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MEDITERRANEAN ACTION PLAN UNITED NATIONS ENVIRONMENT PROGRAMME

IMPROVING THE ENVIRONMENT IN THE MEDITERRANEAN: LESSONS FOR SUSTAINABLE DEVELOPMENT

European Commission - DG XI - 3
B7- 8/10/97/804/UNB/A4



ATHENS - DECEMBER 1999



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PREFACE

The Mediterranean is the cradle of civilization, an area of intensive cultural, social and economic exchange and linkages. Over the centuries Mediterranean societies have developed rational patterns of living which are well adapted to local conditions. Development patterns have been characterized by respect for the place and the environment.

In the last century, the Mediterranean has been subject to intensive pressures which have strained the relationship of man and the environment. Population growth, rural-urban migration and rapid urbanization have been major factors which led to concentration of people and economic activities in cities and coastal areas, abandonment of rural mountain and island areas and degradation of environmental resources and ecosystems. Technological, organizational and institutional innovations at a global scale might affect negatively environmental quality even further in the Region. Protecting the environment is recognized worldwide as an important goal together with the strive for economic and social development for the future in the context of a broader strategy for sustainable development.

Mediterranean societies have responded in an active way to such challenges by developing local, national and international initiatives to cope with their increasingly complex environment-development problems. In this direction it is important to develop further activities but it is equally important to learn from past successes and failures. Such experiences may also be of particular value to other societies around the world seeking examples of good practice.

For these reasons the Mediterranean Action Plan of the United Nations Programme has undertaken the initiative to highlight some of the efforts by Mediterranean societies to improve the environment presented in this document hoping that such communication will propagate the seeds of change much needed around the world towards sustainable development.

H.E. Mrs Faiza Kefi

Minister of Environment and Land Use Planning

Tunisia

FOREWORD

This is the final Report for the Project Life B7-8/10/97/804/UNB/A4 which benefited from funds from the European Commission, DG XI-A3 to which UNEP/MAP wishes to express its gratitude. The Project was coordinated by Mr. Arab Hoballah of the Coordinating Unit, Mediterranean Action Plan, UNEP.

This study was commissioned to the Laboratory of Environmental Planning of the University of the Aegean (Greece) under the responsibility of its Director, Prof. Harry Coccossis and a study team consisting of Ms. Anna M. Collovini, Environmental Scientist and Ms. Alexandra Mexa, Environmental Planner.

Also MAP wishes to address special thanks to EcoMediterranea, Friends of Earth, Mrs. Amparo Rambla and Dr. Lirim Selfo for providing information on projects presented.

A significant contribution has been given by all experts participated in the Workshop "Improving the Environment in the Mediterranean: Lessons for Sustainable Development" held in Athens on 22nd November 1999: Mr. George Abu-Jawdeh, Dr. Emad Adly, Mr. Nihad M. Almughany, Dr. Raymond Bar-On, Prof. Mohamed Fakhfakh, Mr. Nikos S. Georgiades, Mr. Georges A. Giourgas, Dr. Magdi Ibrahim, Prof. Rusen Keles, Mr. Franco La Torre, Prof. Aldo Manos, Prof. Michael Scoullou, Mr. Ivica Trumbic, Mr. Samuel Watchueng.

This Report should be considered by Mediterranean concerned partners as a first step in the process of communicating the experience and drawing lessons for sustainable development.

Therefore it will be reviewed and enhanced in the proximate future.

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**IMPROVING THE ENVIRONMENT
IN THE MEDITERRANEAN:
LESSONS FOR SUSTAINABLE DEVELOPMENT**

1. INTRODUCTION

The Mediterranean faces complex development/environment problems. In that sense it offers unique opportunities for applying and testing sustainable development projects. Its natural resources, notably its marine, terrestrial and water resources, whose availability and quality are under threat in the long or even medium term are subject to overwhelming pressures. The trends towards increasingly intensive exploitation of agriculture and fisheries has a significant impact on natural resources and the marine environment. Coastal zones in particular are especially vulnerable to intensive urban and tourism development that affects outstanding landscapes, historic sites and coastal ecosystems. Issues related to the environment, housing, transport and quality of life predominate in large Mediterranean cities which are undergoing rapid expansion. Urban areas, industrial zones and ports whose development has been inadequately controlled, the lack of effective sewage facilities and adequate waste treatment systems constitute environmental "hot spots" that contribute to the pollution of the marine environment, the coast and the atmosphere.

Sustainable development has been addressed by the World Commission on Environment and Development as "... the development that meets the needs of present without compromising the ability of future generations to meet their own needs". Sustainable development is a goal and a process to improve environmental, social and economic performance of societies in a long-term perspective to offer equal opportunities to the future generations. Sustainable development provides a framework under which communities can use resources efficiently, create efficient infrastructures, protect and enhance quality of life, and create new businesses to strengthen their economies. It can help us create healthy communities that can sustain our generation, as well as those that follow us.

To advance forward to this target it is necessary to develop strategies which reconfirm the linkages between environmental and socio-economic factors and base development projects to the capacity of the environment to support human activities, balancing individual rights with collective ones.

In the last decades there is a growing awareness of the effects of economic development on environmental quality particularly from the perspective that environmental degradation may affect prospects for growth and development. This has led to a growing need for more rational and sustainable production and consumption patterns and to the search for ways to mitigate the impacts of development on the environment.

There are many courses that can be followed by countries toward sustainable development and a great deal of activity is undertaken towards this end. In the process it is important to learn from each other's experiences, since the promotion of new ideas and projects is a key element for further development.

2. SCOPE, METHODOLOGICAL APPROACH, STRUCTURE OF THE STUDY

There is satisfactory knowledge of the state of the environment and related problems of Mediterranean countries, in several cases sufficient enough to provide guidance for specific reparative measures. Observation, monitoring, assessment, and evaluation activities have been undertaken throughout the Region providing significant insight. However there is still limited knowledge for the actions undertaken in order to tackle and remedy environmental problems (i.e. pollution, degradation of natural resources and ecosystems). In addition it is not always evident if such actions are part of a broader framework-strategy for sustainable development. The lack of this knowledge, combined with poor evaluation of the implemented projects and other initiatives, limits the efforts towards sustainability. Opportunities and constraints for promoting sustainability principles, as they appear in each project, can provide significant lessons and guidance for future initiatives. The current Study aspires to contribute towards this direction.

The Report is a collection of initiatives implemented in the Region and may help in showing the dominant trend towards sustainable development through almost 100 concrete projects. Its aim is to promote the exchange of experience between successful projects and act as a basic reference for the countries of the Region as well as in other world areas.

The procedure adopted for the preparation of this Study followed four main phases:

Phase 1: Conduct a research to collect information about projects promoting sustainable development.

The collection of this information was pursued through different but complementary ways:

- Contacts with experts working in the Mediterranean region, NGOs and Public Authorities of Mediterranean countries in order to collect information about successful cases implemented in the area
- An exhaustive survey of the databases available on the Internet concerning Sustainable Development projects/programmes (see Appendix I). The survey included projects that were available in the following languages: English, French, Italian and Spanish. It should be mentioned that several projects found in existing databases were not considered for further study since not enough information was provided and no contact details were mentioned, facilitating additional research.
- Collection of additional information or data, when missing, directly from the promoters or implementers of the projects

The projects presented in this report were initiated and promoted by several actors reflecting an increasing recognition of the need for joint action and mobilisation of different segments of society in the process of shaping a sustainable future.

Many projects/programmes concerning planning and management strategies have been promoted by public Authorities at various levels (national, regional, local). Many environmental associations have been involved in the implementation of activities, especially in raising awareness, educational support and information exchange among various actors. Private sector and research institutions have set up demonstrative actions through pilot projects promoting innovative decision making tools or adopting clean technologies.

The focus and scale of sustainability initiatives depend on local conditions and particularities as well as on the unique features of each community, such as human and financial resources, political and organisational structures. The projects presented incorporate economic, social and environmental aspects, evident in all problems confronted, such as waste management, water management, loss of biodiversity, use and reuse of natural resources, tourism, quality of the urban environment, energy and transport, education and information, employment and training, rural and local development, island and coastal zone management, etc.

Phase 2: Presentation of the selected projects around selected key issues.

Based on the information available, the description of the projects presented in the second section of this Report has included:

- Title of the project,
- Focus (raising awareness, demonstrative or preparatory activities, combat of a specific problem, elaboration of a management plan, design or test of a specific tool, etc.),
- Background - Problems to be confronted,
- Objectives pursued,
- description of Actors involved (government; local authorities; voluntary associations; private organisations),
- information about Organisation, Financing issues as well as the Time frame.

Contact details (person, or authority, address, tel/fax, email) are also provided in case the reader wants to investigate further a particular project.

Information, when available, is also given for the outcome and results of the projects. Comments are made about the degree and nature of innovation as well as their relation to sustainable development criteria. Finally an attempt is made to discuss the main lessons learnt (opportunities and constraints for sustainable development).

The initiatives described in the Report have been organised around some of the priority subjects identified by the Mediterranean Commission for Sustainable Development and others, leading to the following topic areas:

1. Local management and sustainable development (wetlands, islands, mountain or desertic regions, etc).
2. Sustainable management of the natural resources.
3. Energy, transport and sustainable development.
4. Employment, training, information, education and environment
5. Agriculture and rural areas (agriculture policies, soil use, erosion, desertification, etc)
6. Consumption patterns and waste management
7. Health and environment

Phase 3: Evaluation of the projects in respect to their contribution in promoting sustainable development.

The projects have been evaluated on the basis of the following criteria:

- Multisectorial approach followed. The projects considered were evaluated in terms of their level of integration of different social and economic sectors. Projects based on mono-sectorial approaches were considered as weak.
- Multidimensional approach in the issues of the environment. Given the interdependence of environmental components, projects were examined in order to see whether they have captured the notion of environmental complexity and totality through incorporating several of its features and compartments (air, water, soil, biological life).
- Integration of environmental and socio-economic concerns. Projects were evaluated positively if while addressing socio-economic concerns have sufficiently considered environmental impacts as well as solutions for improving the state of environment or for minimising side-effects.
- Long term intergenerational perspective. Impact consideration on future generations is of fundamental importance and has to be taken into account in all phases of a project, starting from its inception.

Each project has been evaluated using the above four criteria. Each criteria could take three alternative values:

- S : when the criteria was adopted strongly (S) by the particular project.
- W : when the criteria was adopted weakly (W) by the particular project.
- - : when the criteria was not taken into account by the particular project.

It needs to be stressed that the evaluation was performed on a qualitative base and in several cases due to the lack of sufficient information was not easy to decide upon the proper value. As a result, the evaluation given should be considered only as an indication for the initiatives towards sustainable development.

A synthesis of findings followed which was communicated to an expert panel (see below).

Phase 4: Further exploration of lessons learnt through an experts panel.

A Workshop under the title "Improving the Environment in the Mediterranean: Lessons for Sustainable Development" was held in Athens on the 22nd of November 1999. The Workshop has been organised by the Laboratory of Environmental Planning with the collaboration of UNEP/MAP. Several experts from different Mediterranean countries had been invited to participate in the Workshop so as to contribute to the initial goal through exploring successes and failures on Sustainable Development initiatives and presenting their experience from several projects and other initiatives –policy, institutional- undertaken in their countries. Their experience and suggestions raised from the discussion have been considered in the preparation of the Report and particularly in the first section regarding: Recommendations and Lessons Learnt.

Structure of the Report

The Report is organised in two main sections. The first section focuses on the lessons learnt from the selected projects and initiatives and includes some recommendations on both policy and project level for achieving sustainable development.

The second section presents in a more analytic way all projects examined, providing detailed information that can be used by the reader to reach his/her own conclusions, perform his/her own evaluation and come up with his/her own lessons learnt. A summary analysis outlining the situation that led to the implementation of the particular projects, their main objectives and the particular lessons learnt has been also included.

3. LESSONS FROM SUSTAINABLE DEVELOPMENT INITIATIVES IN THE MEDITERRANEAN

There is an increasing number of initiatives undertaken by Mediterranean countries, regions and cities which in a broad sense may lead to sustainable development. These are emerging through a variety of contexts (i.e. sustainable tourism, water resource management, biodiversity protection, Local Agenda 21, etc.) and are supported by a wide diversity of national and international programmes and funds. Such diversity is also reflected in the typology of actors initiating these activities as well as those involved who differ widely on the basis of the character (focus) of the initiatives.

By far the majority of sustainable development initiatives is at an early stage of launching, mostly at a planning preparatory phase, with little evidence of outcome or concrete results. This can be attributed to:

- the recent emergence of sustainable development as a goal and a process in the international –and Mediterranean – community and the general lack of experience in this approach
- the general inertia in adopting innovative concepts in institutional structures, particularly in many Mediterranean countries which are strongly based on centralization
- the recent emergence of many Mediterranean economies, the lagging economic development in most Mediterranean countries and the transition phase of their societies
- the general lack of available support (programmes and funds to act as catalysts) to stimulate initiatives as in spite of declarations and political statements there is still prevalence of commitment in sectoral and fragmented approaches.

Major blocking factors persist in many Mediterranean countries as slow rates of attitude change, low adoption rates for innovative action, the presence of strong social groups, sectoral conflicts and vested interests and absence of processes for social discourse and consensus, general lack of access to resources, etc.

A positive aspect is the widespread range of activities undertaken and the growing number of initiatives in the Region. However the vast majority consists of small scale ad hoc activities outside a broad strategy. Even within a single region or country basis there is usually lack of a broader framework in spite of a general adherence to sustainable development as a goal. The small scale can be attributed to hesitancy and lack of experience with the approach to sustainable development and the lack of support framework (funds mostly) for such activities. The ad hoc nature of most initiatives reflects a general failure to create a broad framework in spite of recent developments either on a country basis (beyond general goals and policy intentions) or Mediterranean wide (i.e. the activities of Mediterranean Commission for Sustainable Development- MCSD).

A positive aspect related to the one above is that most initiatives are developed at a 'grass roots' level reflecting a lagging institutional setting mostly at the higher level (national). Often informal arrangements and outside (non-institutional) actors are more flexible in capturing innovative action. On the other hand though the lack of an organized civil society, evident in many Mediterranean areas, could be an obstacle to innovative action.

There is more evidence for initiatives in northern Mediterranean areas than southern ones probably reflecting differences in accessing relevant funds, in communication and information dissemination on initiatives undertaken or in institutional flexibility to take advantage of opportunities for new activities.

Sustainable development requires anticipatory action. A general threat is the weak institutional context of many Mediterranean countries (north and south) in this respect and the prevailing 'global' trends towards privatization and reduction of the role of the State which could erode the efforts to meet the basic needs of this transitional phase to develop modern institutions to manage growth and development.

Several priority policy areas emerge for sustainable development action in the Mediterranean:

Urbanization and development control. Both are major areas of concern because of the magnitude and extent of the phenomenon and associated public administration inefficiencies, undeveloped local authority structures, lack of planning, ineffective development control implementation. It is improbable that sustainable development can be pursued without effective land-use planning and development control regulation at least at a local level.

Protection of Natural and Cultural Heritage. Although a great deal of progress has been achieved mostly through the various international programmes and initiatives it is necessary to develop actions towards a rational long-term based management of resources (mostly water and land as well as marine) and protection of areas of significant value.

Protection from pollution and management of waste. Changing consumption patterns and rising population and incomes are major forces which lead to mounting volumes of pollutants and waste which coupled with undeveloped collection and treatment systems can pose significant threats to resources, ecosystems and quality of life in general. Prevention and control are important at the local, national and regional level with emphasis on adoption and implementation of strict rules, procedures and standards.

Information and Awareness. There is a general deficiency in this respect throughout the Mediterranean particularly in terms of environmental information available to the public. Environmental awareness is still lacking as many societies strive with development prospects where traditional narrow views (fragmented and sectoral) predominate.

4. REQUIREMENTS FOR SUCCESSFUL PROJECT IMPLEMENTATION

The experience from the Mediterranean projects reviewed in this Study can be of broader utility. Therefore several of the points raised in this section are requirements also at a general level regarding the implementation of sustainable development projects.

The successful implementation of a project is frequently inhibited by several factors of the broader socio-economic, political and institutional environment. These factors, although not often directly addressed in the projects prove to be severe bottlenecks influencing directly the process and expected outcome. Institutions, mentalities, access to technology and information, existing socio-economic conditions, political instability, etc., are some of these factors. Consequently along with the promotion of all initiatives-projects towards sustainable development, it is necessary to work systematically on policy and institutional issues on both the national and regional level.

The establishment of an "enabling environment" can be achieved through:

- A. mobilization of key actors.
- B. international cooperation.
- C. coordination of involved actors.
- D. development of local/regional mechanisms (MCSD, networks, etc.).
- E. institutional restructuring.
- F. promotion of participatory approaches.
- G. elaboration of broader development strategies.
- H. planning, proper implementation and continuous monitoring.
- I. information management.
- J. raising general awareness on sustainable development.
- K. capacity building at local levels.

A. MOBILIZATION OF KEY ACTORS

A1. National States. The Mediterranean State should have a leading role in developing a comprehensive national sustainable strategy on the basis of participatory processes and priorities for action. The States have the responsibility of regulation, infrastructure development, provision of services which are fundamental elements for the effective management of national resources. Also the State needs to balance between conflicting interests and development priorities of different Municipalities and Provinces. The State is responsible for the provision of guidance if localities are to develop their activities as part of a broader sustainable strategy. In the Mediterranean, the State needs to guide donor development assistance and contribute in gaining environmental benefits from investments in various economic sectors. It has to provide also a legal frame supporting and motivating projects that follow sustainable development principles and penalizes, while redefining and sometimes imposing the retract to those projects which are not approved by the communities involved or which do not respect the rights of future generations.

A2. Local Authorities. In most cases environmental problems and solutions stem from local activities and initiatives. In the Mediterranean Local Authorities are still developing their capabilities to manage the local complex problems. However it is widely recognized that Local authorities play a key role in fulfilling objectives for sustainable development. They should facilitate consensus-building among local communities, businesses and industrial organizations towards the elaboration of a sustainable development strategy. Through consultation the increase of people's awareness on sustainable development issues can be expected. People elected locally could assume a leading role and act as interlocutors between public authorities and communities, activate social mobilization towards effective contribution to the definition of coherent strategies. Public Authorities should act as an example and implement actions towards sustainable development while promoting them in the private sector.

A3. NGOs. Although in many Mediterranean countries NGOs of a national or local character are still at a phase of development their efforts towards sustainable development needs to be recognized and specific measures have to be taken by governments to strengthen their role. At present NGOs have limited access to capital and resources, particularly in some Mediterranean countries. Their experience at a grass roots level could be used to mobilize and strengthen the capacity of other partners. NGOs have to create new synergies with public authorities, without losing their autonomy in setting up initiatives. Furthermore, the rising role of NGOs in creating and disseminating awareness on Sustainable Development issues and challenges can provide a model of dialogue that could be replicated, mainly due to their close relationships with local communities.

A4. Local communities. The participation of communities involved is crucial in each phase of planning and implementation of the project/program: inception, implementation,

evaluation, re-structuring. The absence of consultation and information dissemination procedures with local communities may lead to local economic conflicts, bottlenecks and lengthy negotiations. Expansion of involvement is of particular importance for Mediterranean societies which do not benefit from a long tradition or experience in participating to local development issues.

A5. Private sector. The role of the private sector becomes more and more crucial in providing assistance especially to developing countries in support of their training programs and their efforts for capacity building in the transition to sustainability. The private sector can be easily involved if clear gains are expected when investing towards sustainable development. As the Mediterranean economies emerge into a development phase a stronger articulation of the private/public sector interaction is expected.

B. INTERNATIONAL COOPERATION

International cooperation and solidarity can play a decisive role in the implementation of actions especially among Mediterranean countries stimulating concertation of local actors (private sector, associations, local bodies and various technical services).

C. COORDINATION OF INVOLVED ACTORS

C1. Coordination of old and new institutions. Following the change of paradigm in Rio, new institutions were added to the old ones in the form of the UN Commission on Sustainable Development, the Mediterranean Commission on Sustainable Development and others. The relationship between the new bodies and pre-existing representatives bodies (the UNEP Governing Council, the meetings of Contracting Parties to the Barcelona Convention) are still vague, apart from reaffirming that UNEP remains the principal UN body in the field of the environment and that UNCSD is the "main forum for high-level policy debate on sustainable development". The issue to be addressed concerns not the new mechanisms but the clarification of their relationship with the existing ones.

C2. Responsibilities. Although many conventions and agreements are signed and ratified by many governments and parliaments, they are not yet fully transformed into local practices by the various actors. Progress towards a global sustainable future is just too slow and the necessary sense of urgency is lacking. The relationships, roles, rights and obligations of partners involved have to be defined clearly. Furthermore initiatives should ensure a considerable degree of inter-sectoral coordination and arbitration; delineate the mandate, jurisdiction, and clearer definition of the responsibilities and roles of every agency; and establish linkages so that policies are properly integrated, common purposes pursued, and an

effective mechanism for sharing information established. At a policy level it has to be very clear that governments are responsible at least for allowing the active participation of all different actors.

D. DEVELOPMENT OF REGIONAL MECHANISMS

D1. In the Mediterranean there have been successful examples of cooperation at a regional level (i.e. the Mediterranean Action Plan, the Euro-Mediterranean partnership, etc.) It is important to profit from these and develop new approaches dealing with the bilateral, multilateral and foreign financial aid to be invested in the projects.

D2. MCSD is considered as a unique model for initiating dialogue between different actors in different areas related to sustainable development. MCSD should assume a more active role towards capacity building, communication, cooperation, coordination and integration. The presence of NGO's in MCSD on equal footing with governments, local authorities and socio-economic groups is a model that can be replicated at various level (local, national, etc).

E. INSTITUTIONAL RESTRUCTURING

In several cases in the Mediterranean success was inhibited due to administrative and institutional difficulties, shortage of critical resources, lack of trained human resources and organizational problems. Institutional and structural weaknesses must therefore be addressed and issues such as institutional renewal, decentralization, accountability, transparency, credibility are indispensable to strengthen the institutional capability in relation to implementation.

F. PROMOTION OF PARTICIPATORY APPROACHES

F1. **Public Participation.** In several cases the introduction of an action entailing the proliferation of new rules, regulations and standards or significant changes in the way things are or have been done, has led to confusion and uncertainty to all concerned. Public participation in all sustainable development initiatives is approached awkwardly, to say the least, by public agencies given the limited experience in Mediterranean societies. However, it needs to become an integral part of plans, like the cost-benefit analysis component.

F2. **Local Agenda 21** is an instrument expected to bridge the gap and involve local population in the planning process. According to Local Agenda 21 principles, civil society takes part directly in the debate preceding basic choices affecting the area.

F3. **Partnerships.** In particular with local government as national agencies have not realised that it would be almost impossible to secure the acceptance and implementation of initiatives without the co-operation and direct involvement of the affected local communities in order to jointly develop guidelines and procedures and form a consensus focusing on significant issues. Many Mediterranean countries are just discovering the importance of building-up partnerships. It is of crucial importance to build partnerships throughout the community, get local people involved and build consensus especially at the inception stage in the decision-making and planning process.

F4. **Involve political parties.** Quite often they are excluded or simply not invited in planning or Local Agenda 21 procedures although they influence elected assemblies approving local plans and vote for financial resources. In several cases in the Mediterranean they offer opportunities for supporting initiatives as other actors can be weak, although they still lack to a great extent a sustainable development perspective.

G. ELABORATION OF A BROADER DEVELOPMENT STRATEGY

As most Mediterranean economies are still at an early stage of development it is quite often that socio-economic objectives in policy decisions have not explicitly included the protection of the environment along with low level of national interest for the protection of the environment, which is not regarded as a net contributor to national income. There is need at least for major nation-wide or region-wide initiatives to take a closer look into national macroeconomic policies and the way they can serve basic objectives as well as their utilization for encouraging long-term sustainable use of resources.

On a policy level there is a need of valorization and recognition of the potential of informal economy to contribute in creating new job opportunities and investments in some peripheral areas mainly for less privileged groups (i.e. rural women, children, poor people). Development policies have to contribute to the increase of productivity of those activities generated by the urban informal economy. Also, such policies should encourage the demand of goods and services with: formal recognition of these activities; support to groups of economic interests; access to other credit forms; basic formation of young people and actors of vital sectors of the economy.

H. PLANNING AND IMPLEMENTATION

H1. **Preliminary analysis.** Regional policies should be properly designed to ensure that development objectives increase social cohesion. To help the implementers of a project in

making decisions, it is basic to analyze the particular structure and dynamics of local communities, define their social, economic, environmental characteristics using updated information and elaborate a partnership at the community level between the various sectors. The impacts on employment, income, social structures and particular cultural needs and interests of the population should be assessed.

H2. Planning and implementation. In order to comprehend goals on sustainability, initiatives need to emphasise the importance of the environment for sustainable development, including social, economic, scientific, cultural, recreational and aesthetic aspects, through rational arguments and the provision of alternatives. Therefore, success relies to a great extent on the sufficiency of knowledge about what needs to be managed in a sustainable way. Knowledge gaps particularly in regard to specific conditions and key factors hinder sustainability. The degree of success is also in direct relationship with the details and elaboration of the monitoring and enforcement components of any initiative. As a result initiatives need to incorporate and develop appropriate information systems and specify systems for periodically monitoring, reviewing and testing performance, reassessing goals and updating policies. Difficult choices have to be made, particularly during implementation, as many of the short-run objectives may not be compatible or may be inhibited by narrowly defined sectoral objectives. Priority setting is of paramount importance taking into account such fundamental factors as irreversibility and severity of consequences concentrating on area-specific peculiarities and priorities. The use of more or less elaborated indicators has to be applied from the first phases of implementation, rectifying or ameliorating the instruments applied. Impact studies have to be prepared in detail and strictly applied.

H3. Integration of environmental concerns in sectoral policies. The most important ingredient, yet to achieve in the bulk of the initiatives, is the integration of sustainable environmental management in social and economic development. In the Mediterranean, central and local administrative structures, organised on a technical specialisation basis (industry, agriculture, forest, planning, trade, etc.), have to be gradually renewed in order to include a long-term vision, while the immediate needs at medium-term (5-10 years) predominate. It is crucial also to bring in environmental considerations right from the very beginning of policy formulation to recognise the interdependence of economic and environmental systems and to consider the biological limits within which human activities can develop. Sectoral policy should be linked to the Strategic Impact Assessment concept as the only effective means to allow the integration of environmental consideration.

H4. Fiscal instruments. Most of these are concentrated at the national level in the Mediterranean as local taxation is still embryonic. There are however a few pioneering initiatives which included a list of appropriate financial mechanisms supporting the implementation of objectives and measures to internalise environmental costs. An important ingredient in this context is the use of incentives for sustainable development as for example fiscal incentives or disincentives targeted to encourage action or direct activities towards a

more sustainable behaviour. A particularly crucial ingredient is the incorporation of mechanism for compensating communities or individuals for income losses.

H5. Planning for immediate concrete results. Given the need to strengthen actors and convince local societies to change attitudes towards sustainable development it is often necessary to make concrete proposals regarding immediate measures which do not require substantial financing but can make a fast and significant contribution to the preservation of the environment. Implement small demonstration projects with a high replication potential.

I. INFORMATION MANAGEMENT

I1. Access to Information. This is a weak point in several Mediterranean countries. In order for people to participate, they need information, which leads in raising awareness and enhances understanding and perception. Such a goal needs to become an indispensable ingredient of initiatives and should be characterised by interactive communication, engaging, listening, convincing and securing the understanding, acceptance and support of the public and of major target groups.

I2. Data collection and dissemination. Unsuccessful initiatives are more frequently those where statistical information lacks behind and data, if existing, are fragmented, inaccessible, imprecise, incompatible and not widely disseminated. Data collection is of little importance if the resulting information is not disseminated in a standard, frequent and understandable manner to the public. Information dissemination remains a weak point in the chain linking research and monitoring with field action, passing through an informed and concerned public.

I3. Monitoring. The distinction between research and monitoring would allow the former to gain access to new resources specifically geared for research activities, while standard monitoring could be-demystified in order to be carried out, at an affordable cost by developed and developing countries as well. The promotion of low-cost approaches for monitoring could also involve NGOs within strict quality criteria.

I4. Dissemination of "Best practices". In the Mediterranean, during the past decades a great number of initiatives has been conducted and several examples of successful sustainable development projects related to water conservation, use of renewable sources of energy, urban management, rural waste management and waste management have been carried out. Due to the lack of communication skills and technologies, mainly at the less privileged south, many of the success stories can not find their way to the public, policy makers, scientific institutions as well as the regional and international organisations.

J. RAISING GENERAL AWARENESS ON SUSTAINABLE DEVELOPMENT

Consulting actors and public involvement help to meet people's needs. Better communication with the local society helps to increase awareness for initiatives in their social and economic interest and motivate people to take action. Public awareness can be increased also by distributing information through the media, sensitising at the school level, organising active campaigns. Each target group may require long term application of distinct policies and strategies.

Within this context it is necessary to promote sustainable development and raising of public awareness through educational programs and demonstrative actions in cooperation with local NGOs. So far priority has been given to economic development aspects, something well reflected in the flood of TV information that reaches the general public (i.e. rates of inflation, unemployment, etc). Last but not least, states need to invest more in education and mass media especially those promoting the mentality of sustainable development

K. CAPACITY BUILDING AT LOCAL LEVEL

More investments are required for the formation and strengthening of the capacities of actors involved. At the municipality level it is important to facilitate the access of information to the technical personnel and to exchange experience with other municipalities. NGOs can play a significant role.

5. CONCLUSIONS AND RECOMMENDATIONS FOR SUCCESSFUL PROJECTS

It is evident that experience with sustainable development in the Mediterranean is still at a very early stage. However certain conclusions can be tentatively drawn on priority issues to guide future activity in this direction:

1. It is important to persist and expand activities towards sustainable development as the priority should be on developing action rather than learning , at least in the short run (2-5 years).
2. It is important to support local initiatives, reinforce local capacities and spread change in attitudes towards the design and implementation of innovative action.
3. It is important to recognize local differences and diversity in such initiatives.
4. There is need to develop national frameworks of sustainable development policies and provide flexible institutional structures stimulating co-operation.
5. It is also important to promote and develop a Regional vision of sustainable development in the Mediterranean.
6. It is necessary to improve information dissemination about successful experiences in implementing sustainable development projects in the Mediterranean (as for example through the creation of an Internet site and CD, etc.).

One can draw certain basic principles out of the examples of initiatives taken so far in improving the environment for sustainable development in the Mediterranean:

Basic principles

- Be pragmatic. Initiatives should not remain at the general, strategic level, but, building upon a full appreciation of the complexities and peculiarities of the issues, they should elaborate implementation details and the specific instruments required, prioritise action, incorporate realistic timetables, use operational effectiveness criteria, set goals in a transparent and explainable way, safeguard effective communication between all the actors in the process and objectivity and fairness in their outcome.
- Start with a clear and realistic agenda. Do not raise local expectation through a rather optimistic agenda.

Basic Approach:

- Integrate sectoral concerns, environmental protection and development goals and administration at various spatial levels. Environmental impacts along with solutions for improving the state of the environment or for minimizing side-effects have to be considered while addressing socio-economic concerns.
- Incorporate a long-term vision in strategic action. Considerations for long-term impacts is of fundamental importance and need to be taken into account in all phases of a project starting

from its inception.

- Focus on critical factors and bottlenecks. Potential problems and constraints have to be evaluated at an early stage in order to prepare alternative strategies.
- Develop alternatives. The slowness in the change of mentality and habits, particularly concerning traditional production and resources consumption patterns can be an important constraint to the efficiency of an action. For this reason it is important to develop and define clearly the alternatives to the traditional patterns of consumption and production, including appropriate systems and technologies change.
- Encourage process oriented initiatives. Initiatives should be much more than just the eventual document describing the policies to be pursued or the project to be implemented. They must be approached as a learning process, to help build public awareness on a number of subjects, introduce the practice of public hearings, signify a transfer of know-how, be an exercise in institution building, create a depository for economic, spatial and environmental information

Implementation

- Adjust policies to respect local conditions and capacities.
- Adapt instruments to local institutions and societies taking advantage of local practices.
- Create opportunities to spread the benefits from actions.
- Include appropriate financial mechanisms and measures to internalize environmental costs.
- Assign funds for compensation for communities or individuals for income losses.
- Define practical operational definitions and working rules. The evolution of some new important concerns in sustainable development (interdependence, intergenerational equity, common but differentiated responsibilities, precautionary principle, shared resources, common heritage, resilience, carrying capacity, precaution, prevention, prudent avoidance, etc.) are frequently used in projects, but there have been very few attempts to define practical operational definitions and working rules at the plan or project level. Unless the latter becomes part-and-parcel of initiatives, the former would rather create confusion than facilitate implementation.
- Enforce the political will and determination for action.
- Be aware of the limitations of voluntary actions. Projects, particularly local plans, have a greater possibility for being implementing if they are foreseen on an institutional basis.
- Check all phases of implementation. The success of a project has to be assessed, the progress has to be monitored and the results evaluated, so that the action plan can be changed forward the desired goals.
- Design follow up initiatives. Quite often several actions (i.e. setting up networks) collapse after the end of a project due to lack of technical assistance and funds. It is necessary to think from an early stage ways to assure long-term viability of these initiatives. Participation and mobilization of partners (i.e. local communities and authorities) in designing the follow up initiatives is essential.

Participation-Mobilization:

- Establish a process of consensus building through participation from the inception stage.
- Utilize local knowledge and wisdom in order to mobilize community-based capacity for effective participation in the management process.
- Promote initiatives that have immediate results. To gain the trust of associations, local authorities and communities it is fundamental to implement projects that give a fast and significant contribution to meet the local needs and interests. These actions represent the "starters" of local planning. Otherwise the actors get easily fed up of theoretical procedure far from their immediate needs.
- Involve the private sector to expand existing capabilities .
- Assign co-ordination and organisation of the project to a well-structured institutional body, capable of integrating resources, activities and know-how. The lack of a clearly defined, strong co-ordinating role at the onset of the projects may lead to the various implementing bodies working individually on the basis of their own agenda rather than truly co-operating for the achievement of the common strategic objectives.
- Promote cooperation among different sectors in order to agree on priority plans and establish targets or guidelines.
- Allow all actors to participate and define responsibilities.
- Encourage commitment and ownership of expected outcomes.
- Facilitate partnerships with the different actors and persuade them to share responsibilities. The shared responsibility between the main players can manage to create a new synergy which favours the efficiency of the projects/programmes.
- Benefit target groups. Such groups, particularly those most marginalized, vulnerable or invisible (i.e. rural women, children, the poor), if not identified from the outset and if the initiatives do not target them, will most probably not benefit from any initiative.

Information

- Disseminate information assigning resources and assure a continuous updating of the information. The people can be reached by distributing information through the media, Internet and active campaigns. Each target group may require differentiated communication strategies.
- Take into consideration the form of final reporting. Quite often the type of the final reports (language, terminology used, length, etc) is not appropriate for disseminating results to interested partners (i.e. local communities).
- Be innovative in devising information dissemination methods exploiting the possibilities of using existing formal and informal channels of communication.



SUMMARY ANALYSIS

LOCAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT

Introduction

Local development is a goal that can be reached through several courses and strategies respecting environmental and social concerns. In the projects here collected, local management initiatives concern sustainable urban and local planning, coastal zone management and biodiversity conservation, sustainable use of resources as well as sustainable tourism strategies.

Many of the studied cases are suffering from environmental deterioration due to uneven urbanisation patterns, uncontrolled tourism development, unsustainable agriculture and transport which affect the quality of natural and social environment and aim to change the direction of the development.

Objectives and characteristics

In local management, the integration of environmental concerns in sectoral policies is a key aspect for sustainable development. For this reason most of the projects collected in this section - especially the ones promoted by the Public Authorities - deal with the application of environmental criteria and strategies for urban and local planning in order to achieve integrated management, that allows economic development, respect of natural resources, and develop survey and decision tools.

Some of them are promoted as pilot projects in parallel within localities of different countries or different sites of the same country, while other projects represent the answer to particular problems or specific concerns.

Most of the cases considered, implement management plans at the city or neighbourhood level, while few projects are tools or planning analyses for environmental management in the public sector.

Following the criteria described in the previous paragraph, most of the projects consider the integration of environmental and socio-economic concerns as a fundamental aspect of their organisation. As a result, economic development policy is associated with the investigation of environmental carrying capacity and the impacts caused by new activities.

Despite the fact that multi-sector approach is often a project characteristic, the environmental multidimensional approach is not always strong. This is the case when dealing with the quality of the urban environment, through the integration of the environmental, economic and social dimensions of urban development planning with local actions or with the production of tools for local and regional actors.

On the other hand, the long term intergenerational perspective is not often considered as a

priority in the plan, in fact in half of the projects it appears to be a strong characteristic, while in the other half it is weak or non-existent.

Lessons learnt

- The lack of consultation and exchange of information with the local community may lead to conflicts with certain local economic interests and way lengthy negotiations.
- It is important to promote co-operation among different sectors in order to agree on priority plans at the local level.
- Each municipality should study its specific environmental problems and develop land use and planning strategies on this basis. It is possible to redefine the strategies following an integrated approach for local development.

LOCAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT

	Multisector approach	Multi-dimensional approach	Integration env-socio-econ. concerns	Long term inter-generational perspective
Renewal and development of the historic commercial center of Thessaloniki (Greece)	-	-	W	W
"Civis Sistema" Genoa (Italy)	S	-	S	S
Thetis Centro Servizi - Centre for Marine Technology Venice (Italy)	S	W	S	S
Diversification of Tourist Flows and Integration of Peripheral Areas in Sustainable Itineraries in the Venice Lagoon (Italy)	W	W	S	S
Belek 2000 (Turkey)	S	S	S	S
Calvià Local Agenda 21: Sustainable Development in the Tourist Municipality (Spain)	S	S	S	S
Local Agenda 21 - Bursa (Turkey)	S	S	S	S
Albanian Coastal Zone Management Plan (CZMP) (Albania)	S	S	S	S
Information, Concentration, Conditions for the Sustainable Development of the Coastal Zone of Magnisia (Greece)	S	W	S	-
Environmental Analysis in support of the Local Land Use Plan (PRG), Reggio Emilia (Italy)	S	W	S	S
Concerted Action Plan for Sustainable Tourism in the Mediterranean (Spain, France,	W	W	W	-

S=strong

W=weak

LOCAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT

	Multisector approach	Multi-dimensional approach	Integration env-socio-econ. concerns	Long term inter-generational perspective
Italy, Malta, Cyprus, Portugal)				
Demand Side Management Action Programme for the Public Sector of selected Island Cities in Greece	S	W	S	W
The Integral Environmental Plan of Seville (Spain)	S	S	S	S
Creation of an information structure for urban and environmental planning and management in the municipalities, with a projection to the media (Spain)	S	-	S	W
Environmental Center for Administration and Technology ECAT- Tirana (Albania)	S	S	S	-
ENVIMED (Medcities I) (Regional)	S	S	W	W
CADISPA Europe: Activities in Greece, Spain, Italy, Portugal, UK	S	W	W	S
Environmental Centre for Administration and Technologies ECAT -Tirana (Albania)	S	-	W	S
Sustainable development of European cities and regions: A concept for local and regional actors. (Greece)	W	-	-	W
ECOMOST Project - Planning for Sustainable Tourism (Spain , Greece)	S	-	S	S

S=strong

W=weak



SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

Introduction

Natural resources are often threatened due to inadequate management practices or unsustainable use. Unique natural and cultural treasures are facing common threats such as unsustainable agricultural practices and use of forests, conversion of wetlands and other habitats of unique ecological value for agriculture and other uses, overgrazing and hunting, municipal and industrial use of water, pollution. Also, areas protected by national and international legislation are transformed, fragmented and degraded due to increasing population pressure, expansion of urban settlements and increase of tourist activities. Often, improper management of natural resources is connected with a lack of co-ordination in managing common-pool resources, not well defined responsibility, lack of planning and updated information as well as inadequate infrastructure. Valuable resources like water can be over-consumed because of the lack of water conservation norms, institutional policy based on rise of supply and inadequate knowledge for water saving technologies.

The management of environmental issues can only be effective if it is included within a development perspective.

Objectives and characteristics

The projects presented here concern the conservation of resources and the preservation of the environment by making development, tourism, planning, resource use, landscape and cultural value compatible. The conservation of nature, landscape and sites is promoted through the establishment of protected areas that regulate resource uses and respect ecosystems carrying capacity. In several cases, the strengthening of co-operation at all levels - political, technical and local - the improvement of public participation aiming at rising environmental awareness, the improvement of monitoring and information exchange are encouraged. To avoid the over-exploitation of common-pool resources, such as water, the introduction of new norms and impositions, the promotion of saving technologies among consumers as well as the supply of technical assistance can be proposed.

Few projects are transboundary, aiming at the development of the capability of two or more countries to work together for environmental protection and management as well as prepare and adapt regional developing strategies which will serve the needs of all countries.

Most of the 17 projects/programmes, promoted mainly by Public Authorities of all levels and NGOs, concern environmental management plans for ecologically sensitive areas. Some of them suggest the development of sustainable tourist activities by respecting carrying capacity and the equilibrium of the environment. Others involve water management plans at a local or

national level. Of the remaining cases, one represents a preparatory study while another concerns the implementation of telematic tools for environmental management.

The main environmental benefits assured by the implementation of the projects are in many cases associated to social and economic benefits. They try to assure a sustainable livelihood of the people living in and around environmental sensitive areas. The approach used seems to involve different sectors of the economy and different dimensions of the environment.

Environmental protection and related economic activities are planned to be constant over time and use of natural resources has to be sustainable in order to preserve them for future generations.

Lessons learnt

- Prospects for sustainable development in natural resources management require several measures to be taken such as the establishment of appropriate institutional structures to manage natural resources, the strengthening of a monitoring system, the introduction of appropriate legislation to control pollution, a rational planning for the use of natural resources to control their exploitation.
- It is important to work closer with municipal, archaeological and national park authorities, to discuss new development besides expanding community involvement in planning and sustainable issues.
- In order to avoid the over-exploitation of important resources it is necessary to approach the wider public and convince the government to provide with adequate financial resources, to combine a change in habits with a technological change, to persuade all actors that are part of the problem and the solution.

SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

	Multisector approach	Multi-dimensional approach	Integration env-socio-econ. concerns	Long term inter-generational perspective
Sustainable Telematics for Environmental Management (Spain)	-	W	S	S
Influence of tourist activities on mountain regions in Croatia (Croatia)	W	W	S	W
Coastal Forest Reconstruction (Croatia)	W	-	S	S
Karavasta Lagoon- Wetland. Management project (Albania)	S	S	S	S
Lake Ohrid protection project (Albania)	S	W	S	S
Protected Area Management (Morocco)	S	S	S	S
Protected area project (Lebanon)	W	W	S	S
Protected Areas and Sustainable Resources Management (Turkey)	S	S	S	S
Coastal Zone Management, Turkish Mediterranean Coast (Turkey)	S	S	-	S
Society for the Protection of Prespa (Greece)	S	W	W	S
Complete environmental management of Agios Nicolas Park Araptisa River (Greece)	S	S	S	S
Development of eco-tourism in the Riparian ecosystem of Evrotas, near Sparta (Greece)	S	W	S	W
Promotion of tourism activities with regard to nature conservation in the mountain area of Paiko (Greece)	S	-	S	W
Ljubljansko Polje (Slovenia)	S	S	S	S
Zaragoza: a city saving water (Spain)	S	-	S	S
Water Community Program (Jordan, Palestine, Israel)	W	-	S	S
National water strategy for Albania (Albania)	S	W	S	S

S= strong

W=weak

ENERGY, TRANSPORT AND SUSTAINABLE DEVELOPMENT

Introduction

The reduction of fossil fuels reserves, the high costs of energy supply for islands, the increasing energy consumption for domestic and industrial uses as well as the greenhouse gasses emissions from the use of fossil fuels, are some of the issues that stimulate research towards alternative energy sources. Also, traffic congestion - due to the growth of private transport - leading to high economic losses and to the deterioration of the quality of life increases the need for innovative scientific efforts in the energy field.

Objectives and characteristics

The specific projects/programmes collected, aim to promote an alternative approach for energy use by improving energy efficiency, encouraging the use of renewable energy sources and technologies as well as supporting the rational use and management of natural resources. The players involved aim to prepare guidelines for best management practices in energy savings. Awareness-raising campaigns in energy costs and saving potential are also important for an effective Energy Policy.

Furthermore, a Sustainable Transport Policy is targeted towards the reduction of traffic congestion and urban pollution by encouraging the use of public transport, by promoting pedestrianisation and the use of bicycles in cities as well as by introducing integrated urban growth strategies.

The projects collected in this section represent different strategic approaches as well as the implementation of individual measures. Of the 8 projects, three are examples of the application of renewable energy practices in order to solve islands' energy supply problems. The remaining cases represent local or national energy and transport management programmes, the majority of them been undertaken by public bodies (government, local authorities, public corporation).

As far as sustainability is concerned, most promoters of the projects seem to be using an integrated approach when addressing to environmental and socio-economic issues and to have a long term perspective. The specific approaches used include the application of renewable energy practices, innovative transportation practices, integrated energy and waste management as well as public participation. However, there are only few cases where a multidimensional approach for the environment is used.

Lessons learnt

- Renewable energy practices ought to be applied in urban settlements while energy saving technologies should be promoted in private companies. Public buildings (i.e. hospitals) can act as pilot-studies for the implementation of environmental standards and "green" energy practices.
- Planning for energy savings has to consider the impacts on issues such as land use, transportation, waste management, etc.
- Due to the number of actors involved co-ordination is significant in order to facilitate communication and make the policy effective.
- The existing energy consumption patterns as well as different consumer characteristics constitute an important barrier so each target group may require long term application of distinct policies and strategies. For this reason it is crucial to increase awareness and public participation towards reduced energy use and waste production.

ENERGY, TRANSPORT AND SUSTAINABLE DEVELOPMENT

	Multisector approach	Multi-dimensional approach	Integration env-socio-econ. concerns	Long term inter-generational perspective
Solar energy and tourist trade in Cape Corsica (France)	W	-	S	W
Sustainable Transport: Electric Cars (Italy)	W	-	S	W
Optimal integration of a medium size wind turbine in the local electricity grid of small Greek islands (Greece)	-	-	S	S
Lighthouse (Sapienza) powered by PV and wind generator (Greece)	-	-	W	-
Catania: Integrating renewable energy use in urban renewal planning (Italy)	W	-	W	W
Middle East Solar Energy Zone (Egypt, Israel, Jordan, Palestine)	S	-	S	S
Bologna: The planning of an urban energy reduction scenario (Italy)	S	S	S	S
Action Plan "ENERGY 2001" (Greece)	S	S	S	S

S=strong

W=weak

EMPLOYMENT - TRAINING - INFORMATION - EDUCATION AND ENVIRONMENT

Introduction

The conservation of the environment and, respectively, of the quality of life can only be feasible if the public is adequately informed and educated and if the citizens of the Mediterranean , especially women and children, are involved in the process.

Objectives and characteristics

Following this concept, many activities have been undertaken for the promotion of environmental awareness and educational assistance as well as for the exchange and dissemination of information between administrators, academics, private companies, NGOs' and the general public. Other experiences concern the implementation of social and economic regeneration programs, offering prospects for alternative economic activities, employment opportunities and enforcement of existing activities in respect to environmental issues.

Most of the eight projects collected are promoted by NGOs and concern the strengthening of co-operation, training and raising public awareness. The remaining are promoted by local authorities and involve local revitalisation programs in order to improve the economy and employment. Four of the projects are promoted in several sites around the Mediterranean.

A deeper analysis, based on the criteria mentioned, shows the great need to integrate environmental problems in planning and in consumption patterns of the economy, a trend dominant in most projects. The same can be said for the integration of a long term perspective since information and educational programmes intend to involve key-actors in the decision-making process as well as increase participation and awareness for environmental concerns now and in the future. In the same way, projects encouraging economic regeneration intend to create stable economic opportunities for different sectors. Environmental issues are not properly addressed since approaches followed do not consider its multi-dimensional character.

Lessons learnt

- It is necessary to improve further communication with the local population and to increase awareness for initiatives of their economic interest. It is, also, important to design specific information material for each one of the social or economic sector addressed.
- To increase effectiveness and efficiency of actions, the co-ordination and organisation of economic regeneration projects should be undertaken by well-structured institutional bodies,

capable of integrating resources, activities and know-how.

- Training and employment activities could also focus in assisting the disadvantaged and socially excluded groups.
- The promotion of new ideas and projects is a key element for further development.

EMPLOYMENT, TRAINING, INFORMATION, EDUCATION AND ENVIRONMENT

	Multisector approach	Multi-dimensional approach	Integration env-socio-econ. concerns	Long term inter-generational perspective
Green awareness- an action program to sensitize Cypriots to conservation and environmental protection (Cyprus)	S	-	W	S
Green action (Croatia)	W	-	S	W
Sustainable tourism training pack for teachers (Spain, Italy, Greece, Malta, Cyprus, Portugal)	W	-	S	S
The Mediterranean Free Trade Zone (MFTZ) and the Environment (Regional)	S	W	S	S
ECOSVET: legal and non-formal support to environmental NGOs (Slovenia)	W	-	S	W
CHORUS Project: Urban and Social Revitalisation (France)	S	-	W	S
Ulixes 21, for sustainable tourism in the Mediterranean (Regional)	W	-	S	W
The Mediterranean towards sustainable development (Tunisia)	S	W	S	S

S=strong

W=weak

AGRICULTURE AND RURAL AREAS

Introduction

Rural areas are facing several threats, due to increasing human pressure resulting to the deterioration of environmental resources and values. Rural waste management and the increasing demand for leisure in the countryside are some of the issues considered. Also, intense use of water for irrigation - leading to the over-exploitation of aquifers and to the extinction of wetlands-, the loss of traditional cultivation practices, as well as the widespread use of pesticides are some major concerns.

Objectives and characteristics

The main objective of the projects is the long term development of rural space, which is achieved following several courses. Some of the issues considered are: sustainable agriculture with the use of environmental friendly technologies and practices; strengthening of global quality of rural areas at a environmental, economic and social level; the deterioration of rural areas due to urban pressure; strengthening of local identity through sustainable land management and development of co-operation and participation of local population; quality improvement of food farming production and competitiveness of farms and services; establishment of agricultural parks for conservation, improvement and development of rural areas; development of sustainable tourism in rural areas especially in less-favoured regions.

Of the 12 projects considered three represent preparatory studies on the suitability of new practices and management systems, concerning the use of wastewater or recycled sludge in agriculture, while other two cases delineate national management strategies. The remaining projects concern management plans at a local level in order to promote rural development (through sustainable tourism, establishment of Parks, irrigation management, re-introduction of traditional crops, etc).

Considering the whole set of projects one can see that in most cases sustainability is perceived as a process of integrating the environmental dimension with other concerns (economy, socio-cultural, etc) in order to offer equal opportunity to future generations. The projects also showed the inclusion of different sector measures. On the other hand they do not seem to have a strong multidimensional approach for environmental issues.

Lessons learnt

- The implementation of new technologies and practices in agriculture such as the use of recycled sludge and wastewater, if of high quality, is the best environmental option.
- That natural resources management can be sustainable only if practices are attractive and easy to be adopted from local population.
- Any approach should rely on local knowledge and local decision making.

AGRICULTURE AND RURAL AREAS

	Multisector approach	Multi-dimensional approach	Integration env-socio-econ. concerns	Long term inter-generational perspective
Preparation and implementation of a pilot action for the conservation, improvement and economic promotion of Barcelona suburban agricultural area (Spain)	S	S	S	S
Establishment of Notranjski park and Uniesco Mab Reserve Notranjski Kras (Slovenia)	S	W	S	S
Sustainable rural development through the re-introduction of Ginestra cropping (Italy)	S	W	S	S
Cleaning up the countryside (Spain)	W	S	S	S
Installation and management of a met station network system in the Guadiana river Basin in order to help farmers to save water on a regional basis (Spain)	W	W	S	S
Guarantee the quality of sludge recycled in agriculture by managing the whole treatment system (France)	S	W	S	-
Use of wastewater for irrigation global approach blending water treatment, irrigation with various systems on various crops and institutional / organisational aspects (Tunisia, Morocco, Greece, Cyprus, Portugal, Belgium)	S	W	S	S
Cairo sludge disposal study (Egypt)	W	-	S	S
National Rural Finance (Tunisia)	S	-	S	S
Natural Resources Management (Tunisia)	W	W	S	S
Cities, Castles, Cherries Nature, Culture and Recreation for Urban Inhabitants as a Promotion of Rural Areas (Italy)	S	W	S	S
A path towards sustainable tourism: the case of Eurochianti (Italy)	S	W	S	S

S=strong

W=weak

CONSUMPTION PATTERNS AND WASTE MANAGEMENT

Introduction

The projects under this section concern major issues such as the management and disposal of waste and the recycling of used materials. Used materials can be materials with a short life span that have to be replaced frequently (i.e. autocatalysts), substances used for energy production (i.e. used oils), and wastes threatening natural resources which need to be managed in the proper way. Furthermore, the elimination of municipal waste is one of the major problems involving Local Authorities, because of the increasing quantity of waste and the possibility of contamination if disposal sites are not following technical and environmental standards.

Objectives and characteristics

The promoters of the projects/programmes deal with the several aspects of this problem in different ways. Most of the projects (13 out of 18) describe experiences, promoted by private companies and research institutions, concerning demonstration actions, set up through pilot projects in order to develop an integrated and rational solution for the collection and recycling of waste using innovative and environmental friendly technologies. In some cases, an effective collection and storage network has been developed, feasibility studies for material recovery have been carried out guaranteeing also ecologically sound processes, and innovative treatment processes for special waste have been introduced. For products using recycled materials the actors had also to deal with consumer perceptions for recycled products.

Other few cases represent waste management plans applied at municipality level that aim at strengthening waste management, developing of waste management policy and action programs, the promotion of sustainable development and responsible partnership for the environment, rising public awareness through educational programs and demonstrative actions in order to decrease production of waste and promote recycling. The last project considered is promoted by an NGO and focuses on the development of legislation proposals and the implementation of awareness-rising activities in order to promote sound environmental behavior and "green" consumption patterns.

Most of the projects meet the requirement for sustainable development to support a strongly integrated approach between environmental and socio-economic concerns. They offer profitable solutions by creating quality products at a lower cost, restoring the environment and saving energy as well as reducing the consumption of natural resources. The introduction of clean technologies in recycling and waste treatment induces the change of lifestyle and of

production and consumption patterns. Furthermore, it is described an improvement of the participation and responsibility in solving environmental problems and an increase in co-operation between local Authorities and citizens.

The special characteristics of the projects developing special technologies or specific products demand for a multisectoral approach. Only in the cases of waste management plans and strategies do the projects involve a number of sectors. For the same reason when addressing to environmental issues, the approach does not appear to be multidimensional in most of the projects.

Lessons learnt

- From the analysis of the cases, it can be understood, that it is possible to recover and reuse waste while in other cases it is feasible to treat waste producing the lowest impact. This procedures seem to increase more and more especially in the European countries of the Mediterranean.
- It is important to establish stricter international standards and targets and to provide continuous support and advice, especially at the beginning of the processes.
- Great opportunities arise from the intimate co-operation between environmental NGOs, local authorities and waste management companies.

CONSUMPTION PATTERNS AND WASTE MANAGEMENT

	Multisector approach	Multi-dimensional approach	Integration env-socio-econ. concerns	Long term inter-generational perspective
Collection and recycling of spent autocatalysts (Greece) 200	W	-	S	-
Collection Centres (Italy)	S	--	W	-
Recycling of off-gases dusts coming from metallurgical procedures for FeNi production (Greece)	-	-	S	W
Innovative system for the granulation of used tyres and for the selective recovery of rubber granulate, metal and textile fibres (Italy)	-	-	S	-
Innovative technology for panel manufacture from fiberised agriwaste (Greece)	W	-	S	W
Sectorial action for re-using rinsing waters in the jewellery industry (Spain)	-	-	S	W
Innovative process for recovery and regeneration of thermoplastic material (PET) for industrial use as secondary raw material (Italy)	W	-	W	W
Demonstrative project for a hi-tech plant specialised in the production of recycled rubber goods (Italy)	-	-	S W	W
System optimising used oils collecting in Italy (Italy)	S	S	S	W
Paper Making: from seaweed to agricultural-food industry's residual materials (Italy)	S	-	S	W

S=strong

W=weak

CONSUMPTION PATTERNS AND WASTE MANAGEMENT

	Multisector approach	Multi-dimensional approach	Integration env-socio-econ. concerns	Long term inter-generational perspective
Pre-treatment and recycle of automotive used lubricating oil filters with recovery of oil and metals (Italy)	-	-	S	W
Establishment and development of a wastewater treatment plant by high gradient magnetic filtration using ceramic permanent magnets (Italy)	-	-	S	W
Pilot plant installation for the treatment of sludges from refinery crude oil storage tanks (Greece)	-	-	S	W
Assessment, strategy development and implementation of the mining waste management in Cyprus (Cyprus)	-	W	S	W
Lura d.d. Zagreb (Croatia)	S	W	S	W
Organisation of the urban waste management in 6 main Albanian municipalities: a model applicable to towns of other developing countries (Albania)	S	W	S	S
Composting organic matter - Reuse and reduction of waste (Italy, France, Greece, Malta, Cyprus, Tunisia)	W	S	S	S
Waste management in Croatia - reduction of plastic packaging / exclusion of PVC in food packaging (Croatia)	S	-	S	S

S=strong

W=weak

HEALTH AND ENVIRONMENT

Introduction

The quality of the environment affects the quality of life and the health of local populations. For this reason, the projects in this section deal with sanitation improvements, accident prevention, risk assessment of production and manufacturing systems, educational programs, awareness-raising campaigns, diffusion of cleaner technologies, improvement of resources use and enhancement of natural resources values. Other studies concern the evaluation of the effects and safety of innovative sustainable practices as well as the control of pollution sources.

Objectives and characteristics

Objectives of the projects are the implementation of an integrated approach towards the protection of natural resources (especially water resources), the introduction of pollution control measures in order to improve living conditions of local population, and the reduction of health hazards. The primary aim is to cover basic human needs, provide equal rights and opportunities, improve sanitation and quality of life, and increase public awareness about the negative effects of pollution. The establishment of a waste disposal system requires the development of institutional arrangements for the management of waste collection and disposal. Furthermore, the adoption of primary prevention approaches is encouraged by using safety opportunity audits and technology options analyses.

The background that stimulated the implementation of the projects/programmes is in several cases uncontrolled waste disposal in open dump sites provoking risks and hazards from urban and industrial pollution increasing rapidly due to numerous sources. Another characteristic of the pre-existing situation is the misinformation of the local population about the hazards, risks and prevention tools.

So three of the eight projects presented in this section are programmes, promoted by public Authorities and NGOs, of waste management and pollution control in order to improve the quality of life and reduce pollution hazards.

On the other hand, the other cases studied represent the creation of a tool or a model to support local Authorities managing the environment as well as controlling and preventing pollution.

Lessons learnt

- The major concerns are connected with the lack of readily available information about hazards and risks due to pollution and production systems.
- Other problems during the implementation of the projects were associated with the lack of communication among actors involved. For this reason it is very important to stimulate participation of local population and the role of the implementers of the projects is also to facilitate the partnerships with the different actors.

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	Multisector approach	Multi-dimensional approach	Integration env-socio-econ. concerns	Long term inter-generational perspective
Integrated development project of Karyan El-Oued (Morocco)	S	W	S	S
Sebou River Project (Morocco)	W	-	S	S
Antalya Solid Waste Management (Turkey)	S	W	S	S
Mediterranean non-point sources of pollution. Case study: Alexandria (Regional)	W	S	W	W
A Feasibility Pilot Study for the Development of an Inherent Safety Opportunity Audit/Technology Options Analysis (Greece)	W	-	-	W
Iraklion waste water reclamation pilot study for irrigation and ground water recharge (Greece)	W	W	S	-
Solid Waste Management in Sale (Morocco)	W	-	S	W
Environmental demonstration project in the field of industrial activities of the National Spanish Railway Network -RENFE (Spain)	W	-	W	S

S=strong

W=weak



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Renewal and development of the historic commercial centre Thessaloniki (Greece)

Regeneration of the city historic commercial and its economic revitalisation.

Policy issues Series of interventions aimed at the regeneration of the old historic commercial centre of Thessaloniki through targeted re-instating and valorising the historic fabric/profile of the area, whilst revitalising its economic and commercial activities.

Objectives

- Restore and appropriately exploit, for cultural and tourist purposes, the historic fabric and profile of the area.
- Stimulate traditional and new economic activities by designating old listed buildings with new uses responding to modern economic needs.

Background -Problems The most serious problems of the area relate to the quality of the building stock, a run-down of historic fabric, absence of free public space, the lack of proper infrastructure for traffic circulation especially pedestrian access to monuments and small shops.

Actors Organisation of Thessaloniki, Aristotelian University of Thessaloniki, several actors concerned by the various types of Urban Pilot Project interventions (i.e. technical services, the public utilities companies, the archaeological services, public transport services).

Project organisation, financing, time frame A series of interventions of three types were undertaken in six distinct areas/quarters of the historic centre:

- addressing institutional issues (modifications to existing urban plans, changes to or developing new regulations on land use, and identifying listed buildings and monuments);
- undertaking studies (on new uses of buildings, traffic management, historic monuments) and a plan to link the old centre with the "modern" city centre;
- infrastructure works (excavations to reveal historic monuments, restoration of buildings' facades, renovations of old buildings and historic monuments, development of public open spaces and generally the environmental improvement of the area surrounding the restored buildings and monuments).

In addition, the Urban Pilot Project included:

- the construction of a network of pedestrian streets to facilitate access to key locations of cultural/historic as well as economic importance;
- exchange of experience, as well as an independent on-going evaluation of the Urban Pilot Project by an external expert from the University of Thessaloniki.

The project was carried out as an Urban Pilot Project funded during the period 1989-1993

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under Article 10 of the European Regional Development Fund (ERDF).

Outcomes-Results The extent of the results varies between the different sub-areas of the historic commercial centre. Overall, there has been significant environmental improvement:

- public open spaces have been created and a number of historical monuments have been entirely or partly restored and opened to public access;
- the impact of pedestrian ways has not altogether met the initial objectives of the regeneration plan;
- the accessibility in certain areas has been improved but, due to conflicts with local interests, an actual network of pedestrian ways linking monument areas and comprising a "spinal canal" for the historic centre was not created.

Contribution and innovation

- The project was implemented along the lines of the specific actions proposed even if some difficulties occurred. A number of historic monuments were revealed through excavations and environmental works and restored where appropriate. Overall, the Urban Pilot Project has been successful in upgrading the designated area (some parts of it more than others) and in restoring part of its historic fabric, even though it has not yet fully re-instated a local "identity" on the basis of the area's historic/cultural profile.
- The Urban Pilot Project organisational structure provided a unique forum for the cooperation of various levels of government (local, regional and national) as well as a number of other institutional actors. This partnership was most innovative in the national context and in spite of the difficulties in co-operation, resulting from the fact that these bodies had no previous record of working together, it comprises a real breakthrough in terms of the Greek reality.
- The "double" objective of integrating the area into the city's economic life whilst/through restoring its historic fabric and profile is a novelty by national standards, but also in the context of certain other Objective 1 European countries. On-going evaluation undertaken by an independent expert was another innovative aspect with very positive results. It was based on close monitoring of the project's implementation, but was external to the decision making process. It enabled a "global" view of the project and early warnings of institutional, procedural and organisational problems.
- The project has organised two international conferences to share experience on historic centre regeneration policy and practice. This exchange of experience has been beneficial for most cities involved with the prospect of forming a network which would provide for wider dissemination at European level.



Lessons learned

- The impact of the project in terms of attracting private investment, most significantly in certain areas of interventions, has been great and largely contributed to upgrading these areas and integrating them into the city life. The lack of a clearly defined, strong co-ordinating role at the onset of the project led to the various implementing bodies working individually on the basis of their own agenda rather than truly co-operating for the achievement of the common strategic objectives. The "programme" view/identity was therefore lost or at least seriously undermined in the course of implementation.
- The absence of consultation and information procedures with the local community (residents and businessmen) at inception phase led to subsequent conflicts with certain local economic interests and lengthy negotiations. This is symptomatic of the top-down approach adopted by the project (which is nonetheless the norm in the Greek context).
- The lack of clearly defined quantitative and qualitative indicators to inform the monitoring and evaluation of the project and enable a better assessment of the project's impact and sustainability was another weakness.
- There is no evidence that the Urban Pilot Project has had any special direct impact on urban regeneration policy, as such. However, a number of "lessons" have emerged at policy level as a result of the difficulties in implementing the Urban Pilot Project: the need to involve local community and build consensus at inception stage; address the social and economic parameters of regeneration in an integrated manner; the need for institutional and legislative reforms to enable the effective implementation of urban regeneration plans.



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"Civis Sistema" Genoa (Italy)

Urban regeneration and environmental and socio-economic revitalisation.

Policy issues Recovery of the city's Acropolis in an attempt to reverse the process of deterioration of the historic urban fabric.

Integration of environmental, economic and social dimensions in urban development.

Objectives

- Physical regeneration of historic buildings in the Genoa Acropolis.
- Development of a range of information, research and consultancy services for a multitude of public and private bodies concerned with the development and implementation of regeneration plans in Genoa and the Ligurian region (mainly through the establishment of the Urban Observatory).
- Integrate and promote the environmental, economic and social dimensions of sustainable urban development.
- Stimulate joint public and private financing, in the long term, for upgrading and revitalising the city centre.
- The Urban Observatory is also expected to act as a catalyst in increasing partnership activity in the area through the exchange of information and participation in planning.

Background -Problems The Civis Sistema project has to be seen in the context of a more extensive revitalisation programme for the city of Genoa and the region of Liguria as a whole.

Actors Overall responsibility for the implementation of the Urban Pilot Project lies with the Municipality of Genoa. The management of the work related to the Urban Observatory has been delegated to the ICIE (Co-operative Institute for Innovation), which was subsequently represented by Euros sas when ICIE closed down their office in Genoa. The Urban Observatory involves a partnership between different bodies operating in the area including: public bodies (the Municipality and Province of Genoa, Liguria Region, the EU, the University of Genoa etc.); state controlled bodies (public utilities for transportation, gas, water, sanitation etc.); the private sector (building and plant engineering companies, professionals, citizens, corporations, etc.)

Project organisation, financing, time frame

- Design and realisation of an Urban Observatory equipped with sophisticated hardware and software, that will develop a range of information, research, promotional and consultancy activities and services enabling the co-ordination of regeneration activities in the city and the region;
- restoration of an old convent (the Santa Maria in Passione complex) including refurbishment work, environmental improvement, and the establishment of an archaeological



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park on site;

- recovery of the former St Salvatore Church to serve as a cultural venue and as a study centre for urban environment issues;
- management of the project with dissemination activities and international exchanges.

The project was carried out as an Urban Pilot Project funded during the period 1989-1993 under Article 10 of the European Regional Development Fund (ERDF).

Outcomes-Results

- The restoration of two buildings of significant historic and cultural value and their adaptation to modern uses, is having a significant physical impact in an area where the historic fabric has been left to deteriorate.
- The new uses of these buildings and the establishment of the archaeological park are expected to increase economic activity in the area and build confidence in the regeneration scheme for the historic centre.
- Clearly expectations are high regarding long-term, indirect impact that the Urban Observatory is expected to have on further development and regeneration in the area.

Contribution and innovation

- The Urban Observatory is the core action of the Urban Pilot Project. It is of particular interest due to its innovative character at European level and its potential demonstration value. Potential links with the European Urban Observatory (a RECITE Network) increase this value.
- The services envisaged to be provided would enable an integrated and co-ordinated approach to sustainable urban development. However, the actual realisation of these objectives can only be assessed when the Observatory has been functioning for some time.
- The concept of an Urban Observatory making use of sophisticated Information Technology in order to provide and co-ordinate research, information, promotional and consultancy services for the development and implementation of local and regional regeneration plans is innovative at national and European levels. It is particularly innovative as it: views to support an integrated and sustainable approach to urban development, targets a multitude of public and private bodies concerned with urban regeneration and aims to build or quasi-institutionalise long-term partnerships between them.
- Regarding the focus on the regeneration of historic centres, the project has been very active in disseminating results and exchanging experience with other Urban Pilot Projects concerned with the same issue.
- The project has also produced guidelines concerning environmentally friendly techniques



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for the regeneration of historic buildings based upon the experience of the Urban Pilot Project.

Lessons learned

- Clearly the late-running of this project is of some concern and although delays seem to relate to external factors, it does raise questions regarding the efficiency of management

methods/structures.

- The strengths of the project lie in the range of services offered by the Urban Observatory attempting to co-ordinate and integrate regeneration activities in a tightly defined area.



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Thetis Centro Servizi - Centre for Marine Technology Venice (Italy)

Renovation of historical buildings and socio-economic revitalisation

Policy issues Reclamation in order to revive the Arsenal of Venice as a productive infrastructure, to develop a new urban role for Venice and to lessen the current dependence of Venice's economy on the tourism sector.

Goals The project is part of a more global strategy to develop a new urban role for Venice and to decrease the city's economic dependence on the tourism industry, aiming to trigger a wider process of reclamation by introducing new economic activities.

Objectives

- Establish a Centre for Marine Technology (named Thetis Centro Servizi).
- Act as a focus for technical development in Italy and in the international market (especially in the Mediterranean area) and offer inter-disciplinary solutions to problems connected with the sea, coastal settlements and water-based cities.
- Develop and test innovative marine technologies including international exchanges on best practices.
- Draft projects, make and test prototypes and supply technological services in: sectors connected with the knowledge and protection of the marine environment and coastal areas, sectors connected with the utilisation of marine resources and sectors harnessing the sea for the purposes of marine and industrial activities.
- Organise international courses, seminars and workshops providing specialist technical training for technical and managerial staff involved in the marine sector.

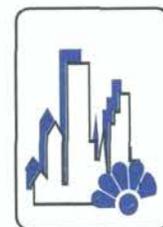
Background - Problems The project focuses on the Arsenal area, a nearly abandoned industrial zone at the north-east of the city.

Actors Faculty of Architecture, Region of Venice, Thetis Centro Servizi SCpA established by Arsenale Venezia SpA, Veneto Innovazione SpA (established by the Veneto Regional Administration), the Thetis Consortium (a group of companies and institutes), the Venice Chamber of Commerce and Tecnomare.

Project organisation, financing, time frame The project was divided in 5 actions, which are strongly inter-linked:

- Offices and training: establishment of an administrative and management centre, conference rooms, a training centre, a library and technical and engineering offices;
- Services and laboratories: a number of laboratories were to be established, such as workshops for prototypes, a tele-robotics laboratory, an environmental laboratory and a

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Marine Traffic Control system;

- Control section: the construction of a test pool;
- Equipment and general services: construction and furnishing of warehouses, garages, maintenance systems, boats/service craft, and a slipway;
- International exchange of experience.

The project was carried out as an Urban Pilot Project funded during the period 1989-1993 under Article 10 of the European

Regional Development Fund (ERDF).

Outcomes-Results

- The project has renovated three abandoned historical buildings and their surrounding infrastructure (a total area of 4.500 sq. m.) for productive use (offices, laboratories, workshops, a conference room, a training centre and a library).
- Regarding employment, the project has created permanent jobs in the Centre (administrative and scientific staff). Indirectly, throughout project implementation, about 220 persons from the Veneto region were employed: about 60% was involved in the renewal of the buildings.
- The development of the Centre provides new, highly qualified jobs for regional or even national scientists and technical experts. Advanced technology within the region will be enhanced through the Service Centre activities and the creation of highly sophisticated and specialised laboratories. The Centre can offer scientific and technological support for activities of various public bodies performing complementary marine related activities, as well as stimulate private investment. The revitalisation of part of the Arsenale is beginning to stimulate further restoration activities in the area.
- The project has acted as a catalyst in the Arsenale area for further revitalisation: the local transport company will transfer its shipyard to other old buildings next to the ones restored by the project. Other restoration activities are also being planned. The Thetis Centre itself hopes to restore some additional buildings for future use.
- The Thetis can act as a focus for the development of marine technologies. The project is currently involved in a number of national and international bidding. It has developed and tested a number of innovative marine technologies and been active in exchanging experience and good practice. The project has drafted and tested prototypes and is currently supplying a number of technological services. A number of international courses and seminars have been organised. Also, the Thetis Centre hosts researchers and students through specific university schemes. Overall, the specific actions of the Urban Pilot Project have been completed and implemented as initially planned.



Contribution and innovation

- The project offers valuable lessons at a national, regional and local level by offering

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innovative solutions to problems connected with the sea, coastal settlements and water-based cities and promoting co-operation with similar marine research-based activities on an international level.

- The Centre, unique in Italy, provides an interesting alternative to Venice's mono-economic structure (tourism industry) by stimulating the development of "cutting edge", marine technologies and by responding to local unemployment problems. It also provides a number of solutions to specific problems of the Venice area.
- Furthermore, the architectural solutions adopted for internal constructions are innovative and demonstrate good practice. The innovative and sophisticated design of internal constructions has attracted the attention of many Italian and foreign architects.
- The concepts applied are of interest to projects focusing on "new uses" for historic buildings. Also, the particular architectural solutions adopted in order to avoid affecting the original structure have a high demonstration potential for other public authorities facing similar difficulties with renovating derelict historic buildings.



Lessons learned

- The project showed that it is possible to generate new economic activities in an area based on the tourism industry only, by restoring and providing new uses for historic buildings in an abandoned area.
- The project's activities and services not only attract experts from other European countries, but also provide high qualified jobs and student placements in a city with a decreasing number of residents due to its decline in employment sectors.
- The strong management structure, the involvement of the private sector and strong commitment to commercial activities are strengths of the project.
- The key barrier to the implementation of the project was the time delay relating to the authorisation required to carry out the works. Although the private partners involved have co-operated successfully, co-operation with public authorities seems to have been less satisfactory due to the lack of interest, active involvement and lengthy procedures.

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Diversification of Tourist Flows and Integration of Peripheral Areas in Sustainable Itineraries in the Venice Lagoon (Italy)

Sustainable Tourism and socio-economic revitalisation of marginal areas.

Policy issues Establishment of sustainable tourism activities promoting socio-economic revitalisation of marginal areas of the Lagoon of Venice.

Objectives

- Increase awareness of the northern part of the Venice Lagoon and known islands.
- Establish a new recognition among visitors for a tourism development that respects the environment and the existing social context.

Background -Problems There is a strong demand for eco-tourism, and the supply is only starting to meet this demand. It is thus the crucial moment to develop new types for tourism, based on the needs and choices of local inhabitants. Improving access to the Lagoon should take into account the impact of new visitors on the environment. The development of tourist excursions to near-abandoned areas of the Lagoon can encourage new activities for the environmental restoration and the sustainable management of these islands.

Actors Forum per la Laguna, local associations, Tourist Office, Transport Service, cooperative societies.

Project organisation, financing, time frame The project has two phases:

- Phase one: plans are drawn up for main activities; co-ordination agreements are established between project partners, and excursions are developed on a pilot basis;
- Phase two: the main activities (excursions, courses) are carried out and information products (guidebook, CD-ROM) are published. A management structure for the excursions is put in place, agreements between project partners are formalised to ensure their continuation, and promotional activities are started.

The project has been sustained by the LIFE program of EU. Its duration was 15 months.

Outcomes-Results

- Excursions have been organised in the Lagoon aiming to increase awareness of the Lagoon unique features (i.e. fragility of the Lagoon ecosystem) and provide an alternative to the mass tourism of Venice. An information office has been established.
- Information tools like a guidebook, CD-ROM and a Web page have been produced.
- A Course on Sustainable Tourism has been organised.

Contribution, innovation

- All activities are undertaken with the participation of other project actors. Thus, the



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activities helped put in place one of the most important components of the project: the involvement of and co-ordination between many different entities and groups.

- The Forum acts as a facilitator for the private organisations, in order to construct a consensus around a common strategy of action. In addition, the Forum tries to focus the attention of public agencies on the needs of the Lagoon areas, to engage these agencies formally in actions in line with the public interest.

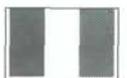
Lessons learned

- It is necessary to introduce the Lagoon as the city's "cradle", to improve mobility and accessibility to some of the minor islands, while stimulating reception services and operation of environmental maintenance.
- Tourism enterprises can upgrade and revitalise the local community suffering from impoverished urban services and immigration from minor islands.



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Belek 2000 (Turkey)

Sustainable tourism.

Objectives establish "sustainable tourism" in the Belek Tourism Centre (Antalya, Serik, Turkey)

Actors Betuyab's (Belek Tourism Investors Association) goals

and activities are realised through the co-operation between investors, local inhabitants, the official association and establishments, as well as the relevant ministries (Ministry of Tourism, Ministry of Environment, Ministry of Health, Ministry of Forestry etc.). Support has been given by the consulting services of various universities, including Hacettepe University and Mediterranean University.

Project organisation, financing, time frame

- An infrastructure participation share was collected from each Betuyab member at the beginning of the project.
- A monthly subscription has since been collected.

Projects with high costs are financed equally (1:3) by the Ministries, public establishments, and Betuyab investors.

Outcomes-Results

- Since sustainable tourism development can not support tourism investments, new investments will not be allowed.
- All tourism establishments are connected to three wastewater purification plants, using some of the wastewater for irrigation.
- Infrastructure projects which required high financial costs and timely planning were finished before the completion of the Belek Tourism Centre.
- The campaign against mosquitoes, houseflies and sand flies, achieving a success rate of 90%, still continues under the scientific consultation of universities.
- Universities continue to investigate the ecological infrastructure and its regional diversity.
- Fire hydrants have been placed in all protected forests of the region, and two firemen, hired and paid by Betuyab, are on duty through the year, reinforced by four more during the high risk season. To prevent fire and other dangers, communication systems have been installed, Betuyab's office serving as their centre.
- Various projects, protocols and collective work has been done in co-operation with NGOs.

Contribution and innovation

For the first time in Turkey, all regional investors have handed over the development and management of an area to an establishment like Betuyab.



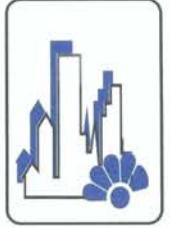
LOCAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT

Lessons learned

- The success of the Belek Tourism Centre relates to the distinct character of the Betyuab organisation as well as to the universities' consultative support.
- It is important to have liable scientific studies with a future perspective.
- The lack of distinction between private and public investors fostered an attitude of trust by the state, private and local public sectors towards Betuyab, encouraging them to co-operate.

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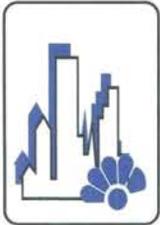
Calvià Local Agenda 21: Sustainable Development in a Tourist Municipality (Spain)

Urban and Regional Planning: localising Agenda 21.

Goals Recover and conserve the environment

Objectives

- Control over urban development.



- Integration of building into local scenery.
- Recovery of land for public use.
- Control of drinking water resources.
- Control of public bathing water.
- Elimination of urban waste.
- Sewage treatment and recycling noise control, etc.

Background - Problems Calvià is one of the largest tourist resort areas on the Isle of Mallorca. During the high season, the 30.000 residents are joined by a population of 120.000 tourists (a total of 1.500.000 tourist per year). Within the municipality there are virgin beaches, town beaches, degraded areas, natural areas of outstanding aesthetic and ecological value, yachting marinas, islets and woodland areas for preservation and protection. The evident improvement in the welfare of the population has been accompanied by a deterioration in local environmental conditions. This situation lead to an advanced breakdown of public and private premises and equipment and to uncertainty for future due to loss of competitiveness and tourist attraction.

Actors City of Calvià, Mallorca.

Project organisation, financing, time frame The initiative started in 1996. For some years the strategic action adopted a three pronged approach:

- environmental recovery of coastal areas;
- improvement in quality, promotion and professionalism;
- co-operation, social cohesion and citizen participation.

Outcomes-Results

- Halt to uncontrolled urban growth with the declassification of 1,350 hectares of building land, equivalent to 40,000 tourist beds.
- Urban renewal and remodelling through the demolition of buildings situated on the seafront and their conversion into park areas as well as remodelling of coastal areas. This resulted to higher quality of the urban environment, both public and private, and to tourist satisfaction.
- Application of programmes for optimising natural resource use.
- Improvement of the quality of public services and tourist establishments.
- Consciousness by the bodies, institutions and society about the need to act.



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- Recognition of the great significance of the project on a local, regional, national and international level (Calvià was awarded the European Prize for Sustainable Cities 1997).
- Institutional support for the development of the project.
- Wide social consensus and active participation of all agents: Assessment Forum, Special Subject Committees, Institutions, University, etc.

Contribution and innovation

- Calvià is developing and applying new long-term strategies based on reorienting development towards new sustainability criteria, assuming a marked vocation for harmonising these strategies through " Calvià Agenda Local 21".
- It ensures its financial, social, environmental future and heritage through a strategic conception of balanced tourist development, considering the environment as a key aspect and making the application of the Resolution of the 1992 Rio Summit Meeting a reality. In this way Calvià has drawn up a theoretical model of action, transforming saturated areas in mature tourist destinations, and has started implementing the various measures.

Lessons learned

- A tourist resort can redefine its strategies by following an integrated conception of local development.
- This experience shows the prospect of the actual application of the Rio Summit Conference Resolution of 1992 in a town with widespread participation and social consensus.
- The economic, social and environmental needs of future generations can be satisfied only in the case of balanced and sustainable tourist development.



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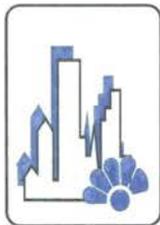
"Local Agenda 21 - Bursa" (Turkey)

Public participation and public information: Bursa's Local Agenda 21.

Policy issues Raising public awareness and supporting participatory processes in order to find solutions together with the local authorities.

Objectives

- Satisfy the basic needs of the local citizens, provide rights and opportunities and ensure the establishment and institutionalisation of sustainable development and urban management practices.
- Ensure the development of participatory mechanisms, decentralised decision-making practices, community empowerment, and collaborative relationships with other local actors in the process of creating and implementing a local action plan for Bursa.



Background - Problems Due to increasing immigration, Bursa has in recent years come face to face with a variety of environmental problems, including irregular urbanisation, and air and water pollution. Meanwhile, the Mayor of Bursa pursued international support for local environmental studies and action planning models that introduced the ideas leading eventually to the creation of the Local Agenda 21 in Bursa. Following the endorsement of "Local Agenda 21 - Bursa" in late 1995, the Metropolitan Council decided in favour of the membership of Bursa in the International Coalition of Local Environmental Initiatives (ICLEI).

Actors The partners involved in developing the "Local Agenda 21-Bursa" process included the decision-making organs of the local authorities in Bursa (the Metropolitan Mayor and Council, the District Municipality Mayors and Councils), relevant units in the municipal organisational structure (including the Metropolitan Municipality Environmental Department and the Local Agenda 21 Directorate), the heads of the neighbourhood administrations, Chambers of Profession, representatives from a wide spectrum of NGOs, former mayors, university professors, and other volunteers and citizens of Bursa.

Project organisation, financing, time frame The primary instruments for implementing "Local Agenda 21 - Bursa" included the following:

- The "City Consultative Assembly" was established in early 1995 to discuss urgent environmental and urban issues. The Assembly has proved to be a very effective mechanism for decentralised decision-making and discusses the problems of the city at a democratic platform.
- In order to increase public participation and information, in 1994, the Municipality initiated a network of neighbourhood offices, referred to as SEDAM. These offices currently functioning in close co-operation with the elected Neighbourhood Heads in the localities,



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provide community education, handicrafts and skills training services, family consultation, etc.

- As an indispensable aspect of developing and implementing local action plans as well as physical development plans, the Municipality has recently initiated the preparation of an Urban Information System
- As another primary implementation tool, the Municipality has merged the long-term physical planning of the city, namely "Bursa 2020", with the "Local Agenda 21-Bursa" process, relying heavily on developing the plan in a participatory manner, and in accordance with the principles of sustainable development.

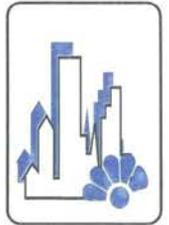
All financial support has been provided by the Metropolitan Municipality.

Outcomes-Results Since the initiation of "Local Agenda 21-Bursa" the following activities and projects have been undertaken:

- An awareness-raising campaign was launched to augment public awareness on urban and environmental issues.
- Citizens of Bursa were informed about "Local Agenda 21" through various means.
- A total of 15 Working Groups were formed from amongst volunteers and representatives of local agencies.
- Representatives and participants from local agencies and community organisations were involved in the preparation of action plans.
- The Metropolitan Council approved the establishment of a Local Agenda 21 Directorate within the municipal organisation.
- A Secretary General was designated from among the Metropolitan Council for co-ordinating and undertaking the activities pertaining to "Local Agenda 21 - Bursa".
- A study tour was organised on the World Environment Day, during which over 800 participants were informed about environmental projects and activities in the city.
- A protest movement was organised, through which voluntary groups and citizens prevented the chopping down of some rare species of trees in the forest area.

Contribution and innovation

- At the national government level, Turkey undersigned the Agenda 21 document in Rio in 1992, committing itself, with other countries, to enable the development of Local Agenda 21 Action Plans. The Mayor of Bursa became fully acquainted with these issues in November 1995 during the Mediterranean Local Agenda 21 Conference, and subsequently initiated studies for implementing a Local Agenda process in Bursa.
- In June 1996, a Local Agenda 21 Directorate was established within the Metropolitan Municipality. Subsequently, formal links were established between "Local Agenda 21-Bursa" and the 2020 Bursa Master Plan (under preparation). Preparatory activities are currently



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continuing in a participatory manner.

Lessons learned

- One of the primary problems at the beginning of the process was the lack of introductory information, readily available to the public. It was therefore decided to reach people by distributing information through the press and other media.
- Because of the large number of working groups (15), there was a lack of communication at the beginning of the process. As a result, a superior committee was formed consisting of the chairpersons of the working groups.



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Albanian Coastal Zone Management Plan (CZMP) (Albania)

Sustainable development of coastal zone, biodiversity conservation, remediation of damaged areas, provide a mechanism for capacity building and planning.

Goals

- Preserve ecological integrity through establishing ecologically sustainable limits for resource use.
- Renew or rehabilitate damaged resources.
- Ensure natural resources are equitable between generations.
- Encourage complementary rather than competitive activities.
- Preserve and promote social equity and introduce participatory processes.
- Provide a mechanism for capacity building and planning.

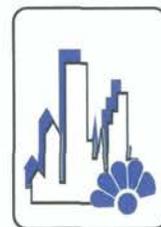
Objectives

- Promote the conservation of Albanian's coastal biodiversity, including marine, freshwater and intertidal habitats.
- Promote the conservation of Albania's coastal cultural heritage, including historical, cultural, architectural and archaeological sites of interest.
- Promote the expansion of Albania's coastal and marine-related tourism and ecotourism industry, other activities, and investment opportunities.
- Enhance employment, create opportunities, and maximise benefits for people living in coastal areas.
- Enhance institutional capacity to manage and implement recommended actions and projects.
- Recommend a series of investment projects boosting coastal economy in an incremental way while providing a vision of the overall Integrated Coastal Area.

Background - Problems The coastal zone is one of the most valuable assets of Albania. The rich diversity of coastal habitats and geomorphologic features, including beaches, wetlands and lagoons, barrier islands and dunes, large bays and harbours, rocky cliffs and caves, have provided an irreplaceable natural resource for the people, since the ilirian tribes settled in Albania, over three thousand years ago. In the coastal zone still exist traditional and extensive ways of exploiting coastal resources. However, due to the fact that coastal regions are attracting population faster than most inland areas in Albania, competition over the allocation and use coastal and marine resources (i.e. space) is increasing.

Actors The Project is carried out through a joint venture between Committee of

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Environmental Protection, Priority Action Program, UNEP/MAP, environmental planning company Dobbin Milus International.

Project organisation, financing, time frame This activity was financed from EU funds. The project cost was 500.000 USD. Time frame was 12 months (1995-1996).

Outcomes-Results Outcomes are the management planning projects, master plans, which spatially correspond to North,

Central and South planning zones.



Contribution and innovation

- The CZMP provides a framework for the spatial organisation of people, activities and infrastructure. It is based on the principles of sustainable development. Specifically, the Plan offers a system of guidelines, policy directives and measurements regulating public and private actions for economic development and environmental protection. The Plan is focused on the identification of initiatives and selective actions as well as on the management of coastal resources. Management Program in a "step by step" implementation program.
- Preparation of CZMP is in compliance with key issues identified by the World Commission on Environment and Development. This Plan will promote conservation and wise use of natural resources.

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Information, Concertation, Conditions for the Sustainable Development of the coastal zone of Magnisia (Greece)

Sustainable development of the coastal zone of the Prefecture of Magnisia.

Policy issues To advance the concept of sustainability in the coastal zone management in the area of Magnisia

Goals

- Preserve the coast as a source of economic and social welfare.
- Create a policy framework with the help of the results of these studies.
- Local Authorities aim at improving the co-ordination between all players, directly or indirectly, involved in the development process, introducing an integrated management approach based on previous experiences as well as improving future prospects of success through co-ordination, information and consultation.

Objectives

- Creation of an information tool (Database) helping policy formulation and supporting decision-making on issues related to coastal zone management.
- Creation of a reference framework for assessing problems, setting priorities and developing strategies for coastal zone management.
- Involvement of those community members that influence the formation of coastal areas in communication and concertation procedures, as well as their familiarisation with the concept of sustainable development.

Background - Problems The project concerns the Prefecture of Magnisia (2.636 km²), which has a multiform, sensitive coastline combining both an excellent natural and built environment. It also includes the northern Sporades archipelago, a large part of which is designated as a Marine National Park. The coastal zone is subject to pressure from tourism, urbanisation, agriculture and transport. At the implementation stage of the project the situation was characterised by fragmentary participation in the management of coastal areas, lack of communication between involved services and non-existence of organised information concerning basic issues of coastal zone management.

Actors The Project will be implemented in co-operation with the Local Authorities of Magnisia (the Prefecture and the nine Local Councils) and the Department of Planning and Regional Development of the University of Thessaly.

Project organisation, financing, time frame Two main actions are planned in this framework:

- a description and analysis of the coastal area of the Prefecture;



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- policy development on protection and management.

A methodology has been developed for organising the existing scattered information and securing, through horizontal co-operations, the viability of the particular project even beyond the time limits of the present proposal. This involves:

- identifying problems and forecasting environmental, economic and housing trends that constitute the main component of this part of the project;

- collection and processing of all relevant information material into an accessible and functional form, for the benefit of the final user (Data Base).

During the second part of the Project, three main studies for the particular area have been conducted concerning:

- the transport network of the Prefecture of Magnisia;
- spatial planning aspects of Tourism Development in the Prefecture;
- the use of the coastline, the seashore and the public coastal land.

The duration of the project is 24 months (March 1996 - Feb 1998). The project cost is 952473.00 ECU, with a funding by the Life programme of UE of 446157.00 ECU.

Outcomes-Results By assessing the progress of the project as a whole, in comparison to its initial objectives, it is possible to point out the following:

- All actions aiming at the accomplishment of the project's objectives have been implemented to a considerable degree.
- At this stage the project has progressed to a degree allowing further involvement in more substantial procedures of participation.
- A significant amount of information has been collected allowing to set crucial questions about the coastal zone and to initiate a different type of dialogue with the agents and actors of the coastal area.

Contribution and innovation

The project aims at sustainable coastal development in the Prefecture of Magnisia. Results expected include the integration of the objectives of sustainable development into the action of Public Authorities, as well as the involvement of local actors in the sustainability issue.



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Environmental Analysis in support of the Local Land Use Plan (PRG). Reggio Emilia (Italy)

Integration of environmental and land use planning.

Policy issues The achievement of the sustainable city through the application of environmental criteria and strategies in land use planning.

Goals Define guidelines for the Land Use Plan.

Objectives The aims of the Environmental Analysis Project included addressing problems such as the:

- lack of environmental services, landscape deterioration and the destruction of open and green areas caused by the continued growth of Reggio Emilia;
- preservation of the 'potential regeneration capacity' for water, soil and air in existing green areas;
- definition of an innovative methodological approach for the Local Land Use Plan.

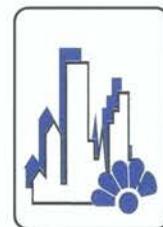
Background - Problems In recent years Reggio Emilia has experienced a vigorous but uneven growth; the city now has 3,000 ha of urbanized land, accommodating 250,000 rooms (2 per person), but generally lacks environmental services. It was decided that an Environmental Analysis Project should be developed to address the environmental problems associated with this growth. The Project is based on the following two studies:

- A Preliminary Project for the Environmental Reorganisation of Town Planning (REU) which focused on the crucial problem of progressive 'impermeability' of urban soil and suggested a new concept for land use theory in Italy (called 'Town environmental pressure');
- An Environmental Study of the 'ecological system in Reggio Emilia' which analysed the concept of 'potential regeneration capacity' of green areas and the characteristics of the main environmental flows, their sensitivity and level of deterioration.

Actors The project was commissioned by the Local Municipality and undertaken by Istituto di Ricerche Ambiente Italia.

Project organisation, financing, time frame

- The Preliminary Project for the Environmental Reorganisation of Town Planning (REU) was undertaken during 1989-1991. The Environmental Study of 'the ecological system' in Reggio Emilia was undertaken in 1992.
- These two studies resulted in the creation of the following: a biotope register; a map of the main sources of impact; a synthetic map indicating the residual regeneration potential; and finally, two maps to complement the land use plan, one illustrating the boundaries of the main significant biotic areas and the other areas with 'mitigation' capacity. The environmental criteria and strategies were developed on the basis of this information.



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Outcomes-Results The Environmental Analysis Project resulted in the identification and adoption of the following environmental criteria and strategies to be applied in land use planning:

- Extension of the sewage system and implementation of a dual-pipe network;
- Extension of bicycle paths and public transport lanes;
- Extension and connection of areas delimited and classified in

environmental zoning;

- Preservation of links between urban and rural green areas;
- Protection of areas with 'mitigation' capacity (in particular along water courses);
- Prevention of construction projects in environmentally sensitive and permeable areas;
- Identification of rural areas where waste dumping from the zootechnics sector is possible;
- Definition of low-building density index in areas for renewal and new development;
- Definition of environmental standards such as minimum proportion of 'permeable' and undeveloped areas in total available space, minimum number of trees along roads, and minimum space (m²) allocated for parking areas.



Contribution and innovation

The Environmental Analysis Project developed for Reggio Emilia is an innovative approach to achieving the integration of environmental concerns in land use planning at the local level.

Lessons learned

- The preparation of the forthcoming plan has highlighted local conflicts concerning the idea of sustainable development for the town, and the very absence of environmental regulations has led to a 'race to develop'. These phenomena could weaken the last version of the Land Use Plan and its future implementation.
- The project has proved that innovative methods can be successful in integrating environmental and land-use planning at local level. However, it has also been proved that local environmental planning, in the absence of effective legislation for the areas subject to planning study, could trigger off undesirable effects. Each municipality should study its specific environmental problems and develop land use strategies on this basis.

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LOCAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT

Concerted Action Plan for Sustainable Tourism in the Mediterranean (Spain, France, Italy, Malta, Cyprus and Portugal)

Mass tourism destinations in Spain, France, Italy, Malta, Cyprus and Portugal, bringing together different tourism-related sectors to establish local priority action plans.

Policy issues Improvement of environmental performance and reduction of impacts on natural, human and cultural resources in tourism management.

Objectives To promote co-operation among diverse sectors, involved in tourism and affected by it, in a concerted effort to agree on priority action plans at the local level to achieve more sustainable tourism models.

Background -Problems Deterioration of landscape; over-use of natural resources; loss of cultural heritage and identity; destruction of natural habitats and spaces and coastal degradation are some of the problems arising from mass tourism leading to the degradation of mass tourism destinations.

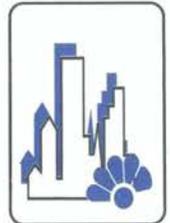
Actors The project developed in 2 case study municipalities for each of the 6 different countries and included: local authorities, tourism authorities and promoters, hotel associations, local business associations, local representatives of international tour operators, citizens and environmental organisations. At international level FoE established a committee, ITPC (International Tourism Partners Committee) including representatives of UNEP, IHEI, WTO, WTTTC, TUI, Thomson Holidays, British Airways Holidays, First Choice, ATLAS and Friends of the Earth.

Project organisation, financing, time frame Co-financed by DGXI, the project began in mid 1994 and was carried out in two phases lasting 3 years (1994 – Phase I, 1996 – Phase II). FoE groups co-ordinated the local working groups. FoE Spain co-ordinated the project and the ITPC. The project was launched in an international conference on sustainable tourism in Majorca, May 1994, the procedures of which were published and distributed.

- The local working groups established priority action plans and met regularly to follow up implementation.
- The ITPC provided input and guidance throughout the project.
- A second publication "Action Plan for Sustainable Tourism in the Mediterranean" was produced.

Outcomes-Results

- Many initiatives were taken by the local actors following the Action Plans and co-operation continued locally.



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- Contacts were established between the local representatives of the international tour operators and local authorities (this had not always been the case previously).
- Increased environmental awareness was gained in all sectors; continued co-operation at international level between FoE and ITPC members.

Contribution and innovation

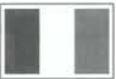
Covered basic Agenda 21 issues but directed specifically towards the tourism sector. Successful in bringing together the business sector with other sectors and in bringing awareness in the case study destinations of the need for change in management systems.



Lessons learned

- Need for education on environment and sustainability issues of people working in the tourism industry sector.
- Lack of knowledge of the state of the local environment by the representatives of the tour operators.

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**Demand Side Management Action Programme
for the Public Sector of selected Island Cities in
Greece (Greece)**

***Development of a Demand Side Management (DSM)
Action Plan for the island cities of Corfu, Mykonos,
Chania and Chios.***

Policy issues Provision of a coherent DSM action plan for the most critical energy needs of the 4 specified island cities.

Objectives Develop a Demand Side Management (DSM) Action Plan for the island cities of Corfu, Mykonos, Chania and Chios in order to assess the most economic and environment friendly DSM options for the particular local authorities and public energy needs and specify a realistic implementation strategy.

Background - Problems Environmental impacts from conventional power plants operating in Greek islands have provoked the opposition of local people, setting a barrier to any further development of the local power supply system. As a result, electricity shortages are experienced, especially during the tourist peak, summer months when energy demand is maximised. Moreover, the consumption of conventional fuels in various end-uses, particularly in the building sector, causes an additional burden to the local environment.

The public sector owns and operates a significant number of energy consuming installations, such as: pumping stations for water supply and sewerage, wastewater treatment plants and water desalination plants, public lighting facilities for streets and squares, public buildings (schools, hospitals, etc.) and public authority operated tourist shops and restaurants. Hence, it is of vital importance for the local authorities to initiate a demand side management (DSM) action plan starting from their own energy consumption.

Actors LDK Consultants Engineers and Planners, National Technical University of Athens (NTUA). In order to properly analyse local needs as well as to maximise the potential applicability and dissemination of the results of the study, the following local partners will participate in the study: the Municipalities of Chios and Mykonos, the Development Corporation of the Municipality of Corfu, the Municipal Corporation for Watering and Sewerage of Chania, Energy Agency of CreteEnergy, Agency of Cyclades, Energy Agency of Northern Aegean, Energy Agency of Ionian Islands.

Project organisation, financing, time frame

- The action plan will be developed incorporating the DSM methodology adopted by most European Union energy companies and local authorities, taking into consideration the significant growth of all economic activities (tourism, industry, agriculture) as well as the energy and environmental problems of the island (high energy costs, energy and capacity shortage, difficulties in licensing new thermal power plants, voltage levels, pollution).



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- The selection criteria for the considered island cities were: different tourist loads, different energy costs, different population sizes.
- A study was performed for the public sector of each one of the selected island cities, focusing on three different end-use sectors, namely: public buildings, pumping stations for water supply, sewerage, wastewater treatment and water desalination, and public lighting.

- Data concerning operational characteristics, energy related equipment and energy consumption were collected for the above mentioned sectors in co-operation with the Municipal Technical Departments and were analysed and processed in order to identify the specific energy demand characteristics.

The duration of the project is 14 months (Jan 1997 – Feb 1998). The project cost is 225000.00 ECU, with a contribution of 90000.00 ECU

Outcomes-Results

- To date efforts have been concentrated on conventional supply side options resulting in high electricity and fuel costs, without taking into consideration the opportunities presented by DSM or environment friendly supply side options (such as power generation by renewable resources).
- Different, technically reliable DSM interventions were determined and evaluated both at end-user (Municipality) and National Economy (N.E.) level.
- Potential DSM interventions were classified according to the ratio of conserved energy cost to conventional energy cost.
- Various groups of interventions, formed by the combination of simple interventions and classified in descending order of profitability, were assessed.
- Once the most beneficial and environment friendly DSM interventions were identified, a realistic implementation strategy was proposed to the Municipal authorities.

Contribution and innovation

The conclusions drawn for the selected island cities would also be applicable to other Greek island cities with similar tourist load, energy cost and population size characteristics.

Contact



Project Reference: XVII/4.1031/96-127

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The Integral Environmental Plan of Seville (Spain)

Development of environmental policy in the urban management plan.

Goals Promote and encourage economic growth policies focusing on the well being of future and present generations.

Policy issues Formulation of an Integrated Environmental Plan (IEP), which focuses on upgrading public services and provides for a programme of co-operation with other European cities facing the same problems. The city's goal is to become an environmental model for the 21st century, and a model for the quality of life it offers: a public service-minded city. The quality of life that Seville hopes to achieve requires the effective delivery of services such as waste management, water supply and transportation, as well as a focus on crime prevention, air quality and the environment.

Background - Problems Seville is the capital city of Andalusia and its metropolitan area hosts a population of 1.2 million inhabitants. It is the fourth largest city of Spain, an important port with a relevant industrial pole. However, its development has raised many problems. The city has suffered from intensive speculation, with large-scale demolitions and unrestricted construction of shopping centres and dormitory neighbourhoods. Most of the trips are made within the boundaries of the city centre, causing enormous transportation problems and air pollution. Seville also suffers from long periods of drought due to its geographical location, as a result of which not all inhabitants have a constant supply of water.

Actors City Council of Seville.

Project organisation, financing, time frame Several actions have been planned:

- Water supply. The struggle against water shortage requires a policy of reducing water consumption. The first aspect of this policy is raising awareness regarding the value of water, with information campaigns and a manual about. A change from collective to individual meters is also planned. Furthermore, it will be necessary to assess and measure the total flow of water consumed. An immense financial effort will be required to upgrade the mains in order to reduce leaks. Measures aimed at discovering new resources and rationalising consumption will be implemented. Irrigation procedures and resources will be modified.
- Traffic and transportation. The considerable transportation and pollution problems are partly due to the arrangement of the streets in the city centre and partly to the large and ever increasing amount of public transport and cars. The overall objective of Seville in relation to transportation consists of two parts: reducing traffic in the city centre and promoting ecologically sound means of transport, such as walking and cycling.
- Cleaning and waste management. The city suffers from problems such as noise and



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pollution from waste collection trucks and unauthorised dumps scattered around the city. The local government intends to identify all unauthorised dumps and to set aside suitable areas to be used instead. Areas of selective collection have been identified, aimed to promote the recycling of solid waste and the composting of vegetable waste. Waste collection trucks will be improved. The implementation of these projects will lead to a waste management network capable of meeting the current

demand.



- **Energy.** The local authorities of Seville consider important to prepare an energy saving plan, based on a twofold goal: to optimise the efficiency of local government installations (street-lighting, sports facilities, administration and cultural buildings) and public transport and, to save resources.

- **Raising public awareness.** To improve the quality of life of the citizens requires awareness raising campaigns, promotion of different attitudes and behaviour, and the active citizen participation. Proposed actions include carrying out surveys and studies on the environment, improving air pollution monitoring and forecasting systems and introducing a charter on noise pollution, promoting a "keep the city clean" campaign and a manual of the environment, creating a permanent city forum on ecology, in the form of an "environmental centre".

- **Inter-municipal co-operation.** The City Council is, therefore, keen to establish close links with other European cities committed to sustainable development. The creation of an interactive network of European cities with similar characteristics might prove advantageous. This is why Seville is a member of the Trans-European Network grouping Seville-Vienna-Burdeos-Milan.

- **Project for the transformation of Seville's Green Belt.** The aim of this project is to restore a more pleasant appearance in Seville's peripheral areas, re-establishing the continuity between the city and its natural surroundings and to create a continuous belt of parkland surrounding the entire city to be connected with small parks and gardens within the city, through landscaped "corridors". To achieve this, the City Council is preparing a project with the Laboratory of Ecology and Plant Biology of the Faculty of Biology.

Outcomes-Results

- Only one action had been implemented by the end of 1996. The work is ongoing. Seville, through the implementation of this plan, is focusing on projects based on simple and fundamental concepts. It is fully aware of the general environmental issues and its projects are aimed at introducing solutions at the local level. However, it is difficult to know if these projects are economically viable and technically effective.

- For the time being, the plan is essentially based on pollution abatement or control. Very few objectives address prevention, except for the establishment of a team of experts. Despite this, Seville and its citizens are making a common effort to actively participate in the concerns associated with sustainable development.



LOCAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT

Contribution and innovation

- The most important part of the Integrated Environmental Plan concerns urban economic issues for sustainable development. Seville seems to show a real willingness to improve the use of its natural resources, reflected in the project for the reforestation of its green belt and the development of its parks and gardens, allowing the protection and restoration of the flora and fauna and the establishment of a continuous link between the city and the surrounding countryside. Furthermore, in its water resources management project, the local government of Seville intends to play the card of the economy to protect its resources. The policies based on the accurate measurement of water consumption, the upgrading of the water supply distribution network or the reduction of consumption are all sustainable development projects. Lastly, the promotion of waste recycling, the composting project and the reutilization of products such as the methane produced at the waste water treatment plants also move towards this direction.

- Transport management is the policy's strong point. By promoting public transport, creating a light railway system, in opposition to private vehicle traffic, and the creation of pedestrian precincts, footpaths, bicycle lanes and the improvement of the bus network, Seville has accepted the principle of sustainability in urban mobility. Furthermore, the optimisation of the effectiveness and quality of public transport is a proof of its willingness to reduce pollution.

- Public transport policy is part of the programme to reduce the emission of pollutants into the atmosphere and, limit the greenhouse effect. To this, one must add the use of less polluting fuels. Furthermore, the reutilization of the methane produced at the wastewater treatment plants is targeted towards the reduction of polluting substances. Besides the goal of reducing emissions into the atmosphere, Seville also wishes to implement a global energy policy, by optimising the efficiency of municipal plants as well as introducing new energy sources, such as solar energy. Lastly, the reforestation campaign will make possible to re-establish the imbalances due to the greenhouse effect. All these actions show that Seville is fully aware of its responsibilities in relation to the climate and the planet.

- Seville is also concerned with pollution prevention, as indicated by the above mentioned measures and by the projects for the management of solid urban waste. The construction of selection plants and special dumps are actions that move towards the prevention of soil pollution.

- Most of these projects take account of the information provided by and the actions of the



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various stakeholders involved, i.e. the City Council, the various organisations and the citizens. Awareness-raising campaigns on the environment, on how to save natural resources or on the impact of transport have been proposed. The City Council intends to add to its campaigns studies and surveys on environmental issues, to be carried out jointly with local academic institutions, as well as the creation of an "environmental centre",

jointly with environmental organisations.



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Creation of an information structure for urban and environmental planning and management in the municipalities, with a projection to the media (Spain)

Environmental Protection, land use planning, tourism & integrated socio-economic actions.

Policy issues Establishment of an information platform for the development of strategic plans for sustainable development at the municipal level.

Objectives Using the definition of mechanised protocols with spatial projection and sustainability indicators for different sectors (town planning, environmental, social and economic), the project aims to establish a diagnosis and integrate criteria for municipal planning, apply it to a municipality and pass digestible information to the media for wide dissemination.

Actors Centre of Environmental Information Studies (CEIA), Town Hall of Manlleu

Project organisation, financing, time frame

- The project begins by creating a set of computerised protocols on a cartographic basis. This will be the integrated diagnosis and analysis tool for the environmental, urban, social and economic context of the municipality, and also the basis for preventive decision-making in projects, town planning, territorial ordinances, granting of licenses for classified activities, environmental planning and in social and economic development projects, all of which form the basis for municipal sustainability.

- The pilot test and first implementation of this information system was applied in the Municipality of Manlleu (Barcelona).

The project cost is 551767.00 ECU, with a LIFE program contribution of 243382.00 ECU. The works for the project started in March 1997 and were completed in March 1999.

Outcomes-Results

- The Platform Global City is a very useful tool for town planning, management and study, as well as, for the spreading of information about the function of urban systems and their surroundings.

- The PCG is an integrated source of information, that can be used by different collectives, and offers the possibility of interaction between different users. Therefore, it can be considered as a complex source of information.

- The PCG is directed towards: Town managers, Technicians and people that study the urban system and the municipality, Media professionals, Citizens and different social actors.

Contribution and innovation

- The PCG offers a new and more global view of the municipality to municipal managers,

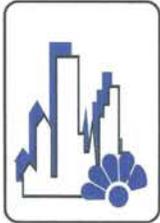


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citizens and media making relations between the different fields of the reality clear.

- A lot of information about the municipality is made available through PGC to other departments and citizens.
- The PCG can act as an inductor of a process towards the continuous improvement of information quantity and quality, concentrating efforts and resources for the improvement of the most useful information for town management and decision

making.



- The PCG's user-friendly interface and easy functionality allows users non-specialised in GIS to exploit the potential of such tools.
- The PGC has been conceived to be transferable to any small or medium sized European municipality. The PGC adapts itself to each municipality so the municipality can then adapt itself to the PGC and not only a tool is transferred, but also a model of communication.

Lessons learned

- Involvement of the town council in the implantation process of the PGC has allowed the establishment of a joint reflection and discussion process about information available for their work and the actions to do for its improvement.
- It was made evident the common interest in exploiting all information available about the municipality that is currently 'monopolised' or 'isolated' in certain departments.
- Several proposals for the improvement of the information produced by the Town Hall arose from this joint discussion.

Contact

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ENVIMED (Medcities I) (Regional)

Amelioration and protection of the environment in coastal cities of the Mediterranean Basin.

Policy issues Reinforce of the role of municipalities

Objectives

- Amelioration and protection of the environment in coastal cities of the Mediterranean Basin.
- Reinforcement of technical and institutional capacities within the municipalities for environmental management.

Background - Problems The project is being carried out within the framework of Medcities bringing together 26 Mediterranean cities in a decentralised co-operative network.

Actors Medcities, Mediterranean municipalities

Project organization, financing, time frame The project goals will be achieved via information and experience exchanges in the field of environment. Four fields of activity have been prioritised, of which the first three will be carried out within the framework of the current project:

- implementation of environmental audits
- institutional reinforcement and training
- raising of public awareness concerning the environment
- pre-feasibility studies.

The duration of the project is 1 year (Nov. 1995 - Oct 1996). The total budget is: 978.114,7 Euro, with a LIFE contribution of: 622.506,08 Euro (63,64 %).

Outcomes-Results

- Environmental audits will be carried out for the cities of Haifa, Gaza, Tetouan, and Silifke.
- Training programmes will be held in the form of seminars on auditing and institutional strengthening.
- There will also be a seminar held for elected officials and technicians on environmental management.
- Public awareness will be addressed through the drafting and distribution of a brochure on 'Sustainable Development in the Mediterranean', written in both English and Arabic.

Contribution and innovation

Medcities aims to reinforce the role of municipalities in environmental problems relevant to them, as well as improving co-operation among cities.

It also assists municipalities to carry out better environmental management, through training, technical assistance and preparation of investment projects.

Contact

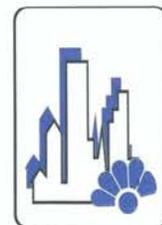
Project reference: LIFE94 TCY/INT/0962

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LOCAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT

CADISPA Europe Activities in Greece, Spain, Italy, Portugal, UK (Greece, Spain, Italy, Portugal, UK)

Conservation and Development in Sparsely Populated Areas.



Policy issues Conservation and Development in Sparsely Populated Areas (CADISPA) aims to help empower local communities to develop economically, while preserving their rich cultural and biological heritage,

Goals Develop a model action plan to help empower local communities in sparsely populated areas of Europe to develop economically, while remaining preserving their rich cultural and biological heritage.

Objectives

- Achieve conservation, development, public awareness, and educational objectives in remote rural areas in Europe.
- Devise, through strongly integrated fieldwork in pilot areas, a conservation and development strategic plan that can be applied to sparsely populated areas all over Europe and meet objectives 1 and 5b of the Structural Funds Regulation.
- Train teachers, and develop education programmes and resource materials for primary and secondary schools.
- Provide community education and development techniques and principles.

Background - Problems The Conservation and Development in Sparsely Populated Areas (CADISPA) project works for the economic and social development and conservation of natural habitats in sparsely populated areas of Europe. WWF works closely with other non-governmental organizations (NGOs), at the grass roots level, professional associations and local authorities and has constituted a European CADISPA network sharing experiences and expertise internationally, for and in sparsely populated areas. The two primary methods of CADISPA are environmental education and training, as well as encouragement and motivation for sustainable change and community development action.

Actors The overall coordination of CADISPA is entrusted to WWF International through an Education Officer based in Madrid, Across the Waters office in Barcelona, non-governmental organizations (NGOs), professional associations and local authorities

Project organization, financing, time frame

- This component of the project concerns activities implemented under the CADISPA umbrella in Scotland, Greece, Portugal, Spain, and Italy.
- The range of actions undertaken in the different project areas is wide and varied, although



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the methods used within CADISPA are basically environmental education and training, and encouragement and motivation for sustainable change and community development action.

- The present CADISPA sites remain unique in their own right, but share similar features, in particular: (a) sparsely populated areas, subject to constant emigration, population decrease and ageing ; (b) rich but highly threatened biodiversity; (c) broader environments (natural and human conditions) which are under threat of deterioration; (d) local residents who resent outside agents of decision, often as a result of historical circumstances; (e) local residents who generally have low capacity for self-defence or self-determination and for assessing self-interest accurately; (f) growing interest from outside public authorities to assist and support the local society; and (g) the presence of local, grass roots groups willing to undertake positive action for the conservation and development of the specific areas.

- Efficient co-operation between partners in the participating countries of the project ensures the success of the multiplying and trans-border effect of CADISPA.

Since the beginning of 1996 the project cannot count on the financial support of the European Union. Thus, the CADISPA network has been running on a voluntary basis. The national extensions of the project in Greece, Portugal, Italy, Spain, Scotland, and Sweden are being developed in parallel, but no transnational meeting or exchange is foreseen for the 1997 financial year. A database of the expertise and human resources of the CADISPA network has been set up at the Across the Waters office in Barcelona. Duration of the project: Sep. 92 - Dec. 96.

Outcomes-Results WWF has built on the experiences and achievements of the initial phase of the project and is merging the national projects into a new trans-border programme for the sparsely populated areas of Europe.

Contribution and innovation

Since its beginning in 1988, CADISPA has become an increasingly complex and multi-faceted project. It now involves five different countries and its strength, in part, derives from its cross-boundary, European dimension and the constant exchange of ideas, expertise and experience between the various national components of the project.

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LOCAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT

Environmental Centre for Administration and Technology (ECAT) Tirana (Albania)

Consultancy for cities' problems management.

Policy issues Provision of technical assistance for the establishment of environmental policies and action programmes for nature protection.

Objectives

- Combine Albanian and Western European know-how for the development of environmental policies.
- ECAT wants to contribute to the sustainable development of the City and Region of Tirana.



Background - Problems The ECAT Tirana-team consisting of four Albanian and four Western European experts works in an interdisciplinary way. On the basis of legal, administrative and technological analyses, action programmes and projects will be designed in tight co-operation with local authorities, enterprises and non-governmental organisations in Tirana.

Actors ECAT-Tirana. Terni and Thuringia have significant experience in environmental planning/administration and waste water treatment. The environmental administrators in Terni and Thuringia will support ECAT-Tirana in concrete projects.

Project organisation, financing, time frame

- On the basis of legal, administrative and technological analyses, ECAT-Tirana will assist in the implementation of action programmes and related projects, in close co-operation with local authorities, enterprises and non-governmental organisations.
- Furthermore, ECAT-Tirana is expected to help establish business contacts and give technical advice in the field of environmental technology.

The total budget is 1.838.265,77 Euro, with a LIFE program contribution of 800.067,23 Euro (43,52 %). The duration of the project is 36 months (Jan. 1995 - Dec. 1997).

Outcomes-Result The main task of ECAT-Tirana is to function as a consulting body for the Environment Protection Administration of Albania and the City Administration of Tirana, particularly regarding solid waste disposal management, waste water treatment, protection of urban parks, transport management and the dissemination of environmental information.

Contribution and innovation

ECAT contributes to the sustainable development of the city and region of Tirana and to improvement of the state of the environment in the Adriatic Sea region as a whole.



Contact

Project Reference: LIFE94 TCY/D/0981

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Sustainable development of European cities and regions: A concept for local and regional actors (Greece)

Human dimensions of environmental change.

Policy issues Provide urban and regional planners with an analytical tool to identify potential benefits, likely problems and most suitable sectors for sustainable development in their own region.

Objectives

- Identified and develop planning instruments.
- Provide regional authorities with a range of options for action, including recommendations concerning the implementation of these planning instruments.

Actors Instituut voor Europees Milieubeleid (Brussels), Trierer Arbeitsgemeinschaft für Umwelt-, Regional-, und Strukturforchung (Trier), Mediterranean Information Office for Environment, Culture and Sustainable Development (Athens), Forschungsgesellschaft für Stoff-, Energie-, und Umweltfragen GmbH (Graz).

Project organisation, financing, time frame

- The project starts with an evaluation of different theoretical approaches to sustainable development that may contribute to addressing the specific problems of cities and regions in the three countries studied.
- This is followed by an assessment of a series of practical projects intended to address specific problems of urban and regional areas.
- Based on this analysis, a bottom-up approach for the empirical analysis of sustainability of cities and regions is developed together with the suitable instruments on its implementation in different regional contexts.

The duration of the project is 30 months (May 1996 – Oct 1998).

Outcomes-Results

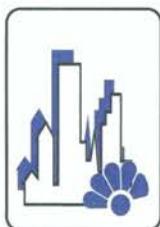
- Case studies will be carried out in three regions: Trier (Germany), Feldbach (Austria), and Rhodes (Greece) and for each of these regions the project will develop policy instruments and sustainability strategies.
- The work will also include an analysis of barriers and incentives which affect strategies for regional sustainable development, at the EU-level and other administrative levels.
- The findings are presented in a manual containing the set of generic guidelines which could assist other regions in carrying out similar analyses.



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Contribution and innovation

A contribution is given by the development of basic tools in the form of a set of generic guidelines in support of a strategy towards sustainability in European cities and regions.



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LOCAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT

ECOMOST Project - Planning for Sustainable Tourism (Spain, Greece)

Contribution to local charities and expertise for research into destination improvements.

Policy issues The project addresses a number of issues: the role of tourism in a country, its potential economic, social and cultural value, its constraints, how to manage resources and set priorities, as well as the necessary legal and political framework.

Goals Offer of a rescue package of private/public sector partnership to over-developed and declining resorts on the Mediterranean islands of Mallorca and Rhodes.

Objectives Provide tools for sustainable development as there was a lack of real understanding in this area.



Background - Problems The tools for territorial, sectoral or strategic planning are powerful allies for the consolidation of island models for the development of sustainable tourism. The most common planning actions in islands refer to:

- Territorial strategies and the preservation of resources;
- Integrated coastal zone management (ICZM);
- Management systems for protected areas;
- Sector planning.

Actors involved/concerned Secretary General, International Federation of Tour Operators (IFTO).

Project organisation, financing, time frame

- The initial research was conducted in Mallorca then validated in Rhodes.
- Simple check lists have been developed which enable dangers to sustainable tourism to be identified, monitored and priorities established.
- The topics covered by these lists are - population, tourism, ecology and politics. Within each topic components, indicators and critical values are identified.

The ECOMOST (European Community Models of Sustainable Tourism) project was initiated by IFTO and funded by EC, Ibatour and Turesspana

Outcomes-Results

- The result was surprising, although obvious, since there were no clear standards for the destination, answers and perceptions were influenced by the cultural and environmental patterns of the tourists' origin, thereby registering significant disparity elements. Against each of the indicators a degree of urgency is assessed.
- In Mallorca the points needing most urgent attention were: bed occupancy (corrected in 1994), drinking water supply and legislation.



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- In Rhodes different urgent points were identified namely: level of qualifications, investments, investment in management, sewage, legislation, efficiency of regional planning and public participation in planning.

Contribution and innovation

- The ECOMOST project comprises an already classic work, which demonstrates how from a research document, valuable instruments and reflections are provided for the authorities and local managers, in order to establish the bases of their decisions in planning.

- ECOMOST also contributed certain innovations as opposed to other projects. By taking into consideration that the relationship between expectations and perceptions lies in the basis of the validation of any tourist product, it centred a large part of its work on questioning tourists, in order to discover if they were aware of how the environment might be protected.



Lessons learned

- Local authorities are encouraged to make use of this work and hopefully the methodology will be developed and improved in the process of usage. In this way local people and tourists, both present and future, will benefit ecologically, economically and socially.
- The ECOMOST approach and methodology can now be applied in other areas. The main obstacle will be the lack of reliable information. Depending on the availability of information a typical project timetable could be 6 to 9 months and the possible cost at least €100,000.

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Sustainable Telematics for Environmental Management (Spain)

Telematics for improving employment and quality of life.

Policy issues Production of one-year feasibility study for a full-scale project in order to develop a telematics system for environmental management (STEM) in remote and ecologically sensitive regions of Europe.

Objectives

- Provide easy-to-use telematics tools.
- Assess the feasibility of creating a telematics application for environmental managers in order to improve their access to information.
- Help land managers to use accurate, up to date, and pertinent information about environmental resources and conditions.
- Improve their decision making.



Background – Problems Current decision support tools provide isolated support for environmental management sub-tasks. In parallel, there is a lack of telematics applications accessing relevant information resources for integration into existing sustainable resource management regimes.

Actors The project was co-ordinated by the University of Edinburgh. The project consortium comprised: Universität Fridericana Karlsruhe (Technische Hochschule) (Germany), Centrum voor Wiskunde en Informatica (Netherlands), Implex Environmental Systems Ltd (UK), Software AG Espana (Spain). Two partners in the consortium are user groups: the Assynt Crofters Trust (ACT), a community of Scottish small farmers who collectively own and manage their land, and the Centro de Estudios Ambientales del Mediterraneo (CEAM) (Spain), a forest management group in Valencia.

Project organisation, financing, time frame

- For the feasibility study, Scottish users focus on the siting of a potential small hydro-electric power generation plant on a loch system, and related land-change decisions such as reforestation in the area. Spanish users focus on restoration of vegetation on land burnt by wildfires, implying decisions about natural regeneration and planting of appropriate tree species.



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- The project will assess the feasibility of accessing, combining and presenting remote and local data sets and knowledge sources using network protocols (e.g. WWW), data-and-knowledge integration by mediators, automated reasoning and multimedia interface tools. Subsequent design work devised an architecture for a generic software system that can be easily configured to meet those requirements for specific user groups.

The project cost is 427240.00 ECU. The project was funded within the Environmental Sector of the European Commission's Framework IV Telematics Application Programme. Duration: 12 months (Jan – Dec 1996).



Outcomes-Results

- Over 50 issues affecting the feasibility of building such a system were identified and assessed. That showed that although there will be technical challenges in bringing together the range of software components needed, some formidable administrative and organisational obstacles have still to be overcome.
- Initial requirements capture confirmed the demand for a tool like STEM while the required functionality showed there is substantial commonality in information access, manipulation and presentation requirements of a range of land managers.

Contribution and innovation

The project has interacted extensively with potential users as well as other projects and generated considerable interest from outside the Consortium.

Lessons learned

- The overall conclusion of the STEM project is that it is feasible to build a working telematics system, constituting a valuable and powerful tool for assistance in environmental management.
- Doing so will require the use of knowledge-based and data integration techniques in order to integrate existing software packages into a single, user-friendly system that can be easily maintained and extended. The consortium is actively pursuing the development of a prototype system as soon as possible.

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Influence of Tourist Activities on Mountain Regions in Croatia (Croatia)

Impact of tourism in mountainous regions in Croatia, information and education of public and proposals for concrete actions of protection to decrease negative impact

Objectives

- Define possible impacts of tourism in mountainous regions in Croatia.
- Inform and educate the public about tourism development.
- Offer proposals for concrete actions of protection in order to decrease any potential, negative impact.

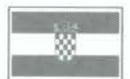


Background -Problems Tourism is one of the major economic sectors in Croatia and further development is expected. Therefore, tourist development of regions with no or very little tourist activities is expected. Croatian mountains are, with no doubt, such a region. Newly built forest roads make mountains more easily accessible than before, same as marketing provided by tourist offices and companies. Mountainous regions spread on nearly two thirds of Croatia, some of them protected by the law. Both strict reserves are in these regions: Bijeleske stijene and Hajdučki I. Rozanski kukovi; three natural parks: Medvednica, Biokovo and Velebit; three National parks: Paklenica, Risnjak and Plitvička jezera, while Velebit mountain is the only UNESCO Biosphere reserve in Croatia (since 1978.). The previously mentioned, protected regions are the most attractive to visitors, making them extremely sensitive to all kind of activities.

Actors Institute Rudjer Boskovic

Project organisation, financing, time frame The project is organised in five steps:

- defining negative impact that tourism has on mountain regions;
- specifying problems evolved by tourist activities;
- comparing current situation in Croatia with that in other countries with long term experience of tourism in mountainous regions;
- providing guidance to decrease negative impact of tourism;
- informing and educating mountain users (visitors, employees and local population).



Outcomes-Results

- A questionnaire involving approximately 200 people has been conducted. The aim of the



SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

questionnaire was to define a profile of users visiting a site and their behaviour.

- From the results of the questionnaire and photographic material environmentally critical points such as illegal dumping sites have been specified.



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Coastal Forest Reconstruction and Protection (Croatia)

Environmental protection and conservation.

Goals Restore and protect forest land in the coastal zone of Croatia in order to enhance landscape and recreational values of the region and thereby contribute to bring tourism to its pre-war level.

Objectives

- Restore the environmental role of coastal forests destroyed by war, in protecting soils and waters, and initiate the restoration of natural vegetation.
- Address the problem of forest fire, a crucial threat to coastal areas.
- Develop the knowledge base for improved management and protection of coastal forests.

Background -Problems Croatia has a large and well managed forest resource base, of just over 2.4 million ha, a strong asset for both economic development and environmental protection. Coastal forests, belonging to the Mediterranean type, are far less productive than continental forests; however, they have high environmental, amenity, and landscape values, specifically for tourism. Coastal forests of Croatia deserve immediate attention and assistance. Indeed, Croatian coastal forests have large areas of degraded stands resulting from intense and long lasting human pressure for timber, fuel, and grazing. In addition to being the most affected by recent war activities, they have been neglected in the past, in comparison with inland forests, in terms of protection and management. They are also very sensitive to fires, mostly of human origin, that ravage a significant area every year. At the same time, coastal forests are a vital asset for the restoration of the tourist industry, which is by far the dominating source of income in this part of the country.

Actors Ministry of Agriculture and Forestry; Ministry of Interior, NGO

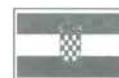
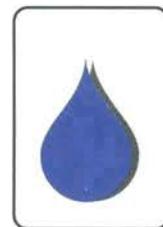
Project organisation, financing, time frame

The Government of the Republic of Croatia in 1994 requested financial assistance from the World Bank to help restore forest areas affected by war activities and fires in the coastal zone of Croatia. Total restoration cost for priority areas is estimated at USD 67.3 mill. It is a five year project to be implemented from 1997 – 2001.

The project would have the following three components:

- Coastal Forest Reconstruction. This component includes (a) the thorough reforestation of forests destroyed by war and fire damage and silvicultural interventions in areas affected by war destruction; (b) the reconstruction of the nursery in Crno, re-established into a modern containerised production unit to grow seedlings for the coastal zone only; and (c) the reconstruction of the arboretum in Trsteno, one of the most ancient in the world, close to Dubrovnik.

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- Forest Fire Management. Prevention activities aim at reducing the number of fires and increasing the resistance of forests to fires, once they have started. Pre-suppression activities would considerably improve the capacity to forecast the occurrence of forest fires, to detect forest fires as soon as they have started, and to access burning areas for terrestrial fire-fighting. Suppression activities would support a major increase in the capacity to

combat forest fires by funding and providing the equipment necessary for an efficient integration of terrestrial and aerial fire-fighting.

- Support Services. The project would support (a) research into improved genetic base of Aleppo, evaluation of the gene base of Dalmatian oaks, development of improved silvicultural techniques, and revised costing standards for plantation establishments; (b) testing new methods of aerial fire-fighting; (c) technical assistance to Ho to plan the privatisation of non-core assets, and improve its organisation and financial management in order to better differentiate its commercial and public functions; (d) training and technical assistance to the Ministry of Interior to improve the organisation of field activities for forest fire management; and (e) the project monitoring and evaluation system. The total project cost is an estimated US\$63.4 million.

Outcomes-Results

- The works implemented so far are: reforestation by ripping (77%), reforestation manual (28%), thinning natural regeneration (46%), roadside forest cleaning (66%), thinning of pine stands (36%), reconstruction of forest fire roads (27%) and construction of forest fire roads (3%).
- In addition the project has financed the range of forest fire suppression equipment (i.e. one seaplane, two initial attack aeroplanes, 30 fire fighting vehicles and other specialised equipment).

Contribution and innovation

- Most significant benefits expected from the project would be improved landscape and environmental condition of coastal forests, resulting from the reconstruction of forests destroyed by war and from the reduction in coastal forests burnt by fires. These benefits are expected, in turn, to contribute to increased economic benefits from the rehabilitation of tourism.
- Other commercial, social, and institutional and scientific benefits would also be generated either by forest reconstruction and protection activities or by project activities related to support services.



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- Field activities of the project would provide employment in an area of the country where war has deeply affected the economy and resulted in increased unemployment and poverty.

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Karavasta Lagoon-Wetland. Management Project (Albania)

Environmental Management.

Objectives Preserve the ecological values and biological diversity of the area through establishing ecologically sustainable limits to natural resources and land use.

Background - Problems Karavasta lagoon and related territory comprising the Divjaka forest, present a unique ecosystem for its nature, fauna, flora and landscape. In this lagoon the 1-2% of the threatened Dalmatian Pelicans are breeding. For its features and particularly for the presence of pelicans, Karavasta lagoon was declared at 1994 Ramsar site of International importance.

Economic and social development in the early '90s have been accompanied by uncontrolled use of natural resources of this sensitive area and losses of a number of Dalmatian Pelicans. Damages were extended to the Divjaka forest as well.

Actors Actors involved in this Project have been the Committee of Environmental Protection (now: National Environmental Agency), Technital Spa (Italy), Biological Station of Tour du Valat (France), Ecotourism Ltd.(UK).

Project organisation, financing, time frame Project lasted 15 months (1995-1995) and costed 400.000 ECU.

Outcomes-Results The Project have produced:

- a management plan and legal framework for its implementation,
- an ecotourism plan compatible with the carrying capacity of the site,
- an assessment of the flora and fauna,
- guidelines for fishery management,
- an assessment of the expectation of local people.

Contribution and innovation

- In the frame of the implementation of Agenda 21, a regional assessment of the state of biodiversity in a sensitive area have been completed.
- Management and ecotourism plans have been prepared and will lead towards sustainable use of natural resources.
- Despite recent difficulties faced by economic and social development, the central and local authorities are taking measures to stop the deterioration of flora and fauna, particularly in sensitive and protected areas.
- Environmental situation in Karavasta lagoon and Divjaka forest is going to be improved, due to the wider involvement of local people and NGOs.

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Lake Ohrid Protection (Albania)

Biodiversity conservation, management of the Lake Ohrid watershed, promotion of cost-effective solutions to transboundary natural resources management.

Policy issue

Develop a basis for the joint management and protection of Lake Ohrid by the National Governments and people of Albania and FYROM.

Goals

By establishing a basis for joint management and protection, the Project will promote cost-effective solutions to transboundary natural resources management and pollution problems, and provide basis for the sustainable economic development of the watershed.

Objectives

Other activities include the sensitisation, awareness-raising and participation of local people in the management and protection of the Lake Ohrid watershed. The LOCP will address the transboundary key elements of the Strategic Action Plan through its four components:

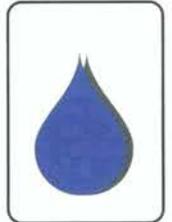
- An institutional strengthening program for environmental authorities at the district and municipal level including the district officers for fishery, forestry and agriculture;
- A joint monitoring program, involving the leading environmental, scientific organisations in the two countries, and support equipment for a comprehensive sampling and scientific program including a new laboratory facility in Pogradec;
- Participatory watershed action planning with pilot and demonstration projects in order to address priority issues in the areas of municipal environmental services, industry, tourism, agriculture, forestry, and fisheries, and;
- A public awareness and participation program involving local NGOs and community groups in all sectors of social and economic activity in the watershed.

Background -Problems Lake Ohrid situated in south-eastern Europe, with Albania and FYROM as its riparian states, excels a unique ecosystem including many endemic species of flora and fauna. The uniqueness of the ecosystem is due to the lake's very high age, approximately three million years. The region was declared an UNESCO World Cultural and Natural Heritage Site in 1980.

Actors A Joint project of Albanian and Former Yugoslav Republic of Macedonia institutions (FYROM).

Project organisation, financing, time frame During the three years of implementation phase of the Project, the activities planned are:

- updating in the existing legal and regulatory framework;



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- a joint water monitoring program for lake Ohrid and its tributaries;
- pilot projects for protection of the lake;
- promotion of the sustainable economic activities.

The total Project cost is 4,4 million USD of which GEF will finance 4,1 million USD and 0,3 million USD from local contributions. Time frame: 3 years (Dec.1998- Dec. 2001).

Outcomes-Results



- The outcomes of the Project will be legal and institutional, updated in compliance with principles of sustainable management and protection of natural resources.
- A new water monitoring laboratory should be established in Pogradec and a comprehensive Watershed Action Plan should be prepared by the end of the third year.

Contribution and innovation

- It will be the first Global Environmental Facility project of its kind in Central and Eastern Europe, and the first between two countries. It aims at developing the capability of the two countries working together for the protection and management of lake Ohrid. It will also provide the basis for the preparation and adoption of a regional development strategy, serving the needs of both countries.
- Lake Ohrid Management Board is established in order to initiate, promote, harmonise and approve the implementation of this Project. It is composed by National and local officials of both countries , including representatives from NGOs.
- There are PIUs in each country to manage Project funds, co-ordinate activities carried out under each of the four Project components, as well as to ensure an effective and timely implementation of the Project.

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Protected Area Management (Morocco)

Environmental protection and conservation.

Objectives

- Establish a system of protected areas in Morocco.
- Promote sustainable conservation management, with the participation of local populations, of the ecosystems in the areas supported by the project.

Background - Problems: Morocco, with a land area of 711,000 km², is the second most biologically diverse country in the Mediterranean basin. The principal threats to biodiversity are habitat transformation, fragmentation and degradation, due to increasing population pressures and poor management of natural resources.

Actors The project would be implemented by the Agency Forests, Water and Soil Conservation Administration (AEFCS), Ministry of Agriculture. At central level, the Department of Wildlife, Hunting and Fishing would have overall responsibility for project implementation. At field level, the Regional Direction of Water and Forest (DREFS) in each province involved in the project would be in charge of local execution, co-ordination and participation of the local population and other local authorities. At national level, the national Council for the Environment would provide overall policy guidance.

Project organisation, financing, time frame The total project costs are estimated at US\$ 13.3 millions, including the GEF grant of US\$ 9.8 millions and government contribution of US\$ 3.5 millions. The projected board date is July 1998

Outcomes-Results

- Implementation of conservation management plans in selected protected areas, including restoration of fragile ecosystems, compensation of interventions for the local populations, participatory workshops, improvement of park infrastructure and establishment of GIS for local park management.
- The component would support up to six national parks, including Ifrane, Tazekka, Toubkal, the Eastern High Atlas, Talassemtane and Al-Hoceima.
- Preparation and implementation of conservation management plans at selected Sites of Biological and Ecological Interest (SIBEs), and pilot programs for the re-introduction of selected mammals and raptors.
- Training of park management staff and rangers, training of AEFCS staff.
- Establishment of a GIS at central level to facilitate ME, and establishment of multi-annual plans for resource mobilization for selected raptors and mammals.
- Public awareness activities, in cooperation with NGOs, schools and local organisations, to promote understanding about nature conservation.



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Contribution and innovation

- Project objectives would include the establishment of a system of protected areas in Morocco, together with a system of sustainable ecosystem management, in cooperation with local populations.
- Benefits would comprise, in addition to ecosystem restoration, increased awareness by the Moroccan community of the importance of sustainable conservation management, and increased understanding by the regional and global community of the importance of Moroccan ecosystems and their linkages with those of other countries.

importance of sustainable conservation management, and increased understanding by the regional and global community of the importance of Moroccan ecosystems and their linkages with those of other countries.

- While poverty alleviation is not the principal objective of the project, preparation and implementation of conservation management plans in the protected areas will help assure a sustained livelihood for the people living in and around the parks, many of who are among the poorest of Morocco's rural population.



Lessons learned

- Prospects for sustainable improvements in natural resource management require a decentralised approach for implementation, ownership and participation by local communities.
- Detailed planning at field level.
- Implementation experience is better where project objectives and designs are simple and well-focused.
- These lessons will be incorporated into the project design. The proposed project is the first GEF-financed Biodiversity Project for Morocco.

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Protected area project (Lebanon)

Establishment of protected areas and strengthening of participation in conservation.

Policy issues Strengthening of National capacity and grassroots in-situ conservation for sustainable development

Objectives

- Establishment of protected areas and safeguard of endangered species of flora and fauna
- Promotion of educational and sensitization activities
- Stimulation of better communication between Institutions and communities

Background -Problems Centuries ago Mount Lebanon was carpeted with a rich stand of cedar (*Cedrus libani*), pine (*Pinus brutia*), oak (*Quercus calliprinus*), juniper (*Juniperus excelsa*) and fir (*Abies cilicica*) to name a few. It is a documented fact that from about 5,000 years ago, the demand for the stately cedars, pines and firs was high.

In the early 1970s, a small group of concerned citizens, NGOs, and members of the scientific community stepped forward and began to defend conservation as an integral part of development. They believed in providing a series of positive, conservation experiences in order to draw attention of the public and private sectors. Their message was clear: the reconstruction of Lebanon is vital but not if it destroys the environment, which constitutes the basic infrastructure of the country.

Actors The Lebanese National Council for Scientific Research (NCSR) and several NGOs collaborated in the implementation of this project. They are: Al-Shouf Cedar Society (ACS), Friends of Horsh Ehden (FOHE), Environment Protection Committee (EPC), Green Line (GL), Friends of Nature (FON), Society for Protection of Nature in Lebanon (SPNL).

Project organization, financing, time frame The project commenced operating on 15 November 1996.

Outcomes-Results During the first three years of implementation (1996 to 1999) the project accomplished its main objectives of:

- putting in place three well managed, demonstration, protected areas, namely Al-Shouf Cedar Nature Reserve, Horsh Ehden Nature Reserve and the Palm Islands Nature Reserve;
- safeguarding endemic and endangered species of flora and fauna by conserving their habitats;
- incorporating biodiversity conservation as an integral part of sustainable human development;
- illustrating the short and long-term ecological and economic objectives of biodiversity conservation;
- introducing educational and sensitization components directed towards local communities and decision makers;



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- promoting national reconciliation by bringing people and institutions together for nature conservation.

Contribution and innovation

The project is a model for the future management of protected areas in Lebanon and the Middle East region because it has:

- brought together a large number of players (official organizations and individuals) to work together for the

implementation of all project activities. In fact not many developing nations have established a working relationship between Government agencies and non-governmental organizations in the field of protected area management;

- improved communication with local municipalities, researchers, and individual stakeholders. Doing so was instrumental in fostering greater respect for nature conservation and increasing cooperation between stakeholders;
- stimulated the establishment of four new nature reserves by the Lebanese Parliament in 1998 and 1999, in addition to the three existing ones of Al-Shouf, Ehden and Palm Islands. The four new protected areas are the sandy beach in Tyre, the pine forest of Bentael, the lake of Yammouni, and cedar forest of Tannourin;
- promoted a better understanding of the effectiveness of in-situ conservation through the dramatic increase of flora and fauna in the three nature reserves of Al-Shouf, Ehden and Palm Islands during 1997, 1998 and 1999. This increase is expected to have a significant impact on both the national and regional levels;
- improved the capability of the permanent staff in the Nature Reserves Unit, the Ministry of Environment, to oversee and monitor protected areas;
- improved the capability of the 23 full-time NGO staff of Al-Shouf Cedar Society, Friends of Horsh Ehden, and Environment Protection Committee to manage nature reserves;
- improved the capability of researchers and members of the National Council for Scientific Research, Green Line, Friends of Nature and Society for Protection of Nature in Lebanon to study, monitor and document the flora and fauna species of existing and future nature reserves;
- promoted management planning through the preparation of the first draft management plans for the Al-Shouf, Horsh Ehden and Palm Islands Nature Reserves, distributed to all the PCC members in March 1999;
- mobilized financial donations by introducing donors to the three nature reserves through organized site visits and the distribution of management and landscape plans;
- promoted significantly national reconciliation which is an important component of the Protected Areas Project.

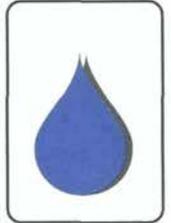


Lessons learned

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A number of important lessons were gained in the management of the Protected Areas Project which had no precedent in Lebanon and where all the activities had to start from the ground up:

- Exposing all the participants in the project to new disciplines and techniques resulted in a marked increase in their management ability.
- The most direct and cost effective means of conserving biodiversity in Lebanon is through the establishment of nature reserves and the in-situ management of wildlife.
- The most effective format for formulating policies and resolving problems encountered in managing protected areas are the Project Coordinating Committee meetings (PCCs) and the Managers Meetings (Mms), held bimonthly and weekly respectively.
- Management plans are an indispensable tool for pooling information, determining objectives, formulating policies and focusing on activities for each individual protected area.
- Landscape plans with guidelines and cost estimates are essential tools for guiding the physical development of each nature reserve and for soliciting donations as illustrated by the success of the Al-Shouf Cedar Society.
- Even though some of the partner NGOs in Lebanon are experiencing organizational and administrative difficulties in the execution of their contracted duties to the project, they are learning to organize their internal affairs and enlarge their membership base to include more professionals.



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SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

Protected Areas and Sustainable Resource Management (Turkey)

Alternative conservation management strategies of an unique and threatened ecosystems.

Policy issues preparation of the Biodiversity Strategy, identifying the major elements of the project as national

priorities.

Goals sustainable conservation of the biological diversity and ecological integrity of the internationally important forest, wetland, steppe and alpine ecosystems of the four major Turkish biogeographic zones.

Objectives The proposed project would address priority strategic recommendations, including the need for:

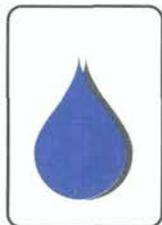
- greater public awareness and the involvement of local communities in biodiversity management,
- development of institutional capabilities for protected area and biodiversity management at both the field and central levels,
- establishment and preparation of management plans for protected areas, and
- improved monitoring and information exchange.

Background - Problems Turkey has 75% of the plant species occurring in the whole of Europe. The country has several distinct bio-geographic regions, each with its own endemic species and natural ecosystems. In addition, one of the three major flyways for millions of migratory birds passes through Turkey. Furthermore, Turkish flora include many wild relatives of important domestic species. Turkish biodiversity is of major international importance but is under threat from a variety of unsustainable land and natural resource use pressures, taken place in the country over the last 60 years. These include: overgrazing and other unsustainable agricultural practices; unsustainable use of forests; conversion of wetlands and other critical natural habitats for agriculture or other land development; interference with the hydrological regime of wetlands for agriculture, municipal and industrial use of water; pollution, hunting and unsustainable harvesting of wild plants and tubers. Designated protected area coverage is only 1% of the country.

Actors Agencies Ministry of Forestry, and NGOs through local offices of the General Directorate of National Parks Game and Wildlife of the Ministry of Forestry Local communities the Ministry of Environment, Local communities.

Project organisation, financing, time frame

- The main objective would be achieved through the preparation and implementation of integrated protected area management plans at four priority sites, each including



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representative examples of unique and threatened ecosystems, and alternative conservation management strategies.

- Local communities and NGOs would participate in planning and implementation.
- Building on the information technology system established with GEF support under the pilot phase, the project would also improve the biodiversity information base and monitoring systems needed for protected area and conservation management.
- Investments, training and institutional arrangements funded under the project would address priority conservation planning and management problems, common to many important and threatened biodiversity sites throughout Turkey and would, therefore, allow for replication of conservation management planning and implementation throughout the country. The cost of the project is \$6.5 million, the negotiations started on March 1998

Outcomes-Results

- The proposed project would support Government, NGOs and local communities in working together to ensure conservation of: (a) some of the last and largest remaining pristine and natural alluvial, Mediterranean and North East Black Sea Mountain forests, and (b) Turkish wetland ecosystems that are of international significance.
- Also, the conservation management demonstration sites include alpine and steppe ecosystems, supporting plant communities with many locally endemic plant species.
- Sustainable management of the protected area management sites, which are the focus of this project, will also benefit poor rural communities through stimulation of economic development (i.e. tourism) based on the sustainable management of natural resources, including local land races of traditional crop species.
- Furthermore, the project will improve institutional and legal arrangements and strengthen the capacity for conservation of biodiversity throughout Turkey, while raising public awareness for conservation and environmental issues, and providing improved opportunities for education.

Lessons learned

- The experience gained in the previous natural resource management projects, co-ordinated by different ministries, shows that while co-ordination between ministries has, traditionally, been very difficult in Turkey, it has been facilitated by:
 - (a) close involvement of all concerned agencies and a participatory approach to project preparation,
 - (b) clear budget allocation to each ministry, and
 - (c) organising regular co-ordination meetings of the concerned agencies.
- Additionally, the World Bank Resident Mission in Turkey (RMT) has been holding monthly



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co-ordination meetings with these agencies. Performance of both ongoing projects is currently satisfactory, with a high degree of local commitment and good progress in the field, though both suffer from the "generic" problems, common in Turkey, of slow budget releases and delays in approval of procurement by the central ministries. These constraints will have to be taken into account in project design.



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Coastal Zone Management, Turkish Mediterranean Coast (Turkey)

Nature conservation, awareness raising, integrated coastal management.

Policy issues This project involves a action programme to safeguard the most important turtle nesting beaches along the Turkish Mediterranean coast, identified from earlier surveys.

Objectives

- Lobby authorities regarding implementations in existing protected areas, for the better implementation of SPAs in Turkey, and elaboration of management plans.
- Lobby for establishing new protected areas.
- Lobby for implementing newly adopted, coastal laws.
- Organise a coastal erosion survey and report the situation to relevant authorities.
- Deal with industrial pollution.
- Establish integrated coastal management, involving local and federal authorities.
- Mobilise support from local societies.
- Promote conservation of marine turtles and coastal zones through raising awareness and organising information activities for decision-makers, local people in the breeding areas, and tourists.



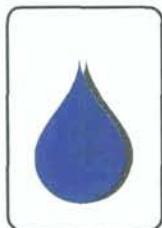
Background -Problems Loggerhead (*Caretta caretta*) and green turtles(*Chelonia mydas*) are among the most endangered reptiles in Europe. They are threatened by a variety of factors, including incidental capture by fishermen, pollution and direct exploitation. However, the most serious threat is the destruction of existing beaches through industrial and tourist developments, as well as disturbance during laying eggs and subsequent damage. Zakynthos, the largest known loggerhead turtle nesting site in the Mediterranean, has experienced a rapid expansion in tourist development in recent years, and numbers of nesting turtles have fallen sharply as a result. Protection of the remaining nesting beaches is a high WWF priority. Even more important is the need to identify other significant nesting beaches in the eastern Mediterranean, and to protect them before tourist development reaches the stage it has in Zakynthos and in the Dalyan delta of Turkey. It is estimated that, in the Mediterranean, at least half of all nesting for loggerhead turtles occurs in Turkey, while virtually all known green turtle nesting sites are on beaches of the extreme south-east coast of Turkey. Information from local residents indicates that there are also important marine turtle nesting areas in northern Cyprus, but the numbers and species involved are not as well documented. With the rapid growth of tourism in northern Cyprus likely in the near future, it is essential that data are gathered on marine turtles and nesting beaches, and steps taken to protect them as soon as possible.



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Actors Society for the Protection of Nature DHKD, WWF
Project organization, financing, time frame

- WWF's involvement in Turkey has been channelled through its associate organisation, the Society for the Protection of Nature DHKD. Collaboration between WWF and DHKD started in 1988 with a joint project to undertake a comprehensive survey of the 2.000 km-long Turkish Mediterranean coast to identify major turtle nesting sites.



- A coastal zone management plan has been prepared at October 1996 with the aim to find a balance between the demands of tourism and the needs of turtles in the Belek area.
- The last WWF project was initiated in 1990 by WWF and DHKD to campaign for the protection of 17 nesting areas according to the recommendations presented in the WWF survey.
- Up to date most of the attention has been to identify threats, create awareness about the need to protect the sites, and to persuade authorities in designating the most important areas as Specially Protected Areas (SPAs).
- Work is continuing in the preparation of management plans for specific areas, better implementation of existing coastal legislation, preparation of educational material, and raising public awareness.

Outcomes-Results The main achievements are the following:

- Seventeen sites were pinpointed as being particularly important to this instinct-driven creature which consistently returns to lay eggs in its own birth place. The survey was updated in 1994 with the assistance of over 100 volunteers.
- In 1988, thanks to intense lobbying and campaigning efforts, DHKD achieved spectacular conservation success in countering a huge tourist development complex on Dalyan, a much valued beach for loggerhead sea turtles. Dalyan was declared a Specially Protected Area (SPA) under the Barcelona Convention. For the first time in Turkey, environmental interests superseded economic ones.
- After Dalyan, another three important nesting beaches received SPA status. The effort now lies in developing appropriate management plans for these beaches, to ensure that the area is not only protected but that the human-nature interaction is harmonious and sustainable.
- In 1995, funding by the World Bank was secured to prepare a comprehensive management plan for the Belek coast. The plan incorporates such aspects as legal and administrative matters, economic and social issues, and involves local participation in an effort to ensure its long-term success.
- Information campaign, over 70 per cent of the local population thought it should be transformed into a protected area.



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Contribution and innovation

- The approach taken by DHKD and WWF is holistic. It incorporates lobbying efforts to influence government decisions, scientific monitoring and research to clearly identify threats, raising public awareness, and education. The latter ensures local support and understanding of the importance of their environmental heritage.
- The development of coordinated management plans integrates the needs of the people to those of their environment.

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SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

Society for the Protection of Prespa (Greece)

Sustainable ecotourism and environmental protection.

Objectives

- Intervene at the local level and develop the necessary strategies to maintain this area of spectacular beauty and unique

ecosystem.

- Provide information and raise public awareness.



Background - Problems Since 1974 Prespa has been a national park, the largest in Greece, and an important centre of biodiversity for plants and birds. However although having declared as a national park, little was done to develop an appropriate management plan. Most of the local inhabitants are farmers, employing conventional agricultural methods and a monoculture cultivation of beans. This type of cultivation threatens the meadow habitats for breeding birds and the water quality of the lakes from runoff of agricultural chemicals. Three international conservation organisations and six Green NGOs formed the Society for the Protection of Prespa (SPP).

Actors Greek NGOs: Goulandris Natural History Museum and its affiliate in Thessalonike, Greek Wetland-Biotope Centre, Hellenic Ornithological Society, Hellenic Society for the Protection of Nature, Hellenic Society for the Preservation of Culture and Nature (Elliniki Etairia), Arcturos, and WWF Greece. International conservation organisations: International Societies are the Danish Ornithological Society, Tour du Valat in France, and RSPB in UK, WWF, and the EC.

Project organisation, financing, time frame

- Associated activities were developed through many projects including a EU programme jointly funded by the WWF and the European Commission, called CADISPA (Conservation and Development in Sparsely Populated Areas).
- Their activities include the support of organic farming, the marketing of local products (i.e. woollen socks, herbs, dried beans) and preserves that are sold in information centres.
- Conservation activities are conducted in the area include warding pelican colonies and providing information to farmers, fishers and other local people.

Outcomes-Results

- Establishment of an information visitor centre - the first in a Greek National Park.
- Establishment of guided tours as well as an environmental education programme for schools.
- Creation of a second information centre focusing on traditional fishing practices and on the rich varieties of fish present in the lakes.



SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

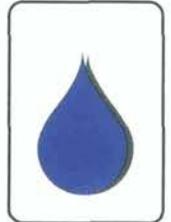
- The two visitor centres are run by expert eco-guides who are young persons from the local community trained in environmental management, interpretation and ecotourism

Contribution and innovation

- SPP has successfully intervened at all levels in the area, and continues to take a multi-layered approach to managing the lake Prespa.
- It was a sure sign of success to find that in 1994 Prespa hosted the largest colony of nesting Dalmatian pelicans in the world.
- SPP works very closely with the local community very sparse settlements, prone to emigration to the cities to encourage a change in attitudes and behaviour to work with nature rather than against it.

Lessons learned

- Local people have taken an interest in sustainable development and protection of the area.
- SPP also recognises the need to approach the wider public, and to convince the Greek government to provide adequate legislative and financial support.
- Thus, a significant part of the work in the area consists of providing information and raising public awareness.



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SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

Complete environmental management of Agios Nicolas Park - Araptisa River (Greece)

Sustainable tourism.

Policy issues Promotion of sustainable tourism and the implementation of new concepts respecting the natural environment

Objectives Achieve the touristic development of Agios Nicolas Park.



Background -Problems Agios Nicolas Park, one of Nature's monuments, is well known nationally for its beauty, its natural springs and its river, Arapitsa.

Actors Municipality of Naoussa.

Project organisation, financing, time frame The proposed actions pertain to the following:

- The management of natural resources: water, mountain-river trout, birds, vegetation and areas of recreation.
 - Sound visitor management, such as land hire, public security and safety, tourist information services and education (including environmental exhibitions, guided walks inside the woodland etc).
 - Other services, such as; exhibitions and talks (specialised and not), shows, brochures, etc.
- The study and exploitation of climatic parameters and environmental findings. The duration of the project is 15 months (Oct 1994 – Dec 1995).

Results – Outcomes Results foreseen:

- full protection and proper development of the area, ecologically;
 - creation of recreational and tourist areas; Modern tourist services;
 - lengthening of tourist season;
 - creation of new jobs;
 - securing necessary means.
- through this proposed project, a great many benefits are expected by controlled and minor interventions and constructions, which, of course, will not harm the natural environment and will bring counterbalancing profits



Contact

Project Reference: 94/GR/A152/GR/01348/KEN

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Development of eco-tourism in the Riparian ecosystem of Evrotas, near Sparta (Greece)

Environmental Protection.

Policy issues Development of ecotourism in the riparian ecosystem of Evrotas near Sparta

Objectives

- Rehabilitation and restoration of part of the riparian system, promotion of the natural beauty of the area and of the nearby archaeological sites.
- Development of an information centre for ecotourism in Laconia and of a recreational area for the town of Sparta.
- Development of models to integrate environmental factors into land-use planning and management, and socio-economic activities.
- Promotion of sustainable tourism and the implementation of new concepts which respect the natural environment

Background -Problems The tasks comprise the development of an ecological park within the riparian ecosystem of Evrotas river, which has suffered substantial destruction and degradation from human activities.

Project organisation, financing, time frame For the implementation of the ecotourism activities, it is necessary to take some preliminary actions:

- The rehabilitation of the ecosystem involves in situ mapping and property registration, repossession of the recently illegally occupied land and performance of design studies for the rehabilitation and restoration of the area.
- Subsequently a number of restoration works will be carried out involving: planting of endemic species, fencing, cleaning the ecosystem and the river bed, construction of ponds and ecological isles, construction of public facilities and promotion of the nearby archaeological sites.
- Finally, the project comprises the construction of an information centre equipped with audio-visual material and with special software providing information on the ecotourism activities in the prefecture.

The duration of the project is 48 months (Oct. 1994 - Sep.1998).

Outcomes-Results As a result, the project combines the development of ecotourism with the salvation of the Evrotas riparian ecosystem and supplies the town of Sparta with a valuable recreational area.

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SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES



SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

Promotion of tourism activities with regard to nature conservation in the mountain area of Paiko (Greece)

Sustainable tourism.

Policy issues Promotion of sustainable tourism and implementation of new concepts respecting the natural

environment.

Objectives

- Rational tourist exploitation of the mountain area of Paiko via soft-form interventions and development of activities which do not abuse the natural environment.
- Development of alternative recreational centres and activities in combination with a raised public awareness on environmental protection issues.

Actors Municipality of Giannitsa & Municipality of Goumenissa.

Project organisation, financing, time frame The duration of the project is 24 months (Sep 1994 Aug 1996). The project was funded by the LIFE program of EU.

Outcomes-Results

- Recreational activities included: the creation of information reception centres for the visitors, the construction of wooden resort cabins for a small number of visitors, the construction of pathways in the forest across passages, the creation of places for picnic and sports areas, the construction of view-towers and wooden observatories which will permit the observation of wild life and birds, the designation of places with special interest for: wayfaring, hang gliding, sports.
- Environmental activities included: special constructions for the collection of wastes in garbage cans, the construction of security view-towers for forest protection against fire and the planning for all recreational and education activities which will assure control of visitor access in the forest.

Contact



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Ljubljansko Polje (Slovenia)

Water Management and Environmental Protection.

Policy issues Supply of technical assistance in order to promote environmental planning allowing the correct management of the Ljubljansko Polje.

Objectives Define practical interventions for a compatible use of the underground hydric resources and of energy supplies, as well as structural and infrastructural interventions to endow the area of services for recreation, sport and touristic activities (Park Sava), perfectly connected with the urban system.

Background -Problems The project covers a territory of 150 ha which is located to the North of Ljubljana. Under this land flows the river Sava creating unique environmental features and high potential for economic activities (water and power supply for the city). In the area concerned, production activities (primary sector - agriculture; secondary sector - industry) use environmental resources (water and soil) and are responsible for very high levels of pollution. The expansion of human settlements on Ljubljansko Polje is a close prospect. As a result environmental balance is threatened, even if the area has been recognized as a protected one due to the important water reserves found in the underground river flowing through it (from which Ljubljana draws its water supplies). Moreover, the Sava river is the main feeder of the above mentioned underground river. The Local Administration, supported by the central Government, has recognised the importance of Ljubljansko Polje and decided to protect it, pointing out the necessity for urban planning.

Actors Local Administration, central Government.

Project organisation, financing, time frame

The project will supply the technical assistance necessary to:

- safeguard the precarious hydrogeologic balance of the whole catchment basis,
- monitor the environment of the area and
- draw up future territorial planning in accordance with these priorities.

The duration of the project is 10 months (Jun 1994 - Mar 1995). The project was funded by the LIFE programme of EU.

Outcomes-Results Results expected:

- safeguarding of water supplies for the city,
- energy supply from Sava river,
- integration of the area concerned in the urban system with recreation, touristic and sport aims.

Contact

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SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

Zaragoza: A City Saving Water (Spain)

Water use and consumption, resource management.

Policy issues The project aimed to promote a new water-saving consciousness through a more efficient management of this resource. It emphasised, above all, the importance of simple technological change in achieving a sustainability-oriented

reduction in water consumption.

Objectives

- The project was to challenge the city: to save 1,000 million litres of domestic water consumption in one year.
- To reach this objective it needs to: introduce new norms and impositions, promote the demand of water saving technologies among consumers, stimulate the market of water saving technologies, form and inform professionals in the water sector.

Background -Problems In 1995, 11 million Spaniards were undergoing daily water restrictions. There were serious inter-regional conflicts over this scarce commodity. There seemed to be only one solution: more reservoirs and more water shipments meaning high costs and harming the environment. In Zaragoza, a city of 700,000 inhabitants in the north-east of Spain, as in other cities in Spain, a triple paradox was to emerge: rainfall was scarce and irregular, water was cheap, and misused. This consumption pattern is due to: lack of norms that promote water saving, institutional policy based on rise of supply, ignorance of the existence of water saving technologies permitting more efficient water use, and when present not widely used for daily consumption.

Actors The promoter is Fundacion Ecologia y Desarrollo. Others participated through sponsorship, promotion and collaboration. Promotion Partners: City Hall, Local Government, Life Program (European Union), Fundacion Ecologia y Desarrollo (Ecology and Development Foundation); Promotion Companies: Balay, Jacob Delafon, RST, Contazara. Sponsors: Ibercaja (Financial Institution). Collaborating entities: business association, trade unions, consumer associations, University, local enterprises, mass media, educational establishments.

Project organisation, financing, time frame The project is organised in two phases.

- Preparation phase: sociologic survey about water perceptions in Zaragoza; participation's composition and structure; identification, information, sensitization of professionals involved in domestic consumption; preparation of a campaign and production of publicity material; operative organisation of the campaign.
- Executive phase: launch of the campaign; articulation of the participation of the collaborators; running of the educational activities; availability to big consumers of water



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saving information and of publicity material; running of the information service "the telephone of the water".

The budget of the project is 85 millions pesetas. Almost 50% is funded by the LIFE program of EU, while the rest is divided between local Governments, Ibercaja, the promotion Companies and Fundacion Ecologia y Desarrollo. The "Zaragoza, the water-saving city" project began in February 1997.

Outcomes-Results

- The project has shown that it is possible to deal with the shortage of water in cities, using a cheap, ecological, fast and contentious-free approach, by increasing efficiency in consumption. Although the project is not yet completed it has already managed to bring about a change in the city's water consumption patterns.
- Until now (April 1998), 592 million litres in domestic water consumption have been saved. Over 2,450 establishments and/or buildings with public washroom facilities have been involved in the campaign. Collaboration agreements have been set up with 143 concerns, involving some 92,000 adult Zaragozans.
- 168 educational establishments with their teachers and students are directly participating in the Educational Programme campaign.
- After many decades of dealing with the issue of water supply, the institutional regional policy is changing and accepts demand management as a priority.
- Over 140 establishments selling products related to domestic water consumption are collaborating in the campaign. Three of the city's property developers have decided to install water-saving devices in their new homes. Over 128 large and small firms are collaborating in the campaign. Plumbing and bathroom retail outlets collaborating in the campaign have seen a 170% rise in sales of their water-saving products.
- 90% of the media in Zaragoza are collaborating directly in the campaign.



Contribution and innovation

Spanish cities now have a successful model to follow for the most ecologically-sound method of confronting the next drought. The project is based on the criteria of Plants and Directories of Agenda 21, the Habitat Program, the V program of EU. For example: efficiency on the use of natural resources, responsibility divided between companies, institutions and NGOs, creation of auto-sustainability synergies, creation of a new environmental market, complementary technological, normative and cultural change, etc.



Lessons learned

- The most important lesson is that the shared responsibility between main players (manufacturers, retailers, consumers, distributors, plumbers etc) has managed to create a new synergy favouring water use efficiency.



SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

- Considering the most important experiences realised in domestic water saving (Mexico, Frankfurt, Madrid, Boston...) the following needs have been defined:

- Combine change in habits with technological change, persuade all actors that are part of the problem and of the solution;
- The importance of sensitising at the school level;
- The involvement of the media;
- An active campaign for the final consumer, the one pushing for environmental changes on distributors and manufacturers.



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SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

Water Community Program (Palestine, Jordan and Israel)

Creation of a community water program involving the public so that they would be empowered to participate in their own management of water use, with the help of specialists.

Policy issues By creating public interest in regional water issues and providing information for the problem, individuals and communities can be empowered to participate in water quality and quantity management.

Objectives

- Encouraging co-operation and involvement of various actors and stakeholders in water issues as responsible participants in sustainable water management.
- Satisfying basic human and environmental freshwater needs by creating transboundary
- Partnering Communities where a lack of freshwater and/or proper sanitation facilities exist.
- Raising regional public awareness and disseminating information on the experience gathered from the Partnering Community Programs in order to encourage public participation in efficient water use and waste water reuse programs across the region.

Background Increased water demand, due to population growth, industrial and agricultural expansion and increased urbanisation, requires a more rational use of water. The lack of co-ordination among countries in managing their shared water resources might lead to increased tension among people whose lives and livelihoods depend on it.

Actors The project will target small communities - Palestinian, Jordanian and Israeli.

Organisation FoEME plans to arrange meetings and workshop among various stakeholders in water issues so as to encourage their co-operation and hence to instigate participation in sustainable water management.

The project is supported by Nathern Cummings Foundation.

Outcomes The project is still in the early phase.

Contribution and innovation

Direct relevance to public participation in natural resource management to promote development and strengthening of cooperation at all levels concerned namely the lowest, national, regional and global levels.

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SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

National Water Strategy for Albania (Albania)

Water management

Objectives The programme aims to establish:

- a stable water management decision-making,
 - harmonised development efforts,
 - adequate water supply to population (public health as first concern) and industry (economic development).
- increase and diversification of agriculture output,
 - environmental sustainability supported with wise water use.



Background -Problems Water resources in Albania have been found to be widely abundant with an uneven, seasonal distribution. Surface water and, to a lesser extent, ground water availability decrease strongly during summer months. Data collection since 1990 has been insufficient. The situation concerning water quality is not well known. Since 1990, water quality parameters have become much less frequently monitored, and the impacts of recent economic changes on water quality could not be assessed.

The main problems faced in strategy formulation was:

- not well defined responsibilities,
- lack of planning,
- lack of updated information,
- lack of resource protection,
- inadequate infrastructure.

Actors Committee for Environmental Protection, Technical Secretariat of National Water Committee and BCOEM French Engineering Consultants. A Steering Committee was set-up for project monitoring.

Project organisation, financing, time frame

- The National Water Strategy has proposed an institutional framework for water resources management and protection.
- To be implemented a time table of interventions is proposed: for sector organisation and legislation, planning information, data collection and elaboration, discharge control (protection of resources) and infrastructure investments. Justification is more detailed in the study, showing plans for the process of problem identification to the attainment of the objectives.

The study have been financed by PHARE; 400.000Ecu. Time frame 12 months (1995-1996).

Outcomes-Results For the implementation of the activities under the National Water Strategy, a number of technical assistance projects have been identified:



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- Management support of the Technical Secretariat of National Water Committee
- Assistance in the implementation of the Water Resources Law and Water Supply and Sanitation Regulations.
- Assistance in the establishment of a National Water Resource Plan
- Assistance to the Ministry of Health and Environment for the establishment of an environmental permitting system.
- Water quality baseline updating: Water resource monitoring system strengthening.
- Development of a Drinking Water and Sanitation Master Plan.
- Development of an Irrigation Master Plan.

Contribution and innovation

Preparation of the National Water Strategy for Albania will contribute towards the implementation of an integrated water management policy into national economic policies.

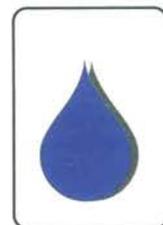
Lessons learned

An analysis of the problems linked with water resources management indicated clearly that several measures should be taken. They are summarised as follows:

- Establishment of an appropriate institutional structure to manage quantity and quality of water resources in Albania.
- Strengthening of monitoring systems for quantity and quality of surface (rivers, lagoons, seas) and ground water.
- Introduction of appropriate legal measures to control the exploitation of water resources for different uses and the pollution of these resources by undesired substances in wastewater.
- Planning for water use to control the exploitation of water resources and the protection of water quality, aiming at the elimination of water conflicts.

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Solar energy and tourist trade in Cape Corsica (France)

Solar energy - Photovoltaic.

Objectives Demonstrate that the pv solution is well adapted for illumination needs.



Actors Total Énergie. Ten different communities are concerned: Murato, Olmeta du Cap, Ogliastro, Nonza, Rogliano, Cagnano, Morsiglia, Pino, Luri, Meria.

Project organization, financing, time frame

- In the tourist area of Cape Corsica a program for the lighting of historical monuments and urban areas was launched.
- The following equipment is installed : 10 sign lamp posts; 52 street lights; 1 lighting of castle; 7 lighting of towers; 14 lighting; 16 lighting of jetties.
- The systems are of modular type : lamp systems with small pv-power (45 or 90 Wp). The lamps have a novel control card which switches them on and off using the output of their own pv module; spot light with intermediate pv-power (450 to 990 Wp).

The project cost is 285012.00 ECU. The project had a contribution of 114005.00 ECU by the ENDEMO C program of EU. The duration was 52 months (Sep 1988 - Dec 1992)

Outcomes-Results

- Installations are in operation and users are very satisfied.
- Global monitoring for two sites has been made for two years (Aug.90 to Dec.92).
- The final global monitoring report is available.

Lessons learned

- Main problems encountered were: delays because authorisations arrived too late; insufficient resistance to storms and salt aggression of masts and racks, (e.g. the 990 Wp system Rogliano was completely renovated after a storm of 200 km/h); thefts and vandalism (one 450 Wp system vandalised, another one stolen, batteries of lamp posts stolen); financing (the users do not pay their part); maintenance for the systems is insufficient.
- Despite of the problems met during the implementation and the monitoring of this project, this experience has enabled the contractor to test the sound operation of the installed systems and to improve the reliability of some components. More experience in complete project



management, including training and maintenance has been acquired.

ENERGY TRANSPORT AND SUSTAINABLE DEVELOPMENT

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ENERGY TRANSPORT AND SUSTAINABLE DEVELOPMENT

Sustainable Transport: Electric Cars (Italy)

Experimental urban use of Electric Cars.

Objectives

- Verify public attitude and concrete use conditions of electric cars in town centres.
- Increase public authorities' awareness regarding the use of electric cars at the service of consumers in town.



Actors Responsible organisation FIAT Auto - VAMIA Platform.

Project organisation, financing, time frame

- Experimental urban use of FIAT Panda with an interchange car park for conventional cars at public disposal.
- The project implied the design, construction and administration of battery recharging systems, agreements with local authorities and monitoring of the results.

Financing Italian Ministry of the Environment: 2 billion Lire

Outcomes-Results

- 140,000 km covered in 8 months.
- Information gathered about public motivation and opinions, and the performance of the cars in everyday use.

Lessons learned

The electric car, although far from being widespread, can contribute to the improvement of the quality of life in the city.

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Optimal integration of a medium size wind turbine in the local electricity grid of small Greek islands (Greece)

Energy Saving and Renewable Sources of Energy.

Objectives Install a 150 kW wind turbine on the small island of Agios Efstratios connected to the local grid of 270 kW in order to cover the maximum possible of the island's energy including the heating and hot water needs of a building.

Background -Problems The island has a permanent population of 250 persons and electricity is supplied by a small diesel plant of 270 kW (3 x 90 kW) installed capacity. Peak demand for 1987 was 180 kW and the low 15 kW. Therefore the cost of the energy produced is extremely high, reaching almost 1,2 ECU/kWh. Although the island has a very high wind potential (more than 8 m/s AMWS) no extensive use of wind energy is possible since the grid is small.

Actors Community of Agios Efstratios. For the realisation of this project the manufacturer of the wind turbine will have to co-operate with RAL (design and measurements) and CRES (for the rest and measurements).

Project organisation, financing, time frame

- A controller will keep constant the percentage of the power fed to the grid by the wind turbine with respect to the power demand. A flywheel system will be used in order to smoothen power fluctuations of the wind turbine and thus to increase the penetration ratio of the wind to the grid.
- Buildings will be heated by using a set of electric storage radiator (heater) units of 40 kW total installed capacity. Their ability to store energy for several hours during the day will help the whole system to function. A hot water reservoir with electric resistance heaters (and a small boiler for cases of emergency) will be used as a dump load of the system.
- A load management system, by using a so called peak saving control strategy, will also be used in order to balance the fluctuating demand for electricity with the power output of the wind turbine. The remaining energy surplus will be fully utilised as dump load either for the heating of the building or for the water heating. In this way the integration of wind energy can be optimised.



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The project cost is 481863.00 ECU, with a contribution of 192745.00 ECU by ENDEMO C program of EU. The duration is 58 months (Dec 1989 – Sep 1993).

Contribution and innovation

Innovation lies on the flywheel application for this size of machine and the very weak diesel grid.



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Lighthouse (Sapienza) powered by PV and wind generators (Greece)

Solar energy -Photovoltaic.

Objectives

- Demonstrate the reliable operation of a combined PV and wind generator to power a flashing beacon lighthouse in Greece.
- The long term aim is that the system should be able to operate unmanned.

Background -Problems The existing system, with a revolving oil lamp which operates using counter-weights raised by hand, is replaced by a long range flashing beacon consisting of halogen lamps each rated at 43 W. The old oil lamps requires manual winding every 1.5 hours while the lighthouse is located 96 m above sea level in an inaccessible location. Three people are continuously present to operate the existing system with a total of 6 persons working in shifts.

Actors Public Power Corporation.

Project organisation, financing, time frame

- **Technology:** The new lamp system, type DSL3 is supplied by Pintsch-Bamag is of rotary type, flashing, reaches 23 nautical miles and consumes 1.3 kWh per day at an operating voltage of 10.7 V. The PV system (1300 Wp) comprises 10 Siemens modules SM144-18 wired in 5 strings of 2 modules each.. The 2 m diameter wind generator, rated at 1000 W in a wind of 13,2 m/s, also contributes via an inverter to the power requirements of the system. Each PV array is connected to the battery via a charge controller, type LR45-24EK of Siemens Solar with two stages of load management. The battery consists of a VARTA solar battery rated at 24V/2000 Ah giving 48 kWh of storage, allowing security of power for 36 days without sun. The DSL3 halogen lamp gets its power at 10.7 V through three DC/DC converters.

- **Monitoring:** A telemetry system, powered by PV array and battery, transmits the climatic and system performance data to a central station. It does also call by telephone automatically in case of an emergency.

- The data are also stored on site on magnetic tape for later analysis. The format is in accordance with JRC Ispra Monitoring Guidelines. Monitoring data are available from April 89 to May 1991.

The project cost is 286513.00 ECU, being the project funding 114605.00 ECU by ENALT 2C program of EU. The duration is 98 months (Nov 1984 - Dec 1992).

Outcomes-Results

- The pv power supply has operated satisfactorily from November 1987 to November 1988, when, probably due to a lightning stroke, the electronic components were destroyed. It has



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been repaired and the overvoltage protection been improved . Since then the PV-lighthouse system works very well and has a high safety margin for permanent availability.

- The unit energy cost is evaluated to be 16.9 ECU/kWh for the demonstration project and 7.0 ECU/kWh for a replication. DIESEL generation costs at such a site are of the order of 2.4 ECU/kWh.

Contribution and innovation

The project demonstrates a novel flashing beacon for use in lighthouses powered by PV. The approach reduces running costs both by saving fuel and by eliminating the need for personnel on site.



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Catania: Integrating renewable energy use in urban renewal planning (Italy)

Renewable energy use

Policy issues Integrating renewable energy uses in rehabilitation planning of a historic quarter in Catania, reducing energy consumption and air pollution levels, improving bioclimatic conditions and general living comfort as well as respecting architectural traditions and aesthetic needs.

Goals Develop databases and urban planning instruments for the application of renewable energy in urban settlements all over Europe.

Objectives

- Develop a methodology for integrated renewable energy planning, applicable under local and national planning requirements and conditions. This entailed assessing current architectural and landscaping features, energy use patterns, potential applications of renewable energy uses, their technical and economic feasibility, and developing criteria for renewable energy selection in the light of applicable regulations.
- Various solutions for aesthetic architectural integration and implementation which is as cost effective as possible are to be developed and discussed.
- Test the methodology, preliminary steps for a pilot project area were taken.
- Ultimately, the resulting methodology was intended to serve as a planning tool suited for wide spread diffusion and duplication in the Mediterranean.
- Within the Italian context, the project in Catania can also be seen as an endeavour to develop a tool for implementing a national law.

Background - Problems The historical city centres of many European towns and cities, like Catania, are characterised by urban decay due to suburbanisation and general economic stress. The necessity for modernisation and maintenance work to improve sanitation systems, living comfort and indoor climate conditions, especially in old buildings, has been ignored. As a result, in recent years many municipalities have laid down re-development and re-furbishment plans to revitalise their city centres. Especially in regions like Sicily, Italy, with a predominantly warm and sunny climate but also in Northern regions, renewable energy use for heating, cooling and lighting can play an important role in planning these rehabilitation schemes. However, in order to maximise the use of these techniques in urban rehabilitation on a regular basis and in a large scale manner, a decisive pre-requisite is that renewable energy application is integrated in the urban planning process at the beginning. Various applications of passive (such as bioclimatic architectural features) as well as active forms can considerably improve energy use patterns, save fossil and financial resources and contribute to pleasant indoor and outdoor climate conditions.

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ENERGY TRANSPORT AND SUSTAINABLE DEVELOPMENT

Actors The project "Urban Planning Maximising the Use of Renewable Energies" is part of the European Union, DG XII, APAS program (APAS RENA-CT94-0026); it involved several European partners which are all members of Communities of Europe for Renewable Energies (CERE). It was co-ordinated by Saarbrücker Stadtwerke, Germany. The Catania sub-project was carried out by the Municipality of Catania as the principal actor. Participating in the investigations were specialists such as town

planners, architects and energy experts. Furthermore regular contact was established to the co-ordinator and to expert participants from CERE.

Project organisation, financing, time frame A basic methodology was developed in the following steps:

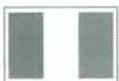
- Study of urban and architectural features, social and traditional conditions;
- Assessment of renewable energy (RE) sources and exploitation potential;
- Study of technical feasibility of possible RE techniques;
- Assessment of energy requirements; Selection of the suitable RE techniques.
- To refine and validate this methodology, a pilot study for preliminary implementation was carried out choosing three different buildings as sample units.

The project was carried out from January 1995 to August 1996. An integrating final report and a handbook for town planners, for which the co-ordinators analysed and evaluated results of the sub-projects, was published in August 1997. The project had a total budget of 80.000 ECU, of which 50% was financed through the EU APAS programme. The remaining half was covered by the Municipality of Catania.

Outcomes-Results Results obtained from the investigation of the three building types showed a number of feasible applications of renewable energy:

- Hot water and heating. In all three sample cases, due to high solar radiation values, exploitation in thermal collectors for water or space heating was selected for integration.
- Interior space cooling. Wind conditions at a low but steady flow of 2-3 m/s were determined to be favourable for natural ventilation systems if they are well driven. Together with measures to reduce solar radiation onto the building walls, they were considered sufficient to allow passive space cooling systems with only marginal support from ventilators.
- Some more general conclusions could be drawn from the investigation concerning the transformation of historical buildings in the course of time and with social change. These conclusions are based on the conviction that historical architecture was constructed in ways that integrated, intricate and sophisticated systems of natural cooling, shading, lighting and ventilation.
- The resulting recommendations should therefore be helpful as general urban planning guidelines:

- First, radical changes in the use of historical buildings often cause over-crowding of the



building, thus generating strong variations in temperature, humidity and physical as well as psychological discomfort.

- Second, artificial lighting should be avoided and, if necessary, restricted to point sources adapted to specific tasks and ergonomic needs.
- Third, urban rehabilitation planning should take advantage of the positive effects green areas can have on microclimate and living comfort conditions.
- Fourth, technical modernisation and improvements to installations and facades should respect the historical architectural character of buildings.

Contribution and innovation

The project in Catania is an outstanding example for good practice in urban development for several reasons:

- the project chose a holistic approach which tries to adapt renewable energy technologies to local planning realities and therefore has good chances of producing lasting successes;
- the project stresses the needs of inhabitants and their physical comfort thus trying to establish a counterweight to purely economic and traffic dominated development schemes common during the 1960s and 70s;
- it provides a useful tool for, and thus promotes, implementation of a national law to support the utilisation of renewable energy sources.

Lessons learned

- In summary, the methodology developed proved to be a coherent and effective guideline for the assessment of renewable energy applications in rehabilitation schemes. This holds true when the specific historic, architectural and social contexts and uses of buildings are taken into consideration.
- Thus, the methodology developed should have the potential to serve as a standardised procedure for the investigation of renewable energy uses in urban rehabilitation schemes.

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ENERGY TRANSPORT AND SUSTAINABLE DEVELOPMENT

Middle East Solar Energy Zone (Egypt, Israel, Jordan, Palestine)

Promotion of renewable energy use in the Middle East Region.

Policy issues Due to the potential effects of global climate change, the international community has taken upon itself the goal of reducing its consumption of fossil fuels. Since all four nations involved in the proposed project rely on fossil fuels for the majority of their energy consumption, clearly, alternative energy sources are needed in order to allow for sustainable development, both economically and environmentally.

Objectives

- Promote alternative development through the use of "clean" energy at selected sites in the Middle east.
- Provide data for additional research on renewable energy.
- Serve as a model for future photovoltaic (PV) development in the Middle East.
- Foster co-operation and communication between the four isolated communities.

Background Local experts in the field of solar energy have developed four projects, one each for Egypt, Israel, Jordan and the Palestinian Territories, utilising Photovoltaic (PV) cells to provide for the communities' energy requirements. These projects will serve as a catalyst for further use of renewable energy and as an example for sustainable development and peaceful co-operation in the Middle East.

Actors The respective scientific institutions from each nation will be responsible for assembling expert teams to assess the scientific, economic and social components of the study at each location. Friends of the Earth, through the consultant service of the Royal Society for the Conservation of Nature in Jordan (RSCN), will undertake the environmental study for all four locations. Relevant members of business and policy-making communities as well as members of the international funding community including Global Environment Fund, USAID, Germany's GTZ will have a role in participation, besides other potential stakeholders.

Project organisation, financing, time frame

- FoEME undertook a three-month long, detailed feasibility study to assess the scientific, economic, environmental and socio-economic merits of the project.
- The results of the feasibility study were presented in Ramallah in 1999 in a forum open to public officials, the scientific community, and interested members of the public in an effort to promote a wide base of support for implementation of the project.
- Implementation is now being sought through the EU, World Bank and other sources.



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The project is supported by Joyce Mertz-Glimore Foundation.

Outcomes-Results

- Developing a regional program will help to reduce costs by initially strengthening the purchasing power of technology buyers and in the longer term by encouraging manufacturers to produce the technology in the region.
- Secondly, a regional program would promote increased contact, joint ventures and information exchange between these sectors.
- Thirdly, the region is eager to show concrete results from the current peace process.

Contribution and innovation

- Such a project, being a regional initiative to promote and develop sustainable communities that rely on joint co-operation and communication, would bring the fruits of peace directly into the people throughout the region.
- It would help communities, suffering from lack of water resources, from no energy power for their schools and clinics and from unreliable or sustainable energy in their homes, to develop in an alternative way in harmony with nature.

Lessons learned

- Photovoltaic electrical production should be implemented in an ideal locale for exploiting solar energy of the Middle East region.
- Involvement and participation of potential grassroots would promote development and would enhance public awareness towards sustainable development.

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Bologna: The planning of an urban energy reduction scenario (Italy)

Air-quality and climate protection, Energy, Information and participation, Urban management tools.



Goals Formulate an agenda for local, energy saving activities through the elaboration of a step-by-step approach in order to combine local energy activities.

Objectives The following themes have been addressed in the Bologna case:

- The policy of energy saving has to look for innovative arrangements for the financing and incentive systems;
- Municipal-owned institutions have to act as models for environmental standard-setting and the environmentally friendlier upgrading of energy systems;
- Institutions like hospitals or the university are best suited to be test cases for energy efficiency;
- The municipality has to work out guidelines for energy efficiency in public and private buildings;
- Information campaigns should be an essential element of an energy saving strategy;
- The municipality should promote the use of energy saving technology in private sector companies;
- The public transport system should have priority in traffic policy. This should include measures for the reduction of private cars and transport vehicles;
- Waste-to-energy should be a field of activity of waste and energy policy. This should include a new waste incineration plant;
- Alternative energy production from wastes should be pursued (e.g. biogas from landfills);
- Ten per cent increase in the biomass should be reached by additional planting in public parks (+ 50,000 trees and 100,000 new shrubs) The potential of renewable energies should be studied.

Background - Problems In 1993, the City of Bologna participated in the Urban CO₂ Reduction Project of the International Council for Local Environmental Initiatives. The City of Bologna had been in a favourable position since it had already undertaken an energy study in 1983. Therefore, the comparison of the consumption structures in 1990 and 1981 revealed some significant changes. Overall analysis demonstrated that more energy was used in all sectors with the exception of residential and industrial areas. The increase in overall consumption of approximately 4% was related to a major drop in the use of heating oil and a marked increase in the use of natural gas. These results can be explained by the fact that city population declined between 1981 and 1990; that private consumption for electricity



increased; that the volume of private transport rose significantly; that the natural gas network was completed to 90%, and that the service sector expanded to a large extent. These trends also led to a 3% increase in CO₂ emissions.

Actors Local Government, NGOs

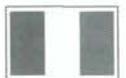
Project organisation, financing, time frame The following stages have been undertaken:

- the setting up of a local task force group in order to compile and analyse all energy-related data;
- the second stage is characterised by the working out of a catalogue of measures which may contribute to a reduction of CO₂ levels at a local level;
- the third stage focuses on the evaluation of single measures on the basis of criteria elaborated with the help of the task force;
- at the fourth stage the municipality has to outline which CO₂ reduction targets are regarded as realistic and which measures are beyond the scope of action;
- the final stage should lead to the formulation of a local energy action plan.

The project was funded by the local Government

Outcomes-Results

- With an integrated planning approach, and with the support of experts from Europe and America, the newly established task force succeeded in elaborating and defining the framework of future measures in order to achieve an optimal 29% reduction of CO₂ emission by the year 2005.
- The project focused its measures in the areas of increased use of natural gas and renewable energy, the identification of energy saving potentials, the planning of a comprehensive traffic and transport policy, and increased planting of urban vegetation.
- In the area of energy supply and use, the extension of the natural gas network has been given priority. Hydroelectric schemes are under study.
- In the area of municipal solid waste incineration, the energy recovery plant provides 6.9 MW of electricity. The solid waste dump has two internal combustion engines which produce 0.86 MW of electricity. A water treatment plant has a combined cycle gas turbine which generates 6.5 MW of electricity via a mixture of biogas and natural gas.
- In the area of combined heat and power, seven sites for plants have been selected and they will eventually be interconnected in order to establish the basis of a city-wide combined heat and power (CHP) network.
- In the area of transportation there are several measures in the planning stage or in consideration for future planning, like a light rail system, modernisation of public transport, automated access control for vehicles to the city centre, automatic traffic light control and the use of the state railway line for regional transport. New pedestrian areas and the introduction



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of electric cars are also issues for consideration.

- In the matter of green areas the target is a doubling of the park land space. In the area of environmental organisation, the municipal utilities of the City of Bologna have established the post of an energy manager who will monitor and calculate energy savings in the individual schemes, analyse the structures and technical facilities to make energy consumption monitoring possible, and continuously monitor and update energy

consumption data.

- The energy manager will also report to the city's energy office.



Contribution and innovation

The Bologna case proved to be an example of good practice for the following reasons:

- close inter-disciplinary planning approach; pooling of know-how of international experts and local actors;
- the projects' stages take into account different strategic ideas as well as individual measures;
- the planning of energy saving had taken into account the impacts in related policy areas like land use, transportation, waste management etc.

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Action Plan "ENERGY 2001" (Greece)

Energy Conservation & Promotion of Renewable Energy. Sources in the Built Environment.

Policy issues The Greek National Policy for Environmental and Energy Efficiency in Buildings for housing, commerce and service at urban level is focused on strategy and activities to change production and consumption patterns, and to promote rational use and management of natural resources.

Objectives

- Implementation of some basic principles of the 5th Action Programme of European Union for the Environment. Rational use and management of natural resources, use of renewable energy sources.
- Sustainable human settlement development (energy efficient).
- Solar, bioclimatic architecture and planning.
- Eco-energy labelling system applying in all buildings. A less than 15% increase in CO2 emissions by the year 2000, reduction of consumption of non-renewable energy resources in industry, transport and construction.



Background - Problems High energy demand in Greece began in the 1970s. Greek energy production and consumption account for 88% of all greenhouse gas emissions and for as much as 98% of CO2 released into the atmosphere in the country. Most of the building stock was produced before the enactment of the Thermal Insulation Regulations; furthermore, inadequate maintenance has led to an increase in demand for the heating and cooling of the buildings. The situation has been accentuated by a rapid increase over the last decade in the use of air conditioning.

Actors Partners: International bilateral co-operation agreements between the Ministry of the Environment, Planning and Public Works and ministries in other countries in the field of sustainable housing development should be established.

Project organisation, financing, time frame

- The Development Act (1892/90) includes many incentives contributing to the protection of the environment, funding the construction, expansion and modernisation of plants.
- Special financial assistance is provided, ranging from 40% to 55% of the total productive investment cost in different categories of development areas and activities which achieve interventions concerning: environmental protection, reduction of pollution in the soil, subsoil, water and the atmosphere, restoration of the natural environment and water recycling.



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- Tax reduction and special loans are offered for energy efficiency improvement, free design advice, etc.
- Financial assistance through the National or European Community's Budget is already offered by the relevant ministries, in the form of subsidies.

Outcomes-Results

• A data bank has been established. Priority has been given to the immediate implementation of energy saving measures in existing buildings, and in buildings constructed before the enactment of the Thermal Insulation Regulations (1979-1980), which are the majority.

- Priority to energy saving applications has been given to all buildings sheltering intensive activities (hospitals, schools etc).
- Other activities concern prices and incentives. Architectural competitions for the award of the most innovative new buildings, designed according to solar architectural principles or to their energy efficiency, are scheduled.
- During 1997-1998 many activities concerning information campaigns, seminars, national and European conferences, exhibitions of pilot projects of solar architecture and planning should be held in different cities in Greece, as well as many training and educational course at all levels.

Contribution and innovation

- Based upon the evidence of socio-economic analyses and especially behavioural patterns, it is the housing sector which has responded and will continue to respond with increased interest taking up different energy saving solutions. A large proportion of this interest involves the use of solar energy.
- Apart from the direct effects such as energy saving and stabilisation of CO₂ emissions, expected benefits from the completion of the Action Plan "ENERGY 2001" are the considerable reductions in the costs of heating and air-conditioning.
- The indirect effects of this are several and concern different factors; early evidence shows that the private sector has already been motivated by the substantial economic benefits in the production of suitable designs, building materials, application of appropriate technologies and finally the production of energy from renewable sources.
- The beginning of the comprehensive approach to energy saving in buildings has also had considerable effects in the saving of water consumption. The technical specifications of housing and development plan expansion studies ordered by Ministries, Local Authorities and Housing Associations also bear the signs of this influence.



Lessons learned

- Interactions and interrelationships affect several levels of planning, decision making and implementation, a large number of agencies, departments, institutions, NGO's, the public etc. are involved. Inevitably during the setting-up stages of "ENERGY 2001" many actors were involved; considering that those involved were already responsible for a broad spectrum of topics such as technology, materials, legislation, incentives, planning and design, energy production, industry, housing, etc., there was a need for very effective co-ordination. Thus, the abilities and the skills of those who make up the management and co-ordination committee are of paramount importance.
- However, it was found that a much better grounding on issues of sustainability on behalf of the participants would have shortened the decision making time considerably, while it would have led to better choice of areas of application. Similarly, a longer period and more resources spent in the enlightenment of the general public and the private sector would have resulted in wider and more effective applications.
- At national policy level, at least, very few of the basic principles of sustainability which concern the built environment have been formally adopted.
- Matters as rational use of natural resources in general and energy management in particular, have received minimum attention and were the main concern of research institutions, which had limited monetary resources for public enlightenment and dissemination. It is therefore estimated that the important factor of social acceptability and the fairly major changes in mentality on the part of the users will take a long time to achieve. The existing energy consumption patterns and consumer characteristics constitute an important barrier and target group which will require the long-term application of specific policies and strategies in order for the Action Plan to be effective.
- The necessity for energy co-ordination and co-operation is considered to be another problematic area, given the fact that in the past it has proved to be one of the more difficult problems in the implementation of comprehensive plans.
- The alignment of Greek standards and regulations with those of the European Union requires significant levels of investment, which the troubled economy of the country often finds difficult to achieve. These concern not only building construction materials but also technical infrastructure, specialised skills and training as well as expensive and sophisticated certification mechanisms.
- Finally, the powerful interests of agents promoting conventional technology, who offer



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continuously reduced prices for their products and design as opposed to the fairly high initial cost of acquiring and installing technologies which promote sustainability in the energy sector, can be considered as a factor which creates both a conflict and a barrier to the build-up of momentum for the application of the Action Plan.



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Green awareness - An action programme to sensitise Cypriots to conservation and environmental protection (Cyprus)

Arising awareness, environmental policies and action programmes for the protection of nature.

Policy issues Sensitise all Cypriot public, especially public and private decision-makers at the national and local level, to the need for conservation based policies, thereby contributing to the harmonisation process for the admission of Cyprus in the European Union.

Goals Promote environmental educational awareness within Cypriot society, thereby, protecting natural resources and heritage, as well as facilitating the island's harmonisation with European environmental legislation and standards.

Objectives

- Implementation of an awareness-raising campaign aimed at various target groups according to their 'multiplier effect'.
- Sensitise all branches of Government to follow a conservation-aimed policy as part of overall national planning. This will involve submission of studies and position papers to appropriate government and other departments, and organisation of seminars with speakers of international repute for decision-makers, senior politicians and elected representatives at the national and local level as well as administrators at district level.
- Offer guidance and advice to rural communities on regeneration through sustainable development; provide field study courses for teachers and students, including preparation of educational materials. These activities will be done through a co-ordinating office in Limassol and an Environment Studies Centre in Laona, Paphos, which is currently being restored and extended, and will act as a training venue, a repository of specialist information, and a data basis for habitats.

Background - Problems Cyprus has preserved many geological and other unique environmental features. It thus hosts many rare Mediterranean floral and faunal species, and is a resting place for migratory birds. It also provides a hatching ground for the green and loggerhead turtle.

The need to rebuild Cypriot economy, particularly its tourist infrastructure, has given emphasis to economic development rather than environmental conservation. The concepts of sustainable development and environmental protection are now being considered seriously by the National Government, but there needs to raise public awareness and provide specific guidance to decision-makers and administrators.

Actors Cyprus Conservation Foundation.



Project organisation, financing, time frame The project comprises three main components:

- Full commissioning and equipping of the Environmental Studies Centre of the Cyprus Conservation Foundation.
- Organisation of courses, seminars and other events to sensitise Cypriot public to environmental issues.
- Publication of documents and other material.

The programme, which had a budget of around ECU 400.00, of which 70% was funded by LIFE 95 has just been completed.

Outcomes-Results

- The Green Awareness Project included funds for equipping the Environmental Studies Centre laboratory. Staffed by two biologists and a forester the Centre, has gone on to offer 98 day courses to Cypriot-public schools, 53 weekend courses to Cypriot schools, public and private as well as the University of Cyprus; and by the end of June 1999 it had also offered 37 courses to a number of overseas establishments who now attend courses regularly. They include the Birmingham College of Tourism, the Bayanl School Bahrain, the English College Dubai, the English School of Riyadh, the English School of Jumeirah, the International Emirates School, the International School of Israel, the International American Academy, the Qatar International School, the St' Christopher's School, Bahrain, the School of Sanaa, the Schools of Bayan and Nassem, Universities of Cardiff and Derby. Overall, approximately 5.500 students visited the Centre.
- The Foundation Headquarters at Limassol are responsible for the organisation of seminars for decision-makers which have been funded through the Green Awareness Project. Their activities have included seminars on "Harmonisation with European Environmental Legislation and Practise - Citizen's rights and obligations", for three political parties during 1996, five seminars for local authorities on "Local Government and Prospects of Upgrading in the light of European Precedents" during 1997 and two seminars with direct EU participation in 1998 concerning the introduction of the *acquis communautaire* (community legislation) to Cyprus.
- The project has offered seminars on environmental and development issues to Cypriot political parties, to local government representatives and technocrats. It has often invited international personalities to address lawyers and jurists as well as the business sector. They have included former EU Commissioner Mr Yiannis Paleokrassas, Justice Mr Michael Decleris, ex Vice President of the Greek Administrative Court, Members of the European Parliament and senior EU officials.

Contribution and innovation

The Foundation's objectives are two fold: to sensitise modern decision-makers through seminars and other activities directed at specific target groups within the community; and to



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pass on an environmental message to potential citizens, i.e. school pupils and students, so that they may deal with the planet earth and its resources with greater responsibility.

Lessons learned

Extensive involvement with local communities of Laona and government officials, made the project team aware of the great need to sensitise Cypriot society generally to environmental concerns.

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Green Action (Croatia)

Rising awareness.

Policy issues strengthening of public participation in the decision-making process with respect to environmental protection and sustainable development

Objectives



- Establish a Legal Working Group and provide individuals and NGOs with legal assistance and help them by making the Green Phone accessible.
- Improve the existing Green Phone (GP) service by fostering more effective use of legal instruments by the general public.
- Increase the interest of the identified target group of currently passive supporters by distributing the GP newsletter.
- Stimulate public discussion of environmental issues by organising monthly public round-table meetings.
- Present complete legal analysis to individuals and NGOs on environmental problems.

Background -Problems Green Action is among the most well-known environmental NGOs in Croatia. Established in 1990, it has approximately 700 active members. In addition to local initiatives around Zagreb, Green Action co-operates with other NGOs at the national and international levels. It co-operates also with national governmental institutions and participates in the Legislative Working Group of Parliament's Environmental Committee, the Commission for Eco-Labeling and the Government Co-ordination Committee for the Protection of the Ozone Layer.

Actors Green Action, Citizen groups, government officials and the media.

Project organisation, financing, time frame

- The recently established "Green Phone Legal Working Group" comprises mostly law students with an interest in environmental issues working with the guidance of an environmental lawyer. The group addressed the lack of capacity to respond to an unexpected increase in the number of requests from the general public. Group members take calls and provide legal advice twice a week. Two model cases were chosen for the case study, in which outside experts were involved as well.
- Model cases of public participation undertaken by GP's Legal Working Group were published along with other articles in the newsletter Zelena Akcija, of which 1,000 copies were printed. All published materials aimed to motivate new activists and overcome the lack



of environmental information in the mass media.

- Round-table discussions were held to discuss model cases. Announcements on radio, advertisements in daily papers and direct invitations encourage participation.
- A press conference was held at the outset of the project to inform the media and the public about the project.
- The Legal Section's work consists of a weekly meeting at the Green Action (GA) office and of direct field work with citizens involved in cases. The discussion focuses on pinpointing available steps that can be taken to solve cases, including formal and non-formal instruments. An advertisement was placed in a daily newspaper to boost the number of requests for information. However, except for inquiry calls, not one letter has been received since the ad first appeared.
- As a result of the GA Legal Section's work, a database on environmental legislation has been created and a small library is being established containing information related to legal aspects of environmental protection.
- Monthly round-table discussions have been organised to discuss priority environmental topics with the participation of all interested parties. Citizens, GA activists, representatives of city agencies and the media were invited with the goal of strengthening co-operation among the various players in environmental cases.

The amount awarded is 11,118 ECU.

Outcomes-Results The project helped to establish the Legal Section working in useful interaction with other sections of Green Action and resulting in significant activities on specific cases.

Contribution and innovation

- In the Croatian environmental movement this is the first time that a grassroots environmental NGO succeeded in involving a group of law students and a law expert in its work on a permanent basis.
- Despite the problems experienced during the project, the Legal Section plans to continue its work raising awareness about the use of legal tools for public participation and encouraging citizens to take a more active role in environmental protection.

Lessons learned

- Because of the low level of public awareness and interest concerning environmental problems, only few phone calls and letters were received and answered by the Legal Working Group.



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- Citizens have been mostly interested in using non-formal instruments rather than seeking legal help or going to court. Although formal and legislative means of environmental protection do exist, legal constraints have nonetheless hindered the activities of NGOs.

- While the project was certainly useful, tangible results could not yet be perceived during the project period. Nevertheless, the

establishment and continuous operation in Croatia of the Green Action Legal Service has been a success.



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Sustainable Tourism Training Pack for Teachers (Spain, Italy, Greece, Malta, Cyprus, Portugal)

Environment and sustainability into tourism school studies in the Mediterranean.

Policy issues Issues related to the environment and sustainability of the tourism sector for education purposes.

Objectives Supply information on adequate tools available for trainers in Mediterranean tourism schools, enabling them to incorporate sustainability issues into tourism studies.

Background - Problems Many future decision-makers and employees in the tourism industry studied in tourism schools. However, most schools do not include education on sustainable development in their curriculum. Relevant publications exist but schools are often not aware of their existence.

Actors Directly involved tourism teachers in selected schools in six participating countries (Spain, Italy, Greece, Malta, Cyprus, Portugal) with members of FoE. Information distributed to tourism schools and authorities in many other Mediterranean countries.

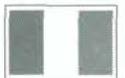
Project organisation, financing, time frame

- FoE carefully selected materials and chose a limited number in order to form a comprehensive pack including videos, books, case study reports etc., covering a wide range of issues on sustainable tourism. These were presented to teachers in selected schools in the six participating countries by way of public seminars and teachers workshops.
- Prior to this a training seminar for FoE groups was organised by FoE Spain in the Tourism School in Ibiza. Teachers were encouraged to test the materials in their classes and FoE evaluated, with the teachers, their usefulness.
- The chosen materials were also evaluated by several international academics in a workshop in the Balearic Islands University.

The project was given guidance by representatives of ATLAS (European Association of Tourism and Leisure Studies) and lasted 18 months until July 1998. Co-financed by DGXI.

Outcomes-Results

- Continued co-operation between FoE groups and participating schools.
- Many teachers are using the material in their classes.
- FoE published a Resource Directory giving information for the selected materials and where to acquire them. This is being distributed to tourism schools throughout the Mediterranean and Europe. The Directory was co-financed by the Environmental Foundation, U.K.



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Contribution and innovation

Facilitates information to tourism trainers on sustainable development issues which will in turn be passed on to future decision-makers and employees in the tourism industry.

Lessons learned

- Pre-established courses and curricula make it difficult to introduce new material; teachers do not have thorough understanding of the issues and need further training.
- Most teachers felt that more effort must be put into promoting sustainable development issues in tourism schools through seminars, interchange of experiences, courses for teachers etc. FoE is working towards developing a series of conferences for this purpose with various tourism academic associations.

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The Mediterranean Free Trade Zone (MFTZ) and the Environment (Regional)

To have significant impact on the sustainable development of the Mediterranean Basin.

Policy issues The project will attempt to set up a program of co-ordinated action for Euro-Mediterranean NGOs, to take into account the environmental respects of the MFTZ as it relates to the Euro-Mediterranean Partnership.

Objectives

- Research on environmental impacts in the Mediterranean, resulting from the creation of the Mediterranean Free Trade Zone (MFTZ).
- Integrate environmental considerations at the earliest stages of negotiations for the MFTZ.
- Raise awareness throughout the Mediterranean Basin about the relationship between the environment and the MFTZ.

Background - Problems In order to prevent a negative impact on the environment due to the promotion of economic activity within the FTZ, an increased capacity is required to manage the increased economic activity in an environmental way.

Actors This project is being conducted in co-operation with three other organisations investigating impacts of the MFTZ on other economic sectors of Mediterranean States.

Project organisation, financing, time frame

- The structure of this project will consist of three phases corresponding to three years.
- One year is allocated for each organisation to research and prepare reports that will later form a chapter in a book.

The project is supported by USAID.

Outcomes-Results

- Looking forward to holding a seminar in Brussels which will be followed by three regional meetings around the Mediterranean.
- As a result, the publication of a report in the form of a book will take place.

Contribution and innovation

Importance of raising awareness among the people of the Eastern Mediterranean regarding the need to prevent or minimise the negative environmental and social side-effects of the MFTZ.

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ECOSVET: Legal and Non-formal Support to Environmental NGOs (Slovenia)

Stimulation of public participation, support legally NGOs

Policy issues strengthen of public participation in the decision-making process with respect to environmental protection and

sustainable development



Goals

- To stimulate a higher level of legal culture within NGOs.
- To improve non-formal public participation with a special emphasis on coalition building.
- To contribute to positive political thinking by establishing arenas where political forces and civil society can communicate with each other.
- Collect data and materials on environmental legislation and provide an advisory service.

Objectives

- Provide legal and non-formal advisory services to the NGO community.
- Improve public participation capacity of NGOs with input from experts on law and social issues and by stimulating the process of learning with the input of Slovenian and foreign NGOs.
- Improve communication between top decision-makers and NGO representatives.
- Link environmental NGOs on the national level by enabling them to use the Internet.

Background -Problems LABECO, the Centre for Ecological Research is engaged in education, seminars, courses and consultations for NGOs, primary and secondary schools (pupils and teachers) and for the general public. One of LABECO's most important programs, "ECOLAB 1.O," is an environmental computer network providing access to information and promoting networking among NGOs, other civic organisations and the general public. LABECO established the ECOSVET project to carry out legal and non-formal advisory service activities.

Actors environmental NGOs and citizens involved in environmental decision-making.

Outcomes-Results

- A survey and analysis of environmental legislation.
- A database on state and local organisations engaged in environmental protection.
- A legal advisory service to consult NGOs and the general public.
- Networking activities to promote the participation of law and social science students in the work of NGOs.
- A workshop, "Environmental Coalition - Building and Lobbying," for NGO activists to strengthen co-operation.



- Materials compiled on cases that have received assistance from LABECO's advisory service.
 - A computer database was made available on the Internet at <http://www.kud-fp.si/retina/okolje/ecosvet/index.html>.
- Most objectives were met during the project's implementation phase. The organisation enjoyed good co-operation with NGOs during the project. Numerous NGOs came forward to request legal advice or other types of assistance regarding public participation.

Contribution and innovation

The project carried out by LABECO's advisory office, ECOSVET, marked the first instance to date that an NGO has provided legal and non-formal help to NGOs in Slovenia on environmental issues. The project's main achievement was the establishment of this service; furthermore, many environmental problems have received more attention and now have a better prospect of being resolved because of the legal and non-formal support provided by ECOSVET.

Lessons learned

- The major problems encountered by the project generally stemmed from the fact that while threats to the environment are often immediate and substantial, legal procedures to stop questionable activities and alleviate impacts are too slow to guarantee quick intervention.
- Considering the number of requests received by the organisation, the set-up and operation of the advisory service was fully successful. The contribution of the organisation was of help in further cases that saw participation.
- Experience has shown that some local governments are ambivalent because they could earn substantial income from certain investments. They have been compelled, however, by pressure from the community or from NGOs to oppose such plans.

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CHORUS Project: Urban and Social Revitalisation (France)

Economic activities in urban centre

Policy issues Regeneration of the historic centre economically and culturally, through encouragement of economic activity and promotion of cultural and tourist attractions.

Goals Address these problems by regenerating the historic centre economically and culturally, through encouraging economic activity and promoting cultural and tourist attractions.

Objectives

- Offer demonstrative solutions to Besançon's problems.
- sustainable development and employment as a result from the expansion of commercial and cultural activities in the centre.
- Create in the short-term 13 jobs at the "Time Museum", 44 in the market place and 15 in the Saint-Jean district.
- Address the problems of the historic core on the success of this partnership

Background - Problems The city of Besançon has a wealth of historic buildings which tend to be overlooked and undervalued by visitors. The historic centre suffers from problems common to the historic cores of other cities. Narrow streets make access and traffic circulation difficult. Shops and businesses in the area face tough competition from those in the surrounding districts where circulation is less of a problem. In addition, a lack of cultural activities means that the city attracts very few tourists. This has led to a decline of economic activity in the city centre.

Actors The pilot project was developed within the framework of a partnership created in Besançon in the 1990s, involving representatives from local and regional governments, the Chamber of Commerce and Industry, crafts associations and other private sector representatives.

Project organisation, financing, time frame The pilot project consists of four actions to support and develop business, the arts and crafts sector and to promote tourist and cultural activities:

- Through a package of measures to stimulate economic activity, major infrastructure works will be undertaken to construct an "old-style" covered market in the present market square, with space for 54 stalls;
- To create further tourist attractions in the centre, the historic Palais Granvelle will be restored and converted into a "Time Museum";
- The third package of measures proposed by the project aims to create links between the



"Time Museum" and other cultural attractions in the historic centre, such as the "Museum of Arts and Archaeology" and the "Citadel Museum". Links will be created through a series of tourist walks. Other actions involving the artisan sector are also envisaged, including a system of "quality labelling" for artisans adhering to a "tourist standards charter";

- The fourth action involves the redevelopment of the Saint-Jean district, situated on the southern edge of the historic centre, at the foot of the Citadelle. The area has recently suffered from a downturn in its economic activity. In order to define actions for the revitalisation of the district, an in-depth study will be undertaken to collect information about companies in the neighbourhood.
- Following the study, actions to redevelop the area will be launched, for example, converting vacant property to suit small businesses.

The project is an Urban Pilot Project (Phase II, 1997-99) supported by DG XVI of the European Commission

Outcomes-Results A number of projects have already been carried out, including the construction of a tunnel under the Citadelle to reduce traffic circulation problems.

Lessons learned

The strength of the CHORUS project lies in the fact that it is an integral part of the town's overall development strategy combining transport policy, measures to support and maintain activities in the town centre, policies to promote local business and actions to restore building façades.

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Ulixes 21, for sustainable tourism in the Mediterranean (Regional)

Awareness-raising campaign for sustainable tourism in the Mediterranean aimed principally at tourists, local tourism managers, and local population.

Objectives Ulixes 21 is a project aiming to inform and raise awareness of the agents involved in tourist activity on the need for greater integration of environmental problems in the planning and consumption patterns of all tourism activities in order to ensure sustainable tourism development along the Mediterranean coastline.



Actors Project Ulixes 21 has been designed by EcoMediterrània and carried out by: EcoMediterrània (Barcelona), The Comité de Liaison des Associations pour l'Environnement du Languedoc-Roussillon (CLAPE-LR, Montpellier), The Association de Protection de l'Environnement pour la Wilaya de Tetouan (APEWT), The Association Marocaine pour la Protection de l'Environnement (ASMAPE, Rabat), The Ecological Malta Foundation (ECO, Malta). All of which are members of MED Forum, network of Mediterranean NGOs. The first phase was carried out during 1997 and 1998. From January 1999 on, it is the MED Forum network itself that has been developing the project.

Project organisation, financing, time frame Sphere of action:

- Tourist-receptive countries: France, Spain, Malta, Morocco...
- Tourist-emitting countries: Germany, United Kingdom, France...

Project Ulixes 21 has been financed by Directorate General XI of the European Commission, the Languedoc-Roussillon Region, the Environment Ministry of the Generalitat of Catalonia, the Junta of Andalusia, the Balearic Islands Government, and the City Council of Sant Feliu de Gu_xols. There have also been contributions from the city councils of Tarragona, Calvià, Roses, Gruissan, Argelès-sur-Mer, and other collaborations.

Outcomes-Results To reach the majority of involved agents, 6 different actions have been carried out:

- The awareness-raising campaign aimed at tourists "Wanted: the tourist of the future".
- The publication of the book "Sustainable tourism in the Mediterranean. Guide for local management" aimed at tourist managers.
- Web site [www.medforum.org/ulixes 21](http://www.medforum.org/ulixes21).
- International congress "Sustainable tourism in the Mediterranean. The participation of the civil society."
- The travelling exhibition "The Mediterranean towards sustainable development".
- "Appeal for sustainable tourism in the Mediterranean".

Lessons learned

- The main virtue of this project is that it has designed specific materials for each one of the social and economic sectors implied, without leaving any of them unattended.
- A specific emphasis was given on the campaign aimed at tourists so that they might help to define a new, more sustainable tourism model.
- The project results have motivated the MED Forum network to assume the project as its own and to expand it to other regions.

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The Mediterranean towards Sustainable Development (Tunisia)

Project carried out in 5 Tunisian cities: Sousse, Marsa, Hammamet, Zarzis, and Tabarca.

Policy issues Preparation of environmental diagnoses and definition of local, sustainable development projects based on the

joint work of local NGOs, administrations, and other socio-economic organisations from these 5 municipalities.



Objectives

- To draw up concrete projects of sustainable development on the local level.
- To stimulate participation in the diagnosis of environmental problems so as to involve civil society.
- To promote cooperation between NGOs (EcoMediterrània and ATPNE)
- To evaluate the set of environmental problems of the municipality and define an action plan.
- To promote the training of technicians.
- To develop an Environmental Education program aimed at citizens and schoolchildren.

Actors City Council of Barcelona, County Council of Barcelona, EcoMediterranea, ATPNE

Project organisation, financing, time frame The City Council of Barcelona funded 7.000.000 pesetas, The County Council of Barcelona funded 7.000.000 pesetas. The total is 14.000.000 pesetas.

Outcomes-Results

- The initial objective was the preparation of 5 projects, 1 per city; however, only 3 were prepared:
 - "Creation of a natural reservoir in Ras-Khsim, Zarzis."
 - "Decontamination of the Sousse lake and management plan for a zone affected by the dumping of wastes in an area near the town."
 - "Reusing of sewage water for irrigation in the area south of Hammamet."
- Evaluation of the environmental situation of each municipality.
- Preparation of concrete action proposals on a municipal level.
- Technical training
- Environmental education through an exhibition on the Mediterranean.



Contribution and innovation

The applied methodology in the elaboration of urban environmental diagnoses, and the projects proposal were made on the basis of the extensive participation of the involved sectors: the local Administration, NGOs, businesses, technicians, the University, and young people.

EMPLOYMENT TRAINING INFORMATION EDUCATION AND ENVIRONMENT

Lessons learned

Achieving civil participation is difficult in a country where civil society is not very structured and associations are highly dependent on public authorities. The objective of these types of projects is precisely the reinforcement of these social organisations.

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AGRICULTURE AND RURAL AREAS

Preparation and implementation of a pilot action for the conservation, improvement and economic promotion of Barcelona suburban agricultural area (Spain)

Environmental Protection, land use planning, tourism & integrated socio-economic actions.



Policy issues Institution of an Agriculture Park following sustainable development criteria

Goals Create a sustainable model for the zone guarantying the conservation of its natural values and development.

Objectives

- Determine the characteristics of a potential 3000 hectare Agricultural Park in the delta and lower valley of the Llobregat River, for the conservation, improvement and development of the outer-suburban agricultural and natural areas of the Barcelona Metropolitan Region.
- The proposed Llobregat Agricultural Park may resolve the problem of conservation and development of the area. Territorial planning (town planning measures) must be combined with a policy aimed at the economic promotion of the area's agriculture (including infrastructure improvements, application of singular structural measures).

Background - Problems The central sector of the Barcelona metropolitan region is environmentally complex. It has several protected natural areas, alluvial farmland and a seafront, subject to heavy social usage. These more or less natural environments must coexist alongside a large, diffuse built-up area. The ensuing human pressure can be seen in the deterioration of environmental resources and values.

Actors PROELSA

Project organisation, financing, time frame The duration of the project is 24 months (June 1996 May 1998). The project cost IS 923861.00 ECU, of which 346904.00 ECU has been founded by LIFE program of EU.

Contribution and innovation

The inclusion of different sector measures in a single project is a methodological novelty for a peri-urban area in the throes of an agricultural and environmental crisis.

Contact



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Establishment of Notranjski park and Uniesco Mab reserve - Notranjski Kras (Slovenia)

AGRICULTURE AND RURAL AREAS

Sustainable Agriculture, Eco-tourism, Housing and General Behaviour.

Policy issues First phase of the establishment of a Regional Park in the karst area of Notranjska.

Goals Establish a holistic model ensuring sustainable development of the area, in order to promote the territorial integration of various sectors as well as the integration of protection and development objectives.

Objectives

- Establishment of a Management Agency to implement the overall management plan.
- Introduction of Codes of Practice for Sustainable Agriculture, Eco-tourism, Eco-housing and General Behaviour.
- Habitat conservation according to the Ramsar Convention, in a manner compatible with human development.

Background -Problems The unique area of karst country known as Notranjska has been proposed by the four constituent Municipalities to be a Regional park. The proposal has been reinforced by the preliminary acceptance of the areas as a UNESCO Biosphere Reserve under the MAB Programme, while the Slovenia national Government is considering legislation to confirm the status of the Park.

The karst area is particularly valuable because of its biological diversity, including 30 endemic species recorded in the IUCN Red List of Threatened Animals. The area is also home to a complex river system, and contains the largest uninterrupted, natural and intact woodland area in the region. The Cerknisko plain and its intermittent lake have been declared a Natural Heritage area and have been proposed for designation under the Ramsar Convention

Actors Environmental Protection Development Fund

Project organisation, financing, time frame

- The Proposed first phase of the establishment of the Park has three components:
 - a Management agency to implement the overall management plan;
 - detailed management plans for Rakov Skocjan, a wetland area forming one of the core zones of the Park;
 - within the outer buffer zone area for the Park Codes of Practice for Sustainable agriculture, Eco-tourism, Housing, and General Behaviour.
- The establishment of protocols will be based on the balancing of active conservation with sustainable human development in the area.

The duration of the project is 18 months (Oct 1994 - March 1996). The project was funded



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by the LIFE program with a contribution in Euro of 176.099,04, 45,98 % of the total budget (382.997,46 Euro).

Contribution and innovation

- Specifically, the project is intended to encourage biological methods of modernising agricultural practices and to devise tools ensuring implementation of such methods. In order to widen the economic base for local populations, it also envisages the development of eco-tourism in the region.
- Sound management of the designated area is also important. This is to be achieved by creation of a management plan allowing for co-operation among local populations, species, habitats and activities, and by consideration of ecologically sound housing and sanitation systems for local population.



Contact

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Sustainable rural development through the re-introduction of the Ginestra cropping (Italy)

Introduction of models to integrate the environment in the land-use planning and management of the rural environment.

Policy issues Use of environmental friendly crop in the management of the rural environment

Goals Implementation of a model suitable to manage marginal lands ensuring sustainable development of the rural environment.

Objectives Perform an agro-industrial initiative with the aim of introducing innovative activities suitable to create environmental protection and socio-economical productive implementations, on some agricultural lands actually lost or with depletion in progress.



Background - Problems Broom, suitable for the production of fibre, was in the past a very interesting crop in the Mediterranean regions. However its cultivation was abandoned because of the development of other fibre crops (cotton, flax), with easier cropping facilities, but with a negative environmental impact due to the large need of chemicals (fertilisers, weed controls). Broom belongs to the leguminous species (self fertilising) and it is so strong to gain against weeds. Broom root apparatus allows the protection of soils from slides. Broom's fibres can be utilised as a textile fibre and as a reinforcement of composite materials substituting polluting fibres like asbestos and glass fibre.

Actors Agricola Arna (Perugia)

Project organisation, financing, time frame The project includes the agronomic phase, the realisation of a harvesting machine, the realisation of a fibre extraction farm unit, tests and trials, information diffusion. The duration was 48 months (Jan 1995 -Dec 1998).

Outcomes-Results

The industrial applications of the Ginestra cropping are the:

- Production of fibres for textiles for strong and/or fashion clothes.
- Use as a reinforcing fibre in high quality components, replacing conventional glass-fibre and other fossil-dangerous fibres.
- Use as a row biomass for energy or panels.
- Production of natural products (yellow colour, proteins, paste, etc)

Some social and environmental benefits of the use of Ginestra are:

- Ginestra is specialised in soil defence and improvement (combat of desertification, landslides and erosion).



AGRICULTURE AND RURAL AREAS

- Landscape effects and creation of a new cheaper rural employment.

Contribution and innovation

Broom, an environmentally friendly crop, can be cultivated with innovative methodologies, allowing economic yield and new employment.



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ITALY



Cleaning up the countryside (Spain)

AGRICULTURE AND RURAL AREAS

Promotion of sustainable development and the quality of the environment .

Policy issues Promotion of sustainable management of agricultural waste.

Objectives

- Create a system wherein those that generate agricultural waste pay for its collection and whereby recycling industries and other economic initiatives could be set up.
- Foster a healthy environment popular for tourists, avoiding further deterioration, and improving already damaged conservation areas.

Background - Problems The agriculture of our district generates 8.000 tons of plastic waste and 350.000 tons of vegetable waste per year, which, for want of alternatives, have been cast indiscriminately into the environment including conservation areas.

Actors Ayuntamiento de El Ejido.

Project organisation, financing, time frame The duration of the project was 24 months (May 1994 - April 1996). The project was funded by LIFE program of EU.

Outcomes-Results

- This system proposes the establishment of transfer centres, with free access for growers, and the support of a public collection service from the greenhouses by containers and compacting lorries which would maximise collection routes.
- The excess of green material would be used in regenerating excavation areas; it would be compacted in high density with a mixture of earth from the walls thereby not only keeping clean the exploited agricultural area, but protecting conservation areas suffering from this aggression.
- The project is accompanied by a strong consciousness-raising campaign with environmental education in order to achieve a change in the attitude of the growers and also to offer a valid example of ecological management to other regions, with similar uses and problems.

Contribution and innovation

- A huge quantity of primary waste, which is now spread and impossible to collect would be easily available for the recycling industry.
- A structure would be achieved to restore other excavation sites which have been abandoned since reaching the water line and have become wet zones where many types of aquatic and migrating birds find refuge.

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AGRICULTURE AND RURAL AREAS

Installation and management of a met station network system in the Guadiana river Basin in order to help farmers to save water on a regional basis (Spain)

Protection and conservation of areas of fresh ground water and fresh surface water.



Policy issues Promotion of an irrigation management program to optimise water use in areas with high demand.

Goals Water conservation.

Objectives Crop Et. estimates on a regional basis with a meteorological network system to help farmers to optimise the use of water for irrigation.

Background - Problems The upper Guadiana basin lies within the Central Spanish Plateau and covers some 16,000 km² from the source of the river Ciguela tributary to its outlet in the reservoir of the Vicario. Agricultural development since 1972 has been achieved by irrigation through pumping of groundwater. Total irrigated surface area has increased considerably in the region for the last 20 years. The intensive use of the water from aquifers, especially during long periods of low rainfall have led to a dramatic and dangerous decline in groundwater levels, which has resulted in the disappearance of important wetlands (such as the Tablas de Daimiel) and a decline in water quality. Much of the irrigated land is managed by farmers with no tradition of irrigated crops, having very poor application efficiencies. Because of this reason an irrigation management program is necessary to help farmers in saving water.

Actors D.G. Produccion Investigacion * Formacion Agraria.

Project organisation, financing, time frame

- An irrigation management program with a meteorological network system is proposed for irrigation scheduling in the Guadiana river basin by the Extremadura Region (western Spain).
- Information will be given by a central computer to the different users through a digitised voice system.

The duration of the project was 48 months (Jan. 1995 - Dec. 1998).

Outcomes-Results

- A meteorological station network system is proposed for a regional real time irrigation scheduling to help farmers in better using irrigation water.



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- The system should be easy to use, by means of a simple touch tone phone call to get the information of water status and best time for irrigation on each particular farm.
- Beside met data, ancillary data should be taken (water volume content with a neutron probe, soil types, irrigation system and type of crops).
- All this data will be processed in a central processing office to facilitate the final information to the different farmers.

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AGRICULTURE AND RURAL AREAS

Guarantee the quality of sludge recycled in agriculture by managing the whole treatment system (France)

Sludge recycling.

Policy issues Ensure that the sludge agricultural outlet is reliable and still competitive compared with landfill disposal and

incineration.

Goals Demonstrate the quality-management method for sludge recycling in agriculture by monitoring the whole of the treatment system.

Objectives

- Validation of an innovative methodology.
- Validation of efficient and reproducible management tools.
- Produce a written commitment of the producers on the quality of sludge.

Actors The project promoter is Anjou Recherche, the research centre of the Générale des Eaux Group in the field of water treatment. The partnership includes: SFDE (a water treatment company), SEDE (a company specialised in sludge recycling) and Orval (an agricultural specialist).

Project organisation, financing, time frame

- The project will be located in Saint-Thibault-des-Vignes, Seine-et-Marne. This site has been selected because it is representative of most of the European sewer systems recycling sludge in agriculture.
 - The stages of implementation have been :
 - Diagnostic: on real sites in France, a risk assessment study about pollution and sludge contamination, along with an analysis of the whole process of sludge production, from the discharge of waste water into the sewerage system to the use as a fertiliser on the land.
 - Analysis and conception: definition of solutions and methods to insure the quality of the sludge to be recycled in agriculture and their acceptability by the public.
 - Verification and transposition: on real sites, validation of the actions and methods defined on stage 2.
 - The whole process could rely on numerous analyses, including agronomic experiments to evaluate the sludge performances as fertiliser.
- This project which was also supported by the Agence de l'Eau Seine-Normandie (a public water agency), started in September 1996 and has been completed in March 1999. The project cost was 602574.00 ECU and it had a contribution of 169576.00 ECU by the LIFE program of EU.





Outcomes-Results

- Following the identification of the critical points in the sludge production process, a procedure of quality warranty insuring the good quality of the sludge to be recycled as well as the detection, selection and elimination of contaminated lots.
- An approach to improve the sludge disposal and limit the drawbacks (i.e. bad odours) for the users and the neighbours, including public information aspects.
- A data base establishing the correlation between economic activity and potential pollutants ACTIPOL (registered), facilitating enquiries in case of pollution and the risk assessment studies, for pollution prevention.

Contribution and innovation

Recycling of sludge in agriculture is of interest for 4 reasons :

- it is an important outlet for the biggest part of sludge production in Europe (2,5 millions tonnes dry solid per year today and 4,5 millions tonnes dry solid per year in 2005),
- it uses the sludge fertilising value,
- it is a cost-effective solution for sludge disposal compared to landfilling and incineration,
- it is consistent with the sustainable development approach (natural recycling of sludge).

Lessons learned

The quality of sludge can be an obstacle for its recycling. It is therefore essential to guarantee quality, from chemical, physical and biological factors.

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AGRICULTURE AND RURAL AREAS

Use of wastewater for irrigation - A global approach blending water treatment, irrigation with various systems on various crops and institutional / organisational aspects (Tunisia, Morocco, Greece, Cyprus, Portugal, Belgium)

Irrigation practices and their impact.



Objectives

Water tertiary treatment and heavy metals removal.

- Water treatment: to elaborate techniques for the reduction of the level of contamination in micro-organisms and heavy metals in the water to reach an acceptable level for agriculture.

The project will work on tertiary treatment of the water for activated sludge plants, lagooning and sand filtration will be tested on site and comparative analysis carried out.

- Elimination of heavy metals from water will be tested by algae and macrophytes. A methodology for the use of algae to reduce heavy metals' levels in wastewater will be designed and tested on site. Absorption by macrophytes will be tested and the possibility to use them for heavy metals' removal assessed.

Irrigation practices and their impact .

- Irrigation practices matching field requirements, water treatment capacities and quality of the water, as well as sanitary aspects both on micro organisms and heavy metals' studies will be concluded by guidelines on field practices following the soil type, crop type and wastewater quality. Different types of crops ranging from vegetables (open air and greenhouses), annual industrial crops, tree crops and forest will be used to study the sanitary problems in parallel with irrigation techniques, their timing and ways of water distribution. The impact of such practices will be studied by analysing the crops, soils and ground water for contamination levels in micro-organisms and heavy metals as well as the effect on animals fed with fodder cultivated on water irrigated lands.

- The effect of irrigation on the different crops will be described and the guidelines for each type of crop described in the final report.

Organisational and institutional recommendations, institutional implications of each technique and its social acceptance.

- Most countries have a legal and institutional problem: waste water reuse is presently not allowed for irrigation although it is unofficially done due to the scarcity of water. It is not clear which institution will be responsible for the treatment of water, quality control, management of the tertiary treatments, water pricing and the financial flow. The project will propose



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institutional structures adapted to each case. The relations between implied parties will be determined and an institutional plan will be worked out.

Actors Faculté Universitaire des Sciences Agronomiques de Gembloux (Gembloux), Institut Agronomique et Vétérinaire Hassan II (Rabat and Agadir), Agricultural Research Institute (Nicosia), Institut National de Recherches en Génie Rural, Eaux et Forêts (Ariana), Instituto Superior de Agronomia (Lisboa), Agricultural University of Athens (Athens), Ecole Supérieure des Ingénieurs de l'Équipement Rural (Medjez El Bab).

Project organisation, financing, time frame :

- **Tunisia:** The conception and management of a re-treatment lagoon are studied in view of the quality of the water needed. The introduction of algae will be evaluated in collaboration with other partners (Morocco Ouarzazat and Belgium); The conception of wastewater storage will be assessed as well as its impact on water quality; The re-treatment of wastewater down stream a water treatment plant (activated sludge). The method will use sand filtering columns observed in laboratory, the water being measured before and after filtering for the major biologic and health parameters.
- **Morocco:** The algal cycle will be experimented in a high yielding channel for algae cultivating, in connection with the Belgian partner; The Agadir centre is working on the reuse of wastewater for irrigation in plastic greenhouses. The project will work on high value added crops in greenhouses: melons and carnation (*Dianthus*). The water is treated with two systems (Epuvalisation and infiltration percolation) in comparison with well water. During the growth and at harvest time the bacteriology and parasitology of all products will be carefully checked (EC, pH, DCO, DBO and salt content), the products being meant for export.
- **Greece:** The Greek partner is studying the reuse of water for forest irrigation. The city of Athens is surrounded by forests that are regularly devastated by fires. The use of wastewater to irrigate non fire susceptible trees (two types of trees: *Eucalyptus* and *Pseudoaccacia*) is studied on trial plots (tree treatments and four blocks). Physical and chemical changes of soil properties are monitored, plant production and the chemical and microbiological content of water will be analysed.
- **Portugal:** The effect of heavy metals (trace elements, mainly Pb, Cd, Cr) using lysimeters (1 m³ capacity) and pots (10 kg soil) with contaminated water is in the focus of this partner. They want to assess the fate of the elements in the soil, plant and runoff water. Two types of soils, three crops and four levels of metal ions in the water will be tested.



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- Cyprus: The effects of irrigation on the soils and the sanitary problems on crops and animals are analysed; The crops are open air vegetables (eggplant and tomatoes), industrial crops (sudax and cotton) and fodder (alfalfa). Routine analyses are performed on the water and on the vegetal products. Faecal and blood samples taken from all animals are analysed for haematoparasites and blood smears for haemoparasitosis. Blood samples will be

analysed for brucellosis, rickettsiosis, leptospirosis and toxoplasmosis. The treatment will include animals that will be given daily sewage water to drink.

- Belgium. The Belgian team will work on the following issues, besides co-ordination: Research on irrigation with wastewater; Control of nitrogen fertilisation; Impact of wastewater irrigation on the fungal infections; Removal of heavy metals with algae; Institutional and organisational considerations.

The duration of the project was 38 months (Feb. 1995 - Dec. 1998). Project was funded by the AVICENNE programme of EU.

Outcomes-Results

- Tunisia: In the case of irrigation by buried pots, when water from the water table is used, less faecal contamination of the soil is detected than when wastewater is used; this is the case whatever the distance from the pot and whatever the depth; In the case of furrow irrigation, the surface soil is contaminated more than when irrigated with the same water by buried pots.

- Morocco: With reference to the three elements analysed (Zn, Pb, Cu), the content of heavy metals in Ouarzazate wastewater confirms the absence of large industrial sites. The presence of zinc in notable quantities is probably due to mining activities associated with the drilling of the drinking water supply; However, the results show that experiments planned for fixation of heavy metals might need the enrichment of effluents before being introduced into the algal system; Following a test in Agadir, it appears that micro-irrigation with purified wastewater does not seem to present any problems on the condition that a good filtration system is placed upstream of the water distribution network. Use of wastewater treated by rapid infiltration has allowed the same yield for melon culture and an increased yield for tomato in comparison with plants irrigated by fertiliser enriched well-water. This has allowed us to economise on the amount of fertiliser for these two crops and to obtain a product similar in bacteriological and parasitological quality to the control.

- Portugal: The results obtained in pot experiments showed that *A. Pintodasilvae* was tolerant towards several heavy metals. Only cadmium application to the soil had a negative effect on dry matter accumulation. However, the mineral composition of *A. Pintodasilvae* was



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influenced by the presence of heavy metals. Increased uptake and translocation of heavy metals was observed in artificially contaminated soils, but the capacity to hyperaccumulate was restricted to Ni; Continued growth and harvest of *A. Pintodasilvae* was possible, suggesting that the plant might be used in the future to extract Ni from polluted soils, especially when Cd contamination is not very severe.

- Cyprus: The yield results indicate the superiority of the treated wastewater and the possibility of producing high yields without additional fertilizers. Soil analyses in progress are aiming at identifying effects on soil and eventual pollution of soil and groundwater particularly by N03-N.
- Belgium: With respect to the objectives of the study, it is clear that irrigation in general and in on cultivated soil has no influence on the movement of nitrates and on the leaching of residues. Irrigation using wastewater does not contribute to soil nitrogen enrichment, as any inputs are compensated for by greater uptake by the irrigated plants. Yields are much more constant and irrigation represents a guarantee of revenue to the farmer and a secure supply for the industry.



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Cairo sludge disposal study (Egypt)

Biosolids reuse in agriculture.

Policy issues The study is intended to make possible the establishment of regulations based on international procedures, modified to suit Egyptian conditions. Technical assistance will be needed to assist the regulator to formulate appropriate laws and

help sludge producers to develop procedures for ensuring compliance.

Goals Implement the optimal disposal of wastewater sludge generated in Cairo.

Objectives

- Develop an integrated disposal scheme to cover all major treatment plants.
- Achieve the most beneficial means of sludge reuse.

Background - Problems Wastewater treatment is an essential component of clean freshwater, in that the former prevents the discharge of pollutants and disease agents to the latter. Sludge, also known as biosolids, is the primary organic residue from wastewater treatment. The implementation of wastewater projects in the major cities of Egypt will result in large quantities of biosolids being produced and requiring disposal.

At present, Egypt has no statutory instruments regulating sludge management. Independent control measures are required in order to ensure that sludge producers employ appropriate monitoring and control techniques, and that these can be audited. The problem of managing wastewater and sludge from large conurbations will increase substantially in certain parts of Egypt in the near future.

Actors National Research Centre in partnership with WRc plc., European Investment Bank and Cairo Wastewater Organisation.

Project organisation, financing, time frame

- The Cairo Sludge Disposal Study was initiated under the Mediterranean Environmental Technical Assistance Programme, funded by the European Investment Bank and promoted by the Cairo Wastewater Organisation, to resolve at least part of the difficult problem of biosolids disposal in the Cairo area.
- The study began in July 1995 and comprises three phases over 42 months. Phase 1 was the review and planning stage, and Phase 2 includes biosolids sampling and field trial programs.
- A practical guide to the use of biosolids, the structure of an organisation for undertaking the operational implementation of biosolids reuse in agriculture, and a master plan will be developed based on the practical results obtained.

Outcomes-Results

- Seven trial sites were established, including a site owned by Ain Shams University and



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several private farms. At each site, several coordinated arable crop or fruit production trials have been installed, and these will continue over three years.

- Different types of biosolids from Cairo wastewater treatment plants are being used, including anaerobically digested and composted materials.
- About 150 acres of test sites have been established. The trials include detailed statistical, multi-factor designs aimed at elucidating the fertiliser values of different types of biosolids in different cropping situations.
- Larger trials demonstrate the practicality and value of using biosolids. Each trial is monitored for crop production and quality, including nutrient efficiency and uptake of heavy metals.
- The Greater Cairo Wastewater Project will result in about 0.4 million tons of dry solids per year within the next decade.

Contribution and innovation

- Interim conclusions are: biosolids had an especially beneficial effect on wheat, berseem, forage maize, and grape vine; digested biosolids appear to offer significant nitrogen fertiliser replacement value to farmers; no harmful effects of biosolids on crops have been detected in field trials; and the benefits of spreading biosolids on newly reclaimed soils are expected to increase with cumulative applications to enhance soil fertility.
- All the data from the trials and the biosolids sampling programs will contribute to the development of agricultural extension information to be used during the operational implementation of biosolids reuse in agriculture.
- The data will also contribute to the scientific basis for regulating biosolids reuse, which is urgently required.
- Effective operational and environmental controls and well-informed farmers are essential for safe, sustainable biosolids reuse programmes.

Lessons learned

- The study will prepare a master plan for biosolids reuse in the Greater Cairo area, taking into account the results of the trials, biosolids quality, farm practices, distances, etc. Despite that very large quantities of biosolids will be produced in the future, the land area required annually will be a very small proportion of potentially available land.
- Farmers in Egypt are prepared to pay for biosolids due to the regional scarcity of traditional manure and rapidly increasing costs of inorganic fertilisers. Consequently, a biosolids reuse program could recover some of its operating costs.
- The Cairo Sludge Disposal Study can be viewed as a model for other towns and cities in Egypt and in other countries, where rapidly expanding urban populations and the installation



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of wastewater collection and treatment facilities will inevitably result in the production of significant quantities of biosolids.

- Biosolids require cost-effective, environmentally acceptable and sustainable disposal and recycling to agricultural land, considered to be the best practicable environmental option. Effective regulation and public education, however, must secure this option.

Contact



Project reference: LIFE93 TCY/INT/6041

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National Rural Finance (Tunisia)

AGRICULTURE AND RURAL AREAS

Promotion of investments in rural areas.

Goals Assist Tunisia in promoting creditworthy private investment in rural areas and in strengthening, on a sustainable basis, the financial viability and institutional reform process of BNA thus improving its development impact on the country's rural sector.

Objectives Bank involvement through the proposed project would help Tunisia in:

- broadening and improving the accessibility of agricultural credit by developing sustainable foundations of a sound rural finance system well-integrated into an increasingly liberalised financial sector;
- promoting the financial viability of rural lending by separating normal credit risk from climatic risk and income transfers;
- and strengthening the operational capacity of the leading bank for agriculture, the BNA.

The proposed project is thus a key complement to the on-going macro and financial reforms to transform Tunisia into a market driven, private sector economy.

Background -Problems Agriculture plays a key role in Tunisian economy. It generates 16% of GDP, employs almost one out of every three workers in the labour force, and contributes about 11% to total export earnings. Tunisian agriculture is predominantly rain-fed. Tunisian farms are primarily small and low in income, and out of the 387,000 farm holdings, 86% operate farms that have less than 20 ha, with many of them only part-time or subsistence farmers. High population density and limited land supply mean that future growth will depend largely on intensifying production on both irrigated and rain-fed land, diversifying farm crop mix, and on increasing efficiency.

Actors The Government of Tunisia, the World bank.

Project organisation, financing, time frame. The project would support the following activities over a four- year implementation period (1995-1999):

- BNA's Credit Program: (i) on-farm processing and marketing investments by creditworthy farmers, co-operatives, and crop and livestock enterprises; (ii) fisheries; (iii) other rural investments; and (iv) rural housing;
- BNA's Institutional Development: (i) implementation of a strategic and organisational plan and decentralised management information systems; (ii) implementation of an action plan to absorb BNA's arrears and strengthen its financial situation; and (iii) improvement of the transparency of its resources and activities;
- Restructuring and Phasing Out of GOT Funded Credit Lines: carrying out of a program to reform the country's rural credit system;
- Drought Risk Management Scheme: consolidating, with GOT, the Fonds National de Garantie (FNG); and
- Informal Rural Finance and Group Lending Schemes: developing and carrying out a study to assess the feasibility of group lending at village level, covering two parts: (i) informal rural markets and the operation of group lending; and (ii) the institutional framework.



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Total project cost is estimated at US\$420 million equivalent, with a foreign exchange about 53% of total cost. The proposed Bank loan of US\$65 million would finance less than 16% of total project costs and 29% of the estimated foreign exchange costs of the project. The project would be cofinanced by the French Caisse Francaise de Developpement (CFD) and Kreditanstalt fur Wiederaufbau (KfW) of Germany for a total of \$60 million.

Outcomes-Results

• The ultimate beneficiaries would be, in particular, the small and medium-scale farmers who could benefit generally from an improved rural financial system and eventually from a better risk sharing mechanism.

• BNA would be strengthened at a crucial stage in its institutional development. In addition, measures complementary to the project will help GOT reorient its rural credit policy which, over time, would make rural financial intermediation more attractive, hence more competitive.

• With the focus on credit risk, BNA would place its agricultural and rural activities on a sounder financial and operational footing and benefit from lasting improvements in recovery. An increased number of creditworthy smallholders should benefit from BNA's strengthened rural outreach.

• To address climatic risk, the Bank will support the GOT's decision to use the FNG to help both farmers and credit institutions to better manage the effects of drought. The objective here is to provide a more efficient alternative to past GOT direct interventions.

Lessons learned

Performance of agricultural credit projects in Tunisia has been good compared to agreed objectives at the time, and this trend shows continued improvement.

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Natural Resources Management (Tunisia)

Natural Resources Management and Institutional Strengthening.

Objectives Intensify sustainable agricultural production and improve environmental quality of farmlands and rangelands through the participatory management of natural resources by rural populations.

Background - Problems Tunisia has a fragile natural resource base supporting an agricultural sector that contributes substantially to economic output, trade and income generation for the rural population. Climatic and human factors have led to significant resource base degradation. The impacts from human activities and climatic conditions vary from region to region; however, the arid and semi-arid regions of Southern and Central Tunisia and the mountainous areas of Northern Tunisia are the most threatened.

Actors Government of Tunisia Implementing Agency Ministry of Agriculture, rural populations.

Project organisation, financing, time frame

- The project would support the first phase of a long-term national strategy to enhance natural resources management and improve agricultural productivity through a participatory approach.
- Implemented over five years, the project would test land-based natural resources management interventions and would be supported by institutional development, in particular to strengthen the capacity to analyse the impact of policy options.
- The project would be implemented in severely degraded areas.

The total project cost is currently estimated at \$54.3 million, with a Bank loan tentatively placed at US\$27 million. The projected board date is April 1997.

Outcomes-Results Not only would the project have a positive environmental impact, but it would also support Bank and Government efforts to reduce poverty, since the intended beneficiaries would be small-holders in rural areas where poverty is concentrated.

Contribution and innovation

The main innovative components of the project are:

- Natural Resources Management Operations, including Participatory Development Plans (PDPs), prepared by local communities to address their priorities for key small-scale, rural, infrastructural investments, as well as Protection and Water Recharge Investments in the three selected CRDAs, outside the areas where the participatory approach would be tested, as part of the strategy for natural resources management conservation;
- Institutional Strengthening at both the regional and central levels, to support MOA human resources and information systems as well as to develop the incentive framework for sustainable resources management.

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Lessons learned

In 1994, the Government of Tunisia began a Natural Resources Management Study that consolidated lessons from experience gained in order to define a new approach to natural resources management and establish priorities for future actions to be included in a Schema directeur. Findings have shown that:

- natural resources management is likely to be sustainable ecologically, economically and socially only if practices can be

made sufficiently attractive to local populations so that they adopt them over the long term;

- the approach must rely on systems of local knowledge and natural resources use as well as locally supported decision-making, both formal and informal;
- the administration must be flexible in defining its contribution under a "social contract" made with communities for resource management; and
- a more integrated approach to natural resources management is needed.

The first risk stems from the lack of experience in Tunisia with the project's proposed integration of participatory management of natural resources into the CRDAs. The second risk is that land tenure constraints to sound resource management - which are moderate - would be difficult to overcome.



Contact

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Cities - Castles - Cherries Nature - Culture and Recreation for Urban Inhabitants as a Promotion of Rural Areas (Italy)

AGRICULTURE AND RURAL AREAS

Promotion of Rural Areas.

Objectives Favour long term development of the rural space of hills surrounding the towns, as well as to increase respect for the environment, mainly through a responsible "taking care" of the area by the two towns, and by activating proper resources from them.

Actors Regione Emilia-Romagna

Project organisation, financing, time frame The project concerns two medium size towns, Bologna and Modena, and an area between them of high environmental quality. It is divided into four different stages:

- Phase A Preliminary study: demand analysis, census of the rural and urban resources potentially interested;
- Phase B Closer definition of the work program: choice of the sectors of intervention, contacts of the potential partners, their involvement and definition of actions to be undertaken by them;
- Phase C Carrying out of the activities: organisation of different initiatives and proposals coming from urban actors; training of rural partners; realisation;
- Phase D Extension of the results through meetings, workshops, educational tours, press releases.

The duration of the project is 24 months. The project was funded by the LIFE program of EU.

Outcomes-Results The project intended to strengthen and integrate the number of services offered by the hillside, either tourist, environmental or recreational, by using the town both as a user's market and as a source for social, economic, and entrepreneurial activities.

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AGRICULTURE AND RURAL AREAS

A path towards sustainable tourism: the case of Eurochianti (Italy)

Ecotourism.

Goals

- Strengthen the global quality of the Chianti area at the environmental, economic and social level.

- Reduce risk of decline in the Chianti area connected with strong urban pressure.
- Strengthen local identity.

Objectives

- Improve the quality of farming production and local services.
- Strengthen SME system.
- Reinforce the quality of tourist supply.
- Strengthen the environmental quality of tile area and improve capability of land management.
- Develop co-operation and participation of local population to GAL activities.

Background - Problems The project is called EUROCHIANTI to signify the unity of local (Chianti area) and global (European) dimensions in this area situated in between two important cities, with a long cultural history and a highly developed tourism sector: Siena and Florence.

Actors Public and private sectors co-operate in the project: 11 local authorities, entrepreneurs, companies and their associations (farmers, manufacturers, craftsmen), banks, local development agencies. The local initiative is promoted by a Local Action Group (GAL) in the ambit of LEADER II.

Project organisation, financing, time frame

PAL strategy includes:

- improving quality of food farming production and competitiveness of farms and services;
- integration of the local net of SME; diversification and strengthening of tourist supply;
- management and preservation of environmental resources; management and monitoring of land.

Actions related to a sustainable tourism supporting policy within the Chianti area involve different integrated initiatives:

- creation of a monitoring system of client satisfaction;
- training courses for the creation of new-businesses servicing tourist sector;
- management and counselling support to newly established tourist businesses;
- organisation of a series of cultural events and innovative tourist packages;
- improved promotion of the area; creation of an area-based, tourist, informative network



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Outcomes-Results

- Reduction of the environmental impact caused by wastes by their reuse, recovery and diversified utilisation (i.e. energy production), reclamation of polluted areas and arid sites.
- Development of organic farming (some small businesses), integrated agriculture, agrotourism.

Contribution and innovation

Recently Tuscany created new instruments (normative and operational) to deal with environmental issues. The environment is conceived as one of the most important endogenous resources and as an opportunity to re-address regional and local programming towards sustainable development, covering both sectoral (i.e. agriculture tourism, energy, etc.) and transversal policy fields (regional development plan).

Lessons learned

Briefly, sustainability is understood as a process of reconciliation (and incorporation) of the environmental dimension with (and within) other dimensions (economy, socio culture, technological innovation, etc.) aiming to offer equal opportunities for future generations.



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CONSUMPTION PATTERNS AND WASTE MANAGEMENT

Collection and recycling of spent autocatalysts (Greece)

Promotion of techniques for the collection, storage, recycling and disposal of waste.

Policy issues Development of an effective collection and storage network of spent autocatalysts for the promotion of sustainable development and the quality of the environment.

Goals Development of a complete and rational solution to the problem of collection and recycle of spent automotive exhaust catalytic converters in Greece.

Objectives

- Development of an effective collection and storage network.
- Development of improved know-how for precious metal recovery.
- Implementation of a detailed feasibility study for developing a complete catalyst recycle unit in Greece.



Background - Problems More than 500,000 cars with catalytic converters are currently in use in Greece. These converters lose their activity and must be replaced every 3-5 years on the average. Catalytic converter disposal poses a serious problem due to the toxicity of some of the converter components. Furthermore the scarcity and high value of the noble metal components makes their recovery economically attractive.

Actors The four collaborating partners (Technodynamics, University of Patras, Aristotle University of Thessaloniki and Association of Automobile Importers-Representatives) have all the necessary complementary expertise for the successful completion of the project.

Project organisation, financing, time frame The main steps of the project are:

- Development of three prototype efficient catalyst collection networks in Athens, Thessaloniki and Patras.
- Development of a prototype catalytic converter pre-treatment unit comprising shell removal, grinding and packaging. Environmental impact assessment. The pulverised catalyst material will be treated by two CEC industries which have agreed to undertake the noble metal recovery.
- Laboratory and pilot-scale development of a noble metal recovery unit in Greece based on an improved hydrometallurgical method.
- Detailed feasibility study for the establishment of a complete catalyst recycle industrial unit in Greece.

The project was funded within the LIFE program of EU. The duration is 36 months (Sep. 1994 - Aug. 1997).



Contact

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200 Collection Centres (Italy)

Organisation of networks of demolition and easy dismantling centres, use of secondary materials, agreements with users, economic equity.

Objectives

- Recover growing quantities of materials from scrapped cars, in addition to the metal parts normally recovered.
- Limit the quantity of scrapped materials.
- Guarantee ecologically sound processes.

Background - Problems Location 200 collection centers in different regions of Italy.

Actors Responsible organisation FIAT Auto - DAPI Description System for the demolition and environmentally sound recycling of cars at the end of their life cycle.

Outcomes-Results Main results achieved:

- Over 200,000 cars treated.
- Over 5,000 tons of materials recovered: windows, bumpers, seat foams, etc. used to manufacture car components, underlay carpets, bottles, etc.

Lessons learned

It is possible to recover and reuse an increasing quantity of material, increasing the international standards and targets. Financing Investment to demolition firms and users of recovered materials.

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CONSUMPTION PATTERNS AND WASTE MANAGEMENT

Recycling of off-gases dusts coming from metallurgical procedures for Fe-Ni production (Greece)

Promotion of techniques for the collection, storage, recycling and disposal of waste.



Policy issues Promotion of recycling and disposal of waste for environmental protection.

Objectives

- The project is aiming at the recycling of more than 1.000.000 tons of dust produced during the procedure for the production of ferro-nickel out of lateritic ore.
- The expected results will be the upgrading of environment, economic benefits on the procedure and energy savings due to the carbon incorporated in the dust.

Background - Problems A big quantity of dust, coming from rotary kilns gases produced during the procedure for the production of ferro-nickel out of lateritic ore, has been accumulated due to the insufficiency of the techniques in the past for dust recycling.

Actors G.M.M. S.A. Larco

Project organisation, financing, time frame

- The recycling will be achieved by introduction of the dust in the existing pelletising system through suitable arrangement of equipment (crusher, sieve, belt conveyor, silos).
- Moreover recycling of the agglomerated pelletised material (due to Portland cement content) during the curing time will be achieved. As a result, pellets unsuitable for feed will not be stored.
- Finally, the continuous operation of the semi-industrial sintering machine will be started up. Through it, an independent way for dust recycling will be in operation at the extra benefit of by-passing the rotary kilns and therefore relieving the burden of today's dust pneumatic transportation equipment given that the sintered product will be fed into the electric furnaces. For this purpose, an installation for mixture preparation to be processed as well as one for sintered product handling will be necessary.

The project is funded within the LIFE program of EU. Its duration is 24 months (Jan. 1995 Dec. 1996).

Contribution and innovation

By this combined way there will be a solution to the problem of the continuous dust recycling, on a permanent basis, with the environment being charged no more under any circumstances.



Contact



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Innovative system for the granulation of used tyres and for the selective recovery of rubber granulate, metal and textile fibres (Italy)

Promotion of sustainable development and the quality of the environment through the development of techniques for the collection, storage, recycling and disposal of waste.

Goals Favour market acceptance for a recycled material deriving from scrap tyres, thus avoiding its disposal in landfill or by burning.

Objectives Set up a mechanical granulation system allowing the production of rubber granulate from scrap tyres with considerable advantage either from an ecological or an energy point of view.

Actors Cisap SpA

Project organisation, financing, time frame. The project is funded within the LIFE program of EU. Its duration is 15 months (Apr. 1994 - Jun. 1995).

Outcomes-Results Ecological and energy benefits: this project allows to reduce the environmental impact by more than 60% if compared with thermo-destruction and a saving of energy of over 70% if compared with the cryogenic process.

Contribution and innovation

This is an action aimed to demonstrate an innovative process for granulating the tyre casings. The technological innovations of the project concern essentially the following points:

- Granulator's Mill: introduces a new concept in the mechanical granulation technique (milling and simultaneous separation of textile fibres, steel and rubber).
- Material Re-processing: in a middle step of the process the rubber granulate is screened. Those granules which are not accepted by the screens are re-processed allowing to obtain the same quality of that of a cryogenic process at absolutely lower costs.
- System Compactness: the CISAP granulator introduces the new concept of compact machine, replacing the line configuration without evident advantages in plant costs and management. The granulator supplies a high quality product. The granulate as recycled material coming from this process is used in the composition of tartan for the flooring of sport fields, industrial flooring, shoe solings, watering pipes, compounds for solid tyres, etc. Another experimented application is in the asphalt compounds (already used in the USA and other Countries).

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CONSUMPTION PATTERNS AND WASTE MANAGEMENT

Innovative technology for panel manufacture from fiberised agriwaste (Greece)

Recycling and recovery of industrial waste.

Goals Scale up of a laboratory developed process for the production of composite panel products using renewable resources such as annual plant fibre and agricultural residues like straw as an alternative to wood.



Objectives Objectives of the current project are to exploit this technology by:

- addressing technical problems involved in scaling it up;
- customising so that particular end user process parameters are taken into account;
- thorough testing and financial analysis in order to ensure its commercial viability.

Actors Woodchem Europe S.A. (Belgium), Akritas S.A. (Greece), University of Toulouse (France), Marlit Ltd. (Greece), Siempelkamp GMBH & CO KG (Denmark).

Project organisation, financing, time frame

- This new process was developed and tested industrially within the framework of a co-operative research project under the CRAFT action of the BRITE-EURAM Programme ("Advanced environmentally friendly composite materials for the furniture and construction industries", contract BRE2-CT94-1535, 01/01/1995-31/12/1996).

- The process was protected by PCT application (WO 97/38833).

The duration of the project is 34 months (Jan. 1999 - Sep. 2001).

Outcomes-Results

- The process employs a combination of chemical, thermal and mechanical treatment to enable the efficient bonding of fibres with conventional urea-formaldehyde (UF) resins to:

- form strong bonds between the UF polymer and the plant fibre cell wall;

- crosslink without depending on the resin molar ratio.

- In the conclusion of the project, intensive industrial testing will be required to achieve reliable new board products.

- The project also carries out a survey of the market potential of the new product along with a validation of the technology in various kinds of plant fibres and the diffusion of information concerning its features and achievements.



Contribution and innovation

The application of the process implies great advantages for the manufacture of agriwaste

CONSUMPTION PATTERNS AND WASTE MANAGEMENT

panels, which can be summarised in the following aspects:

- addresses the problem that most conventional UF resins are not capable of bonding plant fibres;
- offers the advantage of rationally utilising various types of lignocellulosic agricultural wastes;
- meets the requirements for sustainable development;
- offers economically profitable solutions;
- creates quality products at a lower cost.

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CONSUMPTION PATTERNS AND WASTE MANAGEMENT

Sectorial action for re-using rinsing waters in the jewellery industry (Spain)

Promotion of sustainable development and the quality of the environment.

Policy issue development of techniques for the collection, storage, recycling and disposal of waste.

Objectives

- Contribution to the application of Community Legislation in Natural Environment issues by means of eliminating these kind of refuse.
- Make possible a considerable reduction in the consumption of a natural and scarce resource such as reducing water production costs.
- Improve the productive process by using higher quality water for rinsing.



Background - Problems The galvanization, one of the most essential processes in Costume Jewellery, generates two types of contaminating refuse regarding to volume and concentration. Concentrated: proceeding from finished baths static rinses or recuperation; Diluted: contaminated rising waters low in concentration and high continuous volumes.

Actors Companies highly representing the Costume Jewellery Industry section of Menorca.

Project organisation, financing, time frame The present project consists of a demonstrative action with the participation of a collection of Companies highly representing the Costume Jewellery Industry section of Menorca.

The duration of the project is 12 months (Apr. 1994 - Mar. 1995). The project is funded by the LIFE program of EU

Outcomes-Results

- Present action is focused in adopting a solution of a collective character that can be adapted effectively by an Industrial Section basically PYME'S (small and intermediate companies) and permit rectification of the problem planted by diluted residues.
- The contaminated solution resulting from this process will be treated in the Central Station of Purification of the Institute.

Contribution and innovation

The foreseen method for the development of the project in which resides its innovative character combined initiatives particularly or collectively in base of the following plan:

- Installation of columns of interchangeable ionic resins for the treatment of rinsing waters in closed circuits.
- Regeneration by means of the resources of the Institute of Technology of the finished resins for posterior use.



Contact



Project Reference: 94/E/A13/E/01272/BAL
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Innovative process for recovery and regeneration of thermoplastic material (PET) for industrial use as secondary raw material (Italy)

Promotion of techniques for the recycling of waste.

Objectives Regenerate and ennoble used and wasted PET plastics so that can be reintroduced in the industrial production cycle as secondary raw material. Hence PET plastics must be disposed not by landfill disposal or incineration (both environment harmful disposal processes) but by material recycling.

Actors Eco Selekt Italia Srl.

Project organisation, financing, time frame

- A demonstration action will be performed by the construction and operation of a PET regenerating and ennobling plant using a highly innovative and environmentally sound technology and process.
- Raw material for this process will be PET waste from distinct urban waste collection activities.
- The process can be divided into three steps:
 - A. sterilisation of the waste PET,
 - B. removal of residual plastic powder and
 - C. complete regradation and plastification.

The project is funded within the LIFE program of EU. Its duration is 24 months (Apr 1994 – Mar 1996).

Outcomes-Results

- The final output is crystallised into PET chips. Chemical, physic-chemical analysis and mechanical tests showed the product to have the same characteristics as the virgin PET techno-polymer to be used in containers (for liquid) production and many other industrial applications.
- The technologies applied to the regeneration process allow to differentiate product characteristics (fluidity, viscosity) so that it is possible to use our ennobled PET as raw secondary material for different industrial transformations (i.e. blowing, injection, extrusion).

Contribution and innovation

- The above mentioned process is noiseless and does not use any kind of solvent or chemical additive so that no gaseous, liquid or solid waste is generated. These specifications correspond to the best definition of clean technology.
- The establishment and operation of this kind of PET regeneration plant (close to waste



CONSUMPTION PATTERNS AND WASTE MANAGEMENT

PET storage facilities) can help to resolve many environmental problems due to plastic waste with an optimum cost-benefit trade-off.

Contact



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Demonstrative project for a hi-tech plant specialised in the production of recycled rubber goods (Italy)

Promotion of techniques for recycling of waste.

Goals The project is aimed to introduce a strong technological innovation in waste recycling.

Objectives Obtain new rubber mixtures with innovative characteristics (such as self-extinguishness).

Actors Tecnologie Ecologiche Srl.

Background - Problems PHOENIX project is concerned with the rubber articles industry and consists of a set of innovative modifications of the traditional manufacturing processes (raw material preparation phase).

Project organisation, financing, time frame

The project will have a duration of 24 months (Nov 1994 - Oct 1996) necessary to:

- organise the demonstrative production (4 months),
- start the actual production and commercialisation (18 months) and
- spread the results of the project (2 months).

The project is funded within the LIFE program of EU.

Outcomes-Results

- The initial R&D phase brought positive results, so it is necessary to carry out a demonstrative phase before the beginning of an industrial application.
- It is expected to achieve a confirmation of the positive results obtained in the technical and market tests, in order to spread the project feasibility.
- The rubber articles produced with the new technologies will be supplied to a wide range of industries (such as buildings, traffic signs, shoes, etc).

Contribution and innovation

The technological innovation in the rubber manufacturing process is based on a registered patent owned by the promoters allowing a very interesting improvement: if applied in many geographical areas, the technological innovation will be able to solve the rubber waste placing problem, which still has not found any suitable solution under an economical and ecological point of view.

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CONSUMPTION PATTERNS AND WASTE MANAGEMENT

System optimising used oils collecting in Italy (Italy)

Promotion of collection, storage, recycling and disposal of toxic and dangerous waste for a sustainable development .

Goals Develop an optimising system for the collection and storage of used oils, increasing the controlled disposal.

Objectives Modernising and developing monitoring networks in the context of strengthening environmental legislation and knowledge dissemination concerning sound environmental management.

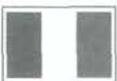


Background Used mineral oils are the result of the consumption of lubricant oils. Lubricant oils have numerous uses in an advanced economy (transport, agriculture, industry, navy and aviation). During its use, lubricant oil is submitted to chemical-physical transformations that make it unsuitable for the functions it was produced for. In Italy, 600.000 tons of oil are consumed annually and it is estimated that a residual of more than 200.000 tons of used oil exists. Lubricant oil if eliminated or not used properly can become a pollution source. Consequently national law forbids any discharge of used oil in water and soil and in an uncontrolled way. However used oil is an important energy resource that can be recovered and reused.

Actors Consorzio Obbligatorio Oli Usati

Project organisation, financing, time frame The project is organised as follows:

- Creation of a collection points database in the project pilot area, using information available from public data sources such as company listing of the chamber of commerce, provincial VAT listings, information from the craftsmanship organisations etc.
- Integration of the data base with additional data, collected through a marketing survey aimed at the potential collection points, to add information not yet available (such as type and capacity of tanks; etc).
- Development of statistical procedures to investigate and evaluate the quantity of used oil collected and potentially collectable in each geographic area, as well as its ratio versus the quantity of fresh oil sold in the same area.
- Rationalisation of the collection routing plan.
- Development of a pilot project to automate the recording of collected data done by regional collectors.
- Evaluation of the chemical composition of the recording of the regional collectors; to allow prompt decisions on the procedures to follow for the recycling or the waste disposal.
- Development of a pilot service to automate telephone requests for recycling or waste



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disposal. The project will develop an information system based on the connectivity of personal computers installed in the regional collection organisations, via a teleprocessing network to a co-ordination centre, installed in the premises of the COOU in Rome.

The project is funded within the LIFE program of EU. The duration of the project is 23 months (Nov 1994 - Sep 1996).

Outcomes-Results

- During the first year of activity (1985) the Consortium collected 82.000 tons of used oils, representing 41% of the total used oil produced. Ten years later, in 1996, the quantity collected rose to 170.000 tons, 85% of the total. Till the end of 1996 1.785.000 tons of oil were collected and 1.732.000 tons have been reused: 1.732.000 tons through the regeneration and 368.000 tons as combustible.
- In 12 years time, the regeneration refineries produced 805.000 tons of regenerated lubricant.
- Nowadays the collection network is formed by 72 collection centres spread on the national territory reaching every producer.
- Educational and information activities have also been done, such as the itinerant educational campaign "Circoliamo", organised with the support of the Ministries of Environment, Industry, Commerce and Handcraft.
- Tools have been produced for schools, like a CD ROM and a video tape.
- An information phone number has also been set up for the citizens concerning the destination of oils and collecting centres.



Contribution and innovation

- Most importantly, the Consortium promotes energy saving through the use of oil that would otherwise be wasted and contributes towards pollution abatement.
- The Consortium is involved in rising awareness through information and education activities promoting sound environmental behaviour. It acts directly capillary in all the country assisting all citizens who hold used oils.

Contact

Project Reference: 94/IT/A13/IT/00076/MLTRG

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CONSUMPTION PATTERNS AND WASTE MANAGEMENT

Paper Making: from seaweed to agricultural-food industry's residual materials (Italy)

Cleaner production.

Objectives Preparation of a new technology enabling the re-use of biomass discarded by other industrial cycles and of algal biomass for the production and marketing of a new series of ecological papers.



Background - Problems Superabundant seaweed is a serious environmental problem caused by water eutrophication which can have a drastic environmental impact as well as cause multiple economic damage in the fishing and tourism sectors. Dumping of agricultural and food industry wastes contributes to the deterioration of the environment.

Cartiera Favini S.p.A.

Actors: Cartiera Favini S.p.A.

Project organisation, financing, time frame Over the last 5 years (1992/1997) Cartiera Favini developed two projects for the production of "ecological" papers that utilise recycled paper and alternative raw materials from surpluses present in nature or from the residuals of other industrial cycles.

Funding has been done by the European Union through the Life Programme for cleaner production.

Outcomes-Results

- Alga Carta is produced with the superabundant seaweed harvested from the Venice lagoon.
- Orange Paper is produced with the left-overs of squeezing citrus fruits, and Sugar Paper with the residuals of sugar-beet processing.
- The alkaline residuals of the sugar sector, the ceramics sector and other industries, are neutralized with the acid gases given off by paper-mill's thermoelectric plant and used for making Smog Paper.
- The superabundant seaweed and agricultural-food left-overs are dried, ground, sifted and used for making paper.



Contribution and innovation

- The use of naturally superabundant seaweed and agricultural food left-overs, compared to the traditional, well-established paper making technology, offers a saving of trees (approx. 10%), mineral fillers coming from quarries, water and energy (approx. 15%).
- The paper produced is ecological, recyclable and biodegradable.

CONSUMPTION PATTERNS AND WASTE MANAGEMENT

Lessons learned

- This use results in reduced consumption of natural resources and disposal of less waste from agricultural food industries, for an environmentally sound production.
- The environmental impact of the paper-making process is limited, thus safeguarding natural resources.

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CONSUMPTION PATTERNS AND WASTE MANAGEMENT

Pre-treatment and recycle of automotive used lubricating oil filters with recovery of oil and metals (Italy)

Promotion of techniques for the collection, storage, recycling and disposal of waste particularly toxic and dangerous.

Objectives Recovery of the lubricating oil content in the discarded filter as well as of the metal constituting it.



Actors Ambiente SpA.

Project organisation, financing, time frame

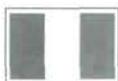
- The project is based on the realisation of three collection centres for the used filters where they are subjected to a first treatment consisting of compaction in a press.
- The pressed filters are transported to the pre-treatment and recycling factory where they are shredded. The organic component of the filter is subsequently oxidised by contacting it with concentrated sulphuric acid and then completely removed.
- The scrap steel is washed off the residual sulphuric acid with a recycled, low boiling hydrocarbon, which is recovered by steam stripping, and sent to a steel mill for recycling.
- The sulphuric acid, containing the products of oxidation of the paper and part of the lubricating oil, is sent to the adjacent sulphuric acid recycling plant where the organic content is combusted thus supplying part of the heat necessary for the regeneration of the acid.

The project is funded within the LIFE program of EU. The duration is 26 months (Nov 1994 - Dec 1996).

Outcomes - Results Recovered oil is utilised in a sulphuric acid purification and recycling plant while the sheet is sent to a steel mill for recycling.

Contribution and innovation

The plant, which is capable of treating 20.000 ton/year of used filters, approximately equivalent to 20% of the country's production, is the first systematic and ecologically sound approach to the solution of the problem related to the disposal of waste lubricating oil filters in Italy.



Contact

Project Reference: 94/IT/A13/IT/00125/PIE

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Establishment and development of a wastewater treatment plant of high gradient magnetic filtration using ceramic permanent magnets (Italy)

Development of techniques for the collection, storage, recycling and disposal of waste.

Objectives

- Establishment and development of a linear filter prototype with permanent magnets;
- Demonstration of results directly in places where treatment plants are located;
- Technology transfer.

Background - Problems The new SMAG technology allows, with low investment capital, to obtain a remarkable improvement in the characteristic of the wastewater coming out from the traditional deputation plants. In case of setting up of new deputation plants, the SMAG technology allows to obtain a convenient cost/benefit ratio of the investment.

Project organisation, financing, time frame The promoters of the new technology, evaluating the great environment implications of linear filters with permanent magnets, are intentioned to develop the project through the following outlines:

- Construction of a movable deputation plant and laboratory on a truck, in order to show on site, the potentiality of SMAG plant;
- Promotion and sensitisation of the new technology in order to set up a relevant number of new filters and plants in Europe;
- Research of synergy, industrial and productive co-operation between other companies by patent license agreement.

The project is funded within the LIFE program of EU. The duration is 24 months. (Apr 1994 - Mar 1996).

Contact

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Pilot plant installation for the treatment of sludge from refinery crude oil storage tanks (Greece)

Development of techniques for the collection, storage, recycling and disposal of waste, particularly toxic and dangerous.

Objectives Handling and disposal of sludge coming from the cleaning of storage tanks of Motor Oil Corinthos Refinery.



Background - Problems The pilot installation presented below is designed to treat the sludge produced at the crude oil storage tanks. In general, the sludge was collected during the cleaning of tanks and was disposed of in lagoons near the storage tanks, or in open land areas for bio-decomposition. The above traditional disposal methods present disadvantages such as:

- Risk of polluting underground water.
- Generation of odours due to decomposition of hydrocarbons.
- Aesthetic deterioration of the environment.

In addition, these methods of sludge disposal result in asset and material losses, with consequent financial implication such as:

- Occupation of land, which could be developed for industrial or other purposes.
- The waste sludge contains approximately 70-75% hydrocarbons. A typical refinery unit produces annually 2000 MT of waste that could be recovered and refined with the perspective financial benefit.

Actors Motor Oil Hellas, SIRMET Ltd, ICEHT and the collaboration of a selected foreign company.

Project organisation, financing, time frame

- Motor Oil engineers with the staff of Sirmet Ltd and Iceht as well as with the collaboration of a selected foreign company have improved a method with which the separation of the solids of the sludge from hydrocarbons and water is achieved.
- The process is based on the feed of sludge mixture pumped under pressure into a pilot separator where the different density of the materials, the temperature and the hydroclonic effect produces streams of water, recovered oil and solids suitable for on site disposal.
- The specific method requires the use of a corresponding area which is increased year by year.

The duration of the project is 24 months (Jun 1994 -May 1996). The project was funded within the LIFE program of EU.

Outcomes-Results

- The proposed method separates the sludge into hydrocarbons for re-treatment, water and



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oil free, dehydrated sludge, suitable for on site disposal by land-farming.

- With the proposed method the recovered hydrocarbons could be reprocessed and the water could be used for the cleaning of the surrounding area or be driven to the existing system of API separators.
- Using the above a reduction of the sludge volume up to 95% was achieved. Up to 90% of the hydrocarbons contained in the sludge were recovered and refined.

Contribution and innovation

The disposal of sludge coming from the liquid fuel storage tanks in the Motor Oil Corinthos Refinery during their cleaning process is a major environmental issue for the company which has been successfully treated so far with the land-farming method.



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CONSUMPTION PATTERNS AND WASTE MANAGEMENT

Assessment, strategy development and implementation of the mining waste management in Cyprus (Cyprus)

Provision of technical assistance for the establishment of environmental policies and action programmes for the protection of nature.



Policy issues Safeguard scarce groundwater reserves threatened by pollution from past exploitation of raw materials, thus safeguarding public health and safety.

Objectives

- Assess the scale of pollution in specific regions of Cyprus and to define acceptable norms according to established EU values.
- Evaluate the migration of toxins into and through the ecosystem by sophisticated computer modelling.
- Carry out an existing data review.
- Recommend measures to reduce and contain pollutant sources around sites of former sulphide, chromite and asbestos exploitation.
- Establish monitoring stations around pollutant sources.
- Establish a GIS-based Decision Support System for a coherent waste management policy.

Background - Problems Exploitation and processing of copper and iron pyrite in the mining regions of Cyprus have a long history and have been particularly intense during the last century. Mining waste from the new defunct as well as formerly very extensive exploitation of massive sulphides, asbestos and chromite, pose a major threat to scarce water resources on Cyprus. Waste dumps from past and present mining activities are a serious threat to plant, animal and human life and health. No investigation or quantification of this problem has been done to date.

Actors Ministry of Agriculture and Natural Resources.

Project organisation, financing, time frame

- The project will develop Decision Support Systems using GIS and help formulate new legislation as well as monitor progress of implementation.
- In a three phase project of assessment, policy development and implementation, a state of the art GIS will be used in order to evaluate analytical data of water and solid samples collected around three representative sites, modelling flow and producing pollution hazard maps.
- The main phase of developing Decision Support Systems will lead to the formulation of management policies for dealing with the waste tips, which will lead in turn to the drafting of legislation governing any future activity as well as implementing policies for dealing with the



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waste tips. Monitoring systems established during the assessment phase will feed data into the GIS in a post-project implementation phase.

The duration of the project is 31 months (Nov. 1994 - May 1997). The total budget is 461.854,38 Euro, the LIFE project contribution 219.854,77 Euro (47,60 %).

Outcomes-Results A major transfer of technology and know-how will be achieved during the project through training on the use of advanced GIS, management and analytical techniques, development of Decision Support Systems and the drafting of legislation conforming to EU guidelines.

Contribution and innovation

Cyprus has been active in the 1990s in gearing national legislation towards a safer and more responsible environmental protection. A Commission's assessment of Cyprus' application for EU membership noted that the protection of scarce water resources and waste management were priority problems. The current project attempts to address both these issues, by evaluating the environmental impact of mining operations on water resources, and then using these results to develop a long-term mining waste management policy.



Contact

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CONSUMPTION PATTERNS AND WASTE MANAGEMENT

Lura d.d. Zagreb (Croatia)

Waste treatment and compost production.

Objectives Achieve not only wastewater treatment in line with legal requirements, but also a significant and lasting contribution to the environment.



Background - Problems The LURA d.d. is the leading dairy company in Croatia. In 1998, the LURA d.d. established a central environmental department, produced and adopted its own Environmental Charter. In 1999, the company prepared and published its first environmental report. All of its operational developments are planned and adjusted according to ISO 9000 and 14001. A programme of regular Environmental Reviews is in the process of being introduced - carried out annually by the Group itself and every two years by independent auditors. The company's Environmental Strategy 1999-2008 is in its final stages of development. In 1997, LURA d.d. management identified the wastewater from the Sirela dairy production plant as its top environmental priority. Sirela's highly saturated wastewater was being emitted into the main sewer in Bjelovar and mixed with municipal wastewater. The partly treated municipal wastewater is carried by a local stream into the river Cesma.

Actors LURA d.d.

Project organization, financing, time frame

- During the various development stages - research, project design and investigations into potential partnerships - the opportunities for cost-savings and even getting a pay-back on investment in the short term began to emerge and were studied and evaluated.
- Sirela's complete wastewater purification plant started operating on 1st December 1998. This plant contains the equipment carrying out a balanced combination of physical, chemical and biological processes, that result in almost completely purified wastewater.
- Sirela's solution was to invest in setting up of a manufacturing facility to produce, on the local Samarica farm, high quality compost. Sirela signed a long-term co-operation contract with a local company called Sivicon for the development of the composting technology implemented in this case.
- At the same time, ideas were explored for extending the project to the recently installed new cheese line. Eventually the possibility of actually making a profit, instead of simply continuing to pay disposal fees, came into play as a truly eco-efficient solution started taking shape.

The total investment (1997-98) is EUR 1.174,875.

Outcomes-Results

- After the wastewater treatment has been completed, a final process removes pollution, effective to more than 90%. This purified water not only meets all the standard requirements of the local water management permit but the values being obtained are several times lower



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than those set by the State Water Directorate. The output of sludge from the complete purification process is approximately 7 tonnes daily.

- As a result an investment which had initially been based entirely on achieving environmental objectives took on all the attributes of good business. In the final project, the circle was joined; complete wastewater purification, full sludge treatment and the commercial production of compost.
- The yearly savings (lower environmental fees) are EUR 527,000. He expected yearly net income (compost) EUR 200,000. Expected pay-back period about 1.5 years.

Contribution and innovation

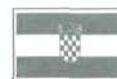
Sirela's investment in the treatment of the wastewater from its dairy production is proving to be a good business decision in a number of ways. In fact, it is a "win-win" situation, as follows:

- environmental performance is significantly improved and a final solution to the environmental priority problem has been successfully developed and applied
- annual savings on the wastewater pollution fee are significant, and
- Sirela's business operations are extended into the area of compost production, thus bringing new earnings, new partnerships, and creating new employment possibilities.

Lessons learned

Sirela's wastewater purification and sludge disposal system was one of the largest environmental investments in the Republic of Croatia in 1998.

- In June 1999, the LURA d.d. was presented with the annual award of the State Directorate for Nature and the Environment, in the section Water and Sea Protection. The award is mainly in recognition of the Sirela wastewater purification system.
- The significantly improved wastewater quality at the exit of Sirela's treatment plant makes an important contribution to the smoother functioning of the municipal wastewater treatment plant, which remains uncompleted and therefore not yet fully operational.
- The publicity given to these achievements, the 1999 environmental award, the numerous visitors and the resulting interest in experience-sharing, have all given the management and employees of both Sirela and the LURA d.d. a great sense of pride in the success of this investment.
- Both the evidence that it is possible to realize a short-term pay-back out of an environmental investment, and that some new profitable business can come out of applying creative thinking to a problem such as having to pay waste disposal fees, represent some valuable encouragement and best-practice examples for the business community in Croatia.



CONSUMPTION PATTERNS AND WASTE MANAGEMENT

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Organisation of the Urban Waste Management in Six Main Albanian Municipalities; a Model Applicable to Towns of Other Developing Countries (Albania)

Urban waste management in Albania.

Goals

- Strengthen the waste management sector and develop a waste management policy and action programs.
- Promote sustainable development and raise public awareness through educational programs and demonstrative actions in co-operation with local NGO-s.
- Decree annual production of waste and efficient control on the waste management.

Objectives

- Realisation of an approach favouring sustainable development in the national and regional level through the detailed planning of waste management.
- Identification of the most appropriate structures, in charge of the waste management.

Background - Problems Urban waste management in Albania is inadequate in all stages; collection, transport and disposal. Disposal sites are not conforming technical and environmental standards.

The 1993 Phare Programme financed the National Waste Management Plan (NWMP) for Albania which was finalised in 1996. The Plan's implementation actions identified as necessary the establishment of 12 National Waste Management Basins, the optimisation of waste management and the realisation of waste treatment and disposal plants for six of the main Albanian municipalities: Lezhe, Korca, Shkoder, Elbasan, Pogradec and Fier.

Actors The actors involved in this Project are: National Environmental Agency, Ecology Italy s.r.l. ESHI sh.p.k. ECAT-Tirana and six Albanian municipalities.

Project organisation, financing, time frame The Project have been financed by European Union under LIFE Program and have costed 595.000 ECU. Time frame was 18 months and is completed in June 1999.

Outcomes-Results

- The main product of this Project is the final design (bankable projects) for landfills in six towns of Albania. This is the first project prepared in compliance with EU standards, for the collection, transport and disposal of urban waste.
- Implementation of this project will have a significant impact on the protection of urban environment and particularly for surface and ground waters.



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Contribution and innovation

- The Project is a new experience to be extended in other towns of Albania.
 - Urban waste management provide the basis for further improvements in the waste management sector.
 - The waste prevention approach is focused mainly on changes in life style as well as production and consumption patterns.
- Programs and projects for the reduction, re-use and recycling of urban waste should be the next step.



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Composting Organic Matter - Reuse and reduction of waste (Italy, France, Greece, Malta, Cyprus, Tunisia)

Local Authorities, Waste Management companies, and Local Citizen groups in seven Mediterranean countries promoting composting, particularly domestic composting.

Policy issues Reduction of waste, improved waste management, improved soil quality, environmental awareness and citizens responsibility.

Objectives

- Raise awareness generally about composting and its advantages.
- Establish domestic compost programmes in various municipalities in the Mediterranean.

Background - Problems Elimination of municipal waste is one of the major problems facing Local Authorities. Organic matter constitutes approximately 40-50% by weight of municipal solid waste. Mediterranean islands have particular problems with waste management. Organic matter dumped in landfills is one of the causes of underground water contamination through leakage. On the other hand, a great part of the Mediterranean suffers from erosion processes. Organic matter is needed to improve soil quality and avoid erosion.

Actors Local Authorities, local citizens' organisations, farmers associations, waste management companies.

Project organisation, financing, time frame

- The project is mainly focused on promoting domestic compost programmes.
- An initial training seminar took place in Majorca, organised by FoE Spain with the participation of other FoE groups from Italy, France, Greece, Malta, Cyprus and Tunisia. This practical seminar provided information on organisation and promotion of domestic compost programmes for implementation at local level.
- FoE groups in the Mediterranean are carrying out activities in various municipalities to promote home composting amongst individual citizens and citizens groups in general. Promotion also takes place in schools and communities.

The project commenced in February 1999 and the initial phase, co-financed by DGXI, will last one year. FoE groups in the Mediterranean plan to continue with this project in the future as it has begun with great success so far. Contract: DGXI – 1999

Outcomes-Results

- At present several municipalities have committed themselves to organise pilot domestic compost programmes co-ordinated by FoE groups.
- Various materials have been produced in several languages including a Manual for Compost



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Making, an itinerant exhibition and other general awareness raising materials.

Contribution and innovation

- The project contributes towards the improvement of public participation and responsibility in solving environmental problems such as solid waste.
- Also intends to increase co-operation between local authorities

and citizens in general.



Lessons learned

- Importance of providing continual support and advice at the beginning of the process to neighbours participating in domestic compost schemes.
- Opportunities arise for close co-operation between environmental NGOs, local authorities and waste management companies.

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Waste Management in Croatia - Reduction of Plastic Packaging/ Exclusion of PVC in Food Packaging (Croatia)

Rising awareness.

Objectives

- Give information to the public on desirable - sustainable packaging and instruction on how to avoid excessive waste in food packaging.
- Put pressure on the Croatian Government to regulate against the use of PVC in food packaging.

Background - Problems The Green Alliance of Croatia is an alliance of 30 local organisations for the protection and advancement of the environment (pre-war situation). At the present time, about a half of these organisations continue their activities.

Actors Local organisations

Project organisation, financing, time frame The duration of the project is 1 year (Jan. - Dec. 1993). The project has a REC support of 20,000 ECU

Outcomes-Results

- Within the scope of the project a number of workshops were organised in which the participants were given information on desirable - sustainable packaging and instruction on how to avoid excessive waste in food packaging.
- Exhibitions on the subject of sustainable packaging were mounted, as well as mobile exhibitions of the works produced by children in the workshops.
- During the first 4 months 35,000 leaflets were distributed and 1,000 posters put up. A total of 13,000 postcards were sent to the Prime Minister with the demand for the enactment of regulations banning the use of PVC in food packaging. A meeting between the Prime Minister and ten children from various parts of Croatia was arranged.
- A Round Table took place with the representatives of the food industry, in an effort to convince them that it is also in their own business-interest to introduce sustainable packaging and to reduce waste.
- Also, a brochure was printed under the title "There is a way out - Say no to waste".
- In the course of the European Week on Sustainable Packaging a draft proposal was sent to the Parliamentary Committee on Physical Planning and Environmental Protection for regulations to reduce excessive packaging, together with a survey of solutions adopted in this field by some other European countries.
- A protest was also organised outside the oil factory in Zagreb against the sale of oil in PVC bottles. A demand was sent to them for a gradual substitution of PVC packaging by returnable (glass) bottles. The European Week was further marked by depositing plastic



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packaging outside a number of supermarkets, with the request that they give their customers a chance to choose returnable packaging.

- There was a 30-minute TV educational program and several radio broadcasts as a result of the campaign.

Contribution and innovation

The greatest development will be achieved if the proposed draft legislation is passed by the Croatian Parliament. Despite the above, the awareness of children and adults about waste and packaging was raised.



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Integrated development project of Karyan El-Oued (Morocco)

Poverty alleviation and Improvement of living conditions, Education and Awareness raising.

Policy issues Organisation and education of local population for the promotion of actions and interventions to improve living conditions.

Objectives

- Improve the living conditions of local population.
- Eliminate the nuisance caused by the open contaminated water, i.e. lack of a sewage system.
- Set up a waste treatment and disposal system.
- Improve the leisure facilities of local population.

Background - Problems Karyan El-Oued is a shanty town at the outskirts of Salé. Initially ENDA sat down with the local population to decide for the most appropriate way to intervene and improve living conditions in the community. A number of research projects were undertaken together with the local population in order to confront the neighbourhood's solid and liquid waste management problems. ENDA faced a number of constraints: local authorities refused to provide basic sanitation services to the residents. Instead they planned to move the residents to a new site. Local population was largely illiterate, without the experience, the solidarity or the confidence to act. Local population clearly needed a structure in which they would be organised. Women from the district, mostly emigrated in the 1980's from the rural areas to Salé to find jobs in the textile sector (not prosperous anymore) were identified. Some of them turned to the production of rugs from used materials, for selling to families in the district.

Actors involved/concerned Local population, ENDA Maghreb.

Project organisation, financing, time frame ENDA organised training programmes - with financial support from the Foundation de France, French Embassy, Canadian Co-operation, UNICEF and American Women's Association. The project started in March 1993.

Outcomes-Results Some results of the projects are the:

- Constitution of a district association and a rules committee.
- Implementation of a commission, comprising of representatives from ENDA Maghreb, the district association and the local authority.
- Environmental awareness raising and education programmes in the district, local schools and nearby colleges.
- Clean up of rubbish by local population on a voluntary basis.

HEALTH AND ENVIRONMENT



HEALTH AND ENVIRONMENT

- Construction of the sewage system, leaking close to accommodation facilities.
- Voluntary contribution from the local population towards the construction of a landfill.
- Establishment of a district development association.

Lessons learned

• Targeted to local women, the project improved their position due to their permanent representation in the local association. Increased savings contributed to the establishment of the micro-credit initiative.

• The initiative - through solidarity and business funding - provided local population with a low interest form of finance for small businesses and contributed to a social security system for a marginalised community.

• This experience enhanced the capacity of local population to negotiate with authorities through the new districts association. Our aim is to further facilitate participative planning procedures taking into account the local context and necessary partnerships with different actors.



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Sebou River Project (Morocco)

Improvement of environmental quality and management of the Sebou River Watershed .

Policy issues Explore the possibility of implementing an integrated approach for natural resource quality protection (in particular water) and pollution control in the Sebou River Watershed (SRW).

Goals Improve environmental quality and management of the Sebou River Watershed.

Objectives The proposed project is expected to:

- implement investments and actions that would produce effective and permanent mitigation of the degradation and/or mismanagement of resources;
- support the implementation of the Sebou Water Basin Agency making feasible the use of economic incentives and some of the environmental management measures recommended;
- spur privatisation of environmental services and establish the appropriate incentive framework to involve the private sector in environmental management;
- be used as an example in other priority areas receiving future loans by the World Bank and other donors.

Background - Problems The Sebou River Watershed (SRW) covers 40,000 km² (6% of the national territory). Eighteen percent of total population live in the basin, 40 percent of which in urban areas. The main urban conurbation of Fes and Meknes are located in the upstream part of the basin. The basin hosts around 200 industrial and 190,000 ha of irrigated perimeters. Thirty percent of the country's total water resources are concentrated in the basin. It is expected that the basin will produce more than 70 percent of regional water surpluses to supply the rest of the country. The ecosystem of the SRW is now endangered by numerous sources of pollution, in particular urban and industrial pollution, increasing with the rapid development of the basin, and by high pressure on the use of its natural resources, in particular intensive water mobilisation and encroachment on forests and marginal lands. Water pollution has reached levels far beyond the renewal capacity of the river

Actors Ministry of Environment, Ministry of Public Works, Ministry of Agriculture, Office National de l'Eau Potable (ONEP) and Regies of Kenitra and Meknes.

Project organisation, financing, time frame The following components have been identified and discussed with the authorities

- De-pollution of the Sebou River Water Basin;
- Conservation of Natural Resources;
- Institutional and Regulatory Component.

The preliminary total project cost is around US\$240 million, with an estimated Bank loan of



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\$70 million. Co-financing is being sought. Projected Board date July 22, 1999.

Outcomes-Results

- Major positive environmental impacts are expected in terms of water quality improvements, more efficient sustainable use of natural resources and improvement of sanitation.
- Negative environmental impact may be caused by the construction of sanitary landfills, disposal of sludge from

treatment of industrial wastes, and construction of aerated ponds for treating olive oil production wastes.

- The project is expected to produce sanitation improvements, diffuse clean technologies, improve resource use and enhance natural resource values.

Contribution and innovation

The establishment and operation during project implementation of the new Water Basin Agency, managing pollution prevention and control of water quantity in an integrated manner will provide for a sustainable model of water resources management. Such a model will be based on the polluter-pays principle and user fees guaranteeing at least partial cost-recovery of prevention and pollution control investments and O & M costs.



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Antalya Solid Waste Management (Turkey)

Introduction of private sector participation in the operation of municipal services and improvement of environmental conditions and reduction of health hazards.

Objectives The project would support the Antalya Metropolitan Municipality efforts to:

- meet at least the demand for solid waste collection and disposal;
- develop new institutional arrangements for the management of solid waste collection and disposal services as well as to introduce private sector participation in the operation of services;
- improve and sustain environmental conditions and reduce health hazards threatening local population and tourism industry; and
- improve urban environmental management in Antalya.

Background -Problems Solid waste management is a serious environmental problem in modern Turkey. Domestic solid waste is often disposed of in open dump sites, where garbage is left uncovered. Industrial, medical and hazardous solid waste are generally disposed of with little regard for the environment, public safety or protection of underground water. This situation is worsened by the rapidly increasing population and living standards, which causes a geometric increase of solid waste. The largest municipalities (Istanbul, Ankara, Bursa, Izmir, Izmit and Antalya) are, however, becoming increasingly aware of these problems and are taking action to improve sector performance. Antalya Metropolitan Municipality is a major tourism centre and the largest municipality on the southern Turkish Mediterranean coast. Solid waste management is a growing problem, especially at the disposal site. All garbage, including medical waste is collected by the Cleaning Works Department of the Municipality.

Actors Antalya Metropolitan Municipality (AMM), a company (ALDAS), incorporated under Turkish trade law and owned by AMM, the District Municipalities (DMs) and Antalya Water Supply and Sewerage Company (ASAT).

Project organisation, financing, time frame The project will:

- improve solid waste collection, close the existing dump site, develop a sanitary landfill on a new site, provide containers to store domestic and industrial wastes and address the management and disposal of medical wastes;
- improve land management and pollution monitoring in the Municipal Planning, Mapping and Land Registry Departments as well as in the centralised laboratory as part of coastal zone management;
- provide technical assistance for project implementation and institutional development.



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The project cost is estimated at US\$24 million equivalent, with a foreign exchange component of US\$15 million equivalent (63%). The remaining US\$9 million of the project cost would be financed from the proceeds of the Cleansing Tax and from the Municipality's general revenues. The projected board date is January 1998

Outcomes-Results The project is expected to generate significant environmental benefits as it will:

- protect and improve underground water quality through sanitary disposal of solid waste;
- improve sanitation and quality of life through improved solid waste collection and disposal;
- improve land development through improved procedures for construction permits; and
- improve population awareness about deleterious consequences of pollution through improved pollution monitoring.



Lessons learned

The main lessons learned from previous experiences are:

- satisfactory management of solid waste collection and disposal is an activity that requires managerial and technical expertise not available within municipal administrations. This lesson has been considered in the proposed project;
- securing land availability is a complex matter that requires close co-operation between municipal authorities and communities being affected by the project. The Antalya Municipality is expected to secure the required land shortly;
- specialised contractors are needed for the construction and rehabilitation of landfills. Hiring contractors with experience only in earthworks is extremely risky.

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Mediterranean non-point sources of pollution. Case study: Alexandria (Regional)

Develop of an information system for environmental protection.

Policy issues An NPS pollution model aids the identification, delineation and mapping of areas with high NPS pollution potential and helps to monitor pollution loading from non-point sources in the study area.

Goals Develop a remote sensing and geographic information system prototype (RS/GIS).

Objectives

- Establish a network of Mediterranean scientific organisations that will define, develop and apply GIS, remote sensing and mathematical modelling methods in an integrated database for the control and surveillance of the Mediterranean coastal water resources and the estimation of NPS pollution impact.
- Create an integral and competitive methodology applicable to all the Mediterranean basin assisting the development of Integrated Coastal Zone Management (ICZM) plans and sustainable use of water resources (Agenda 21, UNCED, Rio, 1992).
- Deliver compatible GIS products to the EC for the extension of CORINE, NATURA 2000 databases, etc.
- Integrate, by an appropriate computer-based solution, an agricultural NPS pollution model, a GIS, and relevant data sources; to apply the approach to several catchment areas, exploring the issue of NPS pollution under various scenarios.
- Evaluate the approach generally, and specifically for use in the other programme, and for analysing NPS pollution issues.

Background - Problems Non-point pollution hydrological models are a part of loading models that represent and simulate the water generation and movement and its pollution content from the point of origin (source area) to a place of treatment and/or disposal (discharge) into receiving waters. These models may be used specifically for planning and design purposes, or may interface with receiving water quality models assessing the impact of non-point pollution on the aquatic biota and beneficial downstream uses.

Actors Laboratories and institutes across the Mediterranean

Project organisation, financing, time frame The project has been organised as follows:

- selection of the NPS model;
- use of Remote Sensing /GIS Methodology; development of a GIS Database;
- integration of GIS And NPS Model;
- Control Measures, Surveillance And Closures.

The duration of the project is 24 months (June 1994 - May 1996). Cost-sharing contracts.



Outcomes-Results

- To evaluate the possible effects of best management practices (BMPs), the SWRRBWQ model was run for several scenarios. The analysis of increasing BMPs included better land management practises to reduce soil loss, grass watershed and impoundment structures, animal waste management practices, and fertiliser management practices. The management scenarios demonstrated that the reduction of fertiliser application rates and

availability levels will bring approximately proportional improvements in water quality related to NPS pollution.



- Further spatial analysis was carried out through the identification of critical areas. An analysis using the spatial capability of the model, showed that the initial definition of a critical area was a good surrogate for some pollutants, but not for others. Critical areas were displayed using the GIS.

- One application at the Alphone watershed in Italy has been developed providing all the technical information of the NPS model SWRRBWQ. Two other applications in Turkey and Egypt have been developed and one in Greece for the Sperchios River catchment. This last application has provided all the information on CORINE classification, GIS and RS as well as on the hydrodynamic and water quality mathematical model. The previously described applications involve the integration of the agricultural non-point source pollution model (SWRRBWQ), the RS/GIS ARC/INFO, data sources and connecting software.

- The primary objective to achieve this integration was met, and a number of scenarios were established to explore rainfall variation, model sensitivity, and changes in management practices.

- Furthermore workshops, training and networking have been organised. Also members of the consortium have disseminated data and results via the internet to some EC projects.

Contribution and innovation

- In the frame of this activity each partner has formulated strategies and control measures for the sustainable use of water resources in its country and designed a future extension of the database. The overall project has established control measures that will benefit the countries involved in the future.

- In addition the use of GIS as a data resource should enable agencies and authorities to establish centralised geo-referenced databases. These techniques also provide federal and state regulatory agencies with the information and tools needed to develop management measures for monitoring sources of non-point pollution. Such tools allow these agencies to prioritise spending, concentrating financial resources on plans that will result in significant reduction of pollution.

Lessons learned

- It would have been almost impossible to do analyses without the use of a GIS and RS system. If more time and training were available the use of the GIS would be extended. Certainly the overall approach was very cost-effective in terms of development time, data management, and scenario evaluation
- The use of the SWRRBWQ model integrated with the GIS was considered to be a powerful tool for the effectiveness of the project. The main strength of the GIS, confirmed in this project, is its communication potential and the visual impact of the information.
- Limitations cited include variation between actual and model data due to seasonal variations not captured by averaging, changes in actual information after data capture, input errors, unavailability of data (e.g. conservation practice values), uncertainty in model relationships, and the applicability of a general regression model to the specific area of study.



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Objectives

- Investigate the feasibility of developing an inherent safety opportunity audit/technology options analysis.
- Encourage the adoption of primary prevention approaches.

Background - Problems It is now generally recognised that in order to make significant advances in accident prevention, the focus of industries must shift from assessing the risks of existing production and manufacturing systems to technological alternatives (i.e. from the identification of problems to the identification of solutions). The underlying premise of this proposed research is that by encouraging industrial firms to perform technology options analysis (TOA) and to consider technological changes, through an inherent safety opportunity audit, facilitate the advancement of primary prevention strategies altering production systems would be facilitated. As a result there would be less inherent risks. Inherent safety approaches have managerial advantages over secondary accident prevention: they fit more easily with proactive policies, and facilitate organisational learning processes that are vital for the continuous improvement in safety and environmental performance, needed for sustainable development.

Actors Nederlands Instituut voor Arbeidsomstandigheden NIA (Amsterdam), Ergonomia Ltd. (Athens)

Project organisation, financing, time frame This project concerns

- the development of a Technological Options Analysis (TOA) as part of an Inherent Safety Opportunity Audit (ISOA);
- the realisation of four pilot projects in relevant companies (2 in The Netherlands, 2 in Greece);
- the adoption and implementation of the Technological Options insofar that they are found to be feasible;
- the evaluation and description of the process of these interventions and the results thereof in the form of a monograph.

The duration of the project is 30 months (Jul 1996 - Dec 1998) with cost-sharing contracts.

Outcomes-Results

A Technology Options Analysis (TOA) should form the centrepiece of an Inherent Safety



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Opportunity Audit (ISOA). This approach enables industries to identify and consider changes and alternatives to their present production technologies and approaches. This includes inputs, final production and process changes involving alternative synthetic pathways.

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HEALTH AND ENVIRONMENT

Iraklion waste water reclamation pilot study for irrigation and ground water recharge (Greece)

Irrigation and wastewater management.

Objectives

- Evaluate the wastewater tertiary treatment efficiency.
- Evaluate the effect and safety of irrigation with reclaimed water

and to develop design criteria for full scale projects.

- Develop a model for water quality management of Finikia area.
- Provide field operational experience.



Project organisation, financing, time frame The duration of the project is 36 months (July 1994 - June 1997).

Outcomes-Results For being able to implement the project the following must be accomplished:

- Study and construction of: Tertiary treatment of secondary wastewater effluent pilot plant; Irrigation trials; Plant tissue and product effect determination in irrigated plots; Groundwater recharge experiments, and; Transform and transport experiments, for various contaminants.
- Operation and management of the above for a period of two and a half years and development of design criteria for large-scale reclamation and reuse of wastewater effluents.

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Solid Waste Management (Morocco)

Reuse of Urban Waste and Water Management.

Objectives

- Review methods of data collection used for similar studies.
- Form an experimental, multidisciplinary research team.
- Propose a socially and financially acceptable system for the elimination of solid wastes in peri-urban areas.
- Publish documents, disseminate project results and the methods used for community education, and raise awareness.

Background - Problems Waste disposal is a major environmental concern in rapidly growing urban areas.

Actors The multidisciplinary team of CNGSE (Centre national de génie sanitaire et de l'environnement) in co-operation with the municipality.

Project organisation, financing, time frame

- This project was designed to assess a waste management system.
- The system comprised of the collection and treatment of household waste and was developed with community participation.
- A small peri-urban community near the city of Sale was used as the pilot test site.

The IDRC grant is \$ 150 000 CAD .The duration of the project is 2 years (in progress)

Outcomes-Results

- Two educational campaigns aimed at informing the public for the importance of environmental protection and the negative impact of improper waste disposal has been organised.
- A questionnaire survey was elaborated and pre-tested. The administration of the questionnaire survey took place just after the second educational campaign and the total sample was over 200 households.
- Community residents were found to be embarrassed by and discontented with the presence of uncontrolled piles of waste in the area.
- Most residents were in favour of door to door waste collection or of installation of large waste bins which can be wheeled to a common collection site.

Contribution and innovation

The system was designed to be adaptable to other areas.

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Environmental demonstration project in the field of industrial activities of the National Spanish Railway Network (RENFE) (Spain)

Hazardous waste management and waste water treatment.



Goals Minimisation of hazardous waste generation and management optimisation as well as appropriate industrial waste water treatment.

Objectives

- Development of an environmental optimisation pilot programme, which would operate over a group of three railway rolling stock maintenance shops.
- The programme will introduce different ways of action in the systems and processes, applicable to all RENFE's repair shops.

Background - Problems Maintenance of RENFE's rolling stock is carried out in 65 repair shops. Environmental considerations include two main aspects: Hazardous industrial wastes and industrial waste water.

Actors INI MEDIO AMBIENTE SA, National Spanish Railway Network (RENFE)

Project organisation, financing, time frame The project will be carried out in 3 installations that represents 49 out of 65 RENFE's repair shops. In the above repair shops the following actions will be undertaken:

- Environmental analysis: integral environmental management audit. I
- Environmental design: Most satisfactory solution for the segregation of different waste flows, design of treatment pilot plants, design of modifications of the production processes and materials involved, design of the hazardous wastes management programme, design of environmental training programme, design of an internal and external, national and international communication programme.
- Demonstration site implantation: treatment plant engineering project (it will include civil engineering and industrial installation), construction of the plants.
- Result analysis during six month operation period.

The project is funded within the LIFE program of EU. The duration is 36 months (Jan 1994 – Dec 1996).

Contribution and innovation

- Once the demonstration project is concluded, and its environmental and economical effectiveness assessed, RENFE intends to expand its coverage to all its workshops.
- It is also intended to generate an environmental support system for the development of specific initiatives within the European railway sector.



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LIST OF WEB SITES

<http://www.bestpractices.org/>

<http://www.cordis.lu/>

<http://www.sustainability.org.uk/>

<http://www.iclei.org/>

<http://www-esd.worldbank.org/>

<http://www.un.org/esa/sustdev/>

<http://wtcc.org/>

<http://europa.eu.int/comm/urban/html>

<http://wbcsd.ch/aboutus.htm>

<http://www.cedare.org.eg/>

<http://www.sdgateway.net/>

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<http://panda.org/resources/countryprofiles/mediterranean/medprojects.htm>

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<http://www.iae.org/metap/>

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