct sowing which reduces significantly the loss of soil due to erosion and results more productive and cost efficient compared to old production systems using conventional tilling. This limitation has been cancelled with the recent approval of a new Decree which substitutes the one of 1990, which was described above. The current law states about the grant of benefits for the compliance of technical standards of conservation, authorizing the Bank of the Republic (BROU) to grant preference loans for the conservation and restoration of soil in their annual programs. This provision is consistent with article 3 of the new Decree whereby the grant of benefits is stated for such land users that apply productive and conservation practices enhancing land productivity. Therefore, the grant of benefits is both described in the law and in the Decree. As for sanctions, the law provided that land users who infringe such rule are not benefited with tax deductions for reinvestments or with other tax benefits and they may be subject to a penalty that may be the double of the sum of land tax. Tax contributions were reduced in recent years many times, due to reasons not related to the conservation of soil, limiting to some extent the expected effects of the legal provision. In all, current legislation in force updated the technical standards provided under different technical conditions which at present are amended, including the power to grant economic benefits and of other nature to encourage the effective compliance of technical standards, and authorizes the competent authority (Division of Natural Renewable Sources, MGAP) to apply sanctions

in case of breach (article 11° de the law 15.239). Transference of technology through technical assistance seems above all as most significant, which is supported by the legal frame and by mechanisms of incentives and sanctions to encourage the sustainable use of soil. The application of continuous programs of technical assistance and grant of incentives must be considered as strengthening opportunities of measures against desertification. The priority of sustainable technology transfer over time is a critical tool in this thematic area and this is evidenced by the PRENADER Project and its evaluation upon termination. This aspect was analyzed in detail in the document of Thematic Profile of Desertification presented at the 2nd Workshop, for such reason it is not analyzed herein, but it is noted that such evaluation confirmed the significance of technical assistance pointing out the difficulty of maintaining just during certain time due to the dependence of funding and institutional frame of a project which is limited by time. Such experience stated the need to advance in a substantial manner in the implementation of technology transfer and was duly considered as an essential element in the formulation of the Draft corresponding to 2nd Phase of PRENADER Project which was implemented until recently under the competence of the Ministry of Agriculture (MGAP).

III.3.3. Coordination among the Institutions.

Problems of coordination among institutions were frequently pointed out to be of priority in the management of natural resources, and particularly in the use of soil. This aspect was pointed out at the Workshops carried out under this project and in the report of the Thematic Profile of Desertification presented at the 2nd Workshop. It was also concluded that regarding erosion and degradation of soil, there exist relevant legislation –which was recently updated with the new decree to enforce the law of soil conservation – apart from the general definitions of policies to be implemented, although its efficiency is below the desirable level, due to the overlapping of competence or non coincident approaches due to lack of coordination. However,

the commencement of activities for the formulation and implementation of NAP (National Action Plan against Desertification under the National Environment Directorate from MVOTMA and the Division of Natural Renewable Resources from MGAP) represents an activity of clear advance in the coordination among the different institutions, which was mentioned above. In this frame also the different activities involving co-participation and coordination of different institutions, not only the ones related to desertification or involving the National Environment Directorate and the Division of Natural Renewable Resources. To mention one example, the Project of Sustainable Management of Raigón Aquifer funded by International Atomic Energy Agency (IAEA), involved such institutions with the University of the Republic, National Hydrography Directorate and the National Mining and Geology Directorate, and there are other similar projects.

III.3.4. Education and awareness.

Weakness and limitations in education and awareness should be clearly defined taking into account the sector of society to which the actions should be exerted, since these terms were not used with the same significance at the Workshops carried out under this project. This issue was analyzed in detail in the paragraph related to the identification of priority issues of education and awareness regarding the thematic area of desertification. The strengthening needs are

focused in promotion, enhancement or consolidation – as needed – in the curriculum of University education and of postgraduate courses through the different Services of such institution in the thematic areas related to Desertification, as part of educational activities of regular or specially invited teachers, where recognized experts are performing activities. The strengthening of relationship between the University of the Republic and Technical University (UTU) to enhance training of the teaching staff at Agriculture Schools through specific courses, constitute another significant opportunity, with multiplied effects towards students graduated from UTU. Awareness in narrow meaning was a concept which was dealt inadequately. The lack of commitment with problems of erosion and degradation of soil may be attributed to farmers that are scarcely receptive to practices of sustainable production and to the policy decision makers at higher level. In the first case, opportunity of strengthening capacity lies in the technology transfer from the research centers to the production sector, which has not operated in a satisfactory manner for the unavailability of appropriate and sustainable programs of technical assistance. And regarding the policy decision makers, the detected limitation of awareness may be attributed to the lack of political will or a vision that the government should be less involved with the matter. The mechanisms usually used to raise awareness are not in such cases the most appropriate and overcoming such weakness is not included as an objective in this project.

IV. OPPORTUNITIES FOR THE ELABORATION OF SYNERGIC MULTISECTORAL CAPACITY STRENGTHENING PLANS AND PROJECTS

Capacity strengthening is defined as any activity required to improve the capacity of individuals, institutions and systems.

- a) At the individual level, such strengthening is accomplished by means of education and training in skills, and should lead to an increasingly satisfactory performance in management, motivation and accountability as well as in the individual responsibility.
- b) At the institutional level, the goal is to enhance the institution through an improvement of its general performance and working possibilities, as well as its adaptation to change, regarding both individuals and groups comprising the institution or its external affairs.
- c) At the system level, the goal is less concrete, seeking to create adequate environments for policy, economic and regulatory general frameworks, as well as for the institutional and individual accountability frameworks.

All three Conventions clearly offer a broad scope for the development of thematic projects contributing to the strengthening of capacity, and it seems convenient to assign priority to those projects generating synergy and of multisectoral character. One major challenge is the formulation of ambitious projects on account of their interdisciplinary and interinstitutional character, insofar as execution should not be hampered by difficulties in the coordination among various agencies whose targets, structures and operating procedures may differ, since in such cases, coordination may consume an extremely high amount of project resources, in detriment of the fundamental objectives of capacity strengthening and generation of valid, useful and durable products.

The identification of opportunities for the elaboration of synergic multisectoral plans and projects should also be linked to a strengthening strategy defining “where” and “in what” the country is to reinforce its capacity in order to meet its international environmental commitments under the three Agreements articulated in this Project.

As a result of the consultation process *several environmental issues common to all three thematic spheres* have emerged, and *several needs for capacity strengthening common to all three thematic areas have been identified* which correspond to dimensions that crosscut all areas as detailed further below.

Environmental issues common to all three thematic spheres shall (or at least should) conform, if not all, many of the *opportunities for the elaboration of synergic and multisectoral capacity strengthening plans and projects*. Moreover, *those capacity needs previously identified must be reflected in the elements composing the capacity strengthening strategy*.

Thus, crosslinking of identified issues and needs “in the manner of a double-entry table” will be the basis to outline the strategy and its comprising elements.

Below there follows first a list of the *environmental issues common to all three thematic spheres* that has been approved by the MVOTMA and the MGAP in view of their relevance for the elaboration of synergic and multisectoral plans and projects identified as a priority for capacity strengthening efforts. Then, possible synergic projects are also defined for each one of these issues.

Environmental issues common to all three thematic spheres:

- i. Sustainable forest management criteria and Indicators
- ii. Early alert systems and response measures to environmental emergencies or extreme climate events
- iii. Development, profiting and use of renewable non-conventional energy sources
- iv. Continental, marine and coastal protected areas. Management plans; training of human resources
- v. Environmental land planning
- vi. Protection of ecosystems and native species (maintenance of environmental biodiversity services; research on invading species) including zones outside of the Protected Areas
- vii. Conservation and sustainable use of soils
- viii. Socioeconomic and environmental impacts on productive systems
- ix. Integrated management of water basins

i. Sustainable forest management criteria and Indicators

Within the Montreal Process framework, seven sustainable forest management criteria were identified, which comprise the fundamental functions and features (biodiversity, productivity, forest health, carbon sequestration and soil and water protection), socioeconomic benefits (wood, recreational activities and cultural values), and the laws and regulations constituting the forestry regulatory framework.

1. Conservation of biological diversity
2. Maintenance of the productive capacity of forest ecosystems
3. Maintenance of health and vitality of forest ecosystems
4. Conservation and maintenance of soil and water resources

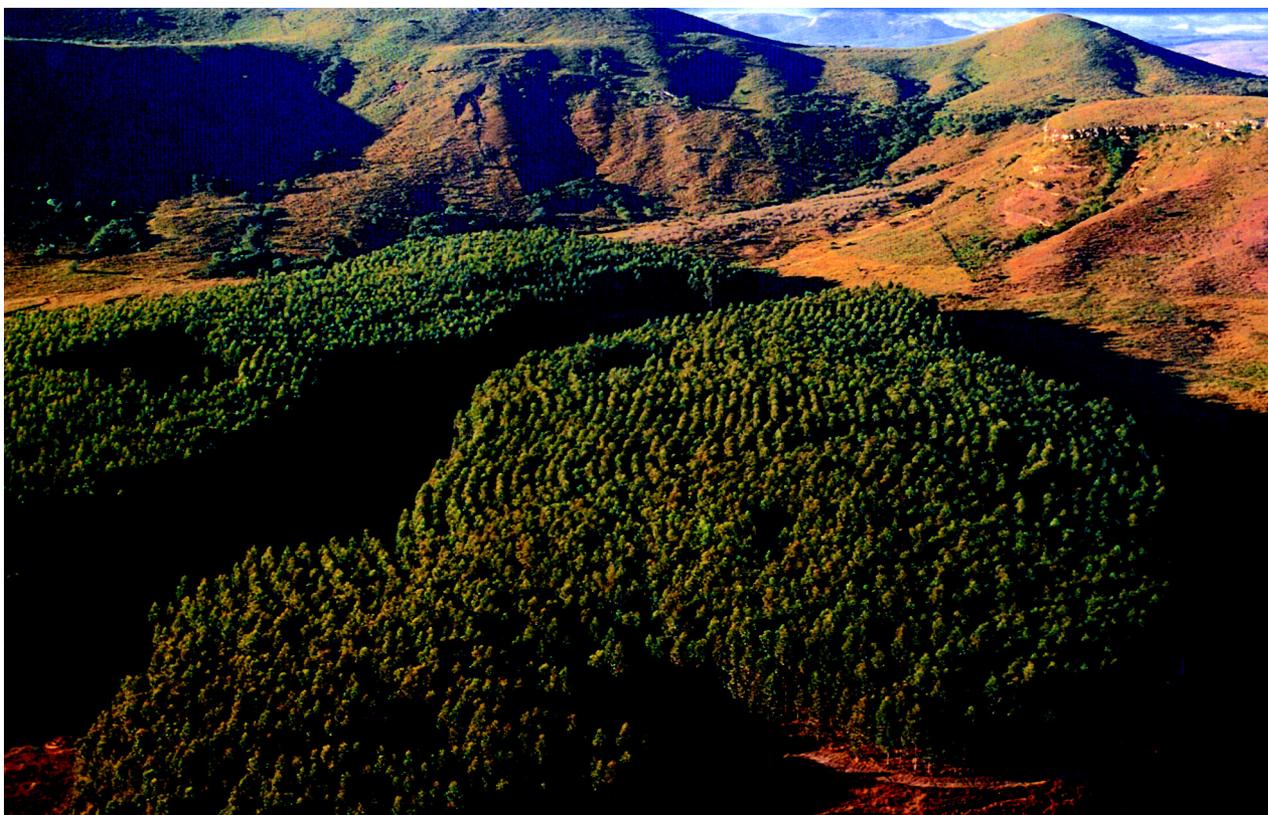
5. Continuity of the contribution of forests to global carbon cycle.
6. Maintenance and improvement of multiple long-term socioeconomic benefits to meet the needs of societies.
7. Legal, institutional and economic framework for forest conservation and sustainable forest management.

The above criteria show an evident relationship between sustainable forest management and the accomplishment of the goals of the International Environmental Conventions on Climate Change, Biodiversity and Desertification and Drought. The indicators arising from the Montreal Process offer modes of evaluating or describing a criterion; many are quantitative and others qualitative or descriptive, yet all provide information regarding current conditions of forests and their use.

In August 1998, the Forestry Directorate of the MGAP, responsible for the country's forestry policy, organized a Workshop on "Data availability and possibilities for the elaboration of reports on Criteria and Indicators as defined by the Montreal Process", attended by representatives of all institutions that would comprise the system for developing the indicators defined: public institutions, research institutes, NGOs and producer representatives of the forestry sector. The workshop was aimed at:

- Identifying the Institutions to conform the System for the collection and monitoring of indicators;
- Identifying strengths and weaknesses of the collection and monitoring of the indicators defined, and proposing actions to overcome weaknesses;
- Where necessary: i) propose new nationwide indicators according to Uruguayan characteristics, and ii) prioritize collection of certain indicators where they are not being measured or the quality or frequency of measurement needs improving.

It was concluded that Uruguay has the technical critical mass to develop a significant number of the indicators defined, while the main



Pine forest

drawback is the lack of financial resources. It was also concluded that the performance of a five-year National Integrated Forestry Inventory would enable total or partial development of most of the indicators defined in the Montreal Process, which would mean a major step towards Sustainable Forest Management. Thus, the integration and dissemination of the results obtained –however partial- as well as of the names of the technicians involved, is an important task.

Since the above conclusions are still considered valid, a proposal to elaborate an Integrated Forestry Inventory on a regular five-year basis has been made. Such Inventory intends to be a tool for the total or partial development of 60 per cent of the indicators defined in the Montreal Process, as a contribution to the definition of the criteria mentioned for the monitoring of forest ecosystems. For that purpose, an application for funding shall be submitted to the GEF.

To that end, in addition to all necessary financial and human resources, also the

availability of a multidisciplinary technical team is considered crucial, as well as the development of a mechanism for interinstitutional participation and coordination, which should involve the Forestry Directorate of the MGAP, the Directorate of Environment of the MVOTMA, the University of the Republic of Uruguay (School of Agricultural Sciences, School of Science and School of Engineering), the National Institute for Agricultural Research (INIA), the National Fire Brigade, the Uruguayan Technical Laboratory (LATU), the Office for National Statistics, the Society of Forestry Producers and the Central Bank.

ii. Early alert systems and response measures to environmental emergencies or extreme climate events

Various severe atmospheric events, which are part of the general characteristics of Uruguayan climate, might become more intense and frequent due to global warming. Therefore, the design and adoption of response measures to such phenomena are among those activities to be

developed by countries in the face of climate change trends.

The adverse meteorological and climate events occurring in Uruguay include: lightning bolts, twisters, gales, frosts, hail, fog, heavy rain, extreme temperature waves, drought and flooding. To a varying intensity and range, nearly all the above events have negative impacts on soil and biodiversity:

The Climate Change Unit of the MVOTMA, with assistance of UNDP, has started to implement a project on "Prevention and Mitigation of Environmental Emergencies Caused by Climate Events" whose main goal is to successfully develop risk management measures devised to anticipate climate anomalies, foresee consequences and reduce negative economic and social impacts. The project also aims at the generation of stronger links among all the actors involved in environmental management and those in charge of addressing emergencies, seeking, in the medium term, to provide a basis enabling:

- strengthening of the existing emergencies system through the implementation of appropriate early alert systems and integral assessment of climate related disasters;
- elaboration of strategies concerning urban development and land planning;
- generation of an appropriate regulatory framework;
- development of associated public awareness programmes and campaigns; and
- improvement of information and research systems.

Today, assessment reports of climate related threats both in the meteorological and hydrologic areas have been completed, considering likelihood of occurrence, severity and area of influence, and an assessment of the vulnerability of affected populations and of information and research needs, so as to provide appropriate planning and management of extreme events.

Based on such reports and with international assistance, a draft for a Plan for the reduction of climate related disasters is currently being elaborated. Such plan will in turn be discussed, adjusted and approved prior to its implementation.

Being a prevention instrument, education and information elements are among its primary elements. These should be developed in both formal and informal education settings, and will imply the development of awareness campaigns at various levels among the general population.

The Plan must also include an institutional strengthening element for the integrated management of climate related risks and climate disasters, providing for coordination among a broad range of institutions in order to strengthen response capacity. One other major element of the Plan will be the elaboration of strategies related to urban development and land planning, entailing the training of technical staff and the development of assistance programmes for the Municipalities, within the framework of the institutional strengthening element.

Also development of early alert systems, data surveys and research into those phenomena not sufficiently known are to be included, which will imply the procurement of the instruments required to perform those tasks. In particular, research should be encouraged to develop and strengthen the tools related to prevention and decision making.

In the light of the results obtained by this project, the next step should be the implementation of the plan and the start of the interinstitutional coordination mechanism suggested.

Taking into account the need of funds for the start of the Plan, an application for funding will be submitted to the recently created Special Climate Change Fund, managed by the GEF, a facility mainly addressing activities related to prevention and mitigation of climate related disasters.

iii. Development, profiting and use of renewable non-conventional energy sources

Non-conventional renewable energies include the following sources: eolic, solar, geothermal and oceanic, in addition to several processes based on non-traditional biomass, and small-scale hydropower processes (microturbines) which are usually considered under this category. All these renewable energy sources are considered as positive for Climate Change as they are substitutes for fossil fuels in heat or energy generation thus avoiding carbon dioxide emissions to the atmosphere and reducing the contribution to the increasing greenhouse effect and climate change.

However, some of them may also have negative effects on the biological diversity and the soil, in particular when they are part of big developments, in such cases projects should be

discussed and assessed prior to the formulation or execution of the works. Small-scale hydropower projects (microturbines) would not have major adverse impacts on ecosystems.

Based on the environmental policy principles set forth in article 6 of the Environment Protection General Law, the DINAMA is committed to the promotion of energy efficiency and renewable energy source alternatives, which provides an enabling framework for the development of initiatives intending to foster use of alternative energy sources.

The subject matter of non-conventional renewable energy sources has mainly been developed at research and pilot experimental level. Such is the case of the air-generator installed Sierra de los Caracoles under an agreement made between UTE (the electric public utility) and the

Biogas power plant at Las Rosas landfill, Department of Maldonado



School of Engineering. UTE has also launched a program for the installation of solar panels in homes far from electric transmission grid.

Four (4) measures relative to the use of Renewable Energies were identified within the framework of the interinstitutional activities promoted by the Climate Change Unit (Programme of General Measures for Mitigation and Adaptation to Climate Change). Likewise, several projects on the issue have been assessed as a part of the activities relative to the implementation of the Clean Development Mechanism of the Kyoto Protocol in Uruguay. Examples of such projects are: the installation of a wind park, the use of landfill gas as power generation source, electricity generation from forest and agricultural waste and the production of biodiesel as substitute for diesel oil in some uses in the transport and agriculture sectors.

The major barriers identified within the framework of the Climate Change Unit for the expansion of energy supply from renewable energy sources are:

- **Financial.** The construction of facilities using renewable energy sources requires a high financial capacity. This situation has been prevalent until now, though it makes the country heavily dependent on third parties due to the need to purchase energy abroad in order to meet the electricity demand, or operate thermal plants using diesel oil or fuel oil, two fossil fuels which are not only expensive but also unfriendly to the environment.
- **Production capacity based on resource availability.** For all the projects studied, the limited availability of resources poses a barrier to the substitution of conventional energy sources by renewable ones. In the case of biomass, the limits result from the availability of raw material. For example, energy generation from rice husk would depend on the maximum possible yield of rice production. In the case of biodiesel, as it is obtained from the seeds of certain crops (sunflower, soy, rapeseed) the limits to the generation capacity further depend on the competition with other uses of these seeds in the food market.

Likewise, the use solid waste to produce biogas fuel depends on the generation of waste and on waste characteristics, ultimately determined by the specific population and their consumption habits.

- **The lack of a national energy policy** promoting the introduction of renewable energies in the energy matrix by means of mechanisms that increase the profitability of these sources.
- **Cultural.** There is also a cultural barrier that hinders the use of renewable energies. The general public considers that renewable energies are “expensive”, and there is a widespread “disbelief” in their effectiveness. To overcome these barriers, the Climate Change Unit has followed to ways: i) the execution of a Project of recovery and use of biogas obtained from the landfill Las Rosas in the Department of Maldonado, a demonstrative project with an emphasis on the dissemination of its results; ii) the organization of workshops aimed at training in residential uses of solar energy with the collaboration of the Uruguayan Research Centre of Appropriate Technologies. In these workshops held in several locations throughout the country, the participants learn how to make simple cooking and heating devices that use solar energy.

In addition to the financial assistance that the country may receive for the installation of power generation plants, it is also essential to access to the new technologies available, which does not necessarily mean to buy equipment abroad but also the development of such technologies within the country, through training of human resources and shared knowledge of their technical specifications and costs.

The development of concrete projects based on renewable energies will help to overcome cultural barriers and therefore, it will also result in increased reliability and interest on this type of project at all levels –two triggering factors for the emergence of new initiatives. An interinstitutional coordination mechanism will be required to implement these activities, whereto discuss the above issues and agree on ideas, projects or actions towards the expressed goals, to further

suppress the obstacles that nowadays constrain the expansion of power supply based on the use of non-conventional renewable sources.

Therefore, the creation of a Work Group is put forward, aiming at the follow-up of the subject, within the framework of the Policy Declaration adopted by representatives of 154 countries, including Uruguay, on the occasion of the International Conference on Renewable Energies held in June 2004 in Bonn.

The Work Team's objectives would include: a) develop capacity for policy analysis and technical advice and to strengthen educational efforts, b) increase awareness concerning the benefits of renewable energies among decision makers, c) promote demand for renewable energy technologies among consumers, d) support the development of marketing, maintenance and other service capacities, and e) strengthen regional and international collaboration and the participation of stakeholders in order to facilitate access to relevant information and good practice, and interchange of same.

The Work Team should be integrated by representatives of the Ministry of Industry, Energy and Mining, other Ministries, the Parliament, UTE, URSEA, ADME, LATU, local authorities, the academic sector, the private sector and the civil society, with the possibility of using existing institutional bodies such as COTAMA, for its creation.

iv. Continental, marine and coastal protected areas. Management plans; training of human resources

Protected Areas are a major environmental management tool recognized as such all over the world, and have been identified as one of the priority issues where to focus capacity building efforts. Thus, these areas are especially considered attending at their value for biodiversity conservation, their significance for climate change adaptation, and their important contribution to the prevention of soil degradation.

Lunarejo Valley, Natural Protected Area in the Department of Rivera



Law No. 17.234 which creates a National System of Protected Areas, defines different protection categories, assigns competences and provides an appropriate legal framework aiming at fulfilling the international commitments undertaken in reference to the conservation of ecosystems and biodiversity. The Protected Areas have been highlighted by the National Strategy for the Conservation and Sustainable Use of Biological Diversity in Uruguay as a pillar for the conservation and sustainable use of biological diversity. The regulation of the Protected Areas law is still pending, however, there are already several cases of protected area management aimed at conservation in the country, which are based either on a separate legal status (Parque Nacional de Islas Costeras, Potrerillo de Santa Teresa, Bosque de Ombúes, Bañados de Farrapos, among others) or on international agreements ratified by Uruguay, which –while not defining protected areas in a strict sense- do establish a number of conservation criteria for their management (Reserva de Biosfera Bañados del Este y Ramsar site for Uruguay).

Recent approval of the delimitation and zoning for the Reserva de Biosfera Bañados del Este (MAB-UNESCO 1976) within the framework of the MAB Committee constitutes a major opportunity, as biosphere reserves imply forms of land management seeking biological conservation, sustainable development and the generation of environments enabling the creation and dissemination of environmental knowledge, monitoring, training and education. The bases have already been developed for a strategy for reserve management and the participatory process for their approval is in course.

The PROBIDES (Programme for Biodiversity Conservation and Sustainable Development in Eastern Wetlands) has developed a Geographic Information system in the Reserve of Biosphere in the Eastern Wetlands (Reserva de Biosfera Bañados del Este) which has permitted the integration of the data collected on the environmental conflicts detected and those on the vulnerability of the various ecosystems. Within the same programme, the change in the surface

Dunes system in the coast of Cabo Polonio



of coastal ecosystems has been monitored, as well as the aquatic bird breeding areas. This has led to the conclusion that habitat loss and fragmentation is the main cause for the loss of biological diversity in the area. The Forum on Integrated Management of the Atlantic Coast has been promoted; and environmental education and protected area staff training have been encouraged and disseminated. Pilot experiences of sustainable development have been implemented, in coordination with the Municipality of the Department of Rocha and the MVOTMA, in order to develop a regulatory framework for land planning and sustainable development of the coastal area. Such regulatory framework has now been approved and includes the delimitation of conservation areas.

Advances have been made with respect to the RAMSAR Agreement, under which Uruguay has undertaken the commitment to indicate the wetlands within its territory to be included in the list of internationally significant wetlands which should be protected, together with their wild birds, through the creation of natural reserves, and to assure their monitoring. In this sense, not only have advances been made but also solutions have been put forward to address the priorities defined by the competent Administrative Authority (National Directorate of Renewable Resources). Among such advances and proposed solutions are: the incorporation of new sites enabling the substitution of a part of the Ramsar Site located in the North of the Department of Rocha –affected by drain and irrigation works- with the Farrapos area and islands in Uruguay river and the Lagoon of Rocha); supporting of and participation in a new water regulatory plan –which would put Uruguay out of the Montreaux Register (list of the countries not fully-complying with the terms of the Ramsar Convention).

The Programme ECOPLATA has developed a diagnosis of the current situation in the interface environment delimited by the River Plate and continental land; it has promoted pilot practical experiences in integrated management; and has carried out a valuation analysis of some coastal ecosystems, resulting from the research and management methodologies applied, specific zoning proposals for the coastal area which take into account the detected conflicts in land use.

The Project FREPLATA has also advanced in the diagnosis of estuary and oceanic biodiversity and in the assessment of fish resources, which will be included in the forthcoming Management Plan for the area.

In addition, the assessment of the climate change vulnerability of the biodiversity, hydrological cycles, agricultural production, fish resources and energy resources, has enabled the detection of threatened ecosystems for different climate change scenarios.

As far as biodiversity conservation is concerned, the priority measures to be considered for adaptation to climate change include: a) research and monitoring, with a view to gaining knowledge of the ecosystem responses to climate change, b) delimitation, implementation and management of Protected Areas, with a view to assure conservation and sustainable use of the biological corridors and of the ecosystems identified as the most vulnerable to Climate Change.

The MVOTMA and the MGAP are working jointly for the selection and delimitation of the natural areas which would be incorporated to the forthcoming National System of Protected Areas after the approval of the regulatory framework of the respective law.

Hence, the immediate need of implementing the Law for the Creation of the System of Protected Areas, whose application shall propend to the conservation of biodiversity, the protection of soils and to respond to any possible climate change threats in the Uruguayan territory.

v. Environmental land planning

Climate change impacts, threats to biodiversity and the loss and degradation of soils are closely linked to the territory and to the territory changes as a result of changes in physical and socioeconomic variables.

During the current process of assessment of the national capacity for environmental management, an approach based on land planning has been agreed upon, including

differentiated management proposals for the different areas, according to their vulnerability and the anthropogenic pressures put on them, and such land management should be integrated by encouraging coordination among activity sectors and the participation of civil society.

There are some legal antecedents of environmental management with a land planning approach; such is the case of the River Bank Defence Fringe. (Law N° 13.737 Art. 295 of 09/01/69). There a defence fringe is defined on the bank of the Atlantic Ocean, the River Plate and Uruguay River (250 m from zero Wharton) whereto all harmful modification of configuration and structure should be prevented. The law also regulates sand, gravel and rock extraction works.

There are several examples of a land planning approach to conservation, all of them in specific areas, such as the declaration of national interest in the preservation of the Atlantic coastal wildlife in Cabo Polonio, Aguas Dulces and Lagoon of Castillos (Decree No. 266/966), which aims at the protection of the dune system between Cabo Polonio and Punta del Diablo, the wildlife in the Lagoon of Castillos and the state property area located on the Atlantic coast between meridians 54° and 54° 20', or the declaration of a Wildlife Reserves (National Forest of Rio Negro, fiscal islands on this river and Potrerillo de Santa Teresa, Law No. 16.226 Art. 305 of 29/10/91 and Law No. 16.226 Art. 304 del 29/10/91, respectively), among others.

The Guide to Local Agenda 21 issued by the International Council for Local Environmental Initiatives (ICLEI) proposes the development of local planning for Sustainable Development based on the hybridization of three recent planning traditions: strategic planning (which rather than magnify the competitive profile, tends to internalize the imperatives of sustainable development), participative planning (linked to a commitment to local residents and service users) and environmental planning (related to the implementation of assessment methods to guarantee that development projects take notice of environmental conditions and project managers include mitigation measures against possible negative impacts). In line with this conception,

the strategy for the strengthening of national capacity will tend to include elements from these three planning traditions.

Within this framework, the Strategic Environmental Assessment comes as a useful tool for accomplishing land planning with a view to conservation and sustainable use. It would also be necessary a rapid approval of the Bill for the Land Planning Law, whose draft was originally developed by the MVOTMA and which is now being discussed in Parliament, to provide a nationwide and enforceable legal framework for Land Planning activities.

vi. Protection of ecosystems and native species (maintenance of environmental biodiversity services; research on invading species) including zones outside of the Protected Areas

For in-situ conservation of biological diversity within and outside of protected areas, development policies need to be reconciled with biological diversity conservation, assigning priority to, among others, restoration and clean up of degraded ecosystems, protection of species and populations, and monitoring and control of introduction of exotic species (MVOTMA-UNDP-GEF 1999).

In this line, important work is currently being performed by the MGAP, through the Forestry Directorate, with regard to the application of the Forestry Law concerning the protection of Native Forest, and also by RENARE through its Fauna Division, in the preservation of native fauna.

Since 1991, efforts are being made to control invading species -wild boars in particular. In 1997-98 an agreement was signed by the MVOTMA, the MGAP and the FAO for the elaboration of strategies to control wild boars.

The implementation of the MGAP-GEF-World Bank Project for Integrated Management of Natural Resources of Agricultural Use is also considered of great importance. This project aims mainly at the protection of ecosystems and species outside of Protected Areas. Its contribution to the



Native forest and fauna

conservation of biodiversity may be significant, and it may also help avoiding soil degradation.

vii. Conservation and sustainable use of soils

One of the environmental issues identified as a priority by both the MVOTMA and the MGAP is the conservation and sustainable use of soils. Surely, this is a broad issue, which offers an opportunity for a long-term programme, embracing more specific synergic mutisectoral capacity building projects, which may qualify for external funding (and also for internal partial funding). Within a programme of that kind, it is possible to identify some thematic areas which have already been the subject of specific projects, or where research efforts by the institutions concerned with desertification are creating or

adapting the scientific knowledge required to support decision making and sustainable management of soil resources.

1. Some initiatives and proposals have already been outlined for developing basic and applied knowledge on the introduction of environmental accounting in national accounts. The first of them was a proposal by Dr. J. Hoehn –included in his consultancy for the National Environmental Study (1990)-, which specifically referred to the loss of soil as a result from erosion. This proposal needs substantial modification in the light of the progress made during the last decade in the field of soil management and conservation, as well as in drawbacks identified in the methodological aspects. Hoehn also

highlighted the fact that certain countries had made advances in partial aspects of environmental accounting for some specific resources (energy, forests, fishery), as well as for the commons (non-private resources such as water and air quality or other elements of physical environment or life). Other authors, cited by Hoeln, have worked on proposals for accounting of forest resources, wood, petroleum and soil resources; all of which serve to illustrate the potential contribution that environmental accounts can make to an environmental policy. In Uruguay, there are various academic institutions and governmental agencies with academic background, as well as basic information, infrastructure and human resources as required to develop strengthening opportunities in this area, through the development of projects to be funded and aiming at the final objective of incorporating environmental accounting –to an extent consistent with scientific knowledge- for major natural resources, as described by Hoeln for various countries. Some years ago, Uruguay implemented a centralized initiative in OPYPA (office of agricultural programs and policies), aiming at the formulation of a programme devised to keep environmental accounts of the soil resource. This programme, however, did not reach a stage of definite proposal, yet it might now be resumed following the recommendations made in different instances³. There is also a draft paper submitted to OPYPA as a contribution to the development of a quantitative procedure for the assessment of stock variations caused by erosion and degradation of the soil throughout Uruguay, pursuing also the following secondary goals: a) make available a methodology to compare soil use and management alternatives in terms of yield variations and resource value, and b) make available a procedure for the integration of physical losses caused by erosion into other estimates of environmental interest, such as changes in the organic carbon stock in soil, an economically –as well as environmentally-relevant issue under the provisions of the Kyoto Protocol. A project of this type –the one cited is only one example- whose goals are on track

with the CCD goals, is clearly synergic with the UNFCCC goals. The development of like initiatives within the scope of biological resources (forests and pastures, for instance) leads in turn to the generation of synergies between the CBD and one or both of the other two Conventions. The same is true for the sequestration or loss of carbon dioxide (or of other greenhouse gases) taking into consideration their relationship with climate change, biological diversity and land use. Several institutions such as DINAMA, INIA, and the University of the Republic have developed and currently develop activities in this matter with an emphasis on synergies.

2. Another thematic area where relevant research has recently been started that determines synergies among all three Conventions –here mentioned from the viewpoint of combat against desertification- is the development of soil quality indices for quantitative assessment of the effect of land use systems on soil erosion and degradation, or on soil biology. The concept of soil quality enables the definition of criteria for the sustainable use and management of soils; this concept is receiving increasing attention as quality certification requirements are already in use in certain markets, and this trend will surely be increased and extended over a wider range of products and productive systems. Soil quality indicators should comply with some essential features: validity in reaching the goal pursued, ease of measurement, consistency with the dynamics of physical, chemical and biological properties of soil, accessibility to a large diversity of users, and sensitivity to climate and management variations. Advances have been made regarding physical and chemical quality indices, for instance, in some research works significantly based on mathematical modelling carried out by INIA since 1990's and more recently by the University of the Republic (School of Agriculture and School of Engineering) and the MGAP (Soil and Water Division). Those biological soil quality indices that had not been prioritized before are now being studied; several projects have been

³ Two Workshops already held within the framework of this project and a proposal set forth in 2002 in a Report for the DINACYT.

concluded or are in course in the University (School of Science) and in Clemente Estable Biological Research Institute. Such research works generate essential elements for the definition of sustainable production systems and therefore for supporting sound decision making by technicians, producers and the institutions responsible for the soil resource; they also lead to the detection of synergies among the three Conventions. Thus, this is another appropriate framework for the generation of opportunities for capacity strengthening, as the ones mentioned in 1 and 2 above.

3. The elaboration of synergic multisectoral capacity strengthening plans and projects requires, to a greater or lesser extent, the availability of soil data bases and support edaphological maps. Mapping in Uruguay shows several and excellent antecedents: the Soil Recognition Country Chart (1:1 000 000) and several regional or departmental soil maps at 1:100 000 or 1:200 000 scale. In addition, we can also mention the CONEAT maps, which are preferred by most private users for site or multi-site studies, and have been the basis for the definition of forestry priority of soils under the current legal framework of the corresponding policy. The Soil and Water Division of the MGAP is currently working on the enhancement of CONEAT maps, incorporating information from its data base, in order to improve them according to its recently approved new structure and priorities (19/09/04). This is complemented by improved laboratory facilities, supported by an agreement made with the School of Chemistry, and unified under the sphere of one only Division by the mentioned restructure.
4. The activities developed to implement actions aimed at complying with the commitments under CCD undoubtedly require education and training of human resources in the thematic elements involved. Training activities should cover different levels, from higher education (graduate, postgraduate and permanent education courses) to secondary education for

the technicians of the agricultural sector; either directly involved in production or skilled workers, as they will be increasingly needed as a process of agricultural sustainable development starts and consolidates. The recent approval of the new Regulatory Decree of the Soil and Water Conservation Law and the implementation of a related policy defined by MGAP require improvements and advances in planning at site level, which should be based on procedures that have already been validated in Uruguay and that have proved suitable tools for the definition of sustainable use alternatives (Model USLE/RUSLE) for soil erosion prevention. This will also concur with the inclusion of the soil conservation processes used in the production system among those under quality and traceability certification. Also in this framework, is the incorporation of management practices aimed at ensuring the quality of soil in the broader sense currently accepted, taking into account not only physical and chemical quality parameters –defined quite long ago– but also indices relative to biological soil communities which have become increasingly important on account of their value as soil health estimates, and which have been object of recent and current research works, as already mentioned. The fundamentals of the proposal is, as emphasized repeatedly in the previous Workshops, the need for training in issues arising from the three Conventions, establishing a link between the application of research results and management of the soil resource and allowing synergic and multisectoral actions, by their crosslinking with the thematic spheres of desertification, climate change and biodiversity.

The abovementioned opportunities for the conduction of strengthening actions, largely on course or scheduled, promote and facilitate intra and inter institutional coordination mechanisms, the relation between academic or managing institutions with productive sectors and civil society organizations, the generation and dissemination of knowledge and information, the procurement and efficient use of human, mate-

rial and financial resources, and the inclusion of international environmental affairs in formal education syllabi and in the general public opinion. All the above supports the proposal, in line with the objectives of the National Capacity Self-Assessment project.

viii. Socioeconomic and environmental impacts on productive systems

One issue that should justify further analysis in the development of this project is that relative to the economic aspects of conservationist production systems, a field in which there are numerous studies abroad while only rare and specific examples were carried out in Uruguay. Moreover, socio economic and environmental impacts on productive systems are also among the specific issues of analysis within the framework of the three Conventions selected in agreement by the MVOTMA and the MGAP. The economic approach to the issue was presented by Cohan and Casás⁴ 25 years ago; yet the regulatory, technological and economic framework differed widely from that of current time. These authors, using a linear programming approach, made an attempt at explaining the low degree of adoption or maintenance in time of an apparently simple practice like rotation. In the light of present studies and physical and productive proposals, the traditional economic approach to soil conservation, the one used by Cohan and Casás, should be substantially broadened. In fact, several

authors that have been studying the issue with a new approach since 1980's, have pointed out that farmers frequently see soil conservation from the perspective that they and their family must survive in a competitive world, and quite often, struggle to meet their basic needs. Despite of awareness of long-term and ex-situ costs of erosion, decisions over the adoption of soil conservation practices are ruled by the economic impacts of these practices on their personal economy or livelihood (Gunatilake et al., Lovejoy et al., cited by Bergsma, 2003⁵). As conservation costs are high and its current net value is negative, it is quite likely that farmers would not adopt conservationist practices unless incentives such as subsidies are made available to them. A study of the World Bank conducted a few years ago highlighted the need for profitable conservation, yet setting the proposal in a broader context, by asserting that other factors apart from cost-benefit considerations, may have a decisive influence in the adoption of conservationist measures. Examples of such factors are market imperfections, reflected in input over costs, and also those of institutional nature such as land leasing and access to credit. It is also worth noting that in extreme cases, small farmers economies do not follow the economic patterns assumed by neoclassical economists and the minimization of risks and family subsistence - rather than maximization of benefits- become the crucial factors (Tobisson, cited by Bergsma, 2003). Whereas the above conclusions were drawn for peasant farms unlike those traditionally found in Uruguay, there are numerous small farms with

Bovine livestock production



production systems resembling the ones considered; hence, the relevance of such considerations.

The lack of reliable predictive models of erosion for different scenarios supported the approach of economists like Cohan and Casás cited above. Nowadays, however, there are sufficiently accurate and experimentally validated tools (USLE) available, crop and pasture rotations have been significantly diffused over the main agricultural area, and new technologies (other than rotations) have been developed (such as zero tilling) and tested and available to farmers. All these changes call for a deeper economic analysis in order to complement other studies, like the already mentioned one by the DIEA, which did not verify the existence of a generalized perception among farmers of lower costs associated to zero tilling—as compared with costs of conventional tilling—as a reason for incorporating such practice in their productive systems. Research on the economic aspects of conservationist production systems and their impact on producers (and ultimately on the decision to adopt most recommended practices or not) will provide new elements to be considered for the design and implementation of technical assistance programmes aimed at the transfer of environmentally sound production technologies which may also be sustainable from the macro and micro economic perspective. Regarding the impact on the macro economy of a project like the one outlined, it would be a valuable complement to the development of environmental accounts of the soil resource.

ix. Integrated management of water basins

It should be noted that the effects of erosion on soil reflect on two different geographical environments and with different direct consequences for each of them. Such effects, associated to different spatial environments may be defined as in-situ and ex-situ consequences of the erosion process. In-situ consequences refer to the loss of soil where the process is developed to



Grape harvest for wine production

the detriment of resource and production, constituting a loss of natural assets. Growth based on resource exhaustion (soil) is clearly unsustainable in time.

Ex-situ consequences include sedimentation in river beds and ponds of a large part of the eroded material, and the contamination and eutrophication of surface water bodies. Both consequences result in loss of resources and/or loss of resource quality.

Ex-situ consequences of erosion affect resources and populations which may be far away downstream of the site where soil loss is generated; and thus it may even have trans-border effects and associated implications. Adequate management of water basins is therefore a major

⁴ Cohan, H. E. y R Casás (1979). Economic feasibility of conservative production systems. First National Seminar on Conservation and Management of Renewable Natural Resources. Montevideo.

⁵ Bergsma, E. 2003 Incentives of land users in projects of soil and water conservation – The weight of intangibles. Enschede.



Uruguay river in the Department of Paysandú

goal and in the case of transborder basins, it should be subject to agreements defining rights and responsibilities as well as the obligations of the parties. For this cases, not further developed in this instance, there are both national and regional regulatory frameworks and several projects of research, management and protection of surface or underground water bodies.

In reference to the use of surface water for irrigation, it is worth mentioning that it is one of the few cases in Uruguay where there is all local stakeholders directly participate and not only in the resource management authority. The Irrigation Advisory Councils are composed by representatives of the irrigators and also of the public agencies involved, and there are also Public Audiences where all stakeholders can participate. This double mechanism ensures the

participation of the society in the management and decision making regarding the use of an essential resource like water; and despite the fact that participation has been mainly related to the resource “quantity”, it would be desirable that it started to also consider the resource “quality”, since water loss or decline in rural areas derives mainly from its contamination with sediments produced by soil erosion.

Several air and space images available for the whole Uruguayan territory and neighbouring zones show clearly the effect of erosion on the sediment charge of the River Plate coming from its basin. The images taken at times 30 years apart show in either case a high degree of estuary turbidity owing to the suspended solids charge, showing that the loss of soil is an active and sustained phenomenon on the upstream lands

which include all MERCOSUR countries. These images confirm the contributions come from both rivers (Uruguay and Paraná).

Other images show the same phenomenon but highlight the difference in type of sediment –due to different prevailing soil types in the Paraná and Uruguay basins, resulting in differentiated water colour according to respective origin.

The loss in water quality revealed by these images may only be reverted if the soil erosion problem is dealt with throughout the geographical environment where it occurs, requiring a multinational approach and a trans-border programme within the framework of an appropriate management of the whole basin. The agreements in force relative to the Uruguay river and the River Plate basin allow adequate framework for the implementation of concrete projects and actions in pursuit of this goal, using cartographical soil information and appropriate technology available to those countries crossed by the waterbeds. Research programmes are being developed for the improvement of knowledge. There is likewise, staff trained in competent services, though they would undoubtedly require constant updating and enhancement for the strengthening of capacity and acquaintance with the latest scientific advances worldwide.

The Project for “Preparation of a Framework Programme for Sustainable Management of Water Resources of the River Plate Basin and their Relationship with Climate Variability and Change” deserves mentioning. This project funded by the GEF is one major strengthening opportunity. The United Nations Environment Program will be the implementation Agency and the General Secretariat of the Organization of American States the execution Agency. Locally the project shall be executed by the River Plate Basin Intergovernmental Coordinator Committee (CIC), in cooperation with national institutions.

The general goal of the Project is to strengthen the efforts of Argentinean, Bolivian, Brazilian, Paraguayan and Uruguayan Governments with a view to the implementation of their sustainable environmental, social and economic development visions regarding the River Plate Basin, specifically in protection areas and integrated management of water resources and adaptation to climate variability and change.

As summary, the following conclusions may be drawn:

1. In order to accomplish individual capacity strengthening, education is required at different levels, as well as technology transfer and technical assistance to producers (item 6)
2. Building institutional capacity obviously requires the political will to achieve it, suitable mechanisms for that purpose should be projects such as those identified in items 1 to 5, and pay the necessary attention to training and renovation of technical staff as well as to the permanent upgrading of material resources for an effective compliance of their tasks. The economic approach to soil conservation and the considerations on water basin management also contribute to the strengthening of institutional capacity, inasmuch as, in addition to the accomplishment of direct effects, they promote interinstitutional coordination as required in order to achieve the goals.
3. The strengthening of capacity at the systemic level necessarily requires strong political will and shared goals among the agencies and institutions involved in decision making, so that intra and interinstitutional coordination may be promoted rather than hampered -often pointed out as one major limitation to efficacy, efficiency and sustainability in the definition and execution of policies and decisions.

V. COMPONENTS OF A CAPACITY STRENGTHENING STRATEGY AND ACTION PLAN TO PROTECT THE GLOBAL ENVIRONMENT

The definition of a capacity strengthening strategy should contemplate: a) the weaknesses and opportunities already identified by the country through a participatory process; b) the multisectoral issues identified as priority; and c) the dimensions in which weaknesses and opportunities were grouped. This process should involve the main actors involved in its execution as a means of generating the necessary commitments among particular interests, daily actions and the goals of general interest. This may be accomplished by means of participative actions in workshops and seminars for discussion and adjustment of this document in order to reach a consensus about the strategy among all the stakeholders involved; an indispensable though not sufficient requirement to ensure the accomplishment of goals.

As recognized at the Earth Summit, local communities have had -and supposedly shall continue to have- an important role in environmental conservation issues, though experience shows that the participation mechanisms included in decision-making process are insufficient in themselves without a lucid political leadership, public education and reasonable socioeconomic stability within the communities concerned.

The strategy should pursue the following goals:

- Promote and coordinate the development of scientific research programs and the training of qualified staff for the solution of specific problems at national level.
- Put forward the environmental factor for consideration in sector development policies, plans and projects, with a land planning approach enabling the establishment of

synergic relationships among the various environmental dimensions.

- Foster the creation of an information and diffusion network.
- Promote interinstitutional coordination, favoring an integrated approach to the environmental issue.
- Favor awareness campaigns relative to environmental issues and the possibilities of making contributions to their solution, through education, diffusion and socialization of information.
- Foster public-private cooperation for environmental management.
- Promote the adaptation of the legal framework to conservation and sustainable land use requirements.

In order to achieve these goals, it is necessary to define facilitating actions for their accomplishment, to identify the main players involved and to define indicators of achievement enabling the monitoring of strategy development.

a) Proposed actions for strengthening of the management capacity

- Develop procedures for systematization of coordination, with short term involvement of the MVOTMA, the MGAP and municipal governments and the middle term involvement of the remaining public institutions involved in biological diversity management at national level.

- Organization of participative activities among ministries, municipal governments, national and departmental legislators, public and private institutions, and civil society.
 - Promote public-private cooperation through environmental management cooperation experiences conducted by the MVOTMA and the MGAP.
 - Improve links and communication between the academic and the public sector (technicians and authorities) and establish effective coordination, meaning that consensus definitions should be heard in political decision making.
 - Promote the generation of a co-management and shared responsibility culture.
 - Periodical upgrading of technical specifications defined by the legal framework in accordance with research advances made in management and conservation of natural resources. This action shall be carried out by the national institutions dealing with the issue.
 - Promote an agreement to incorporate the economic approach into environmental conservation policies, to identify obstacles for the adoption of conservation practices and propose measures to overcome them.
 - Increase and strengthen exchanges among technical teams in charge of inspecting compliance with the legal framework, research teams and the organizations representing the producer sector; in order to generate interaction among the sectors directly involved in the conservation issue.
 - Promote the decentralization of resources management and environmental management, seeking coordination among municipal governments, local councils, educational institutions and civil society organizations nationwide, as well as the MVOTMA and the MGAP.
 - Promote joint actions carried out by several countries (MERCOSUR, River Plate Basin) for the management of water resources, ensuring quality by preventing erosion damages throughout the basin. Meeting this goal entails activities leading to a strengthening of intergovernmental coordination, based on current treaties or agreements offering adequate framework for the proposed actions.
- b) Proposed actions for the generation of knowledge
- In bidding for funding of international cooperation activities, in the framework of agreements of strategic interest (Subprogramme III of PDT) or concerning the organization of coordination of research and thematic nets (Programme CYTED); design guidelines for the inclusion of clauses -in such bids or among the eligibility conditions- whereby projects should contemplate pertinent aspects relative to all three thematic spheres, in agreement with the authorities of the above entities whenever necessary.
 - Since the National Corporation for Development (CND by its acronym in Spanish) coordinates the Global Multisectoral Credit Programme for investment and development projects, design guidelines for the inclusion in projects submitted by enterprises of measures, as necessary, promoting the solution, mitigation or prevention of problems related to the issues of the three Conventions.
 - Develop the introduction of environmental accounts in the national accounts –use may be made of advances made by OPYPA concerning the soil resource, while seeking the progressive inclusion of other resources in the light of advances made in scientific knowledge towards this goal.
 - Promote the establishment of a Station Net to contemplate the needs of study and monitoring of several issues, by consent

among respective specialists. Such Stations should contemplate in the best way possible diverse situations at different combinations of climate, land use, etc. and should be positioned conveniently according to stratification on the basis of geological and edaphological maps. Use of this methodology for surveying and multidisciplinary monitoring of resources would also lead to savings in financial resources and improved interchange of experiences and knowledge among experts.

- Conduct further research into environmental impacts of forestation, to access more information of aspects constituting an important concern at social level, while national information to respond to such queries is still insufficient.
 - Conduct further research and advances in knowledge of the use of agro toxic substances and their impact on human health, as well as means of controlling their use, addressing the needs of different localities.
- c) Proposed actions for education and diffusion of environmental information among the general public
- Diffusion and information on conservation and sustainable use of natural resources among technicians and decision makers, with an emphasis on decisions made at national research level, by means of a network for systematization, interchange and publication of research results and experiences.
 - Diffusion of environmental information among the general public, by means of the implementation of an environmental information system and the organization of conferences and seminars. The participation of responsible or leading entities is essential to such activity (University, MVOTMA, MGAP, Programmes such as PROBIDES, ECOPLATA and FREPLATA, for instance)
- Implementation of staff training programmes for technicians and administrators accomplished through meetings and courses in the charge of the University of the Republic of Uruguay, ANEP, MVOTMA or other institutions with a capacity in international environmental issues concerned with the project.
 - Keep technical staff up-to-date regarding knowledge and training and ensure sustainable renovation of human resources through the incorporation of new staff as others –having completed their work cycle in the institution- retire.
 - Elaboration and launching of a diffusion plan for awareness of political decision makers using the appropriate strategies for the sector, such as the systematic delivery of electronic newsletters designed specifically to that end.
 - Elaboration and execution of a sensitization plan of public opinion, with the following two suggested alternatives (complementary): a massive campaign on the media, as concluded from the previous workshops and a concrete project aimed for the general public by means of training of primary and secondary education teachers.
 - Design and implementation of a training programme for technicians of the productive structure. Formulate and enlarge joint interinstitutional activities in areas of management, research and diffusion of project results and available data bases, enabling increased access by interested players acting in diverse environments: academic, administrative, political, productive and civil society in general. To this end, technical assistance programmes are essential for the transfer of technology, either through the official or private institutions, using the necessary technical assistance and supervision in the latter case.

- Promotion of efficient technical and administrative coordination among different institutions participating in research and management of natural resources; and, in particular, when institutions not acting directly in one field should not overlook information generated by natural resources which they administrate (such as public or private credit institutions to the agrarian sector or to private technical assistance services to the same sector).
 - Further advances and adaptation of environmental education at primary and secondary education level, as a starting point for a sensitization, acquisition and training process that may be continued in future on a solid basis, and generating a considerable degree of awareness and general knowledge among those who do not further their studies, enabling improved behaviour in the social sphere, avoiding the introduction of undesired simplifications of concepts valid for other realities, and generating objective vision capacity of facts and criticism –whenever necessary- based on rational theses supported by national research activity. The above requires the design of a specific teacher-training Programme including, in addition to updating of information, didactic proposals suitable for the issues under discussion. Likewise, the elaboration of specific didactic material for environment educators is required in pursuit of educational goals concerning the three Conventions.
 - Make use of different, currently available tools for diffusion of knowledge, according to goals and without disregarding any of such tools, considering that information should be delivered to different sectors, where capacities, resources and roles may differ. Scientific journals for diffusion of research results among the academic community, nationwide and abroad. Informative publications aimed for producers or technicians, in support of technology transfer and technical assistance activities. Training publications for the educational levels indicated in item 4 –with most severe weaknesses identified in primary and secondary level education– regarding both quality and validity as required by the Uruguayan reality. Web publications, where updating and amendment is easily performed, using increasingly widespread tools of technology information. Courses, introductory courses, conferences and diffusion using press media in a variety of modes, seeking ample and rapid sensitization and information to civil society, making available accurate and reliable, unbiased information sources.
- d) Actions proposed for adaptation of the regulatory framework
- Inclusion of the environmental variable in decision making on policy, plans and projects, promoting the elaboration of a bill of law for Strategic Environmental Assessment, and follow-up of its approval and regularization process.
 - The establishment of guidelines for the delimitation and management of the National System of Natural Protected Areas, promoting regimentation of its creation law.
 - Renewal of current law regarding the conservation and sustainable use of natural resources, outside of protected areas.
 - Creation of a National Phylogenetics Resource System.
 - Legislation regarding Access to Phylogenetic Resources (implementation of article 15 of CDB in Uruguay).
- e) Actions proposed in the framework of shared environmental issues
- Elaborate regularly on a five year basis, an Integrated Forestry Inventory as a tool for total or partial construction of 60% of the indicators defined in the Montreal Process.
 - Implementation of a Plan for the reduction of natural disasters caused by climatic phenomena, and definition and launching

of an interinstitutional coordination mechanism as required for implementation of the said Plan.

- Create an interinstitutional Work Team for follow-up of the renewable energy issues, in the framework of the Political Declaration adopted by representatives of 154 countries including Uruguay in the occasion of the International Conference on Renewable Energies held in June 2004 in Bonn.
- Implement (following regimentation of) the Law for the Creation of a National System of Protected Areas.
- Continue joint work developed by the MGAP and the MVOTMA for the selection and delimitation of natural areas, as should be incorporated into the forthcoming National System of Natural Protected Areas.
- Accelerate, inasmuch as possible, the process of nationwide approval of the Bill of Law for Land Planning.
- Develop soil quality indices for quantitative assessment of the effect of land use systems on resource erosion and degradation, or on its biology.
- Incorporate the analysis of economic aspects of conservationist productive systems and their impact on producers and decision taking regarding the adoption of recommendable practices.
- Advance the Project for “Preparation of a Framework Programme for Sustainable Management of Water Resources of the River Plate Basin and their Relationship with Climate Variability and Change”, using GEF funding.
- Implement a joint MGAP/GEF/World Bank Project for Integrated Management of Natural Resources of Agricultural Use, aimed mainly at the protection of ecosystems and species outside of Protected Areas.

