INTERNATIONAL COOPERATION
with Africa in FP6

PROJECT SYNOPSIS
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International Cooperation with Africa in FP6

Project Synopses
In 2005, the African Union adopted Africa’s Science and Technology Consolidated Plan of Action (CPA) following extensive continent-wide consultations. The CPA emphasises the development of Africa’s research and technological innovation through Networks of Excellence Centres and capacity building programmes.

Improvements of human well-being today depend crucially on knowledge — its production, distribution, ownership and wise application. Research carried out domestically and internationally is vitally important for the generation of knowledge that a country can use for its development. International scientific and technological cooperation is a cornerstone for the transition to sustainability in today’s context of accelerating technological development and global interdependence.

The 8th Partnership on Science, Information Society and Space agreed at the EU-Africa Summit in Lisbon in December 2007 is, therefore, a very important milestone for both sides. We realise that much can and must be done, requiring strong political commitment among African countries to build up their science and technology (S&T) capacities and use the results already available. This must be supported by strong international cooperation.

Fortunately, we have a long and positive track record of scientific cooperation with African teams from across the continent mobilising local scientists and helping to strengthen the local RTD potential, thus promoting excellence from both regions. Since the early times of European Community research, collaboration with Africa has been a centrepiece for international S&T cooperation and has grown steadily in scope and financial resources.

This catalogue documents the part of recent achievements under the Specific International S&T Cooperation Programme (INCO) of the 6th Research Framework Programme (2002–2006). Europe’s present strategic partnership with Africa in S&T can draw on the competence and knowledge mobilised during this and earlier programmes. We need to ensure that the investment into these forms of international cooperation bear fruit for the sustainable development of both sides.
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In keeping with the increasingly international nature of knowledge creation and use, the European Research Area (ERA) is to be open internationally. The Sixth Research Framework Programme (FP6: 2002-2006) was the key instrument for the development of this research policy and implementation in the first phase of ERA.

The FP6 offered three major routes for international scientific cooperation:

a) An international cooperation dimension integrated in the activities of each of the thematic priority fields of the specific programme “Integrating and strengthening the European Research Area” as well as in the “Specific activities covering a wider field of research”.

b) Dedicated international cooperation activities (henceforth referred to as INCO) which are relevant to some groups of countries or regions and which are not addressed by the other thematic activities of the programme “Integrating and strengthening the European Research Area”.

c) A coherent set of actions to support the international mobility of researchers in the framework of the specific programme “Structuring the European Research Area”.

Across all of FP6, 3,888 applications were registered from research teams in 51 African countries in response to the different open calls for proposals leading to the funding of a total of 873 participations in 319 projects.

The present catalogue covers participation of African teams under the second route: Specific measures in support of international cooperation (INCO). INCO focused on mutually beneficial efforts and promoted equitable research partnerships between the Community and its Member States on the one hand and the INCO target countries and other third countries on the other.

For INCO-FP6, there were 2,365 applications from 49 countries respectively, leading to 486 participations. One hundred thirty one (131) projects involving teams from 33 African countries, together with their peers from Europe and other regions, were successful and received funding.

The African and European teams succeeded in a very competitive environment, where not all proposals meeting the quality thresholds could be financially supported because of funding limitations of the INCO Programme.

The value of these collaborations is thus not just measured in the financial contribution from the INCO Programme to African teams. A significant part of the value lies in EU-Africa networking, which also mobilised other societal groups beyond academia and the usefulness of the knowledge for all parties involved and its contribution to overall sustainable development. More than EUR 94 million was directly transferred to African teams, while total funding of the projects was significantly higher due to contributions to other teams and participants’ own resources.

This catalogue is structured into seven sections in line with the structure of the relevant parts of the INCO work programme. Within each section, projects are listed in sequence of contract numbers. Each project sheet contains information about the project title, acronym, the coordinator (including contact details), duration, EC funding, the website (where appropriate), a short project description and information about the partners involved. Indexes by country, sub-region and sector facilitate its use as a reference tool for scientific cooperation between the EU and Africa.

The implementation of Africa’s Science and Technology Consolidated Plan of Action (CPA) will make use, among others, of the research partnerships developed under the successive international scientific cooperation programmes, but will also seize the additional opportunities arising from the 8th Partnership on Science, Information Technology and Space which was agreed at the EU-Africa Summit in Lisbon, in December 2007, using a wide range of implementation mechanisms.

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* These projects are not included in this catalogue.
A. DEVELOPING COUNTRIES

1. HEALTH AND PUBLIC HEALTH

1. Reproductive health
2. Health care systems, policy and management
3. Knowledge and technologies to improve control of neglected communicable diseases
PROMISE COMPONENT 2

Promoting infant health and nutrition in Sub-Saharan Africa:
Safety and efficacy of exclusive breastfeeding promotion in the era of HIV

Context and Objectives

One of the goals of the Millennium development is to globally reduce by two-thirds the mortality rate of children under five years of age. Promotion of exclusive breastfeeding (EBF) is the most effective child health intervention currently feasible for implementation at population level in low-income countries. It can lower infant mortality by 13%, and by an additional 2% were it not for the fact that breastfeeding transmits HIV. The objective of this study is to lead the way in promoting child health by developing, implementing and assessing the health impact of an intervention promoting exclusive breastfeeding in African settings where a high prevalence of HIV is a barrier. More precisely, the principal objective is to assess the following in a community-randomised trial:

- the impact of peer-counselling in increasing the exclusive breastfeeding rates at three months of age;
- the effects of the trial on infant morbidity (two-week diarrhoeal disease point prevalence at three months), growth (up to six months of age), and micronutrient status.

Activities

The PROMISE COMPONENT 2 research consortium consists of three European partners: the University of Bergen, Norway; the University of Montpellier, France; the University of Uppsala, Sweden; and four African partners: Centre Muraz, Burkina Faso; Makerere University, Uganda; University of Zambia and the University of Western Cape, South Africa. The PROMISE COMPONENT 2 EBF is a community-randomised trial of the impact on EBF promotion through peer counselling and in turn the impact of this change on infant morbidity, growth, and micronutrient status. It uses a peer counselling approach, randomised at community level, combined with the production of information that may in the longer run help overcome other constraints to EBF, such as fear that it may lead to micronutrient deficiencies, concern about cost implications, or anxiety about burdens to the health care system of implementing the intervention on a large scale.

Expected Results and Outcomes

In this way, the EU is contributing to the production of knowledge on how to reach one of the Millennium development goals. This study will provide the first data from a randomised trial on the safety and efficacy of peer counselling as a way of increasing the rate of exclusive breastfeeding in an African context. The range of four countries included will enhance generalisability of these findings. Measuring the impact of this intervention on infant morbidity, growth, and micronutrient status as well as the costs, efficacy and implications for the health care system of implementing such an intervention will play a key role in the research.

In one package, it will provide all the information policymakers need and if the outcome is positive, hopefully lead to more rapid replication. Since peer counsellors are by definition local women, this project presents a very low-cost intervention suitable to resource-poor environments.
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TRYLEIDIAG

Simplified and rapid molecular assays for diagnosis of Leishmaniasis and Human African Trypanosomiasis and parasite (sub-) species identification

Period: 01/11/2005 to 31/10/2008
Budget from EC: EUR 2 390 000
website: www.tryleidiag.org

CONTEXT AND OBJECTIVES

Human African Trypanosomiasis (HAT), or sleeping sickness, currently affects 500 000 people in sub-Saharan Africa. Visceral, cutaneous, and mucocutaneous leishmaniases (LEI) threaten 350 million people, with 12 million infected persons in Latin America, Asia, Europe, and Africa. In the absence of prophylaxis or vaccination, control of both diseases is based on diagnosis and treatment of patients.

Due to limited specificity of serological tests and toxicity of the drugs, treatment is started after confirmation of the parasite presence in blood, lymph node fluid, or bone marrow in seropositive persons. Since parasitaemia can be extremely low, quite a number of infected persons remain untreated and constitute a non-controlled human reservoir next to the animal reservoir from which the parasites can always return into the human population.

Recent innovations in molecular diagnosis have opened perspectives for robust and rapid point-of-care molecular tests as a real alternative for parasitological diagnosis in leishmaniases and sleeping sickness, together with the potential of differentiating species and subspecies in one test.

The objectives of the project are:
• to develop and validate a sensitive point-of-care test for molecular diagnosis of both diseases based on ribosomal RNA detection;
• to develop low-tech molecular tests for parasite species and strain differentiation;
• to strengthen research capacity of African investigators on the biology and diagnosis of these diseases.

ACTIVITIES

The project team will combine several innovative techniques to provide solutions for the above identified needs in diagnosis and (sub-)species identification. Activities will comprise:
• establishing documented banks of Leishmania and Trypanosoma parasites;
• establishing documented banks of patient biological samples;

• development of prototype tests;
• laboratory evaluation of the prototype tests for proof-of-principle delivery (phase I);
• large scale laboratory evaluation of the prototype tests that pass the proof-of-principle on a defined collection of patient samples (phase II);
• large scale evaluation of the tests on the target population without prior knowledge of subject status (phase III).

EXPECTED RESULTS AND OUTCOMES

The project is expected to provide the following results:
• robust, rapid, and simple point-of-care alternative for parasite detection with greatly increased sensitivity and specificity to the benefit of the target population;
• beneficiaries of the outputs: patients and the academic community in developing and European countries;
• innovative low-technology tests for parasite detection and unequivocal (sub-)species identification;
• increased scientific and technological expertise of African researchers and institutes;
• participation of researchers from southern partners in European laboratories;
• technology transfer through exchange of personnel within the project consortium;
• delivery of new diagnostic tests to national and international disease control agencies;
• technology adaptable to other diseases.
Buruli ulcer (BU), a disease caused by Mycobacterium ulcerans, is a neglected disease of the poor in remote, rural areas. BU is the third most common mycobacterial disease after tuberculosis and leprosy. It is most endemic in West Africa with incidences as high as 280/100 000, but cases occur around the globe.

Currently, BU is treated by surgery — there are no established protocols for treatment with antibiotics. This is neither affordable nor sustainable in endemic regions, and it is poorly accepted among people in endemic areas. Though mortality of the disease is low, morbidity and subsequent disability are very high, with up to half of those treated being left with disabilities that have long-term social and economic impacts. New molecular tools are needed to explore epidemiology and transmission, and improve diagnostics and treatment.

This project is a multidisciplinary treatise that aims at the development of new tools and knowledge. The overall objective is the improvement of BU control in Africa. This will be achieved by:

- acquiring new knowledge about reservoirs, transmission, diagnostics, treatment, and psycho-social attitudes; and
- application of this knowledge in order to optimise regional control programmes.

**ACTIVITIES**

The following activities are foreseen via close networking of partners with different expertises:

- analysis of molecular epidemiology of M. ulcerans;
- analysis of environmental reservoirs and possible relationship to transmission;
- evaluation of diagnostic principles with the aim of establishing guidelines;
- treatment studies with the aim of establishing guidelines for therapy both with drugs and by surgery;
- analysis of the in situ host response to obtain an understanding of the immune defence against M. ulcerans and to find possible correlates to prognosis;
- a socio-psychological study of the attitude towards BU and its consequences for compliance with old and new therapies.

**EXPECTED RESULTS AND OUTCOMES**

- Identification of the molecular basis of drug resistance in M. ulcerans.
- Identification of host species of M. ulcerans in endemic areas.
- Setup of diagnostic networks capable of supporting case finding, laboratory diagnosis of BU suspects, and epidemiological surveys.
- Proof of principle that clinical cure without recurrence can be obtained by anti-mycobacterial treatment alone in early, limited lesions of BU.
- Evaluation of feasibility of combined anti-mycobacterial and surgical treatment in larger BU lesions.
- Identification and characterisation of lesion-infiltrating T cells.
- Proof that functional limitations resulting from BU can be reduced by early case finding, improved treatment modalities, and appropriate, targeted, and culturally suitable public health campaigns in endemic regions.

BURULICO will also contribute to the optimisation of national control programmes in affected countries. It is expected that the improvement of intervention strategies aimed at in this project will subsequently lower treatment costs, allow wider access to treatment, and therefore contribute to social equity.
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Human African trypanosomiasis (HAT), known as sleeping sickness, is fatal if left untreated and a most neglected disease in Africa. An estimated 350,000 people are infected in 36 countries, the majority living in Angola, DRC, Uganda, Sudan and RoC. New diagnostics and treatments are urgently needed. Diagnostics require invasive methods and lack sensitivity and specificity. Drugs in use are old, toxic, losing efficacy, and require prolonged therapies.

For over forty years, negligible clinical research has been done for new HAT treatments; thus, clinical research infrastructure and professional capacity in disease endemic countries is extremely limited. With new treatments in the pipeline, constraints in clinical evaluation and registration of new interventions for HAT must be urgently addressed. In August 2005, Drugs and Neglected Diseases Initiative (DNDi) sponsored a regional workshop on HAT Clinical Trial Capacity that brought together endemic country HAT disease specialists and European clinical research and disease experts.

This initial meeting resulted in the formation of a regional group of people and institutions, who will work together to determine and implement a strategy to create sustainable regional and national clinical trial capacity for HAT. The present specific support action provides help for the primary activities of this group.

The activities included addressing:
- HAT clinical trial methodology development;
- Strengthening and harmonising regulatory practices throughout the region;
- Developing strategies for national policy change;
- Targeted HAT clinical trial capacity strengthening.

Implementation has been through north-south and south-south exchange of expertise and best practice, specific training and workshops, and concurrent participation in clinical studies. Support to this project has contributed to enabling the disease endemic countries to conduct quality multicenter scale clinical trials in a timely manner with the ultimate aim of getting improved treatments registered and to patients as soon as possible.
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SODISWATER

Solar disinfection as an appropriate Household Water Treatment and Storage (HWTS) intervention against childhood diarrhoeal disease in developing countries or emergency situations

Context and Objectives

Between 2000 and 2003, around 769 000 children under five years of age died annually from diarrhoeal diseases in Sub-Saharan Africa. Solar Disinfection (SODIS) is a technique for making contaminated drinking water safe. Transparent bottles are filled with biologically contaminated water and placed in direct sunlight for six hours. SODIS reduces faecal contamination levels from 1 million bacteria per ml to zero in less than 1.5 hours and is completely effective against the pathogens responsible for cholera, dysentery, typhoid, giardiasis, salmonella, gastroenteritis, and polio.

The strategic objectives of the SODISWATER project are to:
• demonstrate that SODIS of drinking water is an appropriate, effective, and acceptable intervention against waterborne disease for vulnerable communities in developing countries without reliable access to safe water;
• evaluate and test different diffusion and behavioural change strategies in areas with different social and cultural conditions for sustainable adoption of solar water disinfection;
• disseminate these research outcomes throughout the international aid and emergency relief communities so that SODIS is adopted as one of a range of standard, appropriate water quality interventions (for example, filtration, chlorination, desalination, etc.) for use in the immediate aftermath of natural disasters such as tsunami, flood, earthquake, hurricane/typhoon or man-made disasters such as war-zone, famine and refugee camps;
• develop a spectrum of appropriate SODIS enhancement technological innovations that can be matched to varying socio-economic conditions; such technological innovations would include UV dosimetric indicators of disinfection, photocatalytic inactivation, and continuous flow compound parabolic collector arrays for small community distribution systems.

Activities

The research activities will be divided into four specific areas:
• Community Health Impact Assessment Programmes: the overall objective of this work package (WP) is to implement appropriately designed health impact assessments to assess the change in health reasonably attributed to the provision of solar disinfected drinking water, at the point of use, in three African countries (Kenya, South Africa, and Zimbabwe).
• Pathogen Inactivation: the primary aim of this WP is to determine whether important waterborne and/or diarrhoeal pathogens are susceptible to SODIS. Previous work has clearly demonstrated that a wide variety of viral and bacterial pathogens can be inactivated with batch SODIS; however, there still remains a considerable number of important waterborne microbes which are, as yet, untested.
• SODIS Enhancement Technologies: the advantages of the batch systems for solar disinfection include simplicity and cost (small, clear container exposed to sunlight), but their limited capacity and reliance on individual compliance are significant disadvantages which could hinder widespread uptake. One of the aims of SODISWATER is to determine the capability and effectiveness of using enhanced solar collection technologies (Compound Parabolic Collector [CPC] photo-reactors, photocatalytic coatings) to disinfect community water supplies in developing countries. In addition low-cost effective indicators of disinfection will be investigated.
• SODIS Adoption and Dissemination: to offer a new technology is not sufficient to get people to use it, even if it is cheap and promising like SODIS. Several factors can play a role in the non-adoption of a technology, including the following: an unreliable source of information, time and money restrictions, beliefs, habits, or social considerations. To adopt a new technology, people first have to be informed about it and then change certain aspects of their behaviour to integrate this technology into their daily life. Diffusion strategies have to be introduced to bring the information to the people. Behavioural change strategies have to be applied to change behaviour. In the case of SODIS, the ones who will apply these strategies are...
international aid and emergency relief organisations. Therefore the WP ‘Adoption and dissemination’ has to investigate possible diffusion and behavioural change strategies for the adoption of SODIS and disseminate the knowledge about this technology to relevant organisations.

EXPECTED RESULTS AND OUTCOMES

Results are expected in four different areas:

• Community Health Impact Assessment (HIA) programmes:
  • report: a field manual which will describe full details on how field trials will be conducted;
  • report: assessment of the impact of the intervention on health determinants/health outcomes;
  • report: assessment of acceptance/compliance of the SODIS method.
• Pathogen Inactivation:
  • report on efficacy of SODIS against bacterial waterborne pathogens;
  • report on low cost solar concentration system for SODIS treatment of bacterial waterborne pathogens;
  • report on SODIS treatment of viral/eukaryotic waterborne pathogens;
  • report on effect of environmental factors on SODIS efficiency.
• SODIS Enhancement Technologies:
  • operational prototype of a continuous flow SODIS reactor with add-on CPC;
  • operational prototype of a continuous flow photocatalytic SODIS reactor with add-on CPC;
  • operational batch photocatalytic SODIS reactor;
  • operational low-cost UV dosimeter/indicator for batch SODIS;
  • cost-based analysis on enhancement technologies for deployment in developing countries;
• pro-poor business action plan.
• SODIS Adoption & Dissemination:
  • report on current water collection/storage/disinfection practices;
  • guide for deriving diffusion and behavioural change strategies from the data of a standardised survey;
  • standardised social monitoring tool for the evaluation of campaign success;
  • publications on SODIS diffusion and adoption factors;
  • SODIS brochure and presentation set for distribution to target communities/aid agencies/governmental departments;
  • SODIS international conference to be held at the end of the project to highlight/disseminate results;
  • dissemination of project research outcomes in international publications and at international conferences.
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TFCASS

Tsetse flies and the control of African sleeping sickness

**CONTEXT AND OBJECTIVES**

African sleeping sickness is endemic to 37 sub-Saharan African countries, covering 9 million km², with 60 million of the 400 million inhabitants living in the region, at risk for the disease. Africa is in the middle of a sleeping sickness epidemic and the World Health Organization (WHO) estimates that in 2004 there were around 500,000 cases, with 48,000 deaths and an impact of 1,590,000 disability-adjusted life years (DALYs).

The objective of this project is to solve the major technical problems associated with regional control of the vectors of sleeping sickness by doing the following:

- developing potent odour baits for use with traps and targets against palpalis group flies — the major vectors of African sleeping sickness;
- developing tools to enable the genetic structuring, epidemiological significance, and mobility of palpalis group populations to be defined, thus enabling control activities.

**ACTIVITIES**

Environmentally acceptable targets and traps will be a key technology in the regional eradication of vector insects. The African and European partners in this application wish to dramatically improve the efficiency of this process. To this end, in Africa and Europe they will develop novel attractants for use with traps/targets designed for use against palpalis group flies, currently the major vectors of human disease.

Secondly, regional control of the flies depends heavily on understanding the structures and mobility of the vector populations so that epidemiologically important, isolated populations can be identified. Current techniques cannot resolve these issues; consequently, working closely as a partnership, the project team will develop new molecular and morphometric technologies in Africa and Europe for this purpose. The TFCASS project has assembled a unique group of African and European scientists who are motivated and excellently placed to achieve these goals, through a fully integrated research programme.

**EXPECTED RESULTS AND OUTCOMES**

The importance of sleeping sickness as a major societal problem in sub-Saharan Africa has long been recognised by all agencies involved in international health. A major political advance occurred recently when the Africa Union clearly recognised that trypanosomiasis control is of the highest importance for African development, and their initiative has been endorsed by the Food and Agriculture Organization (FAO), International Atomic Energy Agency (IAEA), and the World Health Assembly. Consequently, it is believed that the work programme proposed will have a major strategic impact, as it directly addresses major problems identified by the African Union, the WHO, and other agencies involved in international health, as well the European Community itself, through this International Cooperation proposal. The work will contribute by providing tools and techniques of immediate use to field control operations.
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ARVMAC

Effects of Antiretrovirals for HIV on African health systems, Maternal and Child health (ARVMAC)

Period: 01/11/2006 to 31/10/2010
Budget from EC: EUR 2 400 000
website: http://www.arvmac.eu
Coordinator: Dr Anna Mia Ekström
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CONTEXT AND OBJECTIVES

Increasing access to antiretroviral treatment (ART) in resource-poor settings is an obvious emergency measure, but the scaling up of ART poses serious challenges to the overall functioning of the health system. The system’s answer to these challenges may jeopardise or strengthen its response to other health priorities and will affect the feasibility of MDG 4 and 5 in Sub-Saharan Africa (SSA). HIV is inherently linked to child survival, gender inequities and reproductive health. It increases infant and child mortality by up to 40%. Women are 4 to 25 times more vulnerable to HIV transmission — on average, they are 10 years younger than men when infected — and make up the majority of people living with HIV in SSA.

Donor investment in vertical ART programmes enables the current health budget to be doubled in some SSA countries; accordingly, access is no longer constrained by drug costs. Low absorption capacity and lack of infrastructure and human resources are the major challenges to implementing the WHO ‘3 by 5’. Using Tanzania as an example, a redistribution of 35% to 70% of the health system’s workforce is required, in order to increase the number of those on ART, from 8 000 to 220 000 in 2005. The lack of integration of ART with antenatal care limits the prevention of mother-to-child transmission.

Pooling of staff to ART undermines the quality of basic care (ANC, IMCI) and reduces access to second-level care (e.g. Caesarean sections), thus running the risk of increasing child and maternal mortality. Solutions need to be sought on how to: absorb ART funds; prioritise the different types of care; and correctly distribute, monitor and sustain ART in fragile health systems with weak resource allocation capacity, without harming the most vulnerable. The project partners will study health policy, the consequences of ART scale-up in population-based settings on health services, maternal and child health with existing infrastructures for registration of vital events and diseases, as well as three demographic surveillance sites in three different SSA countries, using both quantitative and qualitative research methods.
Developing Countries

ARVMAC

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SUPPORT

The support collaboration: supporting policy relevant reviews and trails

Context and Objectives

Policymakers may not want to ignore research evidence when making policy, but they often do. The goal of the Support project is to make this phenomenon less likely for policy related to maternal and child health in low and middle income countries (LMIC), by improving access to and use of relevant and reliable research evidence.

Activities

Support will produce highly-focused, quality-assessed, and policy-relevant summaries of research evidence in the field of maternal and child health for LMIC policymakers and researchers. Secondly, the project will increase the ability of LMIC researchers to provide, and policymakers to access, reliable evidence by developing and disseminating a range of tools and workshops to a wide audience in LMIC. Software will be developed to support the day-to-day conduct and management of trials, to make it easier for LMIC researchers to address knowledge gaps. The project will help align the priorities of policymakers and researchers, and promote more evidence-informed policies and the more effective use of research resources.

Expected Results and Outcomes

Support will produce overviews of what is known about effective interventions in maternal and childcare and health services, and develop a software tool to foster the conduct and management of pragmatic randomised controlled trials, which will help trialists resolve practical issues regarding the day-to-day management of a trial. The project will run a series of workshops and other knowledge transfer activities for policymakers, funders, trialists and authors of systematic reviews. Through these results and outcomes, Support will improve healthcare delivery and health systems in LMIC by increasing the proportion of care that can be regarded as best practice, and the extent to which health care policies are based on rigorous evidence of intervention effectiveness.

Aims and outputs of the project will support and promote European values, such as solidarity, while also directly supporting EU development policies, such as the reduction of poverty, sustainability, good governance, and long-term economic growth.
SUPPORT

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VHF Diagnostics

Development of rapid field diagnostics for identification, control and management of haemorrhagic fever outbreaks

Period: 01/12/2006 to 30/11/2009
Budget from EC: EUR 853 000
website: www.vhf-diagnostics.eu/

Coordinator: Dr Manfred Weidmann
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CONTEXT AND OBJECTIVES

The control of Viral Hemorrhagic Fever (VHF) outbreaks depends critically on early detection and an early alert, so as to allow, define, and deliver an appropriate response. In order to improve this process, adequate tools need to be developed to enable early detection in the basic (field) conditions of local hospitals. Once the outbreak is identified, case management also needs on-site tools such as viral genome detection to contain the spread of the outbreak, by carefully identifying and monitoring viraemic patients able to transmit the virus. The general objective of the present project is to make adequate tools available, so as to identify VHF outbreaks on-site at an early stage, and to support and complement the control of an outbreak.

To reach this general objective, the project team will develop the following: line assays (LA) for antibody detection, as an easy to use frontline detection assay for healthcare workers in local hospitals; and fluorescent reverse transcription polymerase chain reaction (F-RT-PCR) assays to be used by specialised mobile outbreak investigation teams, that can be applied at the scene of the outbreak. Both assays will cover the following viruses: the Ebola virus (EBOV), Marburg virus (MRGV), Crimean-Congo virus (CCHFV) Lassa virus (LASV), Rift Valley Fever virus (RVFV), Yellow Fever virus (YFV) and Dengue virus 1-4 (DENV). The F-RT-PCR will additionally cover the most important viral differentials, Influenza A virus (FLUAV) and Influenza B virus (FLUBV).

ACTIVITIES

In order to develop LA, purified recombinant proteins will be expressed in the in vitro RTS-500 system (Roche), and sprayed onto immunoblot strips in the manner of a barcode. The LA will be designed for VHF circulating in Africa. Validation of the LA will be achieved by using available sera in the laboratory consortium, which will be centralised in a repository for VHF diagnostics development.

Existing F-RT-PCRs will be validated for field use (EBOV, MBGV 12, CCHFV 13, RVFV 14, DENV 15, FLUAV, FLUBV16). Additionally, F-RT-PCRs not yet described for LASV and YFV will be designed and validated for field use. To assess the sensitivity of each assay, RNA-standards will be generated for each aetiological agent derived from sections of the respective genomes. The specificity of the assays will be evaluated with recent isolates of each aetiological agent and patient and/or rodent sample provided by the collaborating laboratories. The extraction of nucleic acids from blood samples will be adapted to field conditions. The development of lyophilised ready-to-use PCR mixes for each aetiological agent, will allow field PCR without the need for refrigeration facilities.

EXPECTED RESULTS AND OUTCOMES

In the case of LA, the production of the envisioned line assay is expected, and its applicability tested in local hospitals in Mali and Guinea. It is hoped that it will be proved that an easy-to-use frontline test is indeed a tool able to reduce alert time in the case of an outbreak. Furthermore, detecting either a YFV, RVFV, or LASV outbreak during the evaluation period, would be a positive outcome.

For the F-RT-PCR, the development of an integrated toolbox for mobile outbreak investigation teams, which will enable them to perform initial differential diagnostics and follow-up on patients during the containment of the outbreak, is anticipated. This will consist of a field-evaluated set of lyophilised PCR mixes for VHFV, plus FluA and B virus detection, in combination with a field-evaluated simple extraction protocol. If successful, it may be possible to produce the LA assay for the African market.
VHF Diagnostics

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CONTRAST

A multidisciplinary alliance to optimize schistosomiasis control and transmission surveillance in sub-Saharan Africa

Period: 01/10/2006 to 30/09/2010
Budget from EC: EUR 2 900 000

Coordinator: Dr Thomas K. Kristensen
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CONTEXT AND OBJECTIVES

CONTRAST is a multidisciplinary research alliance focused upon technological innovation and provision of new knowledge to develop locally-adapted and sustainable intervention strategies, complementary with morbidity control using praziquantel (PZQ). CONTRAST is committed to creating a new and much-needed platform for integrated schistosomiasis control in Africa, which will be effective and sustainable at national and local level.

ACTIVITIES

CONTRAST is a multidisciplinary alliance bringing together key skills and expertise to generate new knowledge on biological, environmental, and socio-economic factors relating to schistosomiasis in sub-Saharan Africa. The project will complement ongoing chemotherapy campaigns based on the drug praziquantel and deliver more effective strategies for long-term control of this debilitating disease. The project addresses the basic need of endemic countries to improve understanding of schistosomiasis transmission, in order to target, and make best use of limited resources for control. CONTRAST will lead to better local control solutions that are more sustainable. Working with five European partners (established research institutes and a representative from the commercial sector), a strong research node network across sub-Saharan Africa will do the following: establish innovative molecular tools to characterise both snails and schistosomes; define the importance of host-parasite dynamics across different ecological and epidemiological settings; develop new spatial models for disease risk maps and prediction; encourage and assess novel local control interventions using a social science approach; and ensure widespread dispersal and access to information.

EXPECTED RESULTS AND OUTCOMES

A realistic contribution to solving problems will be achieved by placing a greater emphasis on integrated strategies appropriate to the specific, local settings necessary to cater to the locality and spatial heterogeneity of schistosomiasis. The benefits will be to identify the key biological, environmental, demographic, and socio-economic factors that maintain schistosomiasis at high levels of endemicity.

As such integrated control strategies provide additional evaluation indicators upon which success or failure can be tested, these will include:

- extensive description information of snail-schistosome relationship across endemic areas for disease transmission models;
- a DNA nomenclature to quantify the extent of genetic variation within snails and schistosomes from typical disease endemic environments, enabling associated changes following chemotherapy selective pressure to be assessed;
- measurement of changes in the levels of schistosome contamination in the environment through the use of novel molecular detection methods;
- field validation through parasitological surveys of spatial epidemiological models that aim to predict the distribution of schistosomiasis at local levels;
- information on the numbers of new people provided with clean water and adequate sanitation and its local effects upon schistosomiasis transmission;
- changes in local socio-economic status associated with schistosomiasis control through the use of interrogative questionnaire methods.

Dissemination of knowledge will be to identify target groups, specifically the international scientific and medical communities, as well as all health care stakeholders working with communicable tropical diseases in sub-Saharan Africa. Contribution to health policy standards will be made through representation of partners at the following organisations: the World Health Assembly Forum and WHO technical Expertise Groups, international medical and scientific conferences on international health, as well as at other key stakeholders meeting who have access to basket funds to provide health or associated services (e.g. Global Initiatives). Partners with CONTRAST will also liaise at national governmental level, providing advice on schistosomiasis control, and environmental quality and management, including governmental authorities and NGOs working within these sectors. In addition, partners will engage with the general public in endemic areas at selected field sites.
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SHIELD
Strategies for health insurance mechanisms to address health system inequities in Ghana, South Africa and Tanzania

Period: 01/10/2006 to 30/09/2009
Budget from EC: EUR 1 999 443

CONTENT AND OBJECTIVES
This project will critically analyse the existing health system in Ghana, Tanzania, and South Africa to identify their major equity challenges. This will allow the project to consider alternative approaches to health insurance within these countries, as a mechanism for addressing health system equity challenges and in turn contributing to achieving the Millennium Development Goals. To achieve this principal objective, the distribution of the burden of health care financing between socio-economic groups and the factors influencing this distribution will be evaluated. The project will also evaluate the distribution of health care benefits across socio-economic groups and health system related factors that influence this distribution of benefits. Furthermore, current experience and options for the likely future development of health insurance mechanisms (particularly mandatory insurance and insurance for non-formal sectors) in and between Ghana, South Africa, and Tanzania will be identified and critically evaluated. Assessment of health insurance options will particularly focus on their actual and/or potential equity impact and their feasibility and sustainability given the attitudes and preferences of key stakeholders. Finally, the project will develop strategies and policy recommendations on health insurance mechanisms that will most appropriately address identified health system equity challenges.

ACTIVITIES
There will be five main activities in this project. First, existing national household survey databases, combined with information from tax authorities, will be analysed to determine the current distribution of financing between socio-economic groups. This will be supplemented by case studies in a sample of communities (household surveys, focus group discussions and key informant interviews) to explore factors influencing this distribution. The second activity will involve similar analyses of secondary data on the distribution of health care benefits and case studies in a range of health services (exit interviews, focus group discussions, and key informant interviews) to evaluate factors influencing this distribution. Third, in-depth interviews with key actors will be undertaken to determine their views and preferences in relation to health insurance options and the reasons for these views. The fourth main activity will involve a combination of spreadsheet modelling to identify alternative health insurance designs that would best promote equity and financial sustainability and critical assessment of the feasibility of successfully implementing each option given actor preferences and their relative power in influencing policy processes. Finally, recommendations on the most appropriate health insurance options within each country will be developed in collaboration with policy-makers.

EXPECTED RESULTS AND OUTCOMES:
This research will identify health insurance designs in each of the three African countries that are most likely to promote overall health system equity and be successfully implemented, given stakeholder preferences and ability to influence policy design and implementation. More particularly, it will consider in some detail health insurance design options, which will assist policy-makers in each country in identifying the most appropriate route for future health insurance development. This research will be innovative in its exploration of the system-wide implications of health insurance and its development of innovative tools and methods that will be made available to other groups to use.

A recent World Health Assembly resolution on universal coverage and social health insurance, called for the development of ‘methodologies better to measure and analyse the benefits and cost of different practices in health financing, covering collection of revenues, pooling and provision or purchasing of services, taking account of economic and sociocultural differences’. This project promises to make a major contribution in this regard, particularly insofar as it covers the entire process involving the identification of existing health system equity challenges as well as the identification and evaluation of health insurance options and likely implementation challenges.
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SCOOTT

Sustainable Control of Onchocerciasis Today and Tomorrow

Period: 01/11/2006 to 31/10/2010
Budget from EC: EUR 2 800 000
Coordinator: Prof David William Taylor
University of Edinburgh

CONTEXT AND OBJECTIVES

The purpose of this project is to improve sustainable control of onchocerciasis (river blindness) through refinement of existing chemotherapeutic regimes and identification of new targets and approaches for integrated control that will combine chemotherapy with vaccination. The demand for these studies comes from:

- the need to control re-emergence of onchocerciasis in regions where transmission had been interrupted;
- indications consistent with the emergence of ivermectin resistance;
- concern about adverse side reactions following ivermectin treatment in loiasis endemic areas.

There are three primary objectives:

- research into refinement of existing chemotherapeutic regimes by use of doxycycline to complement ivermectin treatment and further screening of existing drugs;
- assessment of immunological sequelae of ivermectin intervention and their implications for improved control strategies;
- identification of new targets, including vaccine candidates, and approaches for integrated control.

As doxycycline is already licensed for human use, combination therapy with ivermectin for selected indications (not mass treatment) will deliver short-term impact while providing a framework for the longer term vision of integrated chemotherapy-vaccine control of onchocerciasis.
Developing Countries

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NEUROTRYNP

Biology and clinical staging of trypanosome neuroinvasion in sleeping sickness

Period: 01/10/2006 to 30/09/2009
Budget from EC: EUR 1 700 000
Coordinator: Prof Krister Kristensson
Karolinska Institutet

CONTEXT AND OBJECTIVES

The NEUROTRYP project foresees a highly integrated investigation of sleeping sickness or human African trypanosomiasis (HAT). This is a neglected but re-emerging disease in sub-Saharan Africa. HAT develops into an early haemolymphatic and a subsequent encephalitic stage, during which the causative parasite Trypanosoma brucei and/or increased numbers of lymphocytes are found in the cerebrospinal fluid. Arsenic compounds are still the drugs of choice for treatment at the encephalitic stage, but they are associated with severe and often fatal side-effects. Drug resistance also poses a serious problem. There are important gaps in knowledge concerning the following: the mechanisms by which trypanosomes invade the brain; when, post-infection, such invasion occurs; and the effects of drugs on trypanosomes that have invaded the brain parenchyma. Therefore, the objective of the NEUROTRYP consortium is to discover molecules that may be considered as markers for an effective staging of HAT, and design new therapies by using drugs which have already passed clinical trials in humans for other indications.

ACTIVITIES

In order to discover mechanisms of parasite neuroinvasion and thereby devise candidate diagnostic markers for an effective staging and new therapeutic management of HAT, the NEUROTRYP project plans to pursue the following activities:

- strengthen the research capacity of African investigators by providing transfer of technology to and training for junior investigators, especially African scientists; also to develop expertise on HAT and other neuro-inflammatory diseases, which plague the African continent.

EXPECTED RESULTS AND OUTCOMES

The research will provide new knowledge on the biology, epidemiology, and the technologies relevant to sustainable surveillance systems of HAT on a regional scale. In addition, it will provide information with the intention of improving the existing treatment of sleeping sickness. Once established as robust, such technologies can be incorporated into national laboratories and regional reference centres. By including five African and three European partners, the project will provide a basis for the development of a strong and durable partnership, with extensive interaction and exchanges between African and European countries. In particular, NEUROTRYP expects to do the following:

- provide a rationale to develop improved diagnostic tools for disease staging and cure assessment;
- strengthen the research capacity of African students and institutions, and establish durable collaboration between European and African laboratories;
- devise, as an ultimate benefit, therapeutic strategies whereby drugs may be designed to inhibit and cure trypanosome neuroinvasion, which is the most serious complication of African trypanosomiasis.
AUDOBEM-AFRO

Effectiveness of facility-based audits to improve the responsiveness of West African district hospitals to obstetric emergencies: a three-country cluster randomised controlled trial

Context and Objectives

Identifying and implementing sustainable interventions to improve the quality of hospital care in sub-Saharan Africa is challenging. Maternal and perinatal mortality ratios stagnate at a high level and improving hospitals’ responsiveness to obstetric emergencies is thought to be an important potential contribution to decrease in mortality. The World Health Organisation (WHO) has launched an initiative to promote a range of quality assurance strategies, including several types of facility-based audits. While audits certainly hold promise, the evidence for their effectiveness is mixed. All randomised controlled trials of audits have been undertaken in industrialised countries, but the effectiveness of health services intervention is likely to vary according to context.

Activities

The project plans to carry out a cluster-randomised, controlled trial in West African district hospitals to assess the effectiveness of two types of facility-based audits: criterion-based clinical audits (CBCA) and patient-centred case reviews (PCCR). WHO guidelines on the management of obstetric complications and enhanced routine documentation, including the WHO partograph, will be introduced in all 36 participating hospitals, while CBCA or PCCR will be set up in 12 hospitals each. The primary outcome variable is a responsiveness score, designed to measure technical and organisational management of obstetric emergencies. Additional outcome measurements include the delay between decision and start of emergency caesarean section, and hospital-based perinatal mortality. A concurrent anthropological study will improve our understanding of how audits work - or why they fail - and identify barriers and facilitators for their successful integration into routine practice. An economic evaluation will assess the cost-effectiveness of both interventions.

Expected Results and Outcomes

The randomised controlled trial will provide robust evidence on the effectiveness of the two types of facility-based audits introduced by the WHO in first-line referral hospitals in resource-poor African countries. Such evidence will guide policy makers and implementers in deciding whether to adopt one of these two interventions as a quality improvement strategy. The anthropological study will contribute to an understanding of how audits can affect change, or why they fail to do so. Thus, future audit programmes may learn how to avoid pitfalls and how to create conditions conducive to successful audits. The economic evaluation of the audit interventions will inform us about the economic viability of facility-based audits in first-line referral hospitals. If both audit types are shown to be effective, information on their cost-effectiveness will help policy makers choose between them.

The project is expected to contribute to maternal and neonatal survival and wellbeing by providing evidence that will guide policy makers on how good quality in obstetric care can be achieved and maintained. It will also contribute to capacity building in public health research in the partner countries.
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GHIs in Africa

Experience of African countries with global health initiatives

Period: 01/11/06 to 31/12/2010
Budget from EC: EUR 3 199 531
Coordinator: Prof Wim van Damme
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CONTEXT AND OBJECTIVES

The past five years have witnessed a proliferation of global health initiatives (GHIs) which have emerged as an alternative to traditional and multilateral health development funding. GHIs are widely seen as an efficient and rational response to global health threats, yet little is known about how the shift from traditional approaches has impacted health systems in recipient countries. The general objective of the research is to understand how the rise of the GHIs has impacted the architecture of development partnerships and national-level health system management functions in four south African countries. The specific objectives of the research are:
• to assess the impact of GHIs and donor dependency on country-level decision-making and planning processes;
• to assess the impact of GHIs on country human resource policies, deployment, and effectiveness, and/or competition for human resources for programme planning, management, and service delivery;
• to evaluate how the proliferation of GHIs has influenced the within-country praxis of development assistance for health and;
• to identify best practices to integrate new GHIs within existing partnerships and country systems in a way that improves the coherence of development assistance and the coordination and efficacy of the health system.

ACTIVITIES

A document and literature review will be conducted to ensure that research undertaken complements and clarifies existing evidence, both nationally and internationally. The qualitative research methods will help us understand what these initiatives are and how they function in each country. On this basis lessons can be extrapolated from national experiences into international recommendations. The project will also organise expert meetings for partner discussions, methodology development, and exchanges with policy-makers.

EXPECTED RESULTS AND OUTCOMES

The project will close the knowledge gap by contributing information on the evolution and effectiveness of GHIs, typology of donor harmonisation initiatives, the extent and effect of integration in national planning of sub-Saharan countries, the impact on human resources and the performance of health workers. The expert meetings create opportunities to mobilise regional and national stakeholders for discussions and inform them of research findings in order to clarify relevant policy implications and action plans. The project will strengthen the interaction among research partners in Europe and Africa, and representatives of key international organisations (for example, the European Commission, WHO-Geneva, WHO-Africa, NEPAD, SADC, and country WHO offices).
GHIs in Africa

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SCHISTOINIR

Innate Immune Responses and Immunoregulation in Schistosomiasis:
Novel mechanisms in the control of infection and disease

Context and objectives

Chronic helminth infections, such as Schistosoma sp., can cause immune down-regulation through long-term, repeated stimulation of the innate immune system. This follows the binding of parasite molecules to a limited number of innate receptors, leading to changes in the innate immune system that dictate whether the development of an adaptive immune response is stimulated or regulated. This aspect of the immune system represents a novel route to exploit in the development of future control measures.

The project team has four main objectives:

- define innate immune responses in patients infected with schistosomes that are associated with down-regulation of acquired immune responses, or conversely, the development of pathology;
- characterise and manufacture the parasite-derived immunoregulatory molecules;
- use these molecules to manipulate protective immune responses and immunopathology;
- aid existing control programmes by using epidemiological and geographic data gathered in the field.

Activities

The following activities will be carried out under the SCHISTOINIR project:

- investigate differences in the innate immune response, specifically of innate receptors and their downstream events, in groups of infected patients in three different endemic regions that have contrasting histories of infection and pathology:
  i). Recent infection with S. mansoni and/or S. haematobium, evident in northern Senegal;
  ii). Chronic S. haematobium infection but no history of treatment, evident in the Lambarene region, Gabon;
  iii). Chronic S. haematobium infection and current mass treatment, evident in the Volta region, Ghana. These studies will be guided by more detailed investigations of the innate responses in experimental murine models of infection;
- glycan structures on molecules released from the schistosome parasite are likely to be important candidate ligands of host innate receptors and so will be characterised, isolated, and synthesised;
- isolated molecules will be tested using human in vitro assays and in vivo model systems, to identify those molecules with the greatest capacity to enhance or regulate immune responsiveness;
- existing public health programmes will be assisted by Geographic Information Systems (GIS) that will be set up to incorporate both epidemiological and immunological data. A comprehensive GIS will allow the project team to identify spatial components of clinical data on innate immune parameters. The technology will help local teams involved in control programmes, and provide novel insights into the spatial dynamics of immune responses never studied before.

Expected results and outcomes

The potential impact of the project is the improved effectiveness of control programmes i.e. drug-treatment and putative anti-schistosome vaccines, or alternatively the promotion of immunoregulatory networks in individuals with severe morbidity e.g. in patients with hepatosplenic disease. It will upgrade control standards by introducing GIS into teams active in endemic regions where it has not yet been applied. Inherent to the specific objectives will be the strengthening and development of the research capacity of scientists in endemic regions which will aid the training of EU researchers therein.

Data will be submitted for publication in high impact, peer-reviewed journals to ensure public accessibility of the project findings. Dissemination of results via international conferences and meetings is considered of great value. One likely project outcome will be the isolation of parasite molecules with immunoregulatory activity. This will be of major interest to those in the pharmaceutical industry wishing to develop novel strategies in the control of autoimmune and allergic disorders, therefore applications for patents will be filed for any discovered molecules.
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TRANCHI

T cell Regulation and the Control of Helminth Infections

Context and Objectives

Helminth infections are among the most neglected communicable diseases afflicting developing countries. Pharmacological treatments are compromised by rapid reinfection, variable compliance, and emerging resistance. Vaccination has not yet succeeded in evoking strong resistance. The critical question in helminth control remains why the immune system fails to clear parasites, which may be due to the presence of a newly-identified cell type, the Regulatory T cells (Treg). By studying this fundamental issue, the aim of the project team is to develop a novel route to promote host immunity and achieve immunological cure.

The specific objectives are to:
- profile the type and functions of Tregs in filariasis and schistosomiasis infected humans;
- compare Treg activity in patient groups of differing infection status or levels of pathology;
- establish if polymorphisms for regulatory genes are linked to Treg profiles in humans;
- demonstrate the role of Tregs in helminth-associated hyporesponsiveness;
- test whether neutralisation of Tregs restores immune responsiveness in human cells;
- test whether neutralisation of Tregs restores immunity to infection in animal models;
- characterise human Treg gene expression and TCR usage;
- assess community and health system issues for new immunological interventions.

Activities

The project contains seven well-defined work packages involving close collaboration between project partners in three EU Member States and four developing countries:
- recruitment and clinical assessment of study populations in helminth-endemic areas;
- profiling by flow cytometry the Treg populations in infected and uninfected subjects;
- testing the functional role of Tregs in an animal model of helminth infection;
- developing technology for genetic and molecular characterisation in an endemic country-practical manner;
- detailing the gene expression and TCR profile of Tregs from infected subjects;
- genotyping study population for regulatory gene polymorphisms;
- social science research on opportunities and obstacles for new immunological interventions.

Expected Results and Outcomes

The project will have the following outcomes:
- a database of three cohorts of patients containing all clinical and parasitological data required for the project analyses;
- an understanding of the relationship between Treg activity and infection status, intensity and pathology in the two major tropical helminth diseases, filariasis and schistosomiasis;
- testing the hypothesis that Tregs maintain helminth infection in animal model systems;
- ini-gene array for expression analysis of genes associated specifically with Tregs;
- simple, accurate and high throughput genotyping that is user friendly;
- molecular gene expression profile of Treg cells;
- TCR usage and antigen specificity of Treg cells;
- a comprehensive analysis of the extent and patterns of polymorphisms in regulatory genes in Indian, Indonesian, and African populations;
- appraisal of perceptions and attitudes towards new immunological interventions.
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Emergency contraception: a means to improve reproductive health in West Africa?

OBJECTIVES

Progesterone-only emergency contraception (EC) is currently being introduced in West Africa, and could represent an efficient means towards the reduction of unwanted pregnancies and unsafe abortions. The general objective of this research is to fill a gap in existing knowledge by understanding the potential role of EC in improving couples’ sexual and reproductive health in that region. Postulating that EC use is embedded in the articulation of conflicting social logics which depend simultaneously on reproductive and sexual norms, gender relations, and client-provider relations, our specific objectives are to study the following, in the context of West Africa:

• the accessibility of EC;
• its acceptability by women, men, and providers;
• the situations in which its use is particularly adapted;
• the specific obstacles to its utilisation;
• its place in regard to the other fertility regulation practices.

The study will be conducted in Burkina Faso, Ghana and Senegal. Morocco is included in the study design to test whether the success of EC depends on pre-existing widespread contraceptive use: we focus on the capitals of the countries where the supply of contraceptives is the most diverse and the demand for EC is also likely to be the most important.

ACTIVITIES

To assess the accessibility of emergency contraception, we will identify its diffusion channels and collect information from providers. We will conduct a qualitative study (in-depth semi-directive interviews with women, men, providers, and health policy makers in reproductive health care) to analyse the acceptability of emergency contraception, the situations in which its use is particularly adapted, the specific obstacles to its utilisation, and its place in regard to other contraceptive methods. To study the situations in which EC may be particularly adapted, we will supplement the qualitative analysis by a secondary analysis of surveys at national level. We will quantify the potential demand for emergency contraception (women’s socio-demographic variables, knowledge, use, and access to modern contraceptives), and study in more detail the interaction between unmet needs and contraceptive supply. Finally, using the results of the qualitative analysis, we will elaborate a questionnaire section on the use and determinants of EC to be introduced in future reproductive health surveys, and the questionnaire will be tested.

EXPECTED RESULTS AND OUTCOMES

These three levels of research will be synthesised at the end of the project: the quantitative approach will help identify the socio-demographic characteristics of potential EC users, and thus allow for a definition of the target of new contraceptive policies. The results of the qualitative and health system approaches, by identifying obstacles to EC use, the situations in which its use is particularly adapted, its place in regard to other fertility regulation practices, and the health system strategies more adapted to its diffusion, will help design the content of these policies. Using these results, the research team, in interaction with reproductive health policy makers and other stakeholders in the field of reproductive health, will elaborate a set of programmatic guidelines on the diffusion of emergency contraception in the West African region.

This project will be conducted in collaboration with a local stakeholders’ committee composed of the main stakeholders in the field. This committee will give its input throughout the project, and prepare policy recommendations with the researchers at the end of the project. Different dissemination actions will also take place at the end of the project, targeted towards policy makers and other stakeholders, as well as the general and academic publics. This project will moreover train one PhD student in reproductive health in each study country.
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FAHOPHS

Addressing the health of children in urban poor areas through improved home-based care, personal hygiene and environmental sanitation and healthcare services

Period: 01/01/2005 – 31/03/2006
Budget from EC: EUR 150,000

Coordinator: Dr Eliya Msiyaphazi Zulu
African Population and Health Research Centre

CONTEXT AND OBJECTIVES

There have been limited comprehensive interventions that address multiple determinants of child health in settings where the effects of poverty, poor personal hygiene and environmental sanitation are compounded by limited access to appropriate health care. This application sought to build on studies conducted by African Population and Health Research Centre (APHRC) in Nairobi, Kenya to pilot test interventions focusing on improved home-based care of ill children, strengthened provision of care in health facilities, and improved personal hygiene and environmental sanitation - “the three pillar approach”. This approach goes a step further than the “shared-care model” that has had considerable success in rural areas in sub-Saharan Africa. The main aim of this SSA was to facilitate strengthening of the consortium and to prepare the communities to undertake an intervention project from 2005 onwards.

ACTIVITIES AND EXPECTED RESULTS

Through this project the partners conducted exploratory studies in Ghana and Malawi with a view to later implement interventions in west, east and southern Africa. The project had four complementary steps: (1) formation of an expert group comprised of scientists from Europe and Africa; (2) pilot test interventions in Kenya, and exploratory studies in Ghana and Malawi; (3) dissemination of information on child health to policy makers through in-country and regional seminars and targeted publications; and (4) development and submission of a STREP proposal on improving child health based on the “three pillar approach”. This project ultimately contributed towards reducing the burden of disease among children leading to savings on health by households and governments. It had benefits for women who spend substantial amounts of time and resources managing childhood illnesses. The project also increased visibility of child health problems in urban poor areas, thus placing this issue higher on the development agenda of public health services and development donors.
<table>
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REACT

Strengthening fairness and accountability in priority setting for improving equity and access to quality healthcare at district level in Tanzania, Kenya and Zambia

Period: 01/01/2006 to 31/12/2010
Budget from EC: EUR 1,770,000
Coordinator: Dr Jens Byskov
Institute for Health Research and Development (DBL)

CONTEXT AND OBJECTIVES

Health systems in many low income countries are strangled in a vicious circle: management capacity is perceived as too insufficient to be given full responsibility for priority setting. However, without effective decentralisation of the priority setting process, the capacity will never increase.

This project aims to improve health and health care through the application of new approaches to fair and accountable priority setting in order to achieve a provision of quality health care at district level that is accessible and affordable to poor people in Tanzania, Kenya, and Zambia.

The interventions study will:
• apply new approaches to fair and accountable priority setting involving all relevant stakeholders, including the users;
• evaluate changes in processes and outcomes within the domains of management, human resources; generalised care, HIV/AIDS control, emergency obstetric care, and malaria control, focusing on quality, equity, and accessibility of services;
• disseminate the most effective priority setting approaches to health policy-makers and managers for integration into policy.

ACTIVITIES

The project will introduce and apply the accountability for a reasonable priority setting tool in a selected district in each of the three study countries. This will be done via a wide participatory process between all of the partners in the consortium and other relevant stakeholders. Indicators will be selected and applied for evaluating intervention effects on quality, equity, and trust.

Evaluation will be done in both contextual, horizontal, and disease-specific service domains. This will cover the management capability for priority setting at district level based on relevant management elements. Evaluation will also cover the relevance of cultural and social institutions as determinants of the decision-making process and assess the effect on quality, equity, accessibility, and trust in relation to the following:

• HIV/AIDS prevention, treatment, and care; emergency obstetric care; malaria prevention, treatment, and care;
• generalised, horizontal care; and human resources performance.

EXPECTED RESULTS AND OUTCOMES

Sub-study results will be the basis for evaluation of policy relevance of overall study outcomes. The study anticipates far-ranging, sustainable improvements in health system performance in resource-poor countries.
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MUSTSCHISTUKHEMA

Multi-disciplinary studies of human schistosomiasis in Uganda, Kenya and Mali: New perspectives on morbidity, immunity, treatment and control

Period: 01/09/2005 to 31/08/2009
Budget from EC: EUR 1 500 000
Coordinator: Dr Birgitte Jyding Vennervald
Institute of Health Research and Development (DBL)

OBJECTIVES

The project will focus on schistosomiasis in Uganda, Kenya, and Mali in sub-Saharan Africa. In all three countries, schistosomiasis is considered to be an important and prevalent poverty-related health problem. The overall objective of the project is to contribute towards increasing the knowledge regarding the effect of praziquantel (PZQ) on schistosomiasis-related morbidity, and specifically the ways in which PZQ affects the regulation of host immune responses as well as the parasite itself, with the overall aim of improving morbidity control strategies.

ACTIVITIES

Field studies evaluating the impact of different treatment strategies and the effect of other factors, such as malaria, on regression and the rate of reappearance of schistosomiasis morbidity, will take place in Uganda, Kenya, and Mali and address both Schistosoma mansoni and S. haematobium infections. The effect of treatment on immediate and short–term changes in immune responses will be determined, and correlated with the level of morbidity before and after treatment, as well as with the resistance to re-infection in areas with different patterns of transmission. Existing diagnostic tools will be applied and their diagnostic performance validated, with the aim of future use in evaluation of the impact of morbidity control. By application of advanced mass spectrometry (MS) technology, disease-related host or parasite biomarkers, or parasite products related to infection status or released in response to treatment, will be identified in urine samples. The project combines advanced, fundamental research with an active, operational field programme.

EXPECTED RESULTS AND OUTCOMES

In order to reach the overall objective of improving strategies for control, the following research-related outcomes are expected:

- increased knowledge about the dynamics of morbidity and how it may be affected and modulated by treatment;
- increased knowledge about the effect of PZQ on the host immune responses;
- non-invasive and reliable ways of detecting morbidity, all of which will contribute to ‘new knowledge on biology, epidemiology and technologies relevant for sustainable surveillance systems of diseases on a regional scale’;
- improved use of the existing drug in reduction of morbidity, which contributes to ‘innovation in and improvement of existing interventions.’

The combination of all four results will ‘help to implement appropriate strategies and policies for control and treatment.’ The knowledge gained about the modulating and boosting effect of PZQ on immune responses, and the implications for development of resistance may be of value in the design of future vaccines and their strategies. The use of the newest and most advanced MS technology in the identification of parasite or host products related to morbidity, aims at identifying the biomolecules suitable for use in future morbidity diagnoses. This part of the project is highly innovative, and is therefore likely to reinforce competitiveness.

Close contact is established with the ministries of health in Uganda, Kenya, and Mali as well as the control programmes in Uganda and Mali. This will facilitate the transformation of the research findings into strategies for control and future use of the morbidity assessment tools, in evaluating the impact of interventions. It is plausible that some of the results generated will change the current policies. The project will assist in strengthening the research capacity in the partner countries, and contribute to solving specific problems faced by developing countries through equitable partnership, thereby complying with the objectives in the INCO programme.
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A. DEVELOPING COUNTRIES

2. RATIONAL USE OF NATURAL RESOURCES

1. Managing humid and semi-humid ecosystems
2. Reconciling multiple demands on coastal zones
3. Managing arid and semi-arid ecosystems
SUN

Tools for management and sustainable use of natural vegetation in West Africa

Period: 01/01/2007 to 31/12/2009
Budget from EC: EUR 2 499 763
Coordinator: Dr Anne Mette Lykke
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CONTEXT AND OBJECTIVES

Natural vegetation of arid and semi-arid West Africa is of immense value to local people’s daily subsistence and nutrition, economic benefits, and survival in hunger periods. Nonetheless, poor management and unsustainable use deteriorates the vegetation at a high rate. Much scientific information and local knowledge is needed for improving management strategies. Some knowledge already exists, but it must be organised, analysed, targeted and made available to decision-makers and local communities. New research must be targeted to fill important gaps in this knowledge.

One of Africa’s major development challenges is to establish a link between global initiatives and local management actions. The project ‘Tools for management and sustainable use of natural vegetation in West Africa’ (SUN) will broaden the role of scientists as mediators between the world of scientific information, global conventions and the African realities where practical actions are needed. SUN will develop new, practical management tools and concrete management actions for improved sustainable use of natural vegetation by combining scientific vegetation data, remote sensing and socio-economic information with local people’s knowledge and needs.

ACTIVITIES

The project combines three types of activities:

- interdisciplinary research on vegetation dynamics, causal factors, and economic instruments and policies to enhance sustainable economic growth;
- development of new decision support tools for improved natural resource management by organising scientific data;
- new low-budget management and restoration actions in collaboration between scientists and local people.

SUN gathers West African and European scientists within the fields of vegetation-ecology, socio-economy, ethno-ecology and remote sensing, all with experience in applied research. A total of 17 African PhD students will be involved in the project. SUN will function as a knowledge- and technology-based platform for vegetation management in West Africa by gathering the major expertise, making innovative use of scientific data, and improving the interaction between scientists and stakeholders.
ECOST

Ecosystems, Societies, Consilience, Precautionary principle: Development of an assessment method of the societal cost for best fishing practices and efficient public policies

Context and Objectives

The main aim of the ECOST project is to develop a new approach to assess the societal cost of fishing activities and fishing policies. Societal cost are defined as all costs linked to fishing activities: these may be ecological (alteration of the capacity of a system), economic (all costs linked to production, management, subsidies, and external factors), social (linked to choices made in public policy, food safety, provision for national or international markets, the eradication of poverty, and to development models [small scale fishing versus industrial fishing]).

The project has to be seen from the wider perspective of equipping public decision-makers and society with the appropriate tools and methods needed to take into account, not only immediate economic and social profits, but also the costs engendered by fishing activities which relate as much to ecosystems as to societies.

The geographical dimension of the work is spread over three continents (three countries for each continent) that are characterised respectively by ecosystems of coastal upwelling (West Africa), delta (South East Asia) and coral reef (Caribbean). Within each region/ecosystem (eco-region) several fisheries have been selected as representative of global fishing activities. Furthermore, a marine-protected area will be chosen in order to establish comparative analysis within the said eco-region and to serve as a reference point. There is a triple advantage to such a choice as it will facilitate the comparison of: first, the different ecosystems; second, fishing methods and management (public policy); and third, societies based on the choices they have made and their preoccupations regarding various marine resources. The main body of the work will therefore focus on the development of a model that addresses the societal cost of fishing activities, which can reflect the reality of such varied and contrasting coastal regions as perceived via their ecosystems and societies.

At the heart of the project will be the triple theme of 'marine environment — fishing activities — civil society' thus bringing together life and social science. The multi-disciplinary nature of the project is centred on the concept of consilience in order to gain a better understanding of situations that require expertise in different areas of competence.

Activities

- Development of far-reaching research into the capacity of traditional models to take into account the reality of ecological, economic and social effects using purely theoretical considerations, past application experience, and questioning the notion of value. A theoretical study of the strengths of these models cannot be separated from an in-depth study of the values of nature (resources and functions) that underlie the present models. This work on the conception of value is fundamental to the definition of societal costs — costs and values are two sides of the same coin. The result of this first stage of the work (WP1) will be a report on significance using different models until the present time. The report will also examine the notion of value to be considered when measuring the societal cost of fishing activities.

- The construction of an efficient model for societal cost. This model is founded on the close association of economics and ecology. It is constructed using a model which currently has the greatest potential for application in the domain of fishing because it takes into account the variable nature of resources and marine environmental changes. Furthermore, it is able to acquire a dynamic dimension, which is necessary for any prospective on public policy. The measurable result will therefore be a dynamic model that has environmental retro-actions in relation to the ecosystem (WP5 and WP6). To develop this model, scientists will first work in their own field (WP2, WP3, WP4) in an interactive way in order to make progress.

- The production of a generic version of the model for social impact. First, this will be a revision of the model according to the lessons learnt from its experimental application to the three chosen regions/ecosystems. Second, it will consist of a multi-disciplinary study of the biological, ecological, and economic factors that may limit the wider application of the model to other
regions/ecosystems in the world. The validation of the model and its generic formulation will be accompanied by a performance index (for example, in relation to the quality of the data and the nature of the information that has been gathered), an explanatory manual, and an analysis of the model’s inherent limits. The measurable result will take the form of a generic model for assessing societal costs accompanied by an application framework (WP9).

- Comparison of the social costs of fishing activities. Comparative work will be carried out on three levels:
  - work on the ecosystem showing the repercussions of the use of distinct techniques and practices;
  - a comparison of the ecosystems themselves in order to highlight the responses made by the ecosystems to anthropic pressure; and
  - a comparison of ecosystems with free or regulated access and the ecosystems found within marine protected areas. The measurable result will be a comparative analysis of societal costs according to the means of production and valorisation of products and ecosystems (WP7 and WP8).

- Definition of options for public policy by the formulation of certain principles found within the framework of the code of conduct for responsible fishing. The popularisation of the project will be the best means of valorising the model and its application in the formulation of public policy linked to the future of fishing in regions heavily dependent on fishing resources (WP10 and WP11). The measurable result will be the production of an interactive CD-Rom that will project regional effects (as soon as the basic data required by the model is available and integrated). Tools for vulgarisation are usually devised by the public authorities when new working methods are brought out. For the purposes of this project, such tools are considered an element of added value for community research; they must be broadcast as widely as possible to communicate the knowledge of applied science to civil society (WP12).

EXPECTED RESULTS AND OUTCOMES

The research suggested by the project team has the potential to change the way fisheries are managed in the world. The tools and methodologies that will be developed will allow robust management strategies to be formulated, ensuring sustainability of marine ecosystems at the highest level and providing greater security to fishers and fishing companies. This will enable individuals in the fishing market to make the most appropriate investment or disinvestment decisions, permit greater stability in communities dependent upon fisheries, and help diminish vulnerability in these fragile systems.

At a more global level, the project will have a strategic impact on the formulation of national and international policies regarding the governance of ocean and coastal zone resources and ecosystems. This will lead to the development of better policies that alleviate societal problems developing countries face, such as fish availability, poverty, external debt, etc.

The results of the research will be disseminated in a number of ways. First, a series of high quality research papers will be produced and published in influential journals. These will include journals covering fishery science (e.g. Fisheries Research, ICES Journal, Canadian Journal of Fisheries and Aquatic Science), fishery economics (e.g. Marine Resource Economics), fishery policy and sociology (e.g. Marine Policy, MAST) and potentially a range of other socio-economic, modelling, or decision-making journals. Project scientists will also attend key subject-specific conferences (e.g. marine science conferences, economics and social conferences) and formulate research direction based on the information presented. The objective of ‘professional’ dissemination is to ensure the research is of top international quality.

Dissemination will also take place between fishery scientists, economists, and sociologists via plenary meetings and workshops held as part of the coordination activity of the project. These will be open to organisations not directly involved in the project, and will be a conduit for methodology and ideas to spread throughout key scientific and economic communities in the world.
Specific Targeted Research Project

Contract number: 003711

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LoGo Water
Towards effective involvement of local government in Integrated Water Resources Management (IWRM) in river basins of the Southern African Development Community (SADC) region

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CONTEXT AND OBJECTIVES
Approximately 300 million people in Africa are affected by water shortages. Poor water allocation, wasteful use of the resource, and the lack of adequate management action have been identified as three of the most significant factors in the current lack of access to safe water supply. In this context, the LoGo Water project aims to explore the potential contribution of local governments to mitigating this situation through contributing to Integrated Water Resources Management (IWRM) at river basin level.

The objectives of the project are:
- to gain an up-to-date overview on existing research on IWRM at international level;
- to receive an overview on the current involvement of local governments in water management in the SADC region;
- to receive an overview on the current situation of the involvement of European local governments in IWRM in the light of the Water Framework Directive (WFD) of the EU;
- to find a joint position for an effective role for local governments in IWRM in the river basins of the SADC region;
- to become more aware of the constraints that prevent local governments from effectively fulfilling such a role in IWRM in the SADC region;
- to guide local governments on the implementation of actions aimed at adopting IWRM practices;
- to guide other stakeholders in IWRM at national and international level;
- to guide future research towards areas of most need for the further application of IWRM and towards an increased cooperation between EU and Southern African researchers;
- to disseminate the results of the project all across the SADC region in order to raise awareness and encourage implementation of IWRM in Southern Africa, direct policies towards sustainability, and foster further research on the topic.

ACTIVITIES
Concerning the first eight objectives, a consortium of African and European researchers and major stakeholders in IWRM will be established. The members of this consortium will examine existing scientific findings and practical experiences regarding local government involvement in IWRM and further build on this knowledge in consultation with additional partners, especially representatives of local governments in the region. The consortium partners will exchange and discuss their expertise and opinions via electronic means of communication and during six partner meetings. As a result of this exchange the consortium will produce overview reports as a starting point for the later development of strategies, proposals for pilot projects, self-instruction material, guidelines for local governments — as well as for other stakeholders — and future research. The collection of relevant inputs for these materials will be via two consultative workshops to be held with local governments and with a wide range of stakeholders in IWRM.

Concerning the last objective, regarding dissemination and further outreach, a website will be established and information material will be produced in print. In addition, a final seminar will be organised to bring together all target groups in the final phase of the project.

EXPECTED RESULTS AND OUTCOMES
The main result of the LoGo Water project will see local governments in the SADC region becoming more aware about suitable policies and good management practices in order to play their role in river basin management in a meaningful and effective way. They will also be able to use the self-instruction material for building their knowledge and skills on the issue. A tangible change in existing local policies and management structures will be initiated through the implementation of the project proposals which will be developed during the project and carried out afterwards, if funding can be secured. Furthermore, the promotion of the engagement of local governments in sound IWRM achieved by LoGo Water will contribute to the achievement of the Millennium Development Goals, as well as the implementation of the African Component of the EU
Water Initiative. Finally, European research will be enriched by bringing together EU and African researcher and by making use of existing knowledge to ameliorate problems like the water crisis and poor governance practices.

The expected outputs will be the following:

- an overview report on the existing scientific knowledge regarding the participation of local governments in IWRM and the state of the debate at international level;
- a status report covering different kinds of approaches and results of local government measures in Africa related to the implementation of IWRM in the Incomati, Zambezi and Orange River basins and, in further detail, the Limpopo river basin;
- a status report looking into the IWRM practices of local government in Europe and containing first conclusions regarding the consequences of applying the EU WFD at a local level in Europe and focusing on the Rhine, Ebro and Danube River basins;
- a concept paper reflecting the consortium partners views on an effective role of local governments in IWRM;
- a report on the main constraints to local governments in fulfilling their role in IWRM, resulting from the two consultative workshops that will be held with the SADC region local governments and the regional stakeholders respectively;
- a strategy paper assisting local governments in engaging in IWRM; proposals for IWRM pilot projects by and for associated local governments; an implementation workshop for the Limpopo river basin; and IWRM self-instruction material for local governments;
- a set of recommendations to stakeholders in order to facilitate an effective role of local governments in IWRM;
- a policy options report aimed at guiding further research on the topic and in the region;
- a project website and a leaflet, an international seminar on local governments and IWRM, presentations at international events and other means of dissemination.
INCOFISH

Integrating multiple demands on coastal zones with emphasis on aquatic ecosystems and fisheries

Context and Objectives

INCOFISH will conduct specifically targeted strategic research toward reconciling multiple demands on coastal zones. It will evaluate and integrate data, tools, and concepts suitable to contributing to the goals set out by the World Summit for Sustainable Development in Johannesburg, such as restoring healthy fish stocks and ecosystems by 2015.

Activities

INCOFISH will focus its research activities on the following integrated coastal zone management (ICZM) issues:

- document the historical performance of ecosystems in dealing with the ‘shifting baselines’ syndrome and provide sound reference points for resource restoration;
- provide electronic maps for all coastal species to establish authoritative species inventories and explore scenarios of global change and invasive species;
- create spatial ecosystem models for selected coastal zones as a basis for understanding resources;
- provide guidelines and tools for the best sizing and placement of marine protected areas;
- research the impact of ecotourism on coastal ecosystems and provide best-practice guidelines;
- identify suitable and simple indicators to promote and monitor sustainable fisheries;
- provide an estimation of the value of coastal ecosystem products and services and different management regimes;
- review legal instruments for sustainable fishing in coastal zones;
- revisit coastal transects as a tool for structuring and understanding multiple demands on coastal zones;
- provide an archive and web portal for easy public access to all data and tools relevant for ICZM.

Expected Results and Outcomes

The tools and concepts resulting from INCOFISH research will be tested in real-world scenarios in selected coastal systems worldwide. Together, they will form a package with the potential to solve societal problems in the coastal zones of Europe and developing countries alike. All data and tools will be available online.
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The page contains a list of researchers from various institutions around the world, including universities, research groups, and governmental bodies. Each entry includes the name of the researcher, their affiliated organization, address, email, and contact details. The page also includes a section with the contract number: 003739, indicating the specific targeted research project.
AfricaNUANCES

Exploring tradeoffs around farming livelihoods and the environment: the AfricaNUANCES framework

CONTEXT AND OBJECTIVES

The primary aim of this project is to synthesise knowledge and analyse trade-offs when implementing various soil fertility technologies for smallholder farmers in mixed crop/livestock systems, in humid and semi-humid East, West and southern Africa. The emphasis will be on the efficiency of targeting and use of nutrients and legume-based soil improving technologies, with the output evaluated in terms of costs, benefits and compromises in productivity, economics and environmental services. The strategic objectives addressed are indicated below:

• to understand the spatial and temporal dynamics of rural livelihoods and their relationships with food security, sustainability and resilience of the natural resource base;
• to identify measures to promote successful and sustainable development of agricultural smallholder farming systems;
• to build capacity in integrated systems analysis, in order to evaluate approaches to sustainable intensification of smallholder agriculture in Africa.

EXPECTED RESULTS AND OUTCOMES

• An information system will be built, specifically designed to enable the identification of opportunities for enhanced productivity and limits to sustainable production in humid and semi-(sub)-humid ecosystems.
• This information system will guide current and future research programmes on choices from ‘baskets’ of technologies to include in evaluations with farmers.
• Project results will be widely disseminated in Africa through the use of existing networks.
• Policy working papers will be produced in the final year, to provide syntheses of the project findings in terms of enabling policies and the major trade-offs between the goals of sustainable agricultural intensification and improvement of the environment.

ACTIVITIES

The project aims to carry out the following activities:

• develop databases that integrate agro-ecological and socioeconomic knowledge of farm livelihoods and their effects on environmental services;
• develop an integrated dynamic modelling tool to analyse African mixed crop/livestock systems, which includes nutrient, labour and economic balances, and effects on environmental services;
• explain current farmer decisions regarding resource allocation across heterogeneous farms, and analyse inefficiencies in resource allocation, using the database and modelling tool;
• use the databases and the analytical tool to explore different scenarios concerning changes in policy, agrotechnology, markets, demographics and climate for their effects on food security at farm level, and environmental services at regional level;
• evaluate trade-offs between short-term and long-term farmers and regional stakeholder goals;
• to build capacity in Africa in integrated systems analysis at PhD level.
AfricaNUANCES

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Developing Countries
PASARELAS

Discovery Modelling Mediation Deliberation — Interface Tools for Multistakeholder Knowledge Partnerships for the Sustainable Management of Marine Resources and Coastal Zones

CONTEXT AND OBJECTIVES

Policies to encourage research, knowledge exchange and science applications for sustainable development must address urgent social needs and also complex and difficult issues where knowledge is incomplete, values are in dispute and stakes are high. The traditional conception of a largely one-way traffic of information from the experts to the public (and from developed countries to the developing ones, etc.) is being replaced by a more reciprocal partnership among those involved in the process. Such partnership necessarily is constructed through close dialogue and co-operation of scientists and technical experts with policy makers, implementers and stakeholders, including full participation by experts with local knowledge in developing countries. This cannot happen by a cloistered approach to science and technology. Partnership for capacity building must respect the environmental and social circumstances of the host societies, and the variety and tensions within these societies. People in all places and all walks of life have expertise in a range of practical matters. Mobilising knowledge for sustainable development therefore requires attention to the forms of knowledge sharing. The goal overall of the PASARELAS Project was to contribute to development of a North-South capacity for the production, deployment and exchange of research and communication tools at the ‘interfaces’ of different sectors of society in the field of environmental governance and sustainable development. With close reference to the concomitant INCO-DEV projects ‘ECOST’, ‘INCOFISH’ and ‘CENSOR’, the consortium allied multi-stakeholder participatory approaches with the possibilities of the new multimedia information and visualisation technologies for the development of “mediation” or dialogue tools that encourage engagement of individuals and groups as “stakeholders” in environmental policy, management and governance processes for coastal zones, marine protected areas and associated fisheries resources.

ACTIVITIES

Learning about environmental governance challenges was promoted through participation in procedures (real or simulated) of selection and deployment of indicator systems (e.g. computer supported visualisation of scenarios and territories, and multi-criteria evaluation of alternative scenarios for land use, for ecosystem protection and management, for fisheries regulation and marketing, etc.). The multimedia tools and participation processes were demonstrated through exploitation of data, models and institutional knowledge from ongoing INCO-DEV research projects, engaging policy authorities, territorial administrations, higher education, private sector interests (e.g., fisheries, tourism, coastal zone agriculture), with outreach perspectives to civil society in its various forms. Documentation was produced using on-line resources, CDrom, printed documents, and popular media (posters, video presentations, etc.). An important goal was to define in technical and legal terms, the basis for a permanent education-training-outreach programme including pedagogic materials (1) disseminated as free web-based interfaces, (2) as products to be made available through “public good” exploitation agreements for teaching and learning contexts including schools, universities and territorial administrations, (3) as basis for professional services useful to research institutions, companies, community networks and regulatory agencies.

To this effect, four major events were convened bringing together partners in the PASARELAS project, the other INCO-DEV projects and stakeholders from within the different regions. These took place in July 2005 in Corsica (France), in March 2006 in Dakar (Senegal), in September 2006 in Concepción (Chile) and finally in March 2007 in Venice (Italy).
The Action Plan of NEPAD (New Partnership for African Development) and the 6th Community Environmental Action Programme (EAP) of the EU have identified poverty alleviation via rational use of natural resource and ecosystem protection as a priority. This is a particularly sensitive issue in South Africa because of its political past and the creation of bantustan states without planning or development policy and where natural resources (vegetation, wetland, water, soil and vulnerable spring ecosystems) are being depleted.

The aim of this SSA is to strengthen a multi-task research team currently involved in integrated catchment management programmes and to contribute to EU experience in relevant scientific projects.

The catchment of the former Transkei homeland corresponds to semi-humid/semi-arid vulnerable ecosystems. This pilot action on a site will include activities, such as assessing the relevance of current research and available Earth Observation (EO) tools and data sets to support conservation measures and adequate management strategies. Networking with EU and African teams embarked on similar research project will be instrumental in achieving the objectives.

Dissemination of results and education will also be a major component of the project, involving local stakeholders, universities, schools and the community. Land and ecosystem degradation and resource depletion in homelands include interaction between natural (geology, soil, hydrology, climatology) and societal (history, demography, land-use practices) issues. These disadvantaged regions are believed to be in resource terms representative of severely affected regions elsewhere and hence make an invaluable test area to develop the proposed EO initiative. The direct benefit of the SSA will be a training centre for EU researchers, who will have access to a scientifically very attractive opportunity, backed by invaluable local knowledge and expertise. It will of direct support to the implementation future activities under the 7th Framework Programme.

Period: 01/01/2006 – 30/06/2007
Budget from EC: EUR 188,000
website: www.brgm.fr/brgm/Fichiers/europe/EO_LANDEG.pdf

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CONTEX T AND OBJECTIVES

The particular status of estuaries, deltas and lagoons in coastal areas, located at the interface between sea and river influences, results in highly variable environmental and ecological conditions that shift over space and time. The combined effects of climatic changes and human activities have tremendous consequences on these ecosystems. The conservation of these environments is one of the biggest challenges for humanity. In order to achieve an integrated management, researchers, ecologists and managers try to select relevant indicators, which could be used as tracers of the state of estuarine areas. These indicators are generally chosen among living species or physicochemical parameters or a combination of both.

Among the fish species living in estuaries, very few occupy these ecosystems in more than one oceanic region. However, there is one particular species, Mugil cephalus (Mugilidae), which is found worldwide and is cosmopolitan in almost all tropical coastal estuarine zones, but also in temperate ones. This species is able to live and reproduce in widely different habitats. The mechanisms, which are involved in this process, are poorly known or are studied separately in each area. Moreover this species and related ones support important fisheries, especially in developing countries. The aim of the MUGIL project is to choose the species Mugil cephalus as a biological model, to build an observation network and to coordinate the action of using this species as an indicator of the integrity of estuarine areas by analysing the genetic, the life history traits and the physiological responses.

ACTIVITIES

The MUGIL project covers four areas distributed worldwide (Europe, Africa, Asia and America) and involves collaborators from southern Europe (France, Spain, Greece) and INCO partner countries (Mexico, Senegal, Benin, South Africa, Taiwan). It is based on collecting and collating all information available on the species Mugil cephalus around the world inside the four main areas (Europe, Africa, Asia and America) and on a worldwide coordination of research actions within four research fields: population genetics, life history traits (growth and reproduction), migration and physiological responses to salinity and pollution. Through seminars and specific workshops, MUGIL will allow selecting relevant methodologies in terms of sampling strategy, analytical methods and biological survey shared by the consortium. Both the wide range of the concerned populations and the diversity of the proposed study sites, allow testing different scenarios and trying to identify trends at the individual, population, metapopulation and species levels. Finally it aims at proposing this species as a sentinel using selected tools to follow littoral environmental changes through a new STREP proposal within the 7th Framework Programme.
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MITMIOMBO

Management of indigenous tree species for ecosystem restoration and wood production in semi-arid Miombo woodlands in East Africa

Budget from EC: EUR 189,266

Coordinator: Dr Sauli Valkonen
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CONTEXT AND OBJECTIVES

Management of indigenous tree species for the restoration of ecosystems, management of the water balance, provision of resources for rural livelihood and sustainable production of wood are of great importance in semi-arid East and South Africa. Without effective measures, the deterioration of ecosystems including desertification, and poverty and rural depopulation will increase.

The establishment and management of plantation forests with exotic species have neither fulfilled commercial expectations nor benefited rural populations as much as expected. The management of native trees and forests with the intensive involvement of local communities seems to be a key alternative. Women in particular have shown great interest in establishing and managing tree crops and stands. About 90% of the energy consumption in Tanzania is derived from wood, mostly from overexploited indigenous woodlands.

ACTIVITIES AND EXPECTED RESULTS

The project focuses on developing methods for the management of indigenous forests of semi-arid East Africa. Communication and application of established research methods will be organised by initiating experimental studies in Tanzania and integrating this with coaching of Tanzanian researchers. The local farmers and communities will be consulted for understanding of local needs, expectations and practices. Extension work, and cooperation with researchers in East and South African countries will be initiated.

Experimental and demonstration plots will be established to serve as a staging ground for demonstration and application of study methodologies appropriate for complex stand structures and dynamics, natural regeneration, growth periodicity of trees in the area, and pest problems as tree herbivore interactions. The project activities will also include internal seminars and workshops, several exchange assignments of 1-3 months each in Finland and Tanzania, group visits to experimental sites and local offices, and an international seminar organized in Tanzania.
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CONTEX T AND OBJECTIVES

This SSA focused on the analysis and dissemination of research results in sustainable, integrated water resource management at river-basin scale within Ethiopia. WATERMAN was a resubmission of a proposal submitted earlier (INCO-DEV Sept. 2004), which was rated as being “highly relevant” and passed all thresholds, but was not retained for funding because of budgetary restrictions. In accordance to the overall remarks made in the Evaluation Summary Report, the following changes have been adopted in the new proposal:

• Extension of the consortium to include two more relevant European partners;
• More detail and a new topic concerning participatory approaches has been added to the list of sub-topics dealt with in the project and was central as from the kick-off meeting.
• Two new African partners have been added to the consortium to increase the dissemination and impact of the SSA results, both nationally and internationally.

ACTIVITIES AND EXPECTED RESULTS

The 18-month project activities included: (a) three workshops at each of the Ethiopian universities, (b) a scientific Project Plan Award and © an international symposium. All activities focused on strategies and actions for enhanced and sustainable economic productivity with four sub-topics:

1. Use of participatory approaches to integrate socio-economic, ethical and gender issues into research and dissemination to shorten impact times and increase broad uptake;
2. Integrated water supply and resource management (innovative, multi-purpose utilisation, competing demands);
3. Agriculture and irrigation (recycling, reuse, prevent erosion at source);
4. Salinity, water logging and soil fertility.
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INNOVKAR

Innovative tools and techniques for sustainable use of the shea tree in Sudano-Sahelian zone

Period: 01/12/2006 to 30/11/2010
Budget from EC: EUR 1 799 972
website: inco-innovkar.cirad.fr

Coordinator: Dr Jean-Marc Bouvet
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CONTEXT AND OBJECTIVES

The shea tree (Vitellaria paradoxa) is an important species for the production of edible vegetable fat and personal care products, processed from the dried kernel of its fruits. It shows a high potential for income generation and food security in the Sudano-Sahelian zone. To improve the sustainable production in terms of both quantity and quality and in order to promote trade with shea products, an integrated and innovative research approach that couples biophysical, biological, chemical and socio-economic methods will be applied by the INNOVKAR project team. The impact of climate change in the shea tree will be studied by modelling its distribution under climate change scenarios and assessing the resilience of the populations when faced to drought using ecophysiological variables.

Analyses of the impact of global change on natural regeneration and genetic diversity will be undertaken, fruit production in parklands assessed, as well as predicting the long-term effects by elaborating forest dynamic models. Both activities will allow the elaboration of a strategy for managing resources for medium and long term sustainable use. The valorisation of origins and farmer varieties will be studied by characterising the genetic resources, using chemical variables for edible fat and testing their new anti-oxidant properties for the development of personal care markets.

The traceability of the fruit and shea butter at the different stages of processing, from fruit to butter, will be studied using innovative techniques. New methodologies based on near infrared spectrometry will be tested to improve low cost, environmentally friendly chemical analyses.

Research on post-harvest quality control will be undertaken to improve the butter for export markets. The patterns and trends of shea commodity chains and the roles of market participants involved in the production, marketing and consumption of the products will also be investigated. The results will be synthesised, translated as operational recommendations and disseminated through a participative process.
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ACACIAGUM

Innovative management of Acacia senegal trees to improve resource productivity and gum-arabic production in sub-Saharan Africa

Period: 01/01/2007 to 31/12/2010
Budget from EC: EUR 1 799 999
website: http://inco-acaciagum.cirad.fr/

Coordinator: Dr Didier Lesueur
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CONTEXT AND OBJECTIVES

The overall objective is to enhance the sustainable management and use of natural Acacia senegal tree resources thereby supporting the environment and livelihoods in arid and semi-arid sub-Saharan Africa.

A potential solution to land degradation is to promote the utilisation, regeneration and planting of a native under-utilised legume tree: Acacia senegal, the main species in the world producing the internationally traded gum-arabic. In order to mitigate land degradation and enhance sustainability of farming systems, the overall objective of the project is to provide tools to promote use and sustainable management of A. senegal tree resources. The goal is to combine high gum quality and increased gum production with sustainable tree management.

The project will use a multidisciplinary approach focusing on the socio-economic viability of the gum-arabic commodity chain under different tree management and/or site conditions (climate and soil type) on:
- tree eco-physiology and gum production;
- tree genetics and gum quality and production;
- biological soil-tree interactions and tree-crop interactions.

ACTIVITIES

The project team has initiated the following research activities, organised in different Work Packages:
- to gather information on local populations’ experience and constraints in A. senegal management in order to ascertain user priorities with respect to different activities (tree planting, tapping, gum picking, fodder harvest, crop associations, etc) and factors influencing their decisions (Work Package 1);
- to understand the inter-linkages between the institutional organisation of supply chain networks with the dynamics of innovation regimes in gum-arabic production and their implications for rural livelihoods (Work Package 2);
- to characterise the impact of the biophysical environment and tree management on gum yield and quality in multiple A. senegal based systems, and to investigate the consequences of tree management for associated crop production (Work Package 3);
- to characterise existing quantitative and neutral genetic variation and identify and understand the basis of variation in gum quality/yield (Work Package 4);
- to improve understanding of the relationship between soil microbial communities involved in the N cycle and the capacity of A. senegal trees to produce gum-arabic in different environmental conditions and to rehabilitate degraded lands (Work Package 5);
- to ensure that information generated is properly packaged and made available to different stakeholders in a form that is appropriate to each of them (Work Package 6).

EXPECTED RESULTS AND OUTCOMES

In the course of the project, each Work Package (WP) is expected to produce specific results:
- WP1: identification of all the different stakeholders and relevant dimensions that shape the diversity in ‘Acacia related livelihoods’, and also understanding of their main drivers in the management of the resource;
- WP2: identification of multiple market outlets for arabic-gum producers and the determinants of bargaining power between different supply chain agents. Delimitation of the opportunities and constraints for ‘valuing’ innovative management of Acacia senegal tree supply chains;
- WP3: knowledge about the important climatic, edaphic and genetic determinants of gum-arabic production by A. senegal, disseminated to scientists, policy-makers, plantation managers and local farmers in target countries. Improved tapping management and tree management techniques adopted by workers and farmers in target countries, resulting in increased gum yields and improved management of associated crops;
- WP4: Assessment of the importance of genetic and environmental factors in gum quality / yield variation and optimised provenance selection for target farm sites, maximising gum production;
- WP5: use of soil bio-indicators as management tools to maintain a sustainable gum-arabic production, farmers
routinely use microsymbiont inoculants to establish new plantations, and mature trees to stimulate tree vigour and gum-arabic production;

- WP6: coherent outputs for dissemination and technology transfer from different work packages evaluated and prioritised, specific dissemination/technology transfer packages prepared and suitable dissemination/technology transfer pathways developed and implemented.
When African policy makers (governments, national institutions, etc) have to manage their environmental resources, they need reliable information on which to base their decisions. A combination of various European R&D projects’ results and of the EDF funded MTA project allows all meteorological services in Africa to receive data and start using low resolution advanced products. These 10 daily products are derived from data acquired by the VEGETATION instruments onboard the SPOT satellites and disseminated by EUMETSAT in near real time to all PUMA receiving stations through the EUMETCAST system. These different products are useful for African Earth Observation-experts working in the field of operational environmental monitoring, but unfortunately are not yet sufficiently used. This is due to a lack in local capacity in the use and interpretation of these products in an operational environment. This project therefore focuses on local capacity building in order to allow mandated institutions to integrate the stream of satellite data in their pre-existing operational reporting and assessment activities (e.g. production of bulletins) in support of well identified environmental policies and decision makers, both at national and at regional level. As such, the scientific and technical expertise, developed in Europe, should flow towards Africa.

This project aims at bridging the gap between the Earth Observation (EO) experts who have access to data acquired by PUMA receiving stations and the end-users who need information on environmental condition to sustain their decision-making process or to manage the environment on a day-to-day basis. It focuses on the exploitation of this data for operational applications.

The project is targeted to and includes two African partners, i.e. the AGRHYMET Regional Centre in Niamey for the French speaking countries in Western Africa, and the Botswana Met Office in Gaborone for English speaking countries.
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Livelihoods in semi-arid areas depend upon a biological resource base underpinned by access to water. With increasing human populations and water stress come pressures to harness water resources for ‘higher economic value’ uses, instead of an integrated approach that includes provisions for ecosystem conservation and livelihood sustainability.

Nowhere is this lack of integration more prevalent than in the semi-arid regions of Africa. The linkages between Integrated Water Resource Management (IWRM), Sustainable Livelihoods (SL) and Biodiversity Conservation (BC) are poorly known. River basin management, biodiversity conservation and livelihood programmes in Africa have evolved independently, with often overlapping and/or conflicting goals and responsibilities.

The result has been persistent intra- and trans-boundary conflicts; leading to increasing poverty and declines in biological diversity. The INTREPID project addressed this disparity by recognising that IWRM, BC and SL are irretrievably linked and that water management and policy initiatives focusing on individual aspects are likely to fail.

It aimed, therefore, to resolve this gap by initiating and promoting inter-disciplinary and international collaboration to integrate sustainable water resource management, biodiversity conservation and livelihoods using the Mara River Basin as a case study.

The SSA provided a platform for policy makers, practitioners and researchers to consolidate expertise on African IWRM systems and draw on experiences from the implementation of the EU-Water Framework Directive with a view to promote and reinforce the vital synergies between IWRM, BC and SL.

The Mara River Basin system in Kenya and Tanzania formed the case study for this project. It is hoped that the principles and outcomes derived from this SSA could provide an integrated framework to support future policy development and research covering other vulnerable river basins throughout the semi-arid Africa.
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Many Southern African natural resources are legally recognized as commons. The governance of commons in Southern Africa has received a good deal of attention from both researchers and the responsible government agencies. The objective of this Specific Support Action is to share existing research and experiences in the governance of large scale natural resource commons across different ecosystem types Southern Africa including marine and other large water body coastal zones, arid and semi-arid grasslands, savannas and forest patches, and floodplain ecosystems. The SSA builds on existing research on commons governance done by institutions specializing in particular resource management problems. It takes as its starting point the insight that addressing natural resource degradation in Africa means finding ways to identify, reproduce and encourage existing positive practices of commons management across wide scales. The dual challenge of governance is to meet large-scale problems with large-scale solutions that are rooted in local practices and to use an ecosystem approach to integrate the management of different types of commons, each of which may play a role in the household survival strategies of vulnerable populations. Experience with governance in one type of commons generates lessons of value to the governance of other types of commons and for integrated governance.
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BORASSUS

The Environmental and Socio-economic Contribution of Palm Geotextiles to Sustainable Development and Soil Conservation

Period: 01/07/2005 to 30/06/2008
Budget from EC: EUR 1,749,876
website: www.borassus-project.net/

Coordinator: Dr Michael Augustine Fullen
University of Wolverhampton

CONTEXT AND OBJECTIVES

Palm leaf geotextiles offer considerable potential in contributing to global sustainable development and soil conservation. Their use will promote sustainable and environmentally friendly palm agriculture, labour-intensive employment, SME development and earn hard currency. In the industrialised world, they will assist the stabilisation of complex slopes.

The project will test geotextile mats made from ‘Borassus aethiopum’ leaves along with other structurally similar species in field and laboratory conditions, to evaluate their long-term effectiveness in controlling soil erosion and to assess their sustainability and socio-economic viability.

Objectives include:

- promotion of sustainable and environmentally-friendly palm agriculture to discourage deforestation and promote both reforestation and agroforestry;
- construction of palm geotextiles to develop a rural based labour-intensive industry, particularly encouraging the employment of socially-disadvantaged groups;
- export of completed palm geotextiles to industrialised countries to earn hard currency for the developing economy and promote development, based on the principles of fair trade;
- geotextiles efficiently and economically conserve soil. Palm geotextiles will be especially beneficial for complex engineering problems, particularly in the building and road construction industries and coastal defence, to stabilise engineered slopes.

ACTIVITIES

These include:

- assessment of palm-mat geotextile effectiveness for reducing soil erodibility and soil loss in relation to specific soil properties, environmental conditions and land-uses, selection of soil types and materials, and in a range of climatic conditions;
- evaluating palm geotextiles effects, compared to established soil erosion control techniques;
- investigating — under different crop production systems — the economic aspects of applying palm geotextiles on soil fertility changes by using traditional cultivation practices to demonstrate their efficiency as a reliable and sustainable technique;
- developing palm geotextiles for use by the construction industry in ground strengthening to refine analytical and design technologies, advance novel material production and define the performance characteristics and indices of palm geotextiles when used under realistic construction conditions;
- adapting existing soil erosion models, so that the impact of the establishment of palm-mat geotextiles on hydrological and erosion processes can be predicted for a range of environmental conditions;
- formulating recommendations to advise policymakers, particularly in rural development economies, of environmental protection and soil conservation abilities;
- reducing poverty, particularly in rural areas, through teaching people to produce palm geotextiles;
- developing validated production standards and protocols, so that the mats can be efficiently produced by SMEs in INCO-DEV countries.

EXPECTED RESULTS AND OUTCOMES

The project is novel and offers new bioengineering solutions to environmental problems. Preliminary investigations suggest palm geotextiles are an effective, cheap and economically viable soil conservation method, with enormous global potential. BORASSUS will provide multi-faceted environmental benefits, which include technologies for sustainable plant production, promoting sustainable use of indigenous plants, improved ecosystem management for sustainability, decreasing deforestation, improved agroforestry and successful and cost-effective geotextile applications in diverse environments. The project will improve socio-economic foundations for sustainable development, with the benefits for INCO-DEV countries including poverty alleviation, engagement of disadvantaged groups as stakeholders, employment for disadvantaged groups, SME development, export of geotextiles earning hard currency, environmental education and local community involvement in reclamation and environmental-
improvement programmes. Information dissemination via research publications, a website, conference presentations, workshops, media groups, educational pamphlets and instructional videos, will broaden the project’s appeal at multiple levels (international, national, regional and local) to include academics, scientists, policy-makers, environmental planners and managers, and local communities.
SPEAR

Sustainable options for People, Catchment and Aquatic resources

Period: 17/11/2004 to 31/03/2008  
Budget from EC: EUR 1 500 000  
website: www.biaoqiang.org/

Coordinator: Dr J.G. Ferreira  
Institute of Marine Research (IMAR)

CONTEXT AND OBJECTIVES

SPEAR aims to develop and test an integrated framework for interpreting coastal zone structure and dynamics in areas where communities primarily depend on marine resources.

This framework accounts for watershed interactions, ecological structure, and human activities. Our interdisciplinary approach combines natural and social sciences and addresses the complex scaling issues inherent in integrated management.

There are five main project objectives:

• to develop an integrated framework that simulates the dynamics of coastal zone accounting for basin effects (exchanges of water, sediments, and nutrients), ecological structure, and human activities;
• to test this framework using detailed research models, which assimilate dispersed local and regional data, as well as to develop screening models which integrate key processes and interactions;
• to examine ways of internalising environmental costs and recommend response options such as optimisation of species composition and distributions, thereby restoring ecological sustainability;
• to evaluate the full economic costs and benefits of alternative management strategies and societal consequences; three strategies will be examined: business as usual, increased economic exploitation, and ecological sustainability;
• to provide managers with quantitative descriptors of environmental health, including simple screening models, as practical diagnostic tools innovatively combining local and regional datasets.

ACTIVITIES

Two contrasting systems in China will be studied: Sanggou Bay, part of a rural watershed, and Huangdun Bay, located in an industrialised area south of Shanghai. In both systems, large-scale cultivation of seaweeds, shellfish and finfish are of paramount importance for community income and livelihood.

Research and development will use existing local and regional datasets, ongoing Chinese field programmes, archived and contemporary satellite imagery, with limited additional field and experimental measures. Complementary work packages will establish the interactions between catchment use and coastal zone. Work will focus on fluxes of nutrients, organic matter, and sediments, including exchanges at the seaward boundary and the role of ecological processes. Component models will describe the interactions between cultivated species and with their environments, taking into account different levels of human interaction (e.g. resource exploitation, basin water management practices, and sewage discharge). Integrated modelling will permit the dynamic coupling of economic drivers responsible for social issues (over-exploitation, usage conflicts) with ecological models applied by the project team, resolving inter-relations with the natural system. This will allow realistic testing of three contrasting management scenarios. Particular emphasis will be placed on how integrated multi-species aquaculture (polyculture) may be used to restore and optimise sustainability by internalising environmental costs.

Datasets and research models will be used to conceptualise, parameterise and test screening models, which will distil the knowledge obtained from the integrated system analysis into simple and practical diagnostic management tools. Model validation and technology transfer will be ensured through stakeholder involvement in project management, including experimental manipulation at culture unit test sites.

EXPECTED RESULTS AND OUTCOMES

SPEAR provides a conceptual framework for integrated interpretation of coastal zone structure and dynamics by means of a holistic approach to coastal system research, combining disciplines, techniques, and systems. Thus, one of the major scientific challenges this project addresses is the meaningful integration of patterns and processes with widely varying scales. This will provide a new, system-based understanding of the functioning of coastal zones.

This project will develop research models describing interactions among cultivated species, as well as between them and their environments, including both natural coupling and various levels of human interaction. The latter
include resource exploitation but also other, potentially conflicting uses such as water management practices in the river basin, sewage discharge, or coastline modifications like landfilling. The socio-economic component of the project will permit the coupling of economic drivers that are responsible for social issues (overexploitation, usage conflicts, and increasing demand) to the project research models. A dynamic coupling of this nature will provide appropriate feedbacks on the natural system, and thus allow realistic testing of different management scenarios.

SPEAR will be able to quantify the sensitivity of environmental changes on aquaculture production, thereby providing the rationale for minimising environmental stressors, and the impacts of changing demand on sustainability.

SPEAR contributes to the three strategic areas of the Sixth Framework Programme.

- **Fight against poverty** — by optimising sustainable management of marine resources, it will allow stable economic development at the regional level, and exemplify best practice for wider application. This will also contribute to buffer employment and reduce social penalties due to large fluctuations in harvest yields associated with unsustainable farming practices and water use conflicts.
- **EU Water Initiative** — by providing mechanisms for ensuring the health of aquatic systems, requirements for economic development, and tools for integrated assessment and decision-making on the balance between environmental water needs.
- **Millenium Development Goals (MDG)** — by contributing to the stated aims of the UN MDG, endorsed by the EU, in area 7, ‘Ensure Environmental Sustainability’. In particular, this project helps integrate principles of sustainable development into country policies and programmes, reversing the loss of environmental resources and improving the lives of impoverished peri-urban communities.

The consortium implementing the research work in SPEAR is made up of a number of research institutes and universities which bring together:

- experience in field work in coastal systems across a range of disciplines in natural sciences (all partners except CSIR);
- experimental work on aquatic resources (e.g. PML, UOS, UGOT, FIO, NU)
- Technologies such as GIS and remote sensing (e.g. IMAR, PML, UOS, FIO, TIO);
- models developed at various scales and across disciplines in the natural and social sciences (e.g. IMAR, UGOT, WL|Delft Hydraulics, PML, FIO, CSIR);
- integration, stakeholder participation and adaptive management in coastal zones (e.g. IMAR, UGOT, WL|Delft Hydraulics, FIO, NU, CSIR).
SPEAR

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FOREAIM

Bridging restoration and multifunctionality in degraded forest landscape of Eastern Africa and Indian Ocean Islands

Period: 01/06/2005 to 30/05/2009
Budget from EC: EUR 1 639 997
website: foreaim.cirad.fr

Coordinator: Dr Jean-Marc Bouvet
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OBJECTIVES

Uganda, Kenya and Madagascar are strongly affected by deforestation and degradation of forest ecosystems, especially in humid and sub-humid zones. In those countries, forest restoration and rehabilitation are urgently required to secure rural livelihoods, enhance environmental benefits and enable economic development. However, despite this expanding degradation, little hard information is available on restoration options for tropical humid and sub-humid regions. Strategies for rehabilitation to achieve sustainable forest management are extremely limited at both national and regional levels.

By adopting a broad based multidisciplinary approach instead of the mono disciplinary methods which currently predominate local forest restoration research, FOREAIM shall:
• advance scientific understanding of the restoration processes, and through this;
• produce knowledge, practical tools, models and management guidelines for restoration implementation;
• synthesise information on economic, societal, policy and marketing issues, with full involvement of all stakeholders, to enhance employment opportunities and incomes, thus improving livelihoods for all sectors of the community.

ACTIVITIES

The FOREAIM project will use an integrated multidisciplinary approach involving methods in restoration ecology, biophysical techniques and social and economic approaches. It comprises seven work packages (WPs) elaborated in such a way that each work package achieves one specific objective of FOREAIM.

WPs 1 and 6 concern sociological and economics research, WPs 2 and 3 consider biological studies related to vegetation and dynamics, while WPs 4 and 5 address biophysical topics such as soil and erosion and biological indicators. WP 7 integrates all results to produce tools to transfer restoration and rehabilitation technologies and practices to stakeholders, i.e., local populations, economic stakeholders, extension services and governments, both local and national. The project involves the active participation of social scientists, economists, ecologists, specialists in soils, soil microsymbionts and erosion, physiologists working on plant propagation and soil functioning, researchers involved in marketing and in negotiation and decision making processes. Research scientists from European countries and developing countries (Uganda, Kenya and Madagascar) will actively participate together in the implementation of the work-packages described.

EXPECTED RESULTS AND OUTCOMES

Results and outcomes expected from the FOREAIM project are several:
• promote the sciences of restoration ecology and biodiversity conservation by generating a wide variety of data and results on forest restoration dynamics and methodologies deriving from both biological and social disciplines in an integrated manner;
• provide of a set of low cost tools, methods and recommendations to combat and reverse land and forest degradation;
• share and disseminate information on innovative restoration strategies and technologies for sustainable management of natural forests, agro-ecosystems and allied natural resources through country workshops and conferences;
• ensure European researchers’ strong involvement in the project to complement rather than duplicate existing research activities in the field;
• strengthen, develop and consolidate the research knowledge and systems of Partner countries;
• provide employment and improve living standards locally.
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TRANSMAP

Transboundary networks of marine protected areas for integrated conservation and sustainable development: biophysical, socio-economic and governance assessment in East Africa

Context and Objectives

The goal of this project is to develop scientific knowledge for the creation of transboundary networks of Marine Protected Areas (MPAs) in the East African region. Of particular scientific interest is the knowledge relating to the type, size, and location of reserves, which together can maintain ecological functions, resource-uses and future socio-economic developments. To achieve this, the following specific research objectives are addressed:

- to gather and synthesise existing knowledge and databases;
- to map habitat types and coastal land and sea usage;
- to assess the fundamental biophysical data, namely biodiversity evaluation, including an assessment of species and habitats important for conservation reasons;
- to evaluate sources of human income, especially those derived from natural resources, current socio-economic needs, and traditional frameworks, integrating the economic dimension in a multi-criteria analysis;
- to assess the institutional, legal, and policy frameworks for decision-making, operational assessment, and state of management;
- to develop options for zoning plans for each case study area.

Expected Results and Outcomes

The final outcomes are options for zoning plans for two contrasting situations, which encompass a significant fraction of the biogeographical range of the region. These plans integrate the results of the biophysical and socio-economic assessments, innovatively adapted to accommodate the local, regional and governance frameworks. New data will be obtained which will significantly increase knowledge on the regions considered. Interaction between research and end-users is a clear target for this project, and various types and levels of formal mechanisms will allow for increased interchange between partners and decision-making structures, leading to effective policy development. Regional links will also be enhanced, which are necessary for the common management of the natural heritage in the region.

Activities

Following the project’s main objectives, activities will target the acquisition of the necessary interdisciplinary knowledge required for the creation of the transboundary conservation areas. Specifically, the project will:

- produce extensive and complete searches and compile existing information; integrate these data, solve basic knowledge gaps, and merge the information in an appropriate GIS system, which will map biophysical, socio-economic, and governance data;
- develop studies on the biodiversity patterns and habitat condition in considered areas, including basic biodiversity along nested spatial scales, biodiversity hotspots, and connectivity potential;
- analyse sources of income and uses of natural resources by local populations, including gender issues and assessment of expected socio-economic development scenarios;
- analyse governance frameworks, namely policy, legal, and institutional, and assess the state of management;
- develop options for zoning in considered marine transboundary areas using computer-based algorithms modulated by research data.
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Peri-urban mangrove forests as filters and potential phytoremediators of domestic sewage in East Africa

Period: 01/02/2005 to 31/01/2008
Budget from EC: EUR 1 650 000
website: www.pumpsea.icat.fc.ul.pt

Coordinator: Dr José Guerreiro
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CONTEXT AND OBJECTIVES

Extensive amounts of sewage are currently being released into peri-urban mangroves, but there is limited understanding of the consequences. There is evidence to suggest that mangroves filter discharged wastewater and prevent coastal pollution, but this ecosystem service has not been applied to coastal management, nor has the filtration capacity been exploited. Mangrove is one of the world’s most endangered habitats: more than a third is already lost, and the remainder is disappearing at a rate of 2 to 5 % per year, with little notice from the public. Peri-urban mangroves are particularly hard hit. In light of this, the overall objective of the PUMPSEA project is to demonstrate the ecological and economic service that peri-urban mangroves provide by mitigating coastal pollution through sewage-filtration, and to offer innovative solutions for the exploitation and management of this ability.

The project will examine two innovative ways in which mangrove filtration can be utilised to preclude coastal sewage pollution:

- facilitating sewage filtration by conserving filtering mangroves and replanting mangroves in deforested areas exposed to sewage ('strategic reforestation and conservation'); and
- using constructed mangrove wetlands for sewage treatment.

PUMPSEA will be developed in East Africa (Tanzania, Kenya, and Mozambique).

ACTIVITIES

Five main activities will be developed in order to achieve the main goals:

- Field evaluation of evidence and effects of sewage-filtration: evaluation of the effects of sewage-filtration by peri-urban mangroves on ecosystem condition and processes; development of GIS-map location of sewage input; measurement and mapping mangrove degradation and destruction; identification of suitable areas for strategic reforestation and strategic conservation.

- Experimental development of mangrove sewage filtration technology: assessment of effects of sewage exposure on the ecological, microbial and biogeochemical processes; test and refine the remediation performance of a mangrove wetland; provide experimental results that optimise the sewage filtering performance of constructed mangrove wetlands.

- Ecological modelling: development of ecological models combining field observations and experimental results; determination of filtering effect of mangroves with respect to long term stability and optimal treatment regime of mangrove wetlands.

- Socio-economics and ecosystem goods and services: comparison of available sewage management alternatives from a socio-economic and ecological perspective and evaluation of ecosystem goods and services provided by mangroves exposed or not exposed to sewage; summarise the current drivers of mangrove degradation and destruction within the study areas.

- Implementation and governance issues: conception of a strategic plan for implementing the use of mangrove sewage filtration; transforming PUMPSEA findings into appropriate governance guidelines.

EXPECTED RESULTS AND OUTCOMES

The expected project outcomes are:

- documentation of sewage filtration in existing peri-urban mangroves, measurement and mapping of its ecological effects;
- optimisation and development of constructed mangrove wetland technology;
- development of an ecological model, which can determine and interpret the impact of sewage on mangrove environments;
- identification and quantification of ecosystem goods and services generated by mangroves exposed or not exposed to sewage;
- analysis of current sewage infrastructure, policy, and performance, culminating in an action plan for sewage management guidelines.
The expected results of PUMPSEA all have direct applications for regional environmental managers and policy-makers working to improve the current situation in East Africa. More than 25% of the population of the East African region live within the coastal areas (UNEP 1998). This project is targeted at benefiting these people, although the generated knowledge will have evident applications for the developing world per se.
A. DEVELOPING COUNTRIES

3. FOOD SECURITY

1. Health of livestock populations
2. Bio-diverse, bio-safe and value-added crops
3. Aquatic farming systems
RP/PPR MARKVAC

Development of marker vaccines, companion diagnostic tests and improvement of epidemiological knowledge to facilitate control of rinderpest and peste des petits ruminants viruses

Context and Objectives

The project is designed to present an integrated approach to the control and eradication of Rinderpest (RP) and peste des petits ruminants (PPR), two economically important diseases of ruminants. It will address one of the key factors hampering effective control policies involving vaccination, namely the lack of marker vaccines and companion diagnostic tests for these viruses. It will also contribute to the strengthening and further development of surveillance systems with respect to early reaction capabilities in regions that are at risk from the diseases. Therefore the main objectives of the project are specified as follows:

- To develop marker vaccines to prevent RP and PPR infections and examine safety issues relating to currently used vaccines and the marker vaccines derived from them.
- To develop marker vaccine companion diagnostic tests to differentiate between infected and vaccinated animals and validate the existing RP and PPR assays. This will provide the parameters needed when decisions have to be made on vaccine use for specific purposes.
- To use improved epidemiological information systems for a better analysis of the current situation of RP and PPR and for predicting the impact of vaccination strategies.

Activities

The main activities of the project are summarised as follows:

- The reverse genetics strategy will be used to generate marker vaccines via genome cDNAs derived from the classical attenuated vaccine strains of RP and PPR. The overall aim is to produce double-marker vaccines by deletion (negative marker) and addition (positive marker).
- The PPR virus will be used as a model to analyse the role of the N protein and its fragments in the vaccine induced immunosuppression. The functionality of the deleted protein will be studied using minigenome rescue technology.
- Formulation of an inexpensive and robust vaccine easy to administer to animals in areas lacking a cold chain will be developed.

Expected Results and Outcomes

This project will provide marker vaccines capable of preventing RP and PPR infections and also companion tests to differentiate between infected and vaccinated animals. This differentiation is of major importance for eradication programmes because it would allow more precise targeting of the vaccination while serosurveillance of the disease could be maintained through the use of companion diagnostic tests. This would allow for a quicker lifting of control measures. The project should provide, through reverse genetics technology, a better understanding of the genetic determinants of the immunosuppressive effects associated with the current vaccines and consequently of the marker vaccines derived from them. An improved formulation for stable storage of vaccines at higher temperatures will be developed to reduce the stringent requirements for cold chain. This will greatly benefit vaccine delivery to farmers living in difficult field conditions. A clearer understanding of Morbillivirus infection cycles and the dynamics of the disease will generate models that will support decisions for vaccination policies. This proposal will boost the health status of cattle and small ruminants in Africa, allowing higher productivity and an increase in the commercial value of livestock for trade purposes.
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EPIGENEVEAC

Epidemiology and new generation vaccines for Ehrlichia and anaplasma infections of ruminants

Context and Objectives

Tick transmitted Ehrlichia ruminantium (cowdriosis) and Anaplasma marginale (Anaplasmosis) infections of ruminants belong to a group of animal diseases of major economic importance in tropical and sub-tropical regions. Both diseases are classified in list B of the World Organisation for Animal Health (OIE) and their presence in a country is an obstacle to the international trade of animals. The general objective of the project is to contribute to an increase in the productivity of livestock by controlling these diseases in the context of sustainable production systems and environmental safety. In particular, alternatives must be developed to reduce the use of acaricides for vector control, which raise environment and food safety issues. This will be realised through the achievement of three main objectives:

- the development of next generation multi-component vaccines that are efficient and safe;
- the development or improvement of high-throughput multi-pathogen diagnostic tests for extensive use in epidemiological studies aimed at providing descriptions of sanitary situations at regional levels;
- the evaluation of the efficacy, impact, and cost-effectiveness of the vaccines developed in well-characterised farming systems.

Activities

The project is divided into two related headings (laboratory and experimentally-oriented work for vaccine and molecular diagnostic development and field-oriented work for epidemiology) broken down into a logical framework of activities. Modern genomic approaches will be extensively applied to the complete genome sequence of the pathogens, including annotation (bioinformatics), comparative (bioinformatics) and functional genomics of host-vector-pathogen interactions aimed at identifying gene candidates for vaccines. After refinement of the understanding of ruminant protective immune responses, these candidates will be analysed, first in vitro, and afterwards on animals to ascertain their protection capabilities. New delivery systems and formulations will be applied to these candidates and evaluated for their ability to provide optimal protection in a potential field vaccine. Meanwhile, molecular diagnostic (detection and genotyping) will be developed. These will be used as key components of epidemiological studies aimed at characterising the sanitary situation at regional levels in different farming systems where the vaccines will be applied.

Expected Results and Outcomes

The project has the potential to deliver patented products, such as diagnostic kits and vaccines, as well as guidelines for their optimal use by farmers and professionals in an integrated approach bringing in other actions like strategic vector control. This will have a direct impact on the increase in animal production and therefore help alleviate poverty. In addition, the commercial use of these products by private companies will assist industrial and economic development. Epidemiological data will be managed using Geographic Information Systems; this will generate distribution and risk maps of diseases to help decision-making processes in sanitary interventions and serve as a basis for cost-benefit studies of control measures. Computerised systems can be complemented by data relative to other diseases and constitute integrated animal health management systems that assist the Services of Agriculture. Websites where databases are located will constitute a major vehicle for the dissemination of information to technical services and agencies, professionals, and the general public. Finally, scientific and technical networking will strengthen the research capacity of partner countries and contribute to the education of affected populations.
TRYPADVAC2

Development of an “anti-disease” vaccine and diagnostic tests for African trypanosomosis

Period: 01/06/2005 to 31/05/2008
Budget from EC: EUR 900 000
Website: http://trypadvac2.eventos.usb.ve/

CONTEXT AND OBJECTIVES

The aim of the project is to contribute to the improvement of livestock productivity in the developing world through the limitation of trypanosome-associated pathologies and accurate diagnostics of trypanosome infections. A non-conventional vaccine strategy is proposed, which aims at limiting pathology through immunisation against pathogenic factors of trypanosomes. The project aims at:

• identifying major pathogenic factors of trypanosomes, especially those responsible for anaemia, and producing these molecules in suitable forms for use in a multicomponent vaccine;
• developing new diagnostic tools based on antibody and antigen detection.

The specific objectives of the project are:

• to further assess the protective potential of cysteine proteases of Trypanosoma congolense: T. vivax and T. evansi;
• to characterise other trypanosome proteases and protease inhibitors and assess their respective roles in pathogenicity;
• to evaluate the vaccine potential of recently identified candidate antigens;
• to identify and characterise novel pathogenic factors;
• to produce candidate molecules for initial immunisation trials;
• to evaluate the diagnostic potential of recombinant and synthetic products from various trypanosome antigens in antibody and antigen detection tests.

ACTIVITIES

The project will expand initial work on trypanosomal cysteine proteases to screening, characterisation, and assessment of the protective potential of other pathogenic molecules, especially those responsible for anaemia. Trypanosomal cysteine, serine, and metallo-proteases will be characterised for their biological roles in the parasite and host. Natural protease inhibitors present in trypanosomes will be examined for their possible immuno-modulatory effects. The potential of trypanosome proteases and their inhibitors to modulate disease will be examined in immunisation trials. Non-proteolytic pathogenic factors, such as the glycosyl phosphatidyl inositol (GPI) anchor of the variant surface glycoprotein, will also be assessed for their protective potential. Finally, recent developments in the field of proteomics as well as progress in the genome mapping of trypanosomes will provide tools to study new pathogenic pathways and molecules.

Procedures for antibody detection based on recombinant technology will be developed and/or validated. Recombinant and synthetic peptides from cysteine proteases and heat shock proteins, both previously identified as major antigens, as well as newly described molecules will be assessed for their diagnostic potential. Techniques for the detection of parasite antigens in host tissues will be re-examined using recently developed monoclonal antibodies.

EXPECTED RESULTS AND OUTCOMES

Key expected outcomes:

• adoption of new diagnostic tools based on recombinant technology;
• identification and validation of antigens with confirmed roles in pathogenesis that will be used to develop an ‘anti-disease’ vaccine for trypanosomosis.

Expected outputs:

• New knowledge generated on: Pathogenic molecules of African trypanosomes, especially trypanosomal proteases; mechanisms underlying trypanosome-induced anaemia; and mechanisms underlying bovine trypanotolerance;
• publications (15 expected);
• training (five students from DEV trained to MSc and PhD degrees in EU labs);
• technology transfer through exchange of personnel within the consortium.

Outside the consortium: transfer of new diagnostic procedures to national institutions after validation. Beneficiaries of the outputs: academic community and government agencies in DEV countries.
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IndigenoVeg

Networking to promote the sustainable production and marketing of indigenous vegetables through urban and peri-urban agriculture in sub-saharan Africa

Context and Objectives

Indigenous vegetables (IV) play an important role in the African diet, economy, and environment. However, they have not featured significantly in the research agendas of international or local organisations, which have tended to focus on improved exotic varieties. IndigenoVeg aims to create a network of leading EU and African researchers to promote the production of IV varieties in urban and peri-urban agriculture (UPA). Its three operational objectives are to:

• coordinate and link existing research efforts on IVs and UPA by creating a forum where partners can share information on current progress, disseminate best practice, obtain feedback from their peers, and refine and strengthen their on-going activities;
• develop targeted and relevant collaborative future research proposals;
• disseminate the outcomes of the Coordination action engaging with a wider audience, comprised of EU and sub-Saharan African scientists and policy-makers.

Activities

The forum for coordinating research and exchanging ideas hinges on a series of 14 thematic meetings organised under three subthemes: sustainable management practices for IV production; opening niche markets for IV; and development of policy for the promotion of IV in urban and peri-urban areas.

Sub-Saharan African partners will also be engaged in small-scale surveys to gather crucial missing baseline data on the nature and extent of production of IVs in urban and peri-urban areas. Partners will also conduct surveys on marketing constraints and opportunities in relation to these varieties. These data will underlie the development of collaborative research proposals which will take place at an integration meeting, which will also synthesise the outcomes of all thematic meetings. The findings and outcome of the activities will be primarily disseminated through a conference at the end of the coordination action, a specially themed book, and a regularly updated website.

Expected Results and Outcomes

The Coordination Action will result in:

• prestige for IVs within the research and development community, farmer and consumer community, and policy-making environment;
• broader, multidisciplinary perspectives on the issues surrounding the promotion of IVs in UPA;
• capacity building in the African partner institutions;
• current research activities being addressed strategically and effectively, avoiding duplication;
• a sound platform for the development of holistic proposals characterised by the goal of enhancing food security for the urban poor under the current and future EU framework programmes.
IndigenoVeg

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FONIO

Upgrading quality and competitiveness of fonio for improved livelihoods in West Africa

Period: 01/01/2006 to 31/12/2008
Budget from EC: EUR 900 000
website: inco-fonio-en.cirad.fr/

Coordinator: Jean-François Cruz
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CONTEXT AND OBJECTIVES

Traditional cereals constitute the staple diet of many African people. Among them, fonio (Digitaria exilis) is considered the most ancient indigenous West African cereal. This tiny grain is grown in several countries in the region (Guinea, Mali, Burkina Faso, etc.) and provides several million people with food during the most difficult months when other food resources are scarce.

Fonio, which was long regarded as a minor cereal, is now the object of renewed interest in urban areas as consumers begin to recognise its flavour and nutritional qualities. However, its very small grain size makes hulling and whitening, which are traditionally done by women using a pestle and mortar, highly laborious. In order to avoid the decline of this commodity, it is important to solve the many problems that arise after the harvest, in particular by perfecting post-harvest techniques and improving the quality and follow-up of sales and distribution operations.

The principal objectives of the FONIO project are:

• to enhance the local competitiveness of fonio by increasing the productivity of the commodity chain on different levels (adapted varieties, appropriate production and farming systems, innovations in post-harvest mechanisation, etc.);
• to improve the quality and diversity of fonio products, so as to export and thus increase producers’ and processors’ incomes.

ACTIVITIES

To achieve these objectives, the FONIO project favours a multidisciplinary and innovative approach involving scientists from various backgrounds: food technology, nutrition, process engineering, mechanisation, social sciences, and agronomy. It supports research/development operations with a participatory approach involving producers, processors, women’s groups and small enterprises that will benefit directly and rapidly from the research results. The planned research, technological development and innovation operations involve the following items (work packages), with the view to achieving the specific objectives of the project:

• diversification of fonio products for niche export markets and local markets
• nutritional aspects of fonio and fonio products;
• demand for new products and its effects on income generation and distribution;
• small-scale enterprises and product and process innovations
• opportunities for diversification and multipurpose uses of fonio in crop-livestock systems;
• improving knowledge of fonio-based cropping systems and ways of improving productivity.

EXPECTED RESULTS AND OUTCOMES

On a scientific level, the FONIO project will contribute to better knowledge of this neglected cereal. It will generate more detailed information on the physical structure of this tiny grain, its biochemical composition, its nutritional value (bioavailability of selected nutrients) and its technological and cooking qualities. In terms of farming and cropping systems, the FONIO project will also compile knowledge among both scientists and farmers. It will identify ecotypes with good agronomical and technological properties and promote their dissemination throughout the sub-region.

In terms of development, the project proposes to continue to alleviate the workload for women by promoting appropriate processes and equipments to make new products with consistent technological and organoleptic characteristics and of higher nutritional quality. Its originality lies in the fact that equipment will be manufactured locally with local raw materials and processes that are simple and easy to use, at lower costs. The consequence of the development of new products (better perception of consumer preferences) and processes is to be assessed during the project. Information is to be collected from along the market chain, concerning income and employment, but also gender issues and SME organisation (commercial strategy, innovation management, etc).

Moreover, the new products are aimed at local populations but, given their dietetic properties, they will encourage the creation of niche export markets and serve to diversify the range of cereal products in Europe.
People in the Sahel are among the poorest in the world and food security problems are severe. Fruit trees are essential in the diets of rural people, providing:

- nutrients and vitamins to diets otherwise dominated by cereals;
- food at times where stocks of annual crops are low;
- sources of income through commercialisation.

Despite the generally accepted importance of trees, most food security programmes focus on cereals. The potential of fruit trees is under-utilised. The SAFRUIT project aims to increase food security and livelihoods for people in Burkina Faso, Mali and Niger, through facilitating access to knowledge concerning four native fruit tree species.

ACTIVITIES

The project has a holistic approach involving researchers from social (including economic) and natural sciences. The aim of improving food security through increased use of fruit trees will thus be obtained through studies of:

- institutional constraints and opportunities for use of trees;
- marketing of fruit tree products;
- interactions (competition and synergy) between fruit trees and annual crops;
- appropriate technologies for vegetative propagation at village level;
- genetic variation of the selected species, enabling selection and development of superior genotypes;
- alternative pathways for distribution of tree germplasm.

Furthermore, the project will have a strong dissemination component reaching a wide range of stakeholders, including farmers, technicians, scientists and policymakers. The project will focus on four important tree species in the region: Adansonia digitata (baobab), Parkia biglobosa (African locust bean), Tamarindus indica (Tamarind tree) and Ziziphus mauritiana (Jujube or Indian Jujube).

EXPECTED RESULTS AND OUTCOMES

By the end of the project, it is expected that people in the villages studied will get a higher proportion of their nutrition, and experience higher benefits from fruit trees. This should result from adoption of technologies and management guidelines developed by the project, including:

- improved access for poor people to cultivate trees;
- better marketing strategies;
- better understanding of the impact of trees on annual crops grown underneath;
- methods for propagation of trees that can be used by villagers;
- new varieties or better seed sources of the four tree species;
- effective ways for distribution of tree seed and seedlings to farmers.

Dissemination of knowledge should impact on the whole subregion five years after the project has finished.
Developing Countries

SAFRUIT

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BAMLLINK

Molecular, Environmental and Nutritional Evaluation of Bambara Groundnut (Vigna subterranea L. Verdc.) for Food Production in Semi-Arid Africa and India

Period: 01/01/2006 to 31/12/2009
Budget from EC: EUR 1,500,000

Coordinator: Dr. Sayed Azam-Ali
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CONTEXT AND OBJECTIVES

Bambara groundnut can contribute to food security for some of the world’s poorest people. Traditional landraces have good nutritional properties; drought tolerance and can yield protein-rich pods where other crops may fail. Recent EU-funded research has developed the first hybrids of bambara groundnut landraces.

This proposal links partners in Africa, Europe and India in a project that combines molecular, environmental and nutritional studies and end-users of bambara groundnut. By dissecting the underlying genetics of the crop and testing its performance across a range of environments, the project will establish criteria and resources required for systematic, regional breeding and improvement programmes that minimise duplication of effort. Within four years collaborators will produce the first varieties of the crop, assess products for a range of uses and identify cultivars and management practices to optimise performance in specific environments.

Two genetic linkage maps of bambara groundnut will be made — a ‘wide’ cross (cultivated x wild relative) and a ‘narrow’ cross (cultivated x cultivated), using AFLP, SSR and DArT markers. Collaborators will identify genes and QTL’s for drought, heat and cold tolerance and photoperiodic control of pod filling and will link genetic and biochemical composition of seeds from genotypes to quantify nutritional composition, nutritive value and processing potential.

The development of micro-array-based accessions for landraces, micro-satellite markers and genetic maps for bambara groundnut, will be coupled with agronomic and physiological assessment, through multi-environment QTL analysis and the testing of common landraces across locations. Key traits will be dissected and markers developed. The genetics underlying nutritional and processing value will be assessed and new products developed through SMEs. At all stages end users will guide researchers towards desirable traits from new genetic material and novel products.
DADOBAT
Domestication and development of baobab and tamarind

Period: 01/12/2006 to 30/11/2010
Budget from EC: EUR 2 099 944
website: http://www.dadobat.soton.ac.uk/default.aspx

CONTENT AND OBJECTIVES

Both baobab and tamarind are plant species with high potential for arid and semi-arid areas in the developing world. They can provide food, medicine, wood and a number of secondary processed products for income generation that can help meet the basic needs of an increasing number of people within a context of decreasing land availability. The strategic overall objectives of the project will be addressed through a multi-pronged and multidisciplinary research approach are: evaluation and characterisation of germplasm collected in four African countries in different ecological zones (Benin, Ghana, Mali and Senegal); eco-physiological characterisation of field and greenhouse-grown material; domestication of superior germplasm material; development of adapted cropping techniques; development of adapted plant material for introduction into (traditional and improved) agroforestry systems; evaluation of nutritional/medicinal composition of different plant parts; improvement of processing/transformation of the species’ products; and development of (inter)national marketing strategies. The project addresses issues of new crop/niche development through a holistic research approach and envisages multidisciplinary activities to broaden availability of improved plant material for introduction into agroforestry systems.

EXPECTED RESULTS AND OUTCOMES

- Morphological and genotypic characterisation, inventory and presentation of genetic resources conserved ex situ in the different countries are completed. Superior germplasm of baobab and tamarind for further eco-physiological characterisation and propagation/domestication studies is selected. The main pests/diseases/weeds involved are identified.
- Drought tolerance of tamarind and baobab, and their photosynthesis and WUE behaviour are understood.
- Dormancy breaking mechanisms are known and documented of baobab and tamarind. Participative propagation/multiplication techniques are defined, and needed for subsequent sustainable planting.
- Improved protocols for cropping of baobab and tamarind are developed, and needed for subsequent extension and vulgarisation. Irrigation water use of baobab and tamarind is documented and known for different development stages.
- Ethnobotanical profiles of baobab/tamarind are documented. Processing methods are documented.
- The main problems affecting commercialisation, marketing and price formation are documented and known; this result is needed to be able to develop sustainable marketing strategies for the different baobab and tamarind (by-)products.

ACTIVITIES

The project combines activities of research, capacity building and transfer to bridge the gap between knowledge and successful application of the results by the end users. The work plan is divided into six work packages (WPs) and a documentation and information dissemination work package:
- WP1: field characterisation of plant material over different agro-ecological zones in the four countries, and matching of macroscopic characterisation using ‘traditional’ descriptors with results of molecular fingerprinting;
- WP2: eco-physiological characterisation of plant material for understanding drought stress tolerance/resistance in situ and ex situ;
- WP3: domestication: determination of optimal germination conditions and maximum germination rates;
- WP4: development of improved cropping techniques: pruning, irrigation, fertilisers, etc.;
- WP5: characterisation of nutritional and medicinal properties of primary and secondary products;
- WP6: production and marketing chain analysis, including socio-economics and SWOT analysis.
MARAMAII

Development of innovative and healthful marama bean (Tylosema esculentum) products targeting niche markets

Context and Objectives

The marama bean is an under-utilised legume crop native to the Kalahari Desert, the neighbouring sandy regions of Botswana and Namibia and the Transvaal region of South Africa. It forms part of the diet of the indigenous population in these countries. The overall objective of MARAMAII is to improve food safety and diversify livelihoods for poor people in Southern Africa through the development of healthful marama bean products. The products will be targeted initially to niche markets in Southern Africa as well as internationally.

Activities

The project will work closely with small and medium-sized enterprises in Southern Africa and gain knowledge for commercial processing of the marama bean, including factors which influence product quality. This will be done by:
• conducting consumer and market studies in Southern Africa to investigate the acceptability of marama bean and its products and identify potential target markets for the products;
• optimising post-harvest methods for dehulling and processing the beans for the development of a range of high-quality, value-added, marama-based food products including marama oil, marama texturised protein products, roasted marama nuts and marama milk;
• evaluating the quality of the processed products including texture, flavour, taste, and the shelf life of the products during storage;
• evaluating the health benefits of the marama bean and its products by investigating the potential for the following: anti-microbial activity, immunomodulatory and physiologic activities, antioxidant activity, direct anti-HIV properties, and anticarcinogenic activity on different cancer cell lines.

Expected Results and Outcomes

MARAMAII will contribute valuable information about the potential use of marama beans, due to increased knowledge of the following: how to produce marama bean products, factors influencing the shelf life of the products, and the nutrition values, potential antioxidant, and anti-carcinogenic activity of marama beans and products. Manuals for the production of marama bean products will be a constituent part of the outcomes.

It is expected that the project will create awareness amongst the stakeholders of:
• the agricultural value chain of the potential of marama;
• the range of products that can be produced;
• the quality and desirable attributes of the bean and value added products;
• the health effects of consuming the beans and bean products;
• potential target markets for bean products.
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BOMOSA

Integrating BOMOSA cage fish farming systems in reservoirs, ponds and temporary water bodies in Eastern Africa

Period: 01/10/2006 to 30/09/2009
Budget from EC: EUR 1 499 998,60
website:  

CONTEXT AND OBJECTIVES

The BOMOSA cage-based fish farming system is intended as a network of small-scale, locally-run operations whereby rural communities will set up and run the plots both during and after completion of the INCO-DEV research project. For that reason, the project science and technology objectives are also related to the fulfilment of locally and regionally defined socio-economic targets (such as demands and preferences, integration with existing farming and other economic activities, and the ethics and roles of women) rather than purely concerned with achieving fish productivity targets.

Three eastern African countries (Ethiopia, Kenya, and Uganda) share common problems in sustainable management of sensitive and dynamic ecosystems. These countries also face deficits in the supply of high-protein food and an ongoing battle to alleviate rural poverty. The BOMOSA scheme uses an existing fish farm ('hub') to supply fingerlings (mainly Nile Tilapia at approximately 25g) for rearing within suitable water bodies such as reservoirs, ponds, and naturally occurring temporary water bodies formed during the rainy season. Farmers will be trained to rear the fish in cages in their ‘plots’, harvest them for fresh consumption, sell the fish locally, or process them for long-term keeping i.e. drying, smoking, and packaging. The fish will be a high-protein dietary supplement and/or an additional source of income for subsistence farmers.

ACTIVITIES

The first activity of the project will be to apply a participatory approach to define targets in terms of economic viability and social acceptability at community levels for the new Bomosa plots. After this preparatory work, the next step is to develop and validate an evaluation method using remote sensing to assess and characterise water bodies for use as potential Bomosa plots. This information will then be used to set up several plots and optimise the technology for small water bodies within four eco-zones across Ethiopia, Kenya, and Uganda. Besides arranging the plots, a task group will evaluate the locally available agricultural by-products and cost-effective processing technologies as a resource for sustainable production of low-protein fish feed. A main point of the project will be to determine requirements and make recommendations for a legal and regulatory framework based on potential veterinary, public health, and environmental impacts of BOMOSA. Another major outcome of the project is to develop capacity-building and dissemination material for the local community, relevant authorities, policy makers, and the international scientific community. In addition, the project will develop a socio-economic model for sustainable introduction and widespread uptake of the BOMOSA scheme in eastern Africa.

EXPECTED RESULTS AND OUTCOMES

The BOMOSA system will be further developed and optimised for use in four eco-zones within Ethiopia, Kenya, and Uganda within the current INCO-DEV research project. As a result, 14 Bomosa plots will be set up for research and validation, each served from hubs (fish hatcheries) within each country. Furthermore, the fisheries management authorities will initiate the establishment of an institutional framework. Each of the plots will have its own plot committee to ensure relevance in improving local socio-economic conditions through early empowerment of local stakeholders. The lessons learnt, best practices, physical and socio-economic potential, risks, and prerequisites for widespread uptake of the BOMOSA scheme will be analysed in detail and presented at the Bomosa International Conference as the dissemination highlight of the BOMOSA project.

* website: 
https://forschung.boku.ac.at/fis/suchen.projekt_uebersicht?sprache_in=en&menue_id_in=300&did_in=6191
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COMPETE

Competence Platform on Energy Crop and Agroforestry Systems for Arid and Semi-arid Ecosystems - Africa

Period: 01/01/2007 to 31/12/2009
Budget from EC: EUR 1 497 000
website: www.compete-bioafrica.net

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CONTEXT AND OBJECTIVES

The objective of the project ‘Competence Platform on Energy Crop and Agroforestry Systems for Arid and Semi-arid Ecosystems — Africa’ (COMPETE) is to stimulate bioenergy implementation in arid and semi-arid regions in Africa. COMPETE will establish a platform for policy dialogue and capacity building in the major multi- and bi-lateral funding organisations, and for key stakeholders throughout the bioenergy provision and supply chains.

As global fossil energy resources become constrained, bioenergy is emerging as a major potential resource. The arid and semi-arid regions of Africa and Latin America have, in theory, very large areas of land (and associated water and human resources) ‘available’ for bioenergy production. However, the production of biomass for energy will have substantial impacts (positive and negative) on ecosystems and cultures of these target regions. The protection of biodiversity, rural livelihoods and management of scarce water resources are critical considerations in any analysis of the potential for sustainable bioenergy provision in arid and semi-arid regions. Similarly, while modern bioenergy could contribute significantly to poverty alleviation in rural areas, the effects of changes to the supplies of natural resources and ownership of those resources must be an integral part of the development options proposed.

Therefore, a comprehensive, multidisciplinary assessment of current land use, energy demand and technology innovation focused on Africa, will be carried out through COMPETE. It will link implementation activities, policy development, trade, funding and South-South-EU cooperation. The improved knowledge of national and regional land use and technology options generated, will provide the local and international partners with the basis for a complete assessment of social, environmental and economic impacts. Finally, all the outputs of COMPETE will be integrated into a carefully designed dissemination strategy targeted at decision-makers and stakeholders.
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AIDA

Unlocking the Potentialities of Agriculture in Africa’s Drylands for fighting hunger

Context and Objectives

In Dryland Africa (annual rainfall between 300 and 800 mm), climate change is an additional stress factor and poverty and recurrent drought affect millions of people as testified by the severe food crisis faced by Niger and Kenya in 2005/2006. The African Union and NEPAD recognize that, although agriculture is the mainstay of African economies and the main source of food of rural livelihoods, a very limited budget allocation is devoted to this sector (5% on average) and that the international aid is low. However, recent studies show that drylands people are resilient and open to innovation. In this context, SSA Africa 2006 will develop criteria and benchmark indicators for assessing impact of agricultural research and development projects and community driven innovations in Africa’s drylands.

Activities and Expected Results

The project is designed to document and analyse interventions and success stories on the sustainable use of drylands in order to identify the drivers behind the successes with a view of developing policy options and management strategies. Focus is on building capacity to generate knowledge about long-term trends and innovations in agriculture and environment in drylands and integrating the knowledge of farmers, communities and research. Case studies are undertaken by inter-disciplinary groups of postgraduate students supervised by international experts from Africa and Europe. Communities, universities, research institutions and policymakers will prioritise and define policy options for up-scaling the results.

The expected outcomes are (a) an international database of successful innovations in sustainable land management and agriculture in Africa’s drylands, (b) a methodological framework for analysing case studies and prioritising options for improving agriculture productivity in drylands, (c) policy briefs for supporting national and international decision-making capacity built through postgraduate training, participation in expert working groups and international workshops.
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ICTTD
Integrated consortium on ticks and tick-borne diseases

CONTEXT AND OBJECTIVES

Tick-borne diseases (TBD) are responsible for major drops in livestock production and mortality in sub-Saharan Africa, Latin America and Asia. The aim of this Coordination Action (CA) is to support a research programme on tick-borne diseases jointly executed by a consortium of 45 institutions in 30 different countries. The CA will focus on tick-host-pathogen interactions to identify concrete means of control that reduce the prevalence of TBD in (sub)tropical countries.

EXPECTED RESULTS AND OUTCOMES

All information generated by the CA project will be disseminated through ICTTD seminars, special publications and through printed and electronic versions of a newsletter on ticks and tick-borne diseases of livestock in the (sub)tropics.

ACTIVITIES

The project will generate a cluster of integrated databases containing information on ticks, hosts, and pathogens that will be crucial for the correct identification of ticks and the precise differential diagnosis of pathogens. The CA will function as a forum to discuss, evaluate, and recommend changes regarding biosystematics and molecular phylogeny of ticks and tick-borne pathogens. Integrated molecular diagnostic test kits will be distributed to provide research tools for comparative epidemiological studies on tick-borne pathogens. Prevalence data on ticks and tick-borne pathogens will be linked to remotely sensed eco-climatic data to create predictive maps for geographical distribution of tropical ticks and TBD in target regions. Genomics and proteomics data will be used to design integrated vaccine strategies targeting ticks and pathogens to reduce dependency on chemical tick control. The CA will act as a focal point for setting up consortia on novel genomics and sequencing projects particularly for ticks. Differential gene expression studies will be facilitated using sequences from ticks, hosts, and pathogens to provide insight into the three-way interactions of genes within the tick-host-pathogen triangle.
1. ENVIRONMENT

1. Comprehensive water policy and integrated planning
2. Improving the water consumption efficiency and effectiveness by users and uses. Plant breeding for efficient crop water and nutrient use
3. Advanced water treatment, re-use and energy implications
4. Environmental risks
5. Renewable energies for Mediterranean specific needs
A large deficit of well equipped and reliably operated de-central Integrated Water and Power Points (IWPP) for villages and in rural areas is observed in Mediterranean Partner Countries (MPC). Water and power authorities supported by regional R&TD institutions in MPC could reduce such deficits, if they developed their own capacity for flexible, innovative, fast and cost-effective assessment of technically and socio-economically appropriate solutions. Based on the experience from earlier Community R&TD and projects of the Middle East Desalination Research Center (MEDRC) on the use of renewable energy (RE) for de-central water and power, the Consortium has carried out a Specific Support Action (SSA) on the RE and water supply-related topics of the INCO work programme. The main SSA objective was the transfer and dissemination of know-how and tools for systems analysis on the appropriate integration of RE technologies with de-central water and power services under local conditions of MPC. The action comprised:

1. exemplary studies on the integration of (hybrid) RE conversion with combined water and power supply to villages and rural areas;
2. identification of opportunities and conditions for economically and socially sustainable deployment of hybrid RE technologies in MPC;
3. training and capacity building in MPC institutions for IWPP assessment services under local socio-economic conditions;
4. dissemination of results through the networks of the European Desalination Society (EDS) and MEDRC covering the MENA region.

The capacity building shall be oriented to planning and assessment services and included training of the MPC participants in using RESYSproDESAL for case studies in their countries. The SSA concept is open for later extension to the participation of R&TD institutions and water and power authorities from other MPC, not yet represented in the Consortium.
RESYSproDESAL

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QUALIWATER

Diagnosis and Control of Salinity and Nitrate Pollution in Mediterranean Irrigated Agriculture

Period: 01/01/2006 to 31/12/2009
Budget from EC: EUR 1 450 000
website: www.iamz.cieam.org/qualiwater/contenidos/zona_portada.htm

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Int’l Centre for Advanced Mediterranean Agronomic Studies

CONTEXT AND OBJECTIVES

The ultimate objective of this project is to provide guidelines to sustain irrigated agriculture while protecting water resources from the negative impacts of pollution resulting from the disposal of agricultural drainage water. Therefore, our strategic aim is to provide scientific, technical and socioeconomic information on the salt and nitrogen contamination effects and on pollution control measures in Mediterranean irrigated agriculture.

ACTIVITIES

The main activities of the project will be: input-output mass balances in representative irrigation districts and assessment of salt and nitrogen pollution effects of present agricultural management; model simulation studies analysing potential best management strategies for pollution control; evaluation of these strategies in selected pilot field trials (in particular: scheduling of irrigation, nitrogen fertilisation and reuse of drainage waters for irrigation); socio-economic analysis of present agricultural management and of source-sink pollution control management alternatives; and dissemination of results to water users and policy makers. Feedback with project end-users will take place via the participation of the stakeholders, thus ensuring that all relevant issues are properly addressed.

EXPECTED RESULTS AND OUTCOMES

The most relevant deliverables of the project will be: historical characterisation of selected districts, booklet on the use of the EM38 sensor, mapping of salt-affected soils, booklet on agro-meteorological stations, booklet on water level recorders, booklet on water collectors, booklet on gauging stations, water, salt and nitrate balances, booklet on guidelines to improve water use, irrigation model calibration, validation and application, salinity model calibration, validation and application, nitrogen model calibration, validation and application, feasibility analysis of best management practices, field-tested best management practices, current economic/environmental situation, biophysical economic model, transaction costs, environmental cost-benefit analyses, economic costs on ecosystems, edition of project information brochures, support materials for training workshops, support material attendees in IAMZ courses, edition of project results brochures, software release on policy control measures, final synthesis publication, website integration of project results.
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WADI

Sustainable management of Mediterranean coastal fresh and transitional water bodies: a socio-economic and environmental analysis of changes and trends to enhance and sustain stakeholder benefits

Period: 01/01/2006 to 31/12/2008
Budget from EC: EUR 1 820 000
website: www.wadi.unifi.it/
Coordinator: Prof Felicita Scapini
Università degli Studi di Firenze

CONTEXT AND OBJECTIVES

The general objective of the project is to encourage the rational and sustainable use of freshwater resources within Mediterranean coastal areas. The project will focus on issues, constraints and conflicts as identified through the active participation of key stakeholders, with a view to increase awareness and collaboration among actors, for the conservation of freshwater resources and their sustainable use for the benefit of the community at large. Specific objectives are:

• to identify conflicts of use among stakeholders arising from improper management of water bodies and related constraints within selected study sites, which suffer from water scarcity and associated constraints;
• to assess and estimate the impact/s of various water uses as well as nearby human activities on coastal water bodies, such as fluvial systems, estuaries, marshlands and lagoons;
• to produce interdisciplinary scientific inputs for improved participatory water management strategies and related planning regimes for a rational use of water resources, taking into account economical, socio-cultural and environmental constraints at local level, without losing sight of other broader scales (national, regional and international);
• to develop and propose alternative management strategies and plans for the selected sites as well as general guidelines for appropriate and sustainable management of water resources;
• to establish a network of scientists, authorities and local communities in order to enhance local awareness on water quality, use and misuse.

EXPECTED RESULTS AND OUTCOMES

The project will contribute to enhancing local competence for a sustainable use of water bodies and to reducing the existing and potential conflicts for water uses between different stakeholders, with special attention given to the weakest components of the community and to sustainability for the benefit of future generations. At the same time, the project will conduct a comparison of various case studies from the Mediterranean coastal area, on both northern and southern sides, in international cooperation and collaboration with governmental stakeholders from different Mediterranean countries. Databases on a wide geographical scale (ideally the Mediterranean region, comparing databases) and time scale (using time series) would enhance the power of the management plans and assist stakeholders in applying for financial support at national and international level.
The project will contribute to identifying the various stakeholders of water in different case studies and their various forms of contribution to water management according to various physical, socio-economic and cultural backgrounds. This can assist in profiling different local communities and defining the roles of men and women at different areas and levels in water management and planning. The specific role of women as end users of water will be a main focus, and special attention will be paid to their involvement in the local dissemination of the project findings and results. Dissemination material will be produced to convey easy to understand messages about the importance of water resources and their conservation through correct use.
CRESMED

Cost efficient and reliable rural electrification schemes for South Mediterranean countries based on multi user Solar Hybrid grids

Period: 01/01/2006 to 30/06/2009
Budget from EC: EUR 900 000
website: www.cresmed.org

Coordinator: Mr Ingo Vosseler
S.L. Trama TecnoAmbiental

CONTEXT AND OBJECTIVES

Rural electrification (RE) in South Mediterranean countries is mostly achieved by solar home systems, which are only capable of serving a very limited number of appliances, such as lights. This gives the image that photovoltaic (PV) solutions are destined for the poor, and are not sufficient for stimulating economic activities in rural areas. Fuel generators, also used, give more electrical power, but suffer from high maintenance costs, irregular availability of fuel, and are mostly used to provide a limited energy service for only 6 to 14 hours per day. The solution is the employment of hybrid systems using a mix of renewable energies and fossil fuel, and provision of an energy service for a rural community population via a micro grid.

The integrated approach for RE using such multi-user hybrid grids has been tested for electrification in Europe, but has still to be adapted to the different social, economical and environmental conditions found in South Mediterranean countries.

The main strategic objectives of the project are the development of:
• RE electricity produced from multi-user solar hybrid systems (MSGs) combining solar and other locally available energy sources on local micro grids;
• management tools to rationally operate a larger number of MSGs in a region by satellite and other communication technologies

ACTIVITIES

The project follows a clear set of work packages (WPs), which can be broadly grouped as follows: research, technological development and field testing.

WP 1 deals with research studies on the need for energy services in the Mediterranean Partner Countries (MPCs). This gives partners in the Mediterranean countries the possibility to investigate the energy needs in the area, with regard to hybrid systems. The results obtained in WP 1 are used in WP 2 to define a strategy for RE-programmes for each of the MPCs, addressing all non-technical issues requiring research activities. There are two WPs dealing with research and appropriate technology development. The first is WP 3, which covers the additional development of system components (power conditioner, water and wind turbine) in order to fit the social and environmental conditions of the target countries.

WP 4 covers an advanced control system, which is based on a unified communication bus for system components and is used for the monitoring system, which also allows for remote control.

Finally, WP 5 covers research on general technical aspects for the implementation of hybrid systems with high renewable energy content in the target countries. The outcomes of these WPs will be gathered into a design manual for such systems, which may additionally be used in the development of standards.

The results of the work done so far will be tested in a field test system to be carried out in a Moroccan village. All steps for the implementation of such a system will be followed, as well as effecting any necessary improvements to the procedures. After implementation, this system will be monitored technically, socially, and economically for at least six months.

The results of this project are to be disseminated to the decision-makers and stakeholders of the MPCs.

EXPECTED RESULTS AND OUTCOMES

The results of the study on the needs for RE in Mediterranean countries will be used for the development of a RE-strategy, where strategic targets are to be set. Financing schemes and models will be developed in order to achieve a service scheme, which is socially and economically sustainable in the Mediterranean countries. The close cooperation between the European and the partner countries’ research centres will ensure that INCO objectives are met, especially by boosting the RTD capability of MPCs and establishing links between the different centres.
These results will be used in the research and development of appropriate components which can cope with the special operating conditions found in Mediterranean countries, such as high temperatures and high dust content in the ambient atmosphere. The close cooperation of all participants will help to strengthen the links between research centres, businesses and other stakeholders in the society, in addition to the links between research institutions in the EU and MPCs.
ELMAA

Integrated water management of Mediterranean phosphate mining and local agricultural systems

Period: 01/09/2005 to 30/06/2009
Budget from EC: EUR 1 600 000
website: elmaa.brgm.fr

Coordinator: Dr Hervé Gaboriau
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CONTEXT AND OBJECTIVES

The phosphate mining industry is a major contributor to the economy of some Mediterranean countries i.e. Morocco, Jordan, Tunisia, etc. Large volumes of water are required by the mining industry from areas where water resources are limited. Water scarcity may be worsened by a degradation of the water quality after phosphate processing. The pressure on water resources is liable to hamper the development of the phosphate industry and results in competition with other water-reliant economic sectors such as agriculture or tourism. The ELMAA project meets this strategic need: to reduce tensions on water resources (quantity and quality) and to consolidate the sustainable development of the phosphate mining industry.

ELMAA will focus priority on the interface between the mining and agricultural sectors, given the economic and social importance of the latter sector. The general objective of ELMAA is to provide the phosphate industry and the water managers with a methodology for the integrated management of water resources in the zone of influence of the mine sites and provide technological innovations to reduce the pressure on water resources, in mining and agricultural practices. This methodology will integrate a customised Decision Support System (DSS) which will serve to formulate and rank the actions to be initiated, whether they result from technological innovations, or from a change in the institutional or regulatory framework.

ACTIVITIES

The project will concentrate on three major and strategic phosphate mining areas located in Jordan, Morocco and Tunisia. ELMAA will comprise the following activities.

The qualitative and quantitative description of water management in the three selected phosphate mining areas will specifically address the four main components involved in water management, namely phosphate mining, the agricultural sector, the regional, hydrological and socio-economic context. This description will include the analysis of all technological, socio-economic, environmental and regulatory factors that have an impact on water management.

The investigation of different technological routes with the aim of improving the water use will take into account not only the quantity but also quality aspects, both in the mining sector (reduction of water consumption, recycling optimisation, use of municipal waste water) and in the agricultural sector (evaluation of the mining water and the slimes for agriculture use).

The development of a DSS tool aims to provide a simplified but realistic representation of water management at the interface between mining and farming activities, integrating technical, economic, social and environmental dimensions. The DSS will serve to simulate and evaluate different technological development scenarios.

EXPECTED RESULTS AND OUTCOMES

ELMAA meets a strategic need: to reduce existing tensions on water resources — quantity and quality — to consolidate the development of the Mediterranean phosphate industry. The anticipated benefits are commensurate with the challenges associated with the phosphate industry which is a vector of social and economic development.

The ELMAA project focuses on the coupled management of water between the mining and agricultural sectors. Examples of projects in Morocco and in Jordan have demonstrated the full benefit that the regional economy can derive from this coupled management of water. The ambition of ELMAA is to contribute to the generalisation of this type of approach.

ELMAA also takes into account the recommendations of the European Water Framework Directive with respect to the promotion of water use for long-term protection of this resource and participatory approaches to design water-management policies. The objectives of ELMAA fit into this framework by formulating proposals to improve the availability of water resources and promoting a participative approach associating different stakeholders. The ELMAA project will also be a valuable source of inspiration for decision-makers and end users in the ongoing process of water policy review.
The objective of the ELMAA dissemination plan is to spread awareness and information about project results beyond the consortium members and the scientific community, and thus perpetuate the actions initiated within the project.
Self-sufficient Renewable Energy Air-Conditioning system for Mediterranean countries

Period: 01/01/2006 to 31/12/2008
Budget from EC: EUR 1 700 000
website: http://www.crear.unifi.it/react/

Coordinator: Toufic El Asmar
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CONTEXT AND OBJECTIVES

The project aims to set up innovative pilot Renewable Energy Source- (RES) based co-generation plants (heat and air conditioning), to be used in specific environments, i.e. private or public medium and large-sized facilities (hospitals, tourist resorts, etc.) in highly sun-irradiated Mediterranean countries. The main objective of the proposed systems will therefore be to make hot water and air conditioning available in the selected sites without requesting power from the local electricity grid. Moreover, the systems will provide a test-bed for innovative technologies that will result in efficient and cost-effective production of heat and refrigeration. The systems will also be an example and model for future dissemination of the technology to other facilities and resorts. Two different layouts, with different and highly innovative technological solutions, will be developed and evaluated, in order to maximise the energy trapped from the sun by linear parabolic solar collectors. Primarily both solutions will aim to produce heat that will be used in advanced two stage ammonia chillers for the production of refrigeration (cold water: ca. 5 °C) — to be used for air conditioning — and hot water (50 °C) for sanitary needs.

ACTIVITIES

Activities take a straightforward approach starting with a review of the climatic and energetic conditions for both sites (hospital and hotel) as well as full economic and cost-effectiveness analysis; in this way the project will proceed with the appropriate solutions and recommendations enabling the integration of RES solar-based air conditioning and passive measures. The climatic analysis of solar irradiation at both sites will provide the optimised analysis for the passive solutions, taking into account the different climatic conditions of the targeted sites.

The main activities can be summarised as follows:

• preliminary analysis of climatic, environmental and economic conditions of the targeted areas as well as setting up the systems' requirements;
• assessment of the preliminary design of the systems, by determining the characteristics of each subsystem (troughs and collectors, heat transfer system, chillers, etc.);
• final engineering design of the system and simulation of it, determining which prototype will be developed, assembled and tested in Europe;
• transfer, installation and onsite testing of the systems at the targeted sites;
• final assessment of the efficiency of both technologies at each site;
• exploitation and dissemination.

EXPECTED RESULTS AND OUTCOMES

The project’s activities should lead to different and important results, with the design and development of two different solar-based systems. One is to be installed in a public hospital in Casablanca, Morocco and the other in a hotel in Aqaba City, Jordan. Both systems should be able to successfully produce heat and cooling for each building. The local personnel will be able to manage the system independently after a reasonable period of training. This project should reduce non-technical barriers for renewable energy penetration in the EU and Mediterranean Partner Countries (MPCs) through an increased interest in the REACT technology installations from other tourist resorts and hospitals. Finally, citizens, authorities and public organisations of the MPCs and of other Mediterranean and EU Member States will be made aware of the potential for using the newly developed REACT Renewable Energy System-based air conditioning systems.
COORDINATOR

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PuraTreat

New energy efficient approach to the operation of membrane bioreactors for decentralised wastewater treatment

Context and Objectives

The Mediterranean Basin is one of the poorest regions in the world, in terms of water resources. With limited renewable water resources, most countries in the area have been driven to reuse their wastewaters. However, especially in the east and northern Mediterranean regions, wastewaters are inefficiently treated or even reused directly without treatment for irrigation or sanitary purposes, serving as a carrier for diseases, or causing water pollution when discharged to water bodies.

The main aim of Puratreat is to investigate the performance of membrane bioreactors (MBRs) for the treatment of wastewater under operating conditions, which are expected to produce low maintenance and running costs. This project will initiate a new approach to operating MBR systems, adapted to the financial constraints affecting Southern Mediterranean and Middle East peri-urban and rural communities. The consortium will study the behaviour and feasibility of three different bioreactor configurations working at minimum aeration rate and short solids retention time, operating conditions that, if proved effective, would allow the adoption of this kind of technology as a cost-effective decentralised wastewater treatment solution. In addition, the construction and running costs of a potential full scale decentralised wastewater treatment plant will be contrasted with the investment capacity available to several Mediterranean peri-urban areas in North Africa and the Middle East.

Activities

A laboratory modular membrane bioreactor will be built and installed in the facilities of a wastewater treatment plant in Tunisia in order to:

- compare the performance of MBR bioreactors working under conventional operating conditions with the performance achieved under conditions specially adapted to the requirements of Middle East and North Africa (MENA) countries;
- study the performance, energy consumption and maintenance requirements of MBRs working at low Solids Retention Times as a possible operating procedure for the application of these system in peri-urban areas of MENA countries;
- study the characteristics of the microbial community present in the reactor for the different experimental conditions studied;
- propose the most suitable technology for the application of decentralised MBR wastewater systems and its optimum operating conditions;
- study the feasibility of decentralised wastewater treatment plants based on MBR technologies in the Mediterranean Partner Countries (MPCs).

Expected Results and Outcomes

With the experimental results obtained in the project, the consortium expects to be able to assess the feasibility of membrane bioreactors operated in such a way as to address the budgetary constraints that affect the provision of sanitation services in the MENA countries. The consortium intends to identify the most appropriate operating modes and applications for each one of the membrane technologies studied. The consortium expects that MBRs running at low energy, energy consumption modes will prove effective for the provision of affordable decentralised wastewater treatment in the INCO-MED countries.
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**CONTEXT AND OBJECTIVES**

Mediterranean citriculture face an increasing combination of biotic (Citrus tristeza virus (CTV)/phytophthora) and abiotic stresses (salinity/alkalinity). Most of these constraints should be individually managed by the rootstock choice. However, the spread of CTV all over the Mediterranean Basin will soon prohibit the current use of the traditional sour orange rootstock that provides adequate tolerance to salinity and alkalinity. Therefore there is an urgent need to select new citrus rootstocks. All the required traits are present in citrus germplasm but the complexity of citrus biology and genetics make it difficult to combine them through traditional breeding. The objective of this project is to enhance the efficiency of citrus germplasm exploitation for rootstock breeding under two main breeding strategies: sexual recombination and somatic hybridisation.

**ACTIVITIES**

To attain this objective, possible improvements will be investigated throughout the varietal innovation process. Knowledge and methodologies will be developed by combining physiological, genomic, genetic and biotechnological approaches. The project will focus on tolerance to salinity, and tolerance to iron deficiency associated with alkaline soils:

- identification of a physiological indicator of tolerance and development of standardised protocols for physiological evaluation;
- searching of candidate genes, study of their genetic and physical distribution on the genome, and analysis of the relationship between variability of physiological indicators and variability of candidate genes for tolerance to abiotic stresses;
- comparative genetic mapping between citrus and poncirus, and analysis of recombination at intergeneric level;
- development and optimisation of new breeding methods including Assisted Marker Selection and somatic hybridisation.

For a shorter term impact, two regional networks will be implemented:
- a regional citrus rootstock germplasm network; and
- a network for the agronomical evaluation of new rootstocks. Training and methodology transfer to the end users are important components of the project.

**EXPECTED RESULTS AND OUTCOMES**

The CIBEWU project will contribute to providing answers to the citrus industry rootstock challenge in several steps. In the short term, the control of genetic conformity of rootstock collection will give a guarantee on mother trees of rootstock amplification schemes. This guarantee will ensure homogeneity of the planting material and conformity of agronomical behaviour. The network for agronomical evaluation of new rootstock will allow the consortium partners, in the medium term, to share pre-existing rootstock innovation. Multi-local data will give an accurate estimation of new rootstock global behaviour and of their adaptation in the specific context of the producing countries. Adoption of these new rootstocks by citrus growers in the Mediterranean Basin should occur in the next eight to ten years. In the long run, a new generation of rootstock will be created by somatic hybridisation with the specific goals of the Mediterranean Basin in mind. Moreover, the CIBEWU project will give a very strong basis for tolerances to abiotic stresses at genetic and genomic level. This knowledge plus the molecular tools for early selection developed in the project will support to a great extent the management of these tolerance traits both in somatic hybridisation and sexual breeding schemes.
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OPTIWHEAT

Improving the yield stability of durum wheat under mediterranean conditions

Period: 01/07/2006 to 30/06/2010
Budget from EC: EUR 1 800 000
website: www.rothamsted.bbsrc.ac.uk/cpi/optiwheat/

Coordinator: Dr Martin Parry
Rothamsted Research Ltd

CONTEXT AND OBJECTIVES

Water is essential to sustaining human and environmental health but is already at scarcity level in some eastern and southern Mediterranean countries. Agriculture is by far the largest user of water resources accounting for around 75 % of consumption, but nevertheless water remains a major determinant of crop yield. Under rain-fed conditions, characterised by low and uncertain rainfall, durum wheat is one of the most widely cultivated crops.

OPTIWHEAT will use a powerful systems-biology approach combining genomics, crop physiology and agronomy to generate durum wheat cultivars that have higher and more stable yields under Mediterranean drought conditions. The central thrust of the project is to both identify existing variation in durum wheat germplasm and to generate novel genetic variation for the stability of yield under drought stress (SYDS) in durum wheat.

The project will generate a novel mutant population and use these lines to establish for the first time the targeting of induced local lesions in genomes (Tilling) in durum wheat. This population will be used for forward and reverse genetic approaches to identify lines with enhanced SYDS and to understand how the structure and expression of specific genes contribute to the variation of yield trait components under Mediterranean conditions.

ACTIVITIES

The major activities of OPTIWHEAT are to provide additional novel variation to durum wheat germplasm by random chemical mutagenesis and Tilling technology through the production of a Tilling population. This population will be used for forward and reverse genetic approaches to identify lines with enhanced SYDS and to understand how the structure and expression of specific genes contribute to the variation of yield trait components under Mediterranean conditions.

Other researchers and breeders will be given access to this resource to improve the sustainability of durum wheat production under field conditions. This will lead to the development of improved plant crop germplasm more adapted to drought by the identification of genotypes that outperform those currently available in individual Mediterranean Partner Countries (MPCs). This will be determined from the agronomic performance of genotypes grown with and without drought.

EXPECTED RESULTS AND OUTCOMES

The main outcomes of OPTIWHEAT will be:
- a large Tilling population of durum wheat produced from mutagenised seed;
- DNA stocks and seed for the Tilling population archived at two mirror sites (one site will be within an MPC) and made available to interested researchers and breeding companies;
- datasets for field trials to determine the agronomic performance of genotypes grown with and without drought;
- durum gene expression datasets generated under both controlled and field drought conditions;
- a list of candidate gene sets associated with durum wheat stability of yield under drought stress;
- an improved research infrastructure in MPCs;
- training of personnel.
OPTIWHEAT

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CEDROME

Developing drought-resistant cereals to support efficient water use in the Mediterranean area

Period: 01/01/2006 to 31/12/2008
Budget from EC: EUR 1 700 000
website: http://biology.leidenuniv.nl/ibl/S2/CEDROME/

Coordinator: Dr Pieter B.F. Ouwerkerk
Leiden University

CONTEXT AND OBJECTIVES

Limited water resources are now a major challenge to world food security, especially in many developing countries such as those in the Mediterranean (MPC) basin. Cereal cultivation, including rice and wheat, requires a tremendous amount of water, and any deficiency can severely affect yield. CEDROME aims to enhance drought-resistance in durum wheat and rice, both strategic crops for the MPC region, to support the efficient use of water supplies. The strategy is to use knowledge obtained from the model plant rice and to extrapolate this to durum wheat via a process of technology transfer from European and Chinese partners to the MPC region. Two strategic objectives are addressed:

• Enhancement of drought-resistance: development of improved cereal germplasms and varieties that are more adapted to dry conditions in the MPC region.
• Technology transfer from Europe to the MPC region: the level of education and experience has become a major constraint for development in many countries. Therefore, key factors in CEDROME will not only be transfer of capital, but also of know-how and technology.

ACTIVITIES

With the available genomic sequence, the well-defined genetic maps and large collection of mutation and insertion lines, rice is the obvious model for this research. The knowledge obtained and functional genes identified from rice can be extrapolated in the improvement of other cereal crops such as wheat, barley and sorghum since they are closely related. This multi-disciplinary project combines European, Chinese and MPC expertise in classical breeding, plant physiology and cereal crop biotechnology to assist the development of a new generation of cereals with enhanced drought-resistance. Molecular markers will be used to identify drought-related loci. Conventional breeding will be used to combine drought resistance genes in new cultivars and new candidate drought resistance genes will be identified. Constructs will be made with these new and existing putative drought resistance genes, where transgenic rice and wheat plants will be evaluated in various countries under different growing conditions. In addition genetic approaches will be taken to identify new genes from different mutagenised populations.

EXPECTED RESULTS AND OUTCOMES

The EU has taken its responsibility via the INCO Programme to generate knowledge that can pave the way for innovations that are necessary for scientific development, sustainable agriculture and industrial prosperity in the MPC region and developing countries. In agreement with the INCO objectives, results of this project will support sustainable development in the MPC region and will also be applicable to other cereal-growing countries. Expected outcomes are joint scientific publications (e.g. about identification of novel drought-resistance genes in rice and durum wheat and application in conventional and molecular breeding for drought-resistance), other dissemination activities (website, work shop), PhD theses, guidelines and protocols, patents, cereal crops improved for drought-resistance. Experience from European partners gained from rice research will be extrapolated to the wheat research community in North-Africa via training visits. As a consequence, the human resources in the MPC partners will be strengthened allowing further development. Ultimately, this will lead to fair participation in the world economy.
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SOLAR BUILD

Integration of solar technologies into buildings in Mediterranean communities

CONTEXT AND OBJECTIVES

SOLAR-BUILD contributed to the uptake of solar technologies to meet cooling, electricity and heating needs in buildings in Mediterranean communities, via new links and information exchange between relevant professional fields as well as via transfer and adaptation of experience from EU to Mediterranean Partner Countries. Partners were leading networks of sustainable energy professionals and architects within the region, led by CRES who has long-term in-depth experience of research, development and application of solar technologies. Partners will engage with extensive market actors and stakeholders including: architects, building engineers, solar technology manufacturers / retailers etc, local authorities / municipalities, central government departments.

Specific work objectives were:

- To analyse local conditions, current status, future market opportunities & threats.
- To convene working groups comprising relevant professions to deliver analyses & reports on above issues.
- To hold two workshops (Morocco & Egypt) to present & discuss the market analyses results & identify follow-on actions with market actors & stakeholders.
- To collate conclusions & recommendations from above tasks into one e-guide for building-integrated solar technologies in Mediterranean.
- To disseminate findings including targeted emailing to partner’s extensive networks & to make all information & results available via project web site.

ACTIVITIES AND EXPECTED RESULTS

This resulted in increased awareness among actors, concerning the potential of applying Mediterranean-wide and locally adopted solar energy solutions in community buildings. Actors will be equipped with new knowledge and contacts to take forward with research, development and implementation activities. The project offered an important contribution to long-term socio-economic development by promoting locally appropriate, cost-effective, environmental solutions in public buildings.

Period: 01/01/2007 – 28/02/2008
Budget from EC: EUR 124,990
website: www.almee.org

Coordinator: Mr Dimitrios Papastefanakis
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Contract number: 026426
SOLAR BUILD

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DISTRES
Promotion and consolidation of all RTD activities for renewable distributed generation technologies in the Mediterranean region

Period: 01/01/2007 to 31/12/2009
Budget from EC: EUR 999 832
website: www.distres.eu

Coordinator: Dr Andreas Poullikkas
Electricity Authority of Cyprus

CONTEXT AND OBJECTIVES

The overall goal of the DISTRES coordination action project is to exchange and disseminate good practice developed in the field of RES-DG technologies by isolating research activities and performing studies and/or analyses for the Mediterranean needs. DISTRES specific scientific and technological objectives may be summarised as follows:
- to coordinate RTD projects in RES-DG technologies;
- to promote the electricity generation from solar energy, photovoltaic systems and solar thermal systems, paving the way for pilot systems and products;
- to produce capacity building methodologies;
- to disseminate the results as widely as possible in Mediterranean countries and in the EU.

ACTIVITIES

DISTRES is organised into five work packages (WPs) with a total duration of 36 months. WP1 involves various studies concerning RES-DG policies including green hydrogen status and socio-environmental benefits for the EU and the Mediterranean countries. WP2 is targeted to the identification of various successful RES-DG business models. WP3 involves the various studies concerning the EU and Mediterranean countries regulatory regimes. WP4 purpose is to provide building capacity methodologies for the promotion of RES-DG technologies in the Mediterranean region. Finally, WP5 concerns the project management and the coordination of DISTRES. It is intended that the results of DISTRES will be made widely available, both during and after completion of the coordination action. The work programme includes three workshops, a conference, the development of capacity building methodologies, the creation of a website, newsletters and a press release.

EXPECTED RESULTS AND OUTCOMES

To date, RES-DG (solar thermal systems and photovoltaic systems) is deemed neither commercially viable, nor profitable, unless strong subsidies are available within the Mediterranean countries. An immediate conclusion from concerted European research, however, is that solar thermal systems and photovoltaic systems are reliable and technically feasible for installation and operation in the Mediterranean region. It still remains though, to develop strong financial incentives in order that RES-DG may become viable on technical and economic terms. Persistent obstacles are the technology cost, the stability issue for isolated power systems and the Mediterranean countries' energy policies. DISTRES contributes to the promotion of RES-DG technologies and policies while safeguarding the environment, and thus has application at a pan-European level. In particular DISTRES responds to EU policies at a number of different levels, such as:
- promoting the use of solar thermal and photovoltaic systems;
- promoting RES-DG technologies, including green hydrogen based systems (hydrogen as an energy carrier is one of the key technology sectors identified by the EU for the Union’s long-term competiveness and strength of the European economy with a clear goal of providing Europe with a realistic and economically viable route to a green hydrogen economy);
- helping to encourage the development of a European hydrogen economy, this work will help to maintain the ability of Europe’s energy supply infrastructure to smooth the increasingly fluctuating supply/demand balance inherent in an increasing dependence on renewable energy sources;
- contributing to the efforts of the EU of reducing its greenhouse gas emissions and thereby acting constructively in terms of the global climate change issue.
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Mediterranean Countries struggle with serious water problems like rising water competition between agriculture, households and industry, but limited and/or salt-affected water resources, irregular rainfall, escalating dehydration of landscape. Inefficient wastewater treatment systems lead to pollution of surface- and groundwater.

There are different research activities accomplished under the FP5/FP6, showing very promising approaches to re-use and to recycle conventional and unconventional irrigation water in greenhouses, with the potential to up-grade and re-use wastewater as non-conventional water resources, to significantly reduce the pressure on freshwater resources and the pollution of surface- and groundwater, to make greenhouse cultivation almost independent from drought and irregular rainfall, to add value to otherwise unproductive land, and to improve the water consumption efficiency and effectiveness in agriculture.

However, these research and innovation activities have not been implemented in the Mediterranean Partner Countries so far. Main reasons are excessive costs for the special water cycling greenhouse architecture and technology, insufficient studies about MPC’s wastewater collection systems and about the socio-economic benefits and risks to upgrade wastewater by greenhouse irrigation, and insufficient studies about the market value of useful crops which can be used in combination with greenhouse internal wastewater treatment.

This project aims principally at compiling, analysing and disseminating relevant information and experience to facilitate uptake of suitable water recycling technology for high value greenhouse agriculture.
The complex dimensions of the Mediterranean freshwater resources, their fragility and their scarcity have been highlighted and have received considerable attention as a primary priority issue politically, technically and scientifically. Membrane technology, with its different applications in water treatment (desalination, potable water treatment, wastewater treatment and reuse) has shown to be a powerful tool to abate the water crisis in the Mediterranean region.

During the last five years, this technology has received a lot of attention, resulting in an improvement of membrane materials and techniques, which provide higher fluxes, longer lifetime, partly improving the fouling and high costs. Although there are several national and international membrane research activities, lack of cooperation, very limited know-how exchange and an uncoordinated use of resources leads to parallel and ineffective R&D activities.

The primary objective of PROMEMBRANE is to support the current research and development activities in membrane technology focused on water treatment in the Mediterranean area, providing an international stage to local research organisations and universities devoted to the development of membrane technologies in the following areas: municipal and industrial wastewater treatment, surface water purification and brackish and sea water treatment for drinking purpose.

The first stage of the project covered the identification, mapping and evaluation of the on-going research, in order to propose future research and cooperation strategies. The second stage, focused on the dissemination of successful experiences and on-going research activities, mostly through the organisation of two regional contests ‘PROMEMBRANE Young Scientist Award’ in the frame of two regional fairs in Egypt and Syria respectively and an international conference in Tunisia, encouraging and promoting further research activities in membrane technologies.
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STEELWATER

Effective use of water in coal and steel industry

Period: 01/10/2006 – 31/03/2008
Budget from EC: EUR 110,000
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CONTEXT AND OBJECTIVES

Egypt faces a strong demand for modernisation of its industrial sectors. Effective use of water is one of the most important activities for the sustainable society. The methodology of advanced water treatment is used in the European industry in production processes in line of EU directives. In Egypt, there is a need for both theoretical and practical training of the target groups (researchers, governmental people and industrial companies) to increase the building capacity for technology transfer. The project’s aim was to demonstrate, in full scale, solutions minimising the use of water in the production process and treatment of wastewater in a sustainable way.

ACTIVITIES AND EXPECTED RESULTS

One of the core activities in this project was therefore to introduce the technologies and the dissemination to the regions. The methodology was implemented in five manufacturing companies. This was achieved by demonstrating the methodology in three pilot cases for different companies. Results of the project were also presented to a larger number of stakeholders and spread to other regions. This was a contribution to improvements in the Egyptian industrial production and the regions towards sustainable development.
**TERMISOL**

New low-emissivity and long lasting paints for cost-effective solar collectors

**CONTEXT AND OBJECTIVES**

The project aims to develop improved types of selective paints, with high photothermal performance in solar energy conversion, for coating solar collectors. Solar thermal devices converting solar radiation into heat are mainly flat-plate collectors. Their most important and critical part is the absorber surface which is often expensive and mainly based on the application of heavy metals. Nowadays, some manufacturers use alternatives based on painting the solar panels, presenting a substantial economical advantage but of limited use due to drawbacks related to high emissivity-low energy efficiency and low durability in service life. To help overcome these drawbacks, new coatings will provide hybrid-structured surfaces at defined thickness ranges as a result of control application methods and by combining multilayer systems to adjust the whole system performance. The project considers the development of this technology to be applicable everywhere. Moreover, it is especially suited for implementation in Mediterranean countries, which benefit from optimal solar conditions and demand solar infrastructures in remote places such as rural areas and villages, in addition to general buildings e.g. hospitals and hotels.

**ACTIVITIES**

The technical aspects necessary to develop the project are defined by the following key phases:

Research, technological development and innovation related activities:
- search, characterisation and selection of raw materials;
- formulation and development of the selective paint;
- optical and physico-chemical characterisation;
- application methods, design and building-up of multilayer systems;
- artificial ageing and following of the degradation;
- construction of real prototypes and optimisation of performance;
- evaluation of economic feasibility and energetic performance;
- field tests and control of performance.

Demonstration and integration activities:
- training workshop to update partners in the relevant areas and to share knowledge;
- regular six-monthly project meetings involving all partners;
- travel by researchers spending time to learn about other relevant fields.

**EXPECTED RESULTS AND OUTCOMES**

Partners from different participating countries will join together to share knowledge and capacity building in the field of development, as well as research into photo-thermic paints.

The project’s results are to be patented. The coating technology developed will be commercialised by the consortium’s coating manufacturers and the producers of the solar collectors.

The development of appropriate and more cost-effective renewable energy technologies that are suitable for simple manufacturing facilities will help this technology to be taken up by basic workshops.

The different results obtained — from applying different accelerated ageing methods on solar collector surfaces — will be disseminated by conferences and scientific publications.
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HYRESS
Hybrid Renewable Energy Systems for Supplying of Services in Rural Settlements of Mediterranean Partner Countries

Period: 01/10/2006 to 30/09/2009
Budget from EC: EUR 1 249 990
website: http://iter.es/proyectos/hyress_i.html

Coordinator: Prof George Papadakis
Agricultural University of Athens

CONTEXT AND OBJECTIVES

The strategic objective of the project is to remove the knowledge barriers preventing the installation of Renewable Energy Systems (RES) and the creation of mini-grids based on renewables. Research challenges can be found in the field of system management but also best combination of available technologies according to the local prevailing conditions, that is build up hybrid systems to match a varying supply with very different consumption profiles. In order to reduce expenses, it is also very important to minimise the system’s storage requirements. Parallel to having excellent system management, the design technology has to be carefully adapted to meet the extreme framework conditions.

- The technologies have to be very robust and designed for the local climatic and social conditions;
- The requirements for service and maintenance must be very low;
- The technologies should be cost effective and preferably locally manufactured;
- Appliances must have low levels of energy consumption, and be able to cope with the power supplied from stand-alone systems (e.g. fluctuating power, Direct Current or Alternating Current supply etc.);
- Several system typologies will be examined i.e. Direct Current versus Alternating Current based mini-grid systems for optimum and continuous power and energy supply;
- The storage systems have to perform well under the high temperature conditions of the MPC. Under these conditions, the research that has already taken place for the operation of hydrogen subsystems is minimal and so this project will provide valuable new data.

EXPECTED RESULTS AND OUTCOMES

The ultimate objective of the project is to develop, combine, install, test and assess (technically and socially) the performance of low cost pilot hybrid RES in remote areas of the Mediterranean, which are not yet grid-connected. The hybrid systems will consist of photovoltaics, small wind generators, hydrogen subsystems and biomass combustion and/or solar heaters and they will be installed in selected areas of the Mediterranean Partner Countries (MPCs) to set-up and provide energy and thus help improve living conditions in these rural communities.

By setting up the aforementioned three pilot installations in Egypt, Morocco and Tunisia, the proposed research will make a significant contribution to the creation of sustainable structures with a decent quality of living in the rural environments of the MPCs, by developing highly innovative hybrid RES installations based on the availability of local renewable energy sources and the local social conditions and needs.

Finally, a no less important project objective is to propose — and possibly find — new ways and means for project sustainability and repeatability after it concludes, especially in the MPCs.

ACTIVITIES

Three systems will be installed in remote rural areas of Egypt, Morocco and Tunisia. The hybrid systems should fulfil criteria such as modularity, robustness, and simplicity of use and also require very low maintenance. Additional considerations to be taken into account for the technologies’ selection and implementation regard the possibility of potential systems’ standardised production and replication. Furthermore, the local installations will serve as good practice, accelerate local skill development, and promote and encourage international partnerships amongst all relevant stakeholders, such as research, financial, and regulatory institutions, industry and service companies, in particular SMEs, local representatives and social facilitators.
HYRESS

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MEDRES

Cost-effective renewable energy for rural areas in the Mediterranean region

Period: 01/01/2007 to 31/12/2009
Budget from EC: EUR 1 159 781
Coordinator: Dr Houda Ben Jannet Allal
Observatoire méditerranéen de l’énergie

CONTEXT AND OBJECTIVES

The objectives of the MEDRES research proposal, starting from the analysis of the present situation and announced objectives by the countries, with a special focus on the rural and peri-urban areas, are: to assess the opportunities for cost-effective renewable energies for rural areas and villages, by selection and analysis of pilot projects; to assess the real effectiveness of ‘new’ technologies through better knowledge of end user acceptability for energy efficient technologies and practices; and to measure the impact of electrification on socio-economic development in rural areas. The main results of the project will be elaborated in a set of recommendations and proposed adapted strategies to be largely disseminated in the Mediterranean region.

The Southern Mediterranean countries will be studied in order to promote cost-effective renewable energy for rural areas in the Mediterranean region, and best practices to enhance the sustainable development in these regions. This is in line with the Development Millennium Goals; the outcome of the International Conference on Renewable Energies in Bonn 2004 and its follow up initiatives; the Mediterranean Renewable Energy Programme (MEDREP); the Type II Initiative; the newly adopted Mediterranean Strategy for Sustainable Development; and the EU strategy within its neighbouring countries and especially the Mediterranean Partner Countries.

EXPECTED RESULTS AND OUTCOMES

The MEDRES research will have a large impact on sustainable development in the selected Mediterranean Partner Countries and will serve and support the decision makers in these countries to better define the best practices of sustainable energy in the rural and peri-urban areas, especially regarding renewable energy and energy efficient technologies. The project will also assist the European Commission in the formulation of future INCO programmes focusing on the thematic issue of ‘Sustainable Energy’, as well as elaborate draft concepts for ‘Renewable Energy’ projects which may be supported by the EC and the Mediterranean Countries. In this way, the project will help achieve the objectives of the Type II Energy Initiative launched at the WSSD in Johannesburg: the ‘Mediterranean Renewable Energy Programme’ (MEDREP) and the newly adopted ‘Mediterranean Strategy for Sustainable Development’.

ACTIVITIES

The MEDRES proposal is structured along five main work programmes and the related deliverables:

- analysis of energy efficient use in peri-urban and rural areas, technologies and practices effectiveness through surveys, selection of local initiatives, implementation of surveys and analysis of results and lessons learned. The purpose will be to assess the real effectiveness of such solutions, through better knowledge of end-user acceptability for energy efficient technologies and practices;
- measuring the impact of electrification on socio-economic development in rural areas. A selection of internationally recognised indicators will be chosen, and measurement methods developed and tested. ‘Before-after’ comparisons will be made on selected villages to be electrified during the project. The results will be the object of analyses. Strategies for successful implementation will be elaborated;
- management, exploitation and dissemination.

The Southern Mediterranean countries and prospects;
- research on sustainable power for rural areas and villages. Specific attention will be given to diesel mini-grid retrofit using renewable energies, distributed generation in rural weak grids and distributed generation in LV grids, using the concept of microgrids. Studies of selected projects identified by the partners as being strategic and of priority will be performed in each country;

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MEDITERRANEAN-AIRCON

An advanced solar-driven air conditioning system for Mediterranean climate

Period: 01/01/2007 to 31/12/2009
Budget from EC: EUR 1 147 980
Coordinator: Prof Saffa B. Riffat
University of Nottingham

Website: * (see below)

CONTEXT AND OBJECTIVES

The research project aims to investigate an advanced solar-driven air-conditioning system suitable for the Mediterranean climate. The proposed system is comprised of modular evacuated solar tubes coupled with an ejector-cooling device, a booster cold storage and air handling unit. The system will use glass-glass sealed, evacuated tube solar collectors, able to provide a substantial energy output even under extreme weather conditions, and which have an advantage over other types of evacuated tubes in that the vacuum is maintained between two glass tubes, thus providing excellent sealing, for long term use. The evacuated tubes could be installed on the roof of buildings in order to collect solar energy. The heat from the tubes would be extracted using closed-loop heat-pipes and the extracted heat would be used to produce vapour to drive a jet refrigeration device.

The system will use a new, compact ejector configuration, which incorporates all the ejector components in a single shell-and-tube heat exchanger unit. The proposed ejector system eliminates the need for separate heat exchangers, and allows more effective heat transfer in the evaporator as well as condenser sections. Significant reduction of the size, weight and cost of the ejector system is therefore possible.

Other components of the system will include a cold store unit employing microencapsulated phase change material (MCPCM) slurries for improved continuity of cooling supply, and an air handing unit which could be integrated into the air-conditioning system. MCPCM has the advantage that it could be used as a heat transport and storage medium at the same time.

ACTIVITIES

The work programme will involve design optimisation and evaluation of laboratory-scale components of the system, development of a parametric computer model for system performance analysis, investigation of a building-solar tubes integration and construction and evaluation of a full-scale prototype in a Mediterranean climate.

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SOLATERM

Promotion of a New Generation of Solar Thermal Systems in the MPC

Period: 02/10/2006 to 01/10/2008
Budget from EC: EUR 800 000
website: www.solaterm.eu

COORDINATION ACTION

COORDINATION ACTION

Period:
02/10/2006 to 01/10/2008
Budget from EC:
EUR 800 000
website:
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OBJECTIVES

The Mediterranean region has major potential for the use of renewable energies, particularly solar energy, due to its high level of solar radiation. Only a small variety of solar thermal technologies — first and foremost solar water heaters — are used in the region. A closer cooperation between research institutions and energy agencies from the Mediterranean Partner Countries (MPC) and the EU is needed in order to promote a new generation of solar thermal and cooling systems (solar combi-systems, solar cooling systems and high-efficient solar collectors) in the MPC. SOLATERM is working with 18 partners from eight MPC and five EU countries covering R & D, policy and promotion aspects of renewable energies in their daily work. SOLATERM aims at the widespread application of a new generation of solar thermal and cooling systems in the MPC.

The project approach can be summarised in three specific objectives:

• to transfer technological know-how on solar thermal and cooling systems to the MPC and adapt new technologies to the specific needs of MPC;
• to broaden the spectrum of solar thermal and cooling applications in the MPC through the promotion of cost-effective solutions, e.g. combi-systems;
• to support the R & D and application of solar thermal and cooling systems in the MPC with political measures.

ACTIVITIES

The project is based on a north-south, south-north and south-south exchange of know-how and experiences regarding solar thermal systems and their application in the MPC. In order to boost solar thermal combi-systems, solar cooling and high efficient solar collectors in the region the consortium partners are carrying out the following joint activities:

• Opening conference on current technological trends in solar thermal systems.
• Three working groups will elaborate:
  ― an analytical report of the political, socio-economic and climatic conditions in the MPC;
  ― the potential analysis for the new generation of solar thermal and cooling systems in the MPC;
  ― guidelines for planning and dimensioning of solar thermal systems for complex buildings and case studies for selected buildings.
• Mid-term conference on the political framework for the promotion of solar thermal applications.
• Consulting on running or planned pilot projects on upgrading solar thermal technology in the MPC.
• Dissemination of results in regional scientific networks and to political stakeholders.

EXPECTED RESULTS AND OUTCOMES

SOLATERM will promote the widespread application of solar thermal and cooling systems, which have the potential, in the MPC, to substitute a large part of systems for hot water preparation, heating and cooling of complex buildings based on conventional energy resources. SOLATERM concentrates on the aspects of R&D and the political framework in order to contribute to sustainable solutions for the general problems of shrinking conventional energy resources. The project brings together innovative approaches (e.g. combined solar thermal systems for hot water and space heating and solar cooling) with regional knowledge on the conditions in the MPC.
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POWERSOL

Mechanical Power Generation Based on Solar Thermodynamic Engines

Period: 01/01/2007 to 31/12/2009
Budget from EC: EUR 1 050 000
website: https://www.psa.es/webeng/projects/joomla/powersol/
Coordinator: Dr Julian Blanco
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CONTEXT AND OBJECTIVES

The main project objective is the development of an environmentally friendly and cheap shaft power generation technology, based on solar thermal energy and optimised for supplying basic needs to rural communities. The project focuses on the technological development of a solar thermal-driven mechanical power generation system based on a solar-heated thermodynamic cycle (the POWERSOL system). This technological development consists in optimising a solar-assisted thermodynamic cycle that generates mechanical power at low to medium temperature ranges. The optimisation is performed by means of experimental testing of the thermodynamic cycle with selected working fluids and of three solar collector prototypes. Mechanical energy could be used to either generate electricity directly (using a generator) or for the desalination of brackish or seawater by coupling the output to a high-pressure pump connected to a conventional reverse osmosis system.

ACTIVITIES

The following activities are planned:
- modelling a solar-heated thermodynamic cycle (selecting the most suitable boundary conditions and working fluids at three different top temperature ranges);
- development and construction of three solar collector prototypes optimised for operating at around 80 °C, 100 °C to 150 °C, and 200 °C to 250 °C. These are, respectively, a flat plate collector (static), a compound parabolic concentrator (static) and a parabolic trough collector (sun-tracking);
- experimental testing of solar-driven mechanical power generation and solar collector prototypes;
- comparing the cycles at the three temperature ranges for operating autonomously or with energy back-up at different capacity ranges;
- full technical evaluation of the proposed POWERSOL technology;
- economic assessment of the developed technology compared to conventional and solar-driven ones;
- assessment of final potential social and development impact.

EXPECTED RESULTS AND OUTCOMES

The expected result would be the development of a distributed, solar-powered shaft power generation system in the range of 50 kW up to about 500 kW, more cost-effective and efficient than other solar power sources, such as photovoltaic systems (i.e. with real market possibilities). The progress of the project research will be measured according to the results of defined project deliverables and the achievement of the following project milestones:
- preliminary selection of candidate main design features of the POWERSOL technology;
- initial preliminary design of the proposed POWERSOL technology;
- design of solar collectors, optimised for the proposed POWERSOL technology;
- construction of three experimental facilities for testing the solar collector prototypes, one in an EU country and two in third countries;
- design of the proposed POWERSOL technology;
- mid-term assessment meeting: from the results obtained, decisions will be taken for the technological design phase;
- construction of three experimental facilities, one in an EU country and two in third countries, for testing POWERSOL technology;
- final experimental POWERSOL system ready for onsite testing;
- assessment of the developed technology’s contribution to development in remote areas;
- execution of a defined scientist exchange and training programme;
- definition of future consortium exploitation plans and project follow-up.
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The RAMseS project aims at introducing renewable energy in agriculture (specifically photovoltaic power) in an approach producing a two-fold advantage: (i) to solve the problems that are usually associated with renewable energy that is intermittent and the need for energy storage and (ii) to provide concrete support for farms and farmers.

The proposal aims at an innovative coupling of photovoltaic power to a battery powered, all-purpose vehicle. In this scheme, the batteries serve a dual purpose of storage elements and power sources for the vehicle, so optimising the value and spreading their cost.

The vehicle can then be used for a variety of agricultural tasks. The innovative and integrated all-solar power system and multi-purpose agricultural vehicle is therefore a complete solar power system able to achieve the project goals of advancing towards sustainability.

The proposed integrated prototype of solar power storage and agricultural vehicle will be based on concepts which by now are sufficiently developed to be usable to build a practical and efficient system composed of a photovoltaic system and a light/medium duty vehicle for agricultural work.

At the same time, these technologies are low cost and show suitability to the specific socio-economic conditions locally. The solar power photovoltaic system would be used to generate and manage electrical energy. The vehicle does not only serve mobility, but is also a multi-purpose energy system for a series of services, which include energy storage, power production on demand, and back-up power system against grid blackouts, which are frequent in Mediterranean countries.

As a vehicle, it would be used for a variety of purposes such as crop transportation, spraying of pesticides, irrigation and crop collection. It can operate also as an all-purpose, low-speed road vehicle. It would be especially suitable for Southern Mediterranean countries where the potential for renewable energy is very high in terms of solar irradiation.
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CONTEST AND OBJECTIVES

To combat water scarcity and desertification, intensive desalination activities have been carried out in remote arid regions. Very large desalination plants located at coast are inadequate for remote areas because of their expensive infrastructure and high distribution costs, which include important pipe losses. De-centralised solutions therefore offer advantages over large central production sites. In addition, desalting is resource and energy intensive, thus water production must be increased while keeping the consumption of resources affordable. As energy has to be generated to supply the desalination plant, it is logical to think in terms of a co-generating system for water and electricity. Finally, skilled personnel are normally absent in such areas that require dependable systems.

The global objective of this project is therefore to coordinate research and technological development (RTD) joint efforts to produce, with minimum environmental impact, sustainable essential life-resources — water and energy —, in Mediterranean Partner Countries (MPC), by introducing high technology and automation. A review of the standard plant construction and design techniques will lead to a new model-based optimal system design approach, which will economically improve the overall performance, dependability, reliability and availability of these co-generating water-electricity plants. The plants located in remote arid areas are, besides diesel generators, also powered by renewable energy and use a high level of automation. This is necessary to increase reliability, adapt to working conditions and strongly varying renewable energy supply, for remote maintenance as well as to meet specific cost requirements. The approach is based on thorough modelling of the processes and offers a large degree of flexibility in design to meet different production requirements. Finally, the new technology will be disseminated in MPC and the Middle East and North Africa.

ACTIVITIES

The main activities that have to be carried out during this project can be classified into three large work blocks:

- studies, simulation and software development;
- plant design and construction;
- prototype integration, start-up and real-time control implementation.

This subdivision also corresponds to the three-year time frame, as the blocks are scheduled for the first, second and third year, respectively. It should be noted that the dissemination and coordination efforts will be carried out during the entire project period.

EXPECTED RESULTS AND OUTCOMES

As a result of the three main activities, three sets of results are expected, in addition to the concept itself:

- studies on resources, conditions and potentials assessment, as well as market analysis and data collection;
- dynamic models and software for decision support;
- control algorithms and prototype plans.
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MEDISCO

MEDiterranean food and agro industry applications of Solar COling technologies

Context and Objectives

MEDISCO aims to develop, test and optimise solar thermally driven cooling concepts for the food and agronomy industries in the Mediterranean region, which — given the local conditions — can become economically and socially sustainable. The objective is to assess which systems could better suit the actual and future demands of the food and conservation industry sectors in the south edge of the basin and estimate in technical and economical terms the most appropriate approach for the application of solar thermally driven systems. The project partners will carry out a survey and analysis of the energy requirement for the industrial sector in Egypt, Morocco and Tunisia.

Furthermore, the project will be devoted to the development of novel high performing solar driven cooling and refrigeration concepts, aiming at the best possible compromise in terms of innovative technologies use, primary energy savings and economic issues. The concepts developed will be implemented through the collaborative work of the research institutions and technology providers involved, resulting in theoretical and simulation activities.

As a result, the optimised system will be constructed and installed in two experimental set ups (including one in Tunisia), allowing on-site monitoring of system performance activities. The experiences gained through the experimental activities will be used to create guidelines for best practice applications. The project results will increase the knowledge and strengthen the awareness, among the major stakeholders, of the penetration potential of solar technologies in the food industry in the region.

The achievements of the MEDISCO project will contribute to future Community RTD activities related to these systems. Transfer of experiences within the project, at regional level, will be amplified thanks to the Mediterranean Renewable Energy Centre (MEDREC), based in Tunis within the Mediterranean Renewable Energy Programme (MEDREP). Further dissemination to the international scientific community will be carried out (IES-SHC Tasks).
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Environment & Energy

SWAP

Mediterranean dialogue on framing sustainability in water policy evaluation

Period: 01/07/2007 – 30/06/2009
Budget from EC: EUR 216,414
Coordinator: Dr Claudio Bogliotti
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CONTEXT AND OBJECTIVES

Water policies and management of water resources are important issues in the sustainable development of many areas in the Mediterranean, with particular regard to the agricultural sector. The project intends to stimulate communication and dialogue on the problem of policy evaluation in the Mediterranean agricultural water sector and the need of developing a regional and generalised frame of variables and indicators for participatory policy evaluation to enhance sustainable development of the water sector in the entire region.

The main objective of the project is to contribute to the strengthening of knowledge and assessment capability in water policy making and implementation in a Mediterranean context in order to better orient policy development towards sustainability. The specific project objectives are enhancing a participatory discourse on policy sustainability assessing achievement of sustainability objectives as stated in the Mediterranean Strategy for Sustainable Development framing and integrating Mediterranean water policy development (local and regional levels) in a common perspective of Sustainable Development.

ACTIVITIES AND EXPECTED RESULTS

The project is centred on the following main activities:
(a) involving stakeholders and citizens in a multi-stakeholder Forum in three selected case studies;
(b) activating a local public discourse on policy evaluation within the multi-stakeholder for a;
(c) elaborating a frame of variables and indicators, as a base for a common methodology for policy analysis;
(d) guiding the Fora for policy evaluation to disseminate results at high policy levels and
(e) bringing together the Fora and results achieved in a final international conference on water policy.
evaluation.

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SOWAMED
Network for the exchange of methodologies and expertise on sustainable water management and land husbandry in the Mediterranean

Context and Objectives
The global objective of the SOWAMED project is to establish an exchange network for methodologies and strengthen the expertise and capacity between partners in several research projects (STREP and/or CA) of the INCO-MED Programmes under the 4th, 5th, and 6th Research Framework Programmes in the domaine of sustainable land and water resource management and the prevention of risks on cultivated and inhabited watersheds.

Activities and Expected Results
The first step will be to identify and analyse data, models and Decision Support Systems (DSS) available for soil and water management in the semi-arid Mediterranean areas. It will be based on the results of the INCO MED research projects carried out during the ten last years.

The second step will be to test and discuss the availability of data, models or DSS set for particular conditions. The definition of their areas of applicability and limits of use will help to make available to all users the range of methods and tools for proposing solutions to questions of sustainable water management and land management.

The third step consists in reinforcing expertise and dissemination of data and methods.

This will be achieved through regional workshops focusing on three specific issues:
- the management of cultivated watersheds in mountains and hills (water conservation management and land management),
- the management of traditional irrigated perimeters (small and medium hydraulic works SMH), and
- intensive irrigation systems and the management of water and land uses especially in peri-urban agricultural perimeters (competition for land and the use of non-conventional water resources).

The project will associate teams from three EU and five Mediterranean Partner Countries for a duration of 24 months.
SOWAMED

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DIMAS
Deficit Irrigation for Mediterranean Agricultural Systems

Period: 01/09/2004 to 31/05/2008
Budget from EC: EUR 1,015,000
website: www.uco.es/investiga/grupos/agr119/dimas/htm/dimas.html

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OBJECTIVES

Irrigation uses about 80% of all water diverted for various uses in the Mediterranean. It is crucial to reduce the irrigation water use in order to release this scarce resource for alternative uses. The main objective of this project is to evaluate the concept of deficit irrigation (DI) as a means of reducing irrigation water use while maintaining or increasing farmers' profits. DI will be the subject of multidisciplinary research at different scales, geographic locations, and with different perennial and annual crops. This objective includes other specific objectives:

- development and validation of a simulation model for DI design and for yield prediction in water-limited situations in various Mediterranean countries;
- characterisation of current DI situations in participating countries and documentation of farmers' performance and the limitations of existing irrigation networks;
- assessment of the economic viability of DI for various crops and environments;
- determination of the acceptability of DI for the institutional and cultural conditions of the countries involved.
- generation of DI recommendations for farmers and water managers;
- integration of DI strategies into the management of irrigation water at the watershed, irrigation district, and farm levels.

EXPECTED RESULTS AND OUTCOMES

The results of the project will provide recommendations for reducing irrigation water use while ensuring the sustainability of irrigated agricultural systems in the Mediterranean basin. The knowledge output of the project will be disseminated among end users (farmers associations, irrigation water agencies, etc.). The expected results are:

- scaling-up deficit irrigation to watershed: scenario development for designing deficit irrigation strategies, taking into account the socio-political implications of deficit irrigation;
- synthesis, coordination and dissemination of the results (meetings, web-based and paper publications, workshops, seminars, etc.).

ACTIVITIES

The project team aims at carrying out the following activities:

- development and validation of a crop simulation model for cotton, wheat, sugarbeet, citrus, olive and pistachio;
- developing an inventory of deficit irrigation practices: agro-climatic and water resources assessment, surveys with water authorities and water associations and characterisation of the biophysical and socio-economic environments;
- socio-economic optimisation: assessment of crop production economics, cost-benefit analysis and integration with the crop simulation model;
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OPTIMA
Optimisation for Sustainable Water Management

Period: 01/07/2004 to 30/06/2007
Budget from EC: EUR 1 499 997
website: http://www.ess.co.at/OPTIMA/

COORDINATOR: Dr Kurt Fedra
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OBJECTIVES

The overall aim of OPTIMA is to develop, implement, test, critically evaluate and exploit an innovative, scientifically rigorous yet practical approach to water resources management, in close cooperation with local and regional stakeholders, intended to increase efficiency and reconcile conflicting demands based on the European Water Framework Directive (2000/60/EC). The approach equally considers economic efficiency, environmental compatibility and social equity as the pillars of sustainable development. The project realises not only the importance — if not dominance — of the socio-political and economic aspects, but also the importance of a reliable, consistent and shared information basis for the policy and decision-making process. Empowerment through scientifically-based but policy-relevant information is a key concept.

ACTIVITIES

The first phase of the project is dedicated to the analysis of detailed requirements and constraints, the structure of the decision-making processes in the case study regions and identification of major actors.

The second phase will concentrate on data compilation and tool development, integrating quantitative methods (simulation modelling) and qualitative assessment in the socio-economic domain for a broad multi-criteria optimisation approach. Data compilation will also include the building of a regional data base of water technologies and associated cost functions.

The third phase will use the common methodology and tools in the individual case studies. Parallel to the modelling and optimisation tasks, the participatory approach and actor involvement will be prepared and tested, leading to the regional dissemination tasks.

Finally, comparative evaluation and dissemination will be carried out. Formats such as online guidebooks and distance learning tools will be considered in additional to more classical dissemination workshops.

EXPECTED RESULTS AND OUTCOMES

OPTIMA will develop optimisation-based tools and methods for water resource management. These will be tested in local and regional case studies in seven countries, namely Cyprus, Jordan, Lebanon, Morocco, Palestine, Tunisia and Turkey, around the Southern and Eastern Mediterranean. Specific emphasis on local acceptance and implementation will be made, by including stakeholders in an interactive, participatory decision-making process. This will be achieved by carefully embedded institutional structures using a discrete multi-criteria reference point methodology. The project also aims at building a wide dissemination network involving all relevant actors and stakeholders, in particular, all administrative bodies of local and regional governments and the developing water industry. Wide dissemination of results at regional and international level will be through a website and a special regional dissemination workshop with invited participants in addition to the project team.
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ADU-RES

Co-ordination Action for Autonomous Desalination Units Based on Renewable Energy Systems

Context and Objectives

The looming water crisis in the Mediterranean endangers the livelihood of the entire region. Millions of people do not have access to safe potable water and the situation is expected to worsen. In the past few decades extensive research has been performed on small-scale desalination of sea and brackish water. This technology has great potential for providing isolated rural areas with potable water.

The Coordination Action (CA) ADU-RES is striving to remove the remaining technical barriers facing autonomous, renewable energy-powered desalination units. The CA aims to identify policy and institutional obstacles to market penetration of such systems and to suggest appropriate improvements to institutional and policy framework. Finally, the key objective of ADU-RES is to widely disseminate the results to decision-makers and the scientific community, and to start implementation of commercial applications supplying people with safe potable water.

Activities

ADU-RES has brought together leading research institutions from five European and eight Mediterranean Partner Countries (MPCs) specialising in the fields of water desalination and renewable energy systems. This strong and committed consortium will undertake the following tasks:

• existing R & D work as well as the results of their own technical and economic research will be collected and specific guidelines for further development of ADU-RES plant design and construction will be formulated;
• socioeconomic and political framework conditions in the target countries including the relevant EU directives will be analysed in detail. Based on this analysis, a political strategy to boost decentralised, renewable energy-based desalination units will be developed;
• a well-designed dissemination action will take place, comprising widespread circulation of reports, papers, methodology and guidelines at relevant conferences as well as through the media, internet portals and two international seminars — one in Tunisia and one in Jordan.

Expected Results and Outcomes

There are three main outcomes resulting directly from actions undertaken:

• guidelines with recommendations for improved ADU-RES design and construction, incorporating technical, environmental and social concerns;
• recommendations for improvements in the institutional and policy framework of the EU and involved Mediterranean countries will be designed;
• development of information materials to be made available to all interested parties, from local populations to decision-makers.

These direct outcomes will strongly support the objectives of the INCO programme — namely by improving international cooperation between the EU and the MPCs in a vitally important research field.
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WatNitMED

Management Improvements of WUE and NUE of Mediterranean Strategic Crops (Wheat and Barley)

Period: 01/01/2005 to 31/12/2008
Budget from EC: EUR 1 386 700
website: http://www.iamz.cirieam.org/watnitmed/

CONTENT AND OBJECTIVES

Mediterranean climate is marked by a high seasonal variability in rainfall, with soils characterised by their relatively low and variable nitrogen content. As crop productivity for a particular region is the consequence of the breeding x management x weather interaction, understanding the basis for improved management has been becoming increasingly important.

The general objective of this proposal is to identify and transfer improvements in management of wheat and barley to increase productivity while mitigating environmental impacts. In this context the project team aims to improve the understanding of the determinants of the crop’s ability to capture more water and/or to use water more efficiently (WUE) in a range of nitrogen availability conditions; as well as to capture more nitrogen and/or to use nitrogen more efficiently (NUE) in a range of water availability conditions. This knowledge would help identify management strategies by increasing efficiency in the capture and/or the use of the most limiting factors (water and nitrogen) which determine cereal productivity in Mediterranean environments.

ACTIVITIES

Due to the required combination of scientific activities at different levels of organisation, a work plan has been designed over a four year period, combining the expertise and experience of 14 partners, including farmers’ associations. A premise of this project is that a better understanding of the physiological basis of the responses to water x nitrogen shortages is required in order to design more consistent management practices and to overcome the deficiencies explored by the strategic crops, with an objective to make them more profitable and sustainable. This improved understanding would then be introduced into the mechanistically-defined management strategies to be evaluated, both in actual agronomic studies and through modelling exercises.

There are three different types of work packages: one environmental, one socio-economic, and ten work packages that cover the agronomic issues to be analysed. These include levels of organisation believed to have a direct impact on management practices design: three work packages on ‘Whole-Plant Physiology’, three on ‘Crop Physiology’, two on ‘Modelling’, and two on ‘Agronomy’.

EXPECTED RESULTS AND OUTCOMES

By arranging experiments to explore different levels of organisation, but in all cases within the actual regional differences in soil and climatic factors, the project attempts to produce a solid basis for cereal behaviour in a range of water x nitrogen deficiencies that may be confidently used in the design of management strategies with mechanistic basis. In addition, the use and adaptation — including parameterisation, calibration and validation — of a crop simulation model facilitates the study of interactions between year x climate x cultivars x management strategies that will be appropriately complemented by traditional agronomic research.

The project will offer opportunities to students from agricultural universities to work on postgraduate theses in the different areas, thereby contributing to scientific capacity building and the development of human resources. All partners will be exposed to a series of specific, and novel methodologies that are relatively unknown to them. Finally, the project includes farmers’ associations within the partnership in order to ensure a realistic scenario for experimentation and a successful outreach process.
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AQUARHIZ

Modulation of plant-bacteria interactions to enhance tolerance to water deficit for grain legumes in the Mediterranean dry lands

Period: 01/03/2004 to 28/02/2007
Budget from EC: EUR 1 030 000

Coordinator: Dr Carmen Vargas
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CONTEXT AND OBJECTIVES

Cultivation of leguminous crops helps to improve soil fertility by symbiotic nitrogen (N) fixation and protects ground water from toxicity due to excessive application of N-fertilisers. Nevertheless, the production of legumes in farming systems is decreasing because its yield instability results in low-market competitiveness. Productivity of grain-legumes in several parts in the Mediterranean Basin is frequently limited by water insufficiency. This causes the need of importation to fulfill deficits in markets.

The primary goal of AQUARHIZ is to increase the production of chickpea, common bean and faba bean in Algeria, Egypt, Morocco and Tunisia, where their productivity is affected by water deficit. For this purpose, combinations of legume genotype/host-specific rhizobia showing enhanced nitrogen fixation under water deficit will be tested in field trials in reference production areas of the above countries. The economic competitiveness of this strategy in sustainable farming systems of the Mediterranean Basin will be assessed. In addition, physiological and molecular mechanisms of tolerance to water deficit will be studied with the aim of identifying genes that could be used for marker-assisted selection in breeding programmes.

EXPECTED RESULTS AND OUTCOMES

The beneficiaries of the project will be farmers, consumers, and the environment of the targeted countries. The contributions to be presented to the community, public and regulatory authorities as well as interested industries are:

- improved drought-tolerant lines of grain legumes to be utilised for seed production or introduced in breeding programmes;
- a number of specific rhizobial strains that can be used as bacterial inoculants for grain legume-cultivation in the Mediterranean Basin;
- knowledge on the physiological and genetic bases of tolerance to water deficit in grain-legumes and inoculant strains;
- initiation of technology transfer to private (plant breeders, seed and inoculant industrialists), and public (local extension services) sectors, as well as the final users (farmers).

In the Mediterranean Basin, the safety and impact on the environment of agricultural production of food is of paramount importance. Biotechnologies targeting replacement of chemical fertilisers with microbial assisted plant nutrition are considered as a highly promising tool for increasing yield of crop plants in an environment-friendly way. Social impact of the project will have effects beyond the farm, extending indirectly to the community as a whole, and contributing to the reduction of urbanisation.
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TRITIMED

Exploiting the wheat genome to optimise water use in Mediterranean ecosystems

Period: 01/09/2004 to 31/08/2008
Budget from EC: EUR 1,320,000
Coordinator: Dr Dimah Habash
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OBJECTIVES

Water is a major determinant of yield for farming wheat in the Mediterranean Basin. Wheat (mostly durum wheat) is one of the most widely cultivated crops mainly grown under rain-fed conditions often characterised by relatively low and uncertain rainfall. As a result, durum wheat farming faces continuous fluctuations in production. However, bread wheat is imported to a relatively large extent, in many countries. Therefore there is an urgent economic need to improve water use as well as water use efficiency (WUE) in wheat production. This proposal aims to identify crop traits and wheat germplasm, that impart higher and more stable yield under Mediterranean drought conditions. It will be achieved by using an integrated approach combining genomics, quantitative genetics and crop physiology.

ACTIVITIES

This project will:
- evaluate a range of different genotypes of durum and bread wheat for WUE, integrative morpho-physiological traits, yield and quality under Mediterranean field conditions ranging in water availability;
- select best durum and bread wheat lines evaluated under field conditions for integration into breeding programmes;
- detect new regions of the wheat genome—quantitative trait loci (QTL) — that are correlated with water use traits;
- identify new molecular markers closely linked with useful genomic regions for future plant breeding programmes;
- design and build a new custom wheat chip for the study of gene expression in select genotypes evaluated under field conditions in the Mediterranean;
- develop the experience and knowledge of young scientists from West Asian and North Africa (WANA) countries in the latest molecular and physiological techniques;
- conduct a socio-economic study on wheat farming and new technology in Mediterranean countries.

EXPECTED RESULTS AND OUTCOMES

For the scientific community:
- crop traits that impart tolerance to drought;
- germplasm for efficient use of water under Mediterranean conditions;
- new QTL for water use efficiency in wheat;
- new molecular markers linked with high water use efficiency;
- knowledge derived from microarray analysis of wheat subjected to drought stress (scientific publications).

For the emerging science in the region:
- Build up scientific capacity and development of human resources in WANA countries in the latest molecular and physiological techniques.

For the breeders:
- New molecular markers for marker-assisted breeding related to ecophysiological and agronomical traits determining yield under Mediterranean conditions;
- Development of novel wheat germplasm efficient in water use to integrate into breeding programmes.

For the farmers:
- Improved wheat germplasm efficient in water use;
- Involvement in the socio-economic study on water use in wheat farming to identify problems and solutions (integration into breeding efforts).

For the policy makers:
- An integrated study of the socio-economic aspects of water use in wheat for the Mediterranean region (socio-economic study and guidelines);
- Application of the latest scientific tools towards solving aspects of wheat farming.
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Native perennial forage plants for sustainability of farming systems in the western Mediterranean

Period: 01/10/2004 to 30/09/2008
Budget from EC: EUR 1 365 000
website: http://www1.montpellier.inra.fr/permed/

Coordinator: François Lelièvre
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Context and Objectives
The amount of water available in agriculture in the Mediterranean is declining because of increasing population pressure and greater incidence of drought. Perennial forage species utilise water more efficiently than annuals, can restore soil fertility and enhance forage production, thereby contributing to greater sustainability of rain-fed agricultural systems in the southern EU countries and North Africa. By adopting a multidisciplinary approach and targeting the key breeding objectives of superior drought resistance and Water Use Efficiency (WUE), this project aims to:

- accelerate plant improvement in a number of important perennial forage species (alfalfa, cocksfoot, tall fescue, sulla) for various environments across the western Mediterranean;
- develop technical packages for easy on-farm adoption;
- organise plant breeding and multisite evaluation in participating countries, thereby ensuring a long-term interest of the seed industry to produce commercially viable cultivars of broad regional interest and adaptation.

Activities
The activities are divided into eight complementary work-packages:

- collection, evaluation and conservation of North African germplasm in perennial grasses and lucerne;
- use of molecular genetics to identify Quantitative Trait Loci (QTLs) related to drought tolerance and WUE in mapping populations of lucerne;
- evaluation of elite forage populations for high WUE and adaptation to drought through multisite experiments in wide climatic gradients in the region, and analysis of genotype x environment interactions to define traits of new cultivars;
- ecophysiological analysis of traits determining drought survival, perenniality and WUE in forage perennial species;
- variability of Rhizobium strains associated with North African lucerne germplasm and selection of elite strains;
- technical packages to increase the use of perennial forages in four representative farming systems in the Mediterranean;
- enhancement of plant breeding methodologies and activities in perennial forage plants for semi-arid and arid environments, and seed multiplication of improved cultivars;
- coordination and dissemination of the results in participating countries.

Expected Results and Outcomes
The project aims to benefit rural societies in Mediterranean semi-arid and arid areas, submitted to increasing impacts of global climate change on water availability for agricultural activities. It intends to organise a permanent multidisciplinary cooperation in forage science between countries of the West Mediterranean Basin, with a common objective to develop more perennial forage plants in farming systems of the region. A database and a conservatory of North African germplasm will be created. Plant breeding objectives and activities will be coordinated, with attention to new technologies and education of young researchers. A network will be organised to test selected elite material at multisite level, from which acceleration of registration and commercial development of new cultivars is expected. Technical solutions will be proposed for on-farm development of this new material, combining the constitution of grass-legume mixtures for different purposes and environments and subsequent management techniques. Impacts on livestock feeding and on sustainability of biophysical resources (soils, water, biodiversity) in farming systems will be evaluated.
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IRRISEASOIL

A cheap easy-to-handle desalination approach for crop irrigation under Mediterranean conditions

Period: 01/04/2004 to 31/12/2007
Budget from EC: EUR 1 250 000
website: http://www.surrey.ac.uk/Chemistry/research/IRRISEASOIL/

Coordinator: Prof Angela F. Danil de Namor
University of Surrey

CONTEXT AND OBJECTIVES

The objectives of this project are:

- the development of selective polymeric materials (cheap to produce) for desalination of seawater, post-irrigation water and soil with the aim of developing a more effective technological approach than the existing ones.
- the use of biotechnological modes and means for promoting efficient and nutrient use of water by plants, improving their immunity and resistance towards diseases and droughts.

To achieve these objectives the following steps are to be undertaken:

- Selection of main strategic cultives of three Mediterranean countries as pilot sites for vegetation experiments based on socio-economic importance, crops quality and structure, agronomical and climatic conditions of their cultivation.
- Synthesis and characterisation of calix-chitin polymers for desalination of seawater, post-irrigation water and soil, followed by their application at laboratory and pilot plant scale.
- Qualitative and quantitative assessment of the industrial potential of the desorption solutions resulting from sea, post-irrigation waters and soil.
- Design of phenylpropanoid polymeric derivatives with the capability to function as a plant growth regulatory, fertilisers, quality enhancers for the protection of crop quality and productivity under drought conditions.
- Combination of desalination and nutritional processes for crop irrigation and optimisation of dripping irrigation systems.

EXPECTED RESULTS AND OUTCOMES

The IRRISEASOIL project team aims at achieving the following results:

- Constitution of libraries of main strategic regional crops, nutrients and chemical compositions of salted regional water sources and soil projected for desalination;
- availability of novel polymeric materials using natural resources and a new approach to desalination processes, and technological development at pilot plant scale;
- detailed response of horticultural plants to low quality waters in terms of yield and quality of yield, and remediation of soil for horticultural purposes;
- minimisation of the use of mineral fertilisers and toxic synthetic fungicides, and rehabilitation of soil;
- development of a novel method to regain agricultural land rapidly and without the financial burden or technical problems associated to other conventional methods;
- optimisation of current drip irrigation systems and enhancement of the market for irrigation systems.

ACTIVITIES

The activities are summarised as follows:

- characterisation of crops, salted water resources and soil of three Mediterranean countries (Morocco, Palestinian-administered areas and Lebanon);
- synthesis and characterisation of calix-chitin extracting agents; recycling; desalinating with calix-chitine polymers at laboratory and pilot plant scale;
- investigation of crop’s response to treated sea and post-irrigation water under Mediterranean conditions;
- improvement of water consumption in agricultural zones by using silicon — containing derivatives of natural phenylpropanoids;
- desalination of soil by calix-chitine using the results of the steps described above and optimisation of drip irrigation systems by calix-chitin containing desalination units.
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NOSTRUM-DSS

Network on Governance, Science and Technology for Sustainable Water Resource management in the Mediterranean

Context and Objectives

NOSTRUM-DSS aims to contribute towards achieving improved governance and planning in the field of sustainable water management within the Mediterranean Basin by:

- establishing a network between the science, policy and civil society arenas; fostering active involvement of stakeholders in the project’s different stages; and developing and disseminating best practice guidelines for the design and implementation of DSS tools for Integrated Water Resources Management (IWRM) in the Mediterranean area.

In order to contribute to a more policy-oriented research community and a more informed policy-making process, this Coordination Action (CA) — aided by the use of DSS — will pursue three main strategic objectives:

- to establish durable links between scientific institutions, governments, non-governmental organisations, SMEs and other stakeholders in the Mediterranean countries, and to improve public awareness on water management;
- to contribute to the improvement of scientific knowledge and applied methodologies in the field of IWRM;
- to promote the design and development of effective and suitable DSS tools, built on the basis of the real needs of the Mediterranean countries for developing a policy for IWRM.

Activities

This CA is divided into three general groups of activities. The first group is composed of coordination activities that aim at establishing the network and exchange channels and at defining a common starting point for the implementation of the CA. In the context of these activities, all countries participating in the CA will produce a national report with the aim of providing state-of-the-art of water resource management for each country, and of ensuring the active involvement of local stakeholders from the start of the project.

The second group consists of training activities which are devoted to further investigate, consolidate and integrate the aspects related to IWRM and the role of DSS tools emerging from the national reports, and to train policy-makers, young researchers and other interested stakeholders on such issues during the events organised within the project. The organisation of three thematic workshops and two conferences is envisaged within these activities.

The last group refers to consortium management activities, which will be undertaken by the project coordinator during the entire project life-cycle, in order to ensure the implementation of the usual project coordination activities, and to guarantee monitoring, review, assessment and dissemination of project results.

Expected Results and Outcomes

NOSTRUM-DSS is expected to provide contributions for reducing the gap between science and real life, in order to provide DSS developers with an insight into the language and needs of policy-makers and stakeholders. Subsequently, policy-makers will have at their disposal effective tools based on an integrated approach to IWRM problem-solving.

In particular, some of the expected benefits of the CA are to:

- improve communication between science and policy;
- improve cooperation among Mediterranean institutions;
- support participatory planning for water resources management and to facilitate multilateral exchange of expertise and experiences of water management across the Mediterranean region;
- support the creation of DSS tools more targeted to real needs and of greater use for decision making.

The ultimate tangible output of the CA will be a set of best practice guidelines for the development and application of DSS tools for IWRM in the countries of the Mediterranean Basin. The guidelines will be developed with the active participation of scientists, policy-makers, and key stakeholders (such as SMEs and user groups), through a structured sequence of actions aimed at favouring efficient exchanges of information, knowledge and experiences between the various components of the CA.
The establishment of durable links and long-term collaborations between the partners and representatives of the policy and academic institutions in the Mediterranean area will be achieved through the support and early involvement of those international institutions with a long tradition there: (ICS-UNIDO and CIHEAM-IAMB) and a centre of excellence with focus on the Mediterranean area (IDEAS/CESD). Moreover, at the end of the CA, a monographic book on DSS tools in policy-making will be published, targeted for use in teaching, training and skills development.
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Context and Objectives

Following the selection of three pilot zones in Morocco, Tunisia and Lebanon, this project aims to develop novel technological approaches (making use of regional resources) for industrial (prevention) and coastal (remediation) water treatments with a higher degree of efficiency than existing ones. These treatments are based on:

- The production of easily recyclable and low cost receptors grafted into regional silicates (modified silicates) for the removal of phosphates and POP’s from industrial and coastal waters of the Mediterranean Region;
- The use of soil-applied mobilised receptors aiming to enhance the uptake of toxic metal cations by regional plants.

To achieve these objectives the research programme consists of:

1. Search on water chemistry of coastal areas and industrial effluents:
   - Knowledge about the speciations present is crucial for the design of selective receptors. Samples of industrial, coastal and fresh water pilot zones would be investigated by electrochemical methods;

2. Design of immobilised receptors:
   - Receptors to be attached to silicates are: cyclodextrins (known to form inclusion and exclusion adducts with apolar substances); aminocalix[4]arenas (basic centres for interaction with acidic toxic phenols); and calix[4]pyrroles (interact selectively with phosphates).

3. Use of Soil-Applied Receptors:
   - Soil-applied receptors able to enhance the capability of plants to extract heavy metal cations will be used with the aim of developing a more efficient phytoremediation process. Socio-economic aspects of the approach are considered.

Activities

The activities involved are summarised as follows:

- An investigation on the solution chemistry (speciations) of industrial and coastal waters of the Mediterranean region. This step is of fundamental importance for both the design of encapsulating agents to graft on silicates, and the selection of plants for phytoremediation purposes.
- Evaluation of a new system for heavy metal removal from soils by plants followed by an investigation of the improved ability of some plants species after treatment of contaminated soils with the new system. Comparison between the phytoremediation and the synthetic approach.
- Running educational programmes on the environment at an international conference in the field.

Expected Results and Outcomes

The project team aims to achieve the following results:

- In-depth knowledge of the solution chemistry of contaminants in industrial water and coastal waters of the Mediterranean region for the design of selective receptors;
- Availability of novel receptors with selective properties for a variety of pollutants of organic and mineral nature for use in the development of a technological approach for the removal of pollutants from ecosystems;
- Background knowledge to propose a technology based on material resources resulting from detailed physiological aspects of the treatment mechanisms by plants and adaptation tests to real conditions of treatment;
- Public awareness of regional environmental problems and their implications to human health as well as enhancing the link between the University and both the public sector and industry in the Mediterranean region.
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Although women should play a central role in the economy, their contribution to water management is largely invisible at both local and national levels in most of the Mediterranean Partner Countries. Their contribution is thus often overlooked in both economic analysis and policy formulation. This represents a significant obstacle to promoting gender responsive sustainable development objectives. The project aims at establishing a dynamic and effective Mediterranean dialogue among the relevant national and international institutions and bodies (including private ones) to work towards a shared understanding and knowledge of the need for integration of women into water management, and stimulate governments and international organisations to develop and implement real gendered water policies.

The project has been structured in order to meet with the above target, through the organisation and implementation of two major events: the Euro-Mediterranean Workshop and the post-workshop seminar on training of trainers to boost dissemination of workshop results, including a book compiling findings and analyses generated by this specific support action.
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RESOURCENET

Coordination of actions granted by the EU and other international organisms to rationalise the use of natural resources in arid and semi-arid areas

Period: 01/01/2006 – 30/06/2007
Budget from EC: EUR 120,000
website: http://www.itknet.org/web/?page_id=25

Coordinator: Dr Pietro Laureano
IPOGEA

Contract number: 515940

Specific Support Action

CONTEXT AND OBJECTIVES

The project carried out a coordination action among the most relevant ongoing projects concerning the rational use of natural resource in arid and semiarid Mediterranean areas by traditional techniques to respond to need for strengthening their complementarity and uptake of research results.

ACTIVITIES AND EXPECTED RESULTS

“Foggara”, “Shaduf”, “Desertlink”, “Wasamed”, “Medcoast”, “Index” and “Cledmes” were EU supported research and coordination projects already involving the coordinator, IPOGEA. In particular, an innovative aspect had created specific interest: exploring appropriate practices for a more rational and sustainable use of natural resources for the twin purpose of maintaining environmentally sound ecosystems and as key elements of a cultural and monumental heritage. Other projects funded by EU programmes or promoted by other international organisations (UNESCO, FAO, FCCC, UNCCD) tackle similar issues.

The project produced a coherent inventory of the ongoing initiatives as well as a discussion forum in order to encourage harmonising and integrating concepts and terminology, objectives as appropriate, methodologies, indicators and plans of action. The coordination fostered international cooperation and the convergence of European and Mediterranean research efforts and contributed to the development of common and more integrated approaches and strategies to the issue. It generated synergistic use of research capacities currently existing and emerging in the framework of the various projects. It was instrumental in the dissemination of information and exchange of experience among different working teams and strengthened the complementarity of the different projects’ activities.
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HY-PA

Euro-Mediterranean renewable energy partnership

Period: 01/07/2005 – 31/12/2006
Budget from EC: EUR 259,903
website: www.hy-pa.org/

Coordinator: Dr Rainer Janssen
WIP-KG

CONTEXT AND OBJECTIVES

The Mediterranean area is blessed with ample renewable energy (RE) resources which are barely exploited today. It was therefore the purpose of the proposed Specific Support Action (SSA) to give a new impulse to the development of appropriate policies as well as technologies and services under local conditions and to set the scene for their deployment which must be economically and socially sustainable.

This means in particular integration of RE into everyday life in the villages and rural areas with regards to the sectors agriculture and trade, industry, commerce, tourism as well as the general energy and water supply infrastructure. In order to guide towards an enhanced penetration of RE and hybrid systems in Mediterranean Partner Countries (MPC), this SSA supported the set-up and organisation of a Euro-Mediterranean Renewable Energy Partnership (including policy issues).

ACTIVITIES AND EXPECTED RESULTS

An information network of companies and institutions engaged in all aspects of RE and hybrid system applications was initiated and a database of Mediterranean regional and local contact partners was created. This database provides EU industrial partners with the opportunity to implement future co-operation activities and thereby provides the basis for an exploitation of EU experience in the field of policies, technologies, financial and regulatory promotion, market management and capacity building in the context of MPCs. The activities performed within this project, serving to set the stage for the Euro-Mediterranean RE Partnership, included a thorough assessment of the technical, socio-economic and environmental framework conditions for the implementation of RE and hybrid systems in MPC. Results of the action comprised the identification of future technical RTD requirements as well as socio-economic portraits of MPC. Indications for a Policy Agenda for enhanced implementation of RE and hybrid systems was formulated with the intention to support Community development policies for MPC.
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WEMED

Evaluation of water use efficiency indicators in the Mediterranean region

Period: 01/04/2006 – 31/03/2008
Budget from EC: EUR 145,000

Coordinator: Dr Gianfranco Rana
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CONTEXT AND OBJECTIVES

In most of Mediterranean developing countries, although a number of research projects has been developed for increasing the crop water use efficiency (WUE), the results were not translated in practice, both for the difficulties in the spreading of the ideas and for the inadequacy of the approaches to the Mediterranean agriculture reality. Also the knowledge coming from research remains confined in the research world and is not shared with the end users. Therefore, the target of this project is to establish a net of research institutions, farmers and stakeholder organisations in Mediterranean and southern European countries, for studying new methodology of evaluating the water use efficiency in order to improve water management at a regional scale.

ACTIVITIES AND EXPECTED RESULTS

The project workplan has been designed and structured in order to meet with the above target, through the organisation and implementation of two major events:

1. an Euro-Mediterranean workshop and
2. two post-workshop seminars for training of trainers to boost dissemination of workshop results.

In addition, the overall workplan includes building a common and regional knowledge regarding development of research results, and the creation of a common reference frame for collecting the data needed for the evaluation of indicators of WUE suitable for the Mediterranean area. A new Web site devoted to the WUE at Mediterranean scale will be the favourite way to link all the actors of the water management at regional scale: decision makers, stakeholders, farmers, technician and end-users.

The participants to this project have been chosen in order to assure a rational coordination (ISA-Bari, Italy, a research institute of southern Europe), a good knowledge of the Mediterranean reality (USEK Lebanon and INRA Morocco) and an excellent spreading of the results both at Mediterranean scale (IAM Bari, Italy) and southern Europe (ITAL-ICID Rome, Italy).
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MELIA
Mediterranean dialogue on integrated water management

Period: 01/09/2006 to 31/08/2010
Budget from EC: EUR 2 000 000
website: www.meliaproject.eu

Coordinator: Prof Rafael Rodriguez-Clemente
Consejo Superior de Investigaciones Científicas (CSIC), Delegation of CSIC in Andalusia

CONTEXT AND OBJECTIVES

The main objective of MELIA is to contribute to the improvement of effective regional water management to promote sustainable development in the Mediterranean region. In particular, the specific objective is the technical, socio-economic and political exploitation of the dialogue and communication among its 45 relevant partners and other experts and stakeholders, to build-up and share a common knowledge and awareness that would contribute to the sustainable management of water in the Mediterranean region. MELIA aims to provide research review, knowledgebase, debate-dialogue, co-ordination among the various categories of players (researchers, decision- and policy-makers, end-users /providers, SMEs, NGOs), a shared/common conceptual framework for recommendation to policy- and decision-makers on integrated water management in the Mediterranean, dissemination and knowledge transfer, and public access to information. MELIA will be undertaken so that the new common knowledgebase, conceptual frames and recommendations will be built through the coordination and harmonisation of inputs from other relevant project actions in which most of the partners are or were involved as coordinator or members. Moreover, MELIA will constantly look after the needs of a full integration of Mediterranean water actions and policies with the three main dimensions of sustainable development (natural, social and economic dimensions).

ACTIVITIES

Establish a Euro-Mediterranean-wide structure based on ICT to enable communication and dialogue between the players of the project aiming at finding the common ground between them based on a sound knowledge of management for sustainable development, and the correct and effective management of water resources, with the aim of setting a reference system to support decision-making in normal regulatory processes and occurrences of natural water crises. Periodically, a workshop dedicated to specific work packages will be organised incorporating external stakeholders. The dialogue will indirectly constitute a platform for enhancing the attribution of common meanings to technical and non-technical terms, the use of common semantics, the acceptance of standards to be used in technical cooperation, and the application of shared common indicators. Further activities are to promote and facilitate continuous Internet-/media-based dialogue with citizens, through project partners acting as national focal points. This is foreseen in order to listen to the ‘voice’ of the citizens, collect their thoughts, understand their different positions, define a hierarchical list of public concerns and involve them in the building of the knowledgebase in a way that reflects linguistic diversity.

The project will:
- link activities to the real needs and concerns of the Mediterranean countries;
- disseminate and ease access to the relevant common knowledge; discuss and prepare a comprehensive conceptual framework to plan regional sustainable water management based on an efficient system and policy setting;
- create a gateway for the introduction of the criteria and tools of the ‘Water Directive’ in the Mediterranean countries.

EXPECTED RESULTS AND OUTCOMES

The project is expected to provide the following achievements:
- improved national and regional dialogue on Integrated Water Resources Management (IWRM) at different levels;
- increased awareness of Mediterranean citizens, decision- and policy-makers to develop sustainable IWRM;
- improved understanding of cultural heritage and societal impact on water management;
- increased awareness with regard to the need for a culturally-socially sound water management and planning;
- improved understanding and perspectives of Water Technology development and transfer in the Mediterranean;
- improved assessment of strategies needed to optimise use of water resources through combined-integrated...
saving and conservation practices in urban, agricultural and industrial sectors;

• improved tools for estimation of water saving yields at catchment’s scale;

• increased awareness on best practices for the ecosystem and a socio-economic sound rational use of water resources;

• participatory’ consensus on formulation of possible water pricing strategies and increased awareness for the bottom-up participatory policy development on good Water Governance;

• improved relevant knowledge shared by the MELIA partners using the Community of Practice (CoP) tools;

• Networking for knowledge share with other stable structures and networks dealing with water issues in the Mediterranean area in order to obtain a Mediterranean-wide Integrated Knowledge sharing (vertically and horizontally);

• full awareness of MELIA partners on citizens’ perception of water problems and adequate involvement of citizens in MELIA dialogue measured through the qualitative and quantitative participation in fora, public activities and groupware tools;

• material for dissemination in the media on citizens perception of the water issues;

• enlarged awareness of decision makers about the adequate use of relevant indicators;

• a broader knowledge of problems and perspectives linked to the application of the Water Framework Directive in the Mediterranean.

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CONTEXT AND OBJECTIVES

The water scarcity problems faced by the Mediterranean region, coupled with the wide diversity in socio-economic, environmental, geographical, and technological conditions of the countries situated there, have placed it at the centre of research for the water sector. Although policy recommendations and suggestions are a focal point of interest for the scientific and research community, the aspect of water governance and required reforms and policies have rarely been touched upon.

The aim of INECO is to establish a Mediterranean network of research institutes, public authorities and stakeholders for coordinating research and analysing decision-making practices with regard to the application of institutional changes in the water sector. With this in mind, the specific objectives of INECO encompass the exchange and dissemination of good practice, information and research between the participating institutes on institutional and economic instruments for improving sustainable water use. The performance of studies on the assessment of the efficiency of currently applied water management practices, focusing on the financial sustainability of water services and the economic efficiency of water allocation will also be included as one of the primarily objectives.

The key goal of the project is the formulation of adaptive guidelines for alternative institutional arrangements, capable of promoting Integrated Water Resources Management through the application of economic instruments.

ACTIVITIES

INECO encompasses a series of coordination activities, aiming to strengthen the cooperation between the consortium members, but most importantly, to provide public meetings to facilitate dialogue, as well as to exchange and receive live feedback on the issue of institutional and economic reforms in the water sector.

Activities include the review and dissemination of good practice on the application of institutional and economic instruments in arid and semi-arid environments, the performance of studies and analysis regarding both the efficiency of current water and cost allocation mechanisms and governance structures, and the formulation and formalisation of guidelines for alternative institutional arrangements in the form of a web toolbox.

Furthermore, the project will organise a series of workshops in all participating Mediterranean countries (Algeria, Egypt, Lebanon, Morocco, Syria and Tunisia), and Cyprus, to disseminate and validate the results of the Coordination Action and for collecting public opinions on the aspects addressed by INECO. Additional dissemination and information exchange with stakeholders and social actors will be performed through the project website and the established web fora, while scientific publications on current practices, typology of governance structures and guidelines, as well as a Conference organised at the end of the project will target the scientific community.

EXPECTED RESULTS AND OUTCOMES

Through dissemination and information exchange on good practices, the analysis of current governance structures and the formulation of adaptive and socially acceptable guidelines for the application of institutional and economic instruments, INECO aims at raising awareness on making water governance more effective, and proposing structures for a more efficient and transparent allocation of water and the costs of water services.

In addition, the strong participation of stakeholders — with emphasis on the integration of cross-sectoral views and disciplines, promoted through workshops, publications, and web forums — will raise awareness on the importance of a more sustainable, equitable and socially acceptable water allocation. This is of particular importance in the Mediterranean region, where the scarcity of resources and their allocation is an issue that creates conflicts and transboundary water management issues that accentuate social problems.
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GEWAMED

Mainstreaming gender dimensions into water resources development and management in the Mediterranean region

Period: 15/02/2006 to 14/02/2010
Budget from EC: EUR 1,250,000
Website: http://www.gewamed.net/

Coordinator: Dr Atef Hamdy
Istituto Agronomico Mediterraneo di Bari (CIHEAM)

CONTEXT AND OBJECTIVES

The project plans to build an extensive knowledge base for mainstreaming gender dimensions into IWRM. To achieve this objective the project will build a regional network and establish six national ones using internet technology in at least six countries of the South East Mediterranean Region (SEMR). The regional network will be essentially a mean for exchanging experiences, disseminate results and allow for enhanced coordination among national projects’ activities and participants.

The project will improve the cooperation and dialogue among partners and external organisations interested in this subject through participation in three regional workshops and an international conference that will be held at the end of the project’s life cycle. The project will interact with other EU-funded MPC projects, like MELIA, INECO and WADI that also focus on information knowledge management to promote coordination and exchange of experiences.

It is also expected that the project will contribute to improving the coordination of gender activities in an IWRM context and to disseminate information, particularly in the rural areas. For this purpose GEWAMED will establish a National Central Focal Point in each SEMR country that will interact with the other collaborating institutions involved in the water sector. This will not only be a coordination mechanism but also an important means of collecting and disseminating gender information spread among many institutions. One of the most distinctive features of GEWAMED is precisely the establishment of a knowledge base for acquiring and disseminating gender information at national level. The project may also contribute to the adoption of national policies and other related instruments (strategies, approaches, guidelines, incentives and legislation) by involving decision-makers and politicians in the processes of mainstreaming gender dimensions in IWRM. For this purpose the project will organise at least one national policy seminar in each SEMR country.

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INNOVAMED

Innovative processes and practices for wastewater treatment and re-use in the Mediterranean region

Period: 01/01/2007 to 31/12/2009
Budget from EC: EUR 480 000
Coordinator: Prof Damia Barcelo
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CONTEXT AND OBJECTIVES

The need to introduce remediation and treatment technologies in the water cycle was recognised by the European Commission under the Fifth and Sixth Framework Programmes (FP5 and FP6 respectively) and several research projects aiming at improving wastewater (WW) treatment techniques through process optimisation to minimise environmental impacts from WW treatment were funded. In parallel, various initiatives are being conducted at national level, both in the EU and Mediterranean Partner Countries (MPC). However, communication gaps still existing among scientists and local communities (and water users) and the lack of networking among different Mediterranean countries are the main obstacles to a more efficient use of the gained knowledge.

The INNOVAMED Coordination Action will include seven EU funded projects (P-THREE, CADOX, EMCO, AQUACAT, EmWATER, WATERBENCH and HOLIWAST) dealing with wastewater treatment and water management:

• two from the EESD programme (FP5), sub-programme area ‘Waste water treatment and re-use’;
• three from the INCO programme (for western Balkan countries and developing countries and newly industrialised states);
• one from the policy-orientated ‘Scientific support to policies’ (SSP) programme; and
• one project from the EU-MEDA programme.

The main objective is to explore the synergies of the research carried out within different programmes and countries (e.g. ED, WBC, DEV, NIS, MCP), and to coordinate the research activities of ongoing EU and national projects dealing with the development of innovative technologies for wastewater treatment, treatment and disposal of sludge, and application of innovative practices for re-use of reclaimed water. INNOVAMED also aims to facilitate communication between researchers and national and regional institutions from the MPC and to allow a broad dissemination and transfer of the knowledge/technology/practice to the Mediterranean area.
B. MEDITERRANEAN PARTNER COUNTRIES

2. PROTECTION AND CONSERVATION OF CULTURAL HERITAGE

1. Materials, artefacts, monuments and sites:
   New technologies and characterisation
2. Simulation, re-creation, comparative preservation methodology
3. Risk assessment and preventive conservation
**MEDISTONE**

Preservation of ancient MEDiterranean sites in terms of their ornamental and building STONE: from determining stone provenance to proposing conservation/restoration techniques

**CONTEXT AND OBJECTIVES**

The conservation of archaeological sites around the Mediterranean basin constitutes a major challenge for the future. Until now, studies of archaeological sites have tended to lack sustained follow-up over time, and have not interacted sufficiently with other similar sites to enhance the results of research. Three archaeological sites — two of which are listed within UNESCO’s World Heritage List (Djemila, Algeria; Volubilis, Morocco; Alexandria Lighthouse, Egypt) — have been selected for this study. Site selection has been based on priorities for site preservation and tourism indicated by those non-European participating partner countries where a demonstrable scientific challenge and possible breakthroughs for site preservation have been identified.

The MEDISTONE objectives are:

- identifying stones used at the selected sites and determining their origins in terms of geographic areas and, if possible, the former quarry sites; at the present time, the region of origin of numerous decorative stones used in constructions dating from antiquity, both in the West and the Orient (and often reused in the Middle Ages) remains poorly defined or even unknown;
- establishing diagnosis of the state of conservation of the stones at the sites; while the causes and mechanisms of deterioration to stones are relatively well known for temperate European climates, the semi-arid continental climate of the selected sites, characterised by strong thermal amplitudes, high evaporation and strong wind action, together bring about specific weathering and alteration requiring more thorough investigations;
- providing answers to the main problems regarding stone conservation/restoration that are liable to be met at the selected sites; it involves developing techniques for reassembling fractured and fissured stones; this phase will be based on European know-how and will take into account the climatic and environmental specificity, as well as the social-economic context in each Mediterranean Partner Country (MPC).

**ACTIVITIES**

The project objectives will be addressed through a work plan of four work packages organised into three groups of activities covering research aspects, technical developments and dissemination of results, and will:

- identify stones used at the three selected sites and determine their origins in terms of geographic areas and, if possible, the former quarry sites;
- establish a diagnosis of the state of conservation of the decorative stones and constructions at the sites;
- develop and test reassembling of fractured and fissured stone techniques, based on European know-how, and taking into account the climatic and environmental specificity (thermal amplitude related to the particular semi-arid continental climate at the Mediterranean located sites), as well as the socio-economic context in each MPC;
- carry out the dissemination of the scientific and technical research results and data obtained.

**EXPECTED RESULTS AND OUTCOMES**

The scientific and techniques results issuing from the MEDISTONE project will be compiled into three synthetic volumes per site, jointly produced by the partners involved, as follows:

- an atlas including data record for each ornamental or building stone inventoried in the site, including location maps of ancient quarries with explanatory notes;
- a guide for stone conservation, including guidelines for diagnosis and the illustrated index of stone decays observed on the site, and recommendations for maintenance and restoration/conservation strategy;
- technical protocols for reassembling fractured and fissured stones adapted to the site, and long-term monitoring fiches of the in situ test zone

Training of MPC doctorate students during the three years of the project (supervised and guided by both the EU scientists and those from their respective countries) will enable a transfer of know-how from the EU scientists to a new generation of MPC scientists and, at the same time, enhance the transfer and diffusion of data and knowledge in this direction.
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Development of a novel and integrated portable non destructive analysis system for the documentation of artworks

Objective

The core objective of this project is the development of an integrated, non-destructive and portable analysis-diagnosis system for 3D 'sampling', archiving and reconstruction of painted artworks called InfrArtSonic (Infrared and ultraSonics for Art diagnosis). This system will be a unique and invaluable aid for art historians and restorers.

A portable, non-destructive artwork analysis system will be integrated using acoustic microscopy combined with Vis-nIR-mIR spectroscopy. This scientific instrument will be capable of studying the existing stratigraphy of artworks. This will constitute a unique research device for art historians and restorers in the Mediterranean and in pan-European area.

The InfrArtSonic system will combine two modalities that will be developed:
- an Acoustic Microscope for Art Diagnosis (AMAD);
- a Visible near-Infrared/mid-Infrared (VIS-nIR-mIR) reflectance spectroscope (Infrared System for Art Diagnosis (ISAD)).

The information acquired by these subsystems (AMAD-ISAD) will be complementary. The AMAD will provide with an in-depth 'image' (the depth profile) of the paint layers' distribution and the ISAD will identify the materials — mainly the inorganic ones — in each layer.

Activities

Scientific activities include the following:
- An algorithm describing the identification of the present stratigraphy, using spectral data as well as acoustic microscopy data will be developed. This algorithm will be applied to the case study artworks in order to test the effectiveness of the complete methodology and developed system. The final product of the overall research work will be a tool for materials' identification (mapping) and stratigraphy definition.
- An advanced 3D reconstruction algorithm and software for paint layers will be developed. This system will take into consideration data provided by the AMAD and ISAD systems. An overlay technique will put both datasets on the top of each other and correlating them to a multi-modal dataset.
- Development of special libraries containing Vis-nIR-mIR spectra obtained in a non-destructive way will be created and/or extended — depending on if some of these spectra are already available.
- Updating and developing a rich and multilevel database which will be integrated into the system. This database will be based on the system already developed during previous European projects, including both multispectral images and multi-spectral information. New forms and data will be supported by this system, such as ultrasonic-acoustic microscopy and VIS-nIR-mIR spectroscopic data. The algorithms of fusion and signal processing that will be developed will be linked to the new and updated system, which will constitute a new documentation tool for artworks.

Dissemination activities

Activities within this task are devoted to carrying on all promotional activities of the project, with a view to commercially exploiting the research results. The works on dissemination and exploitation will be based on two main actions: permanent observation of state-of-the-art and potential competitors; and direct contact with potential customers by creating a user group to inform them of the project’s progress in real-time.

In addition, on the day before consortium meetings, the consortium will organise training seminars or presentations to potential users of the system, or more generally, users of non-destructive testing techniques on artworks. Participants at these meetings — which are to be held on their premises — will include the target group: conservators, art historians, archaeologists, and possibly scientists as well, who may need or use this kind of system.

Expected results and outcomes

The project plans to achieve the following:
- an innovative scientific device will be developed;
- publications and workshops will be organised for the scientific dissemination of the results;
InfrArtSonic

- a patent will be applied for;
- workshops for the dissemination of results to the end users — conservators, art historians and archaeologists — will be also organised.

All these results will contribute to the EU policy concerning the opening up of the European research area to the rest of the world. At least at a scientific and social level the consortium’s proposal will ensure the opening up of the European research area to Mediterranean countries. The project partners involved come from a wide range of policy fields and from countries such as Germany, Greece, Italy, Cyprus, Egypt, Jordan, and Lebanon.
MED-COLOUR-TECH

Investigation, Revival and Optimisation of Traditional Mediterranean Colouring Technology for the Conservation of the Cultural Heritage

Context and Objectives

Colouring or painting with natural dyeing materials has been fundamental in art and intrinsic to the cultural identity of the Mediterranean area, since antiquity. The reconstruction and revival of traditional manufacturing processes for natural colorants, as well as of dyeing procedures or painting techniques, is essential for the preservation of the Mediterranean cultural heritage.

This project has the following overall objectives:

- establishment of an analytical methodology for dyestuff identification of selected art objects of the cultural heritage in the Mediterranean area, and formulation of corresponding recommendations on conservation;
- systematic analysis and reconstruction of ancient colouring techniques, typical for civilisations developed in the Mediterranean area, to elucidate the local ancient colouring technology;
- dissemination of new natural organic pigments and corresponding colouring components, currently not available in the market, to the scientific community, interested target groups and the general public.

Activities

The activities to be undertaken during this project consist primarily of the following:

- collection of historical data (e.g. ancient dye recipes) and sources of natural dyestuffs and art objects of the Mediterranean area;
- production (chemical synthesis) of colouring components (standards) of the dyestuffs of interest;
- identification of natural dyes in art objects, using analytical techniques such as HPLC-PDA, LC-MS, FTIR;
- production and characterisation of natural organic pigments based on ancient recipes;
- optimisation and standardisation of the production processes of natural organic pigments;
- pilot (industrial) production of natural organic pigments and corresponding standards;
- recommendations for conservation strategies;
- creation of an encyclopaedia of natural organic pigments of the Mediterranean area.

Expected Results and Outcomes

MED-COLOUR-TECH reinforces the competitiveness of EU and Mediterranean countries at multiple levels, scientifically through the development of new diagnostic and identification methodologies, associated with art objects. The project reinforces European organisations and companies with the production of new materials (dyes and colouring components) which are currently in great demand by various bodies active in the area of cultural heritage conservation, pharmacology, plant pathology and analytical chemistry. Protocols for the production of natural organic pigments will be formulated, according to ancient recipes. MED-COLOUR-TECH is expected to elucidate aspects of colouring technologies developed by several civilisations of the Mediterranean area, leading ultimately to the setting up of a database containing recommendations for conservation strategies.
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Mediterranean Partner Countries
QUARRYSERIES

Conservation of Ancient Stone Quarry Landscapes in the Eastern Mediterranean

Context and Objectives

The cultural heritage of the eastern Mediterranean is predominantly one of stone, taken from thousands of quarries throughout antiquity. The archaeological record of the quarries comprises rare evidence of stone extraction sites, roads, harbours, settlements, ceramics and inscriptions, which collectively constitute an ‘ancient quarry landscape’. Yet, heritage sites of such historical importance as these have largely gone unrecognised, mainly due to poor documentation, which has consequently led to their current indiscriminate destruction, as a result of actions such as modern development and quarrying.

QUARRYSERIES will enhance cultural heritage management of ancient quarry landscapes, through the development of methodology and conservation models that can be effectively implemented in a range of cultural contexts. The project will develop scientific and practical methodologies for the documentation, characterisation and conservation of ancient quarry landscapes, and will also raise awareness of the significance and vulnerability of such sites, and contribute to legal protection measures and sustainable management of ancient quarry landscapes.

Activities

Through case studies in Egypt, Jordan and Turkey, QUARRYSERIES will develop theoretical and practical methods pertaining to the major steps in the process of conservation, from recognition, investigation and assessment of significance, to understanding the risks, developing sound conservation and monitoring concepts, and suggesting mechanisms for sustainable management. QUARRYSERIES is divided into ten work packages (WPs), of which one is a case study in Jordan, two in Turkey and four in Egypt, exploring different aspects of a range of quarry landscapes. One WP will be assigned to extract the general scientific achievements from the case studies and form the basis for the compilation of general guidelines for conservation of quarry sites. The ninth WP covers the organisation of workshops and dissemination of project achievements. WP ten contains project management activities.

Expected Results and Outcomes

QUARRYSERIES aims to create knowledge and understanding of the significance of several important, and potentially threatened, ancient quarry landscapes in the eastern Mediterranean. Furthermore, the project aims to generate valuable tools for the characterisation, conservation and management of such sites in general, especially through the development and publication of practical guidelines for conservation of ancient quarry landscapes. With its ambitious dissemination plan, QUARRYSERIES also aims at contributing significantly in raising the awareness of such sites in general, and in the three Mediterranean countries in particular. Through the project website, an atlas of ancient quarries in the eastern Mediterranean, workshops and active publication in scientific and professional magazines, the project intends to reach an audience much wider than that of the scientific community.
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The collective memory of the Euro-Mediterranean, of which medieval Arab manuscripts form an essential component, is currently facing unsurpassed challenges. Sweeping modernisation, war and social tensions, are a few examples. They include natural catastrophes as well as humidity, termites and pollution- all these factors enhance the decay of valuable components of our past leading to a collective amnesia.

This in turn undermines the bringing together of a common Euro-Mediterranean memory and a shared self image. This project attempted to overcome this problem at least partially through the development of a pilot web portal for manuscript collections that can accommodate different data base structures into one information system that allows for search and retrieval of data using XML language accessed on the internet.

Detailed studies have been carried out to determine the commonalities and differences of manuscript information systems by comparing between two information systems currently developed at CULNAT: the first is the publicly owned astrological collection of al Azhar University and the second is a collection of Khezanaz (cases) privately owned by families in the Algerian city of Adrar; a project funded by the Memory of The World Program, UNESCO.

As a result of this effort an expert meeting of regional and national experts, who are also the major stakeholders in the preservation of manuscript collections taken place to evaluate the pilot study and the prototype portal. Upon this assessment the experts identified a logical framework that identified and included all stakeholders in order to produce a cost-effective plan of action. Experts produced a number of recommendations that were presented to the Commission for direction in the area of increasing research and innovation between the EU and Mediterranean Partner Countries (MPC) in heritage documentation and preservation.

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Cultural Heritage Enhancement in the Region of Maghreb.
Integrated approach to the Mediterranean prehistoric cultural heritage: the case of Maghreb

Period: 01/10/2006 – 30/04/2008
Budget from EC: EUR 79,000
Coordinator: Prof Alfredo Coppa
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CONTEXT AND OBJECTIVES

Northwestern Africa (Maghreb) represents one of the areas of major interest for the understanding of cultural similarities within the Euro-Mediterranean Region. The Project focuses on supporting the preservation of the prehistoric cultural heritage of the Region. This heritage has suffered a lot from negligence in conservation and, in the Maghreb, there are serious risks due to the fast territorial development, in particular along the coasts, which could delete forever a great patrimony, helpful in clarifying important episodes in the reconstruction of the evolutionary biology and culture of humanity in the Pleistocene era. The Project’s original value is in helping to defend local cultural and natural heritage.

Activities and expected results

The project will contribute to this objective through systematising and organising knowledge about cultural and natural heritage with the help of new technologies (GIS, µ-CT data/images): at the basis of the conservation of the heritage there is the necessity of a logic and organized database to understand what there is, where and how to intervene. The case of C. H. E. R. M puts together several Euro-Mediterranean Partners sub-divided into three thematic working groups: (a) the Archaeo-topographical (ARCHAEO-GIS) team, (b) the Anthropo-Biological (BIO-ARCHIVE) team and © the Palaeoecological (PALAEO-ENVIRON) team.

The co-ordinator will lead different Partners from Mauritania, Morocco, Algeria, Tunisia, Italy, France, England, Germany, Malta and Gibraltar through three micro-scale thematic meetings of experts, where a common approach to the study of the antiquities through the use of new technologies (GIS, µ-CT data/images) was discussed. The main output of the Project is the development of guidelines and a codebook for GIS data collection and analysis. This Project combines multidisciplinary, state-of-the art research, with local knowledge and aims at providing a co-operative package that enabled better understanding a unique element of global heritage significance and thus contribute to its conservation.

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In the Mediterranean Basin (MB) a lack of information exists about reliable ancient metals conservation, storage and exhibition methods and materials. The dissemination of acquired knowledge and experience could reduce such deficit by developing tailored specific information tools.

The MEDAL project aims at disseminating the experience gained in national and INCO-MED projects for identifying reliable conservation methods and exposure conditions for these precious witnesses of human creativity and technology.

With this aim in mind, the following activities are being undertaken:

- dissemination of a Questionnaire to identify needs of MB conservators and elaboration of the ensuing information
- design of an Anglo-Arabic web-site to address these expectations. In the website a FAQ section will be created and the results of large-scale investigation of ancient metal collections with exemplary cases will be shown with the description of conservation methods.
- The most important literature references and procedures will be reported for offering specific guided information also by using video.
- In order to disseminate information and promote its use, one-week workshops will be held in Turkey and Syria dedicated to innovative diagnostic tools, methods and materials for conservation of ancient metal artefacts and storage and exhibition planning. These workshops will be captured in videos and published on the website.
- During the 15th month a two-weeks stage for young Mediterranean researchers will be organised in Italy and experimental training on innovative diagnostic tools will be organised.
- At the end of the project a Conference will be held in Egypt for building a Mediterranean forum with EU representatives, conservators and policy makers where to discuss further the MB needs and expectations and how knowledge, technology and dissemination activities carried out during the previous European projects may be collectively evaluated and transformed in an improved valorisation of ancient metal artefacts.
Projects aimed at management of the cultural heritage can be an important instrument for the economic growth of the Mediterranean countries. On the basis of a multidisciplinary research programme, the University of Naples “Federico II”, in collaboration with researchers of the University of Rome “La Sapienza”, have signed an agreement for the academic, scientific and cultural cooperation with the University of Kènitra “Ibn Tofail”. A further agreement has been established with the INSAP (Institut National des Sciences de l’Archéologie et du Patrimoine) of Rabat, over the implementation of a partnership between the two countries, to develop common research projects.

Both the agreements were made in view of a more specific Component of the INCO Programme as part of the 6th Research Framework Programme, involving other European Member States and Mediterranean Partner Countries (MPC). Given the enormous amount of archaeological evidence not yet properly surveyed in the Gharb-Chrarda-Beni Hssen region (The city of Kènitra is the regional capital), it seemed urgent to carry out a series of field surveys to report and map the cultural richness of this area.

The main activities of this preliminary SSA were the following:
- geo-archaeological survey of the pre-historical and historical sites, especially those along the coastline of the region;
- identification and dating of the sites, to be mapped in view of specific investigations;
- in-situ analysis of methodologies in case of restoration of the architectural and/or organic and inorganic material there found;
- implementation of GPS and digital technologies, to build a complete GIS, useful for following research activities.

The SSA supported (a) meetings in Italy between the participants with a view to settle the working groups; (b) the mobility of the participants to go three times to Morocco for the field and didactic activities; (c) operational and technical support and communication activities to increase awareness of the potential of the cultural heritage for sustainable tourism.

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WIND-CHIME

Wide-range Non-intrusive Devices toward Conservation of Historical Monuments in the Mediterranean Area

Period: 01/06/2004 to 31/05/2007
Budget from EC: EUR 780 000
website: dipmec.unipv.it/research/chime/

Coordinator: Prof Fabio Casciati
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OBJECTIVES

The objective of this project is the development of a sustainable and cost-effective retrofit technology, which will allow non-intrusive rehabilitation of historical monuments in the Mediterranean area. Following the main results achieved on a theoretical and experimental level within a project of the EU’s Fifth Framework programme, the two main goals of the present proposal are:

- to enlarge the geographical area of intervention of the past cooperative effort;
- to translate the design features from the ongoing project into devices to actually be implemented in some specific cases. In particular, shape memory alloy (SMA) pre-stressed devices will be used to fasten cracked brick and stone monuments, and SMA dampers will be introduced in slender structures such as minarets and bell-towers.

ACTIVITIES

The following three steps are envisaged:

- a metallurgical and thermo mechanical characterisation of different alloys (mainly the classical Ni-Ti alloy and a Cu-based alloy) in order to avoid a last moment inconsistency between material and application;
- a smart implementation of the materials’ properties into suitable devices;
- full validation pursued through case studies located in the historical areas of the Mediterranean partners, namely, a palace in Tunisia, a couple of minarets in Egypt, and two historical masonry constructions in Jordan and Algeria.

EXPECTED RESULTS AND OUTCOMES

The expected results are listed in order of importance to the project:

- structural analysis and consolidation methods for monuments: adaptive reuse of monuments and sites and an integrated approach to conservation (activity code INCO-2002-B2.2);
- development, characterisation, and evaluation of new materials for the conservation and restoration of archaeological artefacts and monuments, assessing matters of compatibility (activity code INCO-2002-B2.1).

Both results will be disseminated through scientific papers and case study reports. A final dissemination conference is planned.
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PAPERTECH

Innovative materials and technologies for the conservation of paper of historical, artistic and archaeological value

Context and Objectives

The aim of PAPERTECH is the development of innovative diagnostic techniques and protocols to evaluate the deterioration degree of paper and papyri items of historical and artistic value, and the study of innovative materials and technologies for their conservation.

The objectives of this project are:

• the development of innovative diagnostic techniques to evaluate the deterioration degree of paper items of historical, artistic and archaeological value;
• the selection and the characterisation of paper/papyri samples of artistic and historical value, and the setting up of model paper samples, i.e. modern samples artificially aged, reproducing the degradation degrees of the ancient samples;
• the development of innovative materials and technologies for the conservation of paper;
• the evaluation of the efficiency of conservative treatments and their endurance with reference to the chemico-physical characteristics of modern papers;
• the dissemination and exploitation of the results.

Activities

The preliminary actions will be focused on the selection of paper items recovered in different areas of the Mediterranean Basin. These items will be characterised by means of non-destructive and micro-destructive methods. In particular, attention will be focused on the:

• identification of the materials and the technologies used in their manufacture;
• evaluation of their origin/provenance;
• identification of inks and pigments eventually present;
• analysis of the deterioration morphologies;
• study of the causes and mechanisms of degradation;
• planning of suitable and eco-sustainable restorative interventions through preliminary tested compatible materials and applicative technologies;
• development, inter-calibration and validation of non-destructive techniques for in situ analysis.

Expected Results and Outcomes

The results and outcomes expected from the described activities are:

• publishing of the project website — an electronic platform considered as the nucleus of a network for exchanging information;
• summary on the analytical results of the diagnostic techniques applied on ancient and model samples, and suggestions for a protocol for analysing the characterisation of ancient items;
• summary on the results of the new materials and technologies set up for the conservation of ancient items;
• production of a CD ROM entitled: Innovative Materials and technologies for the conservation of paper and papyri of historical, artistic and archaeological value;
• dissemination of scientific results through the publication of papers by the partners in national and international scientific and disseminative magazines;
• organisation of an exhibition showing the results of the project, including historical items characterised and restored following the protocols obtained from the research undertaken.
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Mediterranean Partner Countries
PATINE DU DESERT
Recréation de la patine des gres sahariens porteurs d’œuvres gravées ou peintes, témoins de 15000 ans de changements climatiques

CONTEXT AND OBJECTIVES

• Recreate in situ and in laboratory the patina of sandstones of the Saharan desert;
• engraving and/or cave painting supports.
• Seek if there is an ‘images-climate’ correlation.

ACTIVITIES

• Interpret and model the mechanisms of creation of the patina and surface of sandstone, taking into account the characteristics of the rock and their dependence on the local climate parameters. The re-creation strategies envisage the use of liquid silicates and/or of micro-organisms generating bio-minerals.
• Propose an innovative reading of Saharan rupestral art to contribute information on the capacity of ancient people to adapt to climate changes which have occurred in this region for about 15 millennia.

EXPECTED RESULTS AND OUTCOMES

• Development of an innovative method of restoration of the patina of sandstones.
• Evaluation of a new interpretative reading of Saharan rupestral art in relation to climate changes for 15 000 years.
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SHADUF

Traditional water techniques: cultural heritage for a sustainable future

Period: 01/07/2004 to 30/09/2007
Budget from EC: EUR 1 109 880
website: www.shaduf-eu.org

Coordinator: Dr Elena Piccinotti
European Jewellery Technology Network

CONTEXT AND OBJECTIVES

For years, the ancient practices of water harvesting, catchment and distribution has guaranteed water supply to countries and towns all over the Mediterranean area. Such techniques are rooted in society and the environment, thus becoming part of local knowledge, creating the identity and harmonious management of the landscape. Nowadays, the risk of water shortage, desertification and degradation of soils due to global warming, as well as the increase of urbanisation and agricultural industrialisation is high. As a consequence, the reuse of traditional water systems represents, on the one hand, a fundamental contribution to water resource management based on local sustainability and, on the other, restores the aesthetical values of monuments, as a further resource for people.

The project aims at:
• developing a database containing information on key water management practices in ancient times using archaeological, historical, and environmental information and field work;
• carrying out an inventory of traditional Mediterranean water catchment techniques still being used;
• evaluating the nature of monuments and the cultural significance of the techniques under consideration and proposing appropriate strategies for restoration and conservation;
• evaluating the sustainability of current water management activities as well as the proposed activities with regard to the long-term perspective of the project.

ACTIVITIES

The principal project activities will be to:
• investigate water hydraulic engineering technologies in use at water and wastewater heritage sites;
• document the environmental aspects related to water and wastewater heritage sites, and the impact of waterworks on the local environment;
• create a database on archaeological data, historical information, and environmental data, including watershed analysis to assess flash flood control measures where relevant;
• investigate the social and cultural dimensions of water catchment techniques in the various case studies with a comparative interregional analysis of the data;
• utilise the long-time perspective from archaeological data and traditional practices still used.

The project will document the traditional techniques under study. Ancient dams, cisterns, channels and flash flood control measures will be carefully studied. Where the danger of seasonal flash floods is encountered (as in Petra), terrain modelling will be used to analyse the watersheds involved and proposals for flash flood control scarcity will be elaborated. This is an innovative approach that promotes an economic return and brings added value that will justify the efforts in reusing and revitalising the ancient water management technologies.

EXPECTED RESULTS AND OUTCOMES

Adaptive reuse of monuments and sites will help promote an integrated approach to conservation. Cultural heritage sites related to water-works will be surveyed and documented in all case studies using archaeological and historical methods.

The strategic impact of the SHADUF will be to reinforce local economy and competitiveness by solving societal problems. This will be achieved by comparing traditional technologies and approaches to water savings with sustainable irrigation and water use — including reuse — for overall reduction of water consumption.

As water conflicts in the southern Mediterranean are sure to increase in the future, any measures aimed at assessing and alleviating water shortages falls within the common goal of maintaining peace in the area.
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PROHITECH

Seismic Protection of Historical Buildings by Reversible Mixed Technologies

Period: 01/10/2004 to 30/09/2008
Budget from EC: EUR 2 400 000
website: www.prohitech.com

CONTEXT AND OBJECTIVES

It is well known that many countries and cities in the southern part of Europe are extremely exposed to seismic hazard, which causes its valuable building heritage to be greatly at risk due to earthquakes. This problem occurs due to the fact that most of them frequently lack basic anti-seismic features with adequate provisions against earthquake actions. The main objective of the PROHITECH project is to develop suitable methodologies for the use of Reversible Mixed Technologies (RMTs) in the seismic protection of existing buildings of historical and monumental interest.

RMTs are based on the integration of structural members of different materials and construction methods into a single construction. The basic feature of RMTs is that their application should be always recoverable and reversible. Their main aim is to exploit the material and technological features in the best possible way, in order to optimise the structural behaviour under any condition, including very severe seismic actions. The outcome of the research will be a proposal for codification on the use of such technologies which will meet the most up-to-date codification issues at European level and comply with the layout, language and philosophy of structural Eurocodes.

EXPECTED RESULTS AND OUTCOMES

The project will mark a valuable step towards the diffusion of a more effective, environmentally friendly policy in seismic protection of constructions, including those with monumental features. The main direct outputs of the project are purely scientific: it is expected to produce about 50 papers to be published in international journals and presented at international conferences. It is expected that several PhD theses will be written as part of the project.

The final product of PROHITECH will be a proposal for a set of design and execution rules, most likely to be introduced into European codification. This product will consist of the final main deliverable: a ‘Proposal of codification on the use of reversible mixed technologies in the seismic protection of historical buildings’. This proposal will comply with the most up-to-date codification issues in the field of seismic design, e.g. the Performance Based Design, and will share the same global layout, language and philosophy as Structural Eurocodes issued by the European Committee for Standardization (CEN). This codification will fill a real gap that exists in the seismic regulations of all European and Mediterranean Countries which, at the moment, do not allow for any specific provision for seismic protection of their cultural heritage.

ACTIVITIES

The PROHITECH project has been conceived to yield practical guidelines useful for both design and constructional purposes. Project activities have been subdivided into four research areas:

• intervention strategies: assessing the main criteria and methodologies underlying the common practice of seismic upgrading, and improving the knowledge and awareness of engineers with regard to the importance of innovative materials and technologies in seismic rehabilitation;

• selection of materials and technologies: individuation of innovative materials on the basis of their mechanical features in order to select suitable ones for creating both strengthening systems and special devices aimed at achieving adequate structural performances compared with conventional solutions;

• experimental and numerical research: development of advanced design guidelines for the repair and strengthening of existing structures on the basis of the obtained experimental data and numerical simulations;

• set-up of codification rules: selection of study cases of the historical building heritage in the Mediterranean area; preparation of an operational manual for the practical implementation; and proposal of codification rules for the design of seismic protection interventions based on innovative reversible mixed technologies.
PROHITECH

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PROMET

Developing new analytical techniques and materials for monitoring and protecting metal artefacts and monuments from the Mediterranean region

CONTEXT AND OBJECTIVES

Museums and historical sites in the Mediterranean region exhibit collections of Phoenician, Hellenistic, Roman and Islamic metallic works of art that are witnesses to our past. Unfortunately, these objects often suffer serious conservation problems due to the corrosion and degradation phenomena that may, for example, take place during their burial and/or after their excavation during storage and exhibition. The high relative humidity and aggressive agents in the atmosphere may accelerate these problems. Conservation strategies have to be tailored to take into account the different environmental conditions and the degradation causes occurring in the countries of the Mediterranean Basin. While experts seek to slow down the degradation phenomena, it is not possible to protect the metal collections by placing them in strict environmentally controlled areas or by treating them on a regular basis; the large number of objects and the heavy cost of repeated maintenance do not permit this. PROMET aims to establish and promote a preventive strategy designed for the Mediterranean region by developing portable monitoring systems and protection methods, including the identification of degradation phenomena, for collections of precious metals, iron and copper alloys.

ACTIVITIES

New portable techniques, such as Laser-induced breakdown spectroscopy (LIBS), micro X-ray Fluorescence (i-XRF) and Electrochemical impedance spectroscopy, will be developed as analytical tools for metal objects to be used in parallel with scientific techniques for identifying degradation phenomena and to tailor conservation strategies. These advanced analytical methods will be applied to a number of survey collections — including archaeological artefacts in different countries in the Mediterranean region, such as Egypt, Greece, Italy, Jordan, Malta, Morocco, Spain, Syria, Tunisia and Turkey — to identify the conservation problems.

In parallel, safe corrosion inhibitors and chemical agents, as well as PVD and PECVD barrier films combined with synthetic microcrystalline or polyethylene-based waxes, will be developed and validated for use on artificially and naturally aged metal reference alloys.

A maintenance policy for metals collections will be highlighted through dissemination-related activities, such as workshops, conferences, an English-Arab website and the publication of a book.

EXPECTED RESULTS AND OUTCOMES

The project will deliver two prototype portable pieces of equipment to the market: LIBS and i-XRF, which will be able to carry out non-destructive or semi-destructive analyses of ancient metal artefacts. The surveys conducted will provide an accurate description of the different degradation phenomena occurring in the Mediterranean Basin.

PROMET will offer new products, i.e., corrosion inhibitors and barrier coatings for the protection of metal artefacts, to be used for the conservation of ancient metal objects of a different nature, degradation phenomena and manufacturing processes.

The findings of PROMET will make it possible to provide effective tools for the protection of culture heritage by offering reliable solutions that can be applied by end-users e.g. museum curators. Furthermore, this new preventive approach will promote a legislative policy for conservation of metallic objects collections. Finally, a number of PhD theses, scientific publications, conservation guidelines, and new conservation products for metal objects would be the expected outcomes of this project.
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NOESIS

NOn-dEStructive Image-based manuscript analysis System

Period: 01/09/2004 to 30/08/2008
Budget from EC: EUR 709 850
website: http://www.eunoesis.org/

Coordinator: Dr Alexandra Psarrou
University of Westminster

CONTEXT AND OBJECTIVES

The main aim of the project is to promote closer research and cultural links within the Mediterranean region by enhancing accessibility to, and historical research of rare manuscripts. To achieve this, the consortium members will cooperate to establish regional laboratories, and to produce a non-destructive non-invasive image-based processing tool to aid the historical analysis and examination of major Mediterranean collections of manuscripts. To succeed in its goals, the NOESIS consortium will investigate a number of areas of significant scientific and historical research including:

- the creation of online databases of ink and support models;
- the use of the models to examine palimpsests and faded inks;
- aid in authenticating and dating manuscripts from the Mediterranean region.

ACTIVITIES

To enable the study and analysis of the Mediterranean manuscripts using image-based non-destructive and non invasive techniques, the consortium will:

- photograph and digitise a number of manuscripts from the Mediterranean partner collections, based on established selection and evaluation criteria;
- study and analyse the photometric and morphological characteristics of the inks and supports under varying illumination conditions;
- study the historical cross-referencing of manuscripts found in the Mediterranean region;
- verify the homogeneity of the links and supports of the manuscripts;
- develop a suitable interactive and interoperable online tool to enable access to information about the manuscripts;
- disseminate the produced tools to support future research in the common historical and cultural roots between Europe and the Mediterranean region countries.

EXPECTED RESULTS AND OUTCOMES

The main results and outcomes expected to be produced are:

- the creation of an interactive model database which will be accessible from the internet and allow search, submission and analysis of manuscripts based on the stored models;
- to share further development and commercial exploitation of the digital modelling techniques used for the categorisation of inks and supports;
- the presentation of the results at major international conferences;
- the promotion of the project through the production of a CD-ROM and national workshops.
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HAMMAM

Hammam, Aspects and Multidisciplinary Methods of Analysis for the Mediterranean Region

Period: 01/09/05 to 31/08/08
Budget from EC: EUR 1 900 000
website: www.hammams.org/

Coordinator: Dr Heidi Dumreicher
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CONTEXT AND OBJECTIVES

The Islamic public bath ‘hammam’ is a gift from the past to the future. The aim of this study is to develop strategies and scenarios for the safeguard, revitalisation and adaptive re-use of historic Islamic public baths or hammams as important social spaces and facilities within the contemporary and future conditions of Mediterranean Islamic cities. The hammam is a central place of cultural heritage of the Mediterranean civilisation. Hammams are an integral part of the Islamic city and are well embedded in the historic urban fabric. With the disappearance of hammams, Islamic cities are about to lose a major feature of their cultural heritage with deteriorating consequences on the urbanistic, societal and architectural qualities.

The HAMMAM study will develop sustainability-oriented strategies for the adaptive revitalisation of hammams in Mediterranean countries to improve their role as places of cultural heritage that serve both the local communities and tourists. The project will apply an interdisciplinary and trans-sectoral approach, based on the concept of sustainability. It will integrate architectural and technological considerations with the socio-cultural and economic dimensions in order to ensure ways of sustainable restoration of these important cultural heritage sites.

The HAMMAM study uses the methodology of case-studies to fulfill the need for an integrative approach to the research-issue. Starting from the investigation and analysis of the local situation (technical, socio-cultural and economic) of specific carefully selected hammams in six different Mediterranean countries (Algeria, Egypt, Morocco, Palestinian-administered areas, Syria and Turkey), the study develops sustainable future scenarios for these hammams.

ACTIVITIES

The project team has assigned a four-month-orientation phase in which the first results of the background studies will be ready to be presented to all participants in order to configure a common scientific basic knowledge of the hammams.

The data-collection phase will set the basis for the case-study-approach, at the same time establishing the beginning of the participatory sustainability process in the neighbourhoods. During this phase, Mediterranean participants will host members of the HAMMAM project team. It is a phase of intense contact with the hammam users and the stakeholders concerned.

Ten months will be assigned to the analysis phase where the existing patterns and typologies of hammam usage and restoration will become more visible. This phase will rely heavily on the cooperation of the researchers in order to integrate their findings in an efficient way. It is also the time for an intense participatory process in the hammam neighbourhoods and exchange between local and expert knowledge.

The so-called ‘Future concepts phase’ will take eight months and will be dedicated to scenario-making and future strategies. This is a time of intense contact between the researchers who will hold reporting writing workshops in order to strengthen the interdisciplinarity of the scientific results.

The dissemination and documentation phase of HAMMAM will last for five months. As dissemination and policy-making is an important part of this study, special attention will be given to the visual appearance of the findings. The exhibition on the move that has started already in the previous phase will find its final configuration.

EXPECTED RESULTS AND OUTCOMES

The result will be the development of future scenarios for the reconstruction of past and present Mediterranean techniques, lifestyles and environments, contributing to the actual life and restoration activities concerning the hammam. The development of strategies and scenarios for the sustainable or adaptive use of historic hammams will take into account the singularity of each location as well as the common factors between the six cities under investigation. The methodology adopted and the results achieved in this study will be replicable to other case studies of cultural heritage buildings with a high social value. The project team will proceed to show examples for other similar cultural
heritages, considered not only as architectural highlights, but also as having a major contribution to urban day-to-day-life. Sustainable and innovative ways of restoration and revitalisation will be studied which will be applicable to a wide variety of contexts. Particular recommendations for the different sites under investigation will therefore be replicable to other sites of cultural heritage.

Besides this, it is considered that the interest shown to the historic hammams by an EU research team will have a positive impact on increasing local people’s awareness of their cultural heritage and traditional building know-how. It will also provide a strong incentive for local stakeholders in understanding the processes of revitalisation of a cultural heritage building combining vernacular technologies with appropriate contemporary technologies.
OPERHA

Open and fully compatible next generation of strengthening system for the ReHAbilitation of Mediterranean cultural heritage

<table>
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<th>Period: 01/01/2006 to 31/12/2008</th>
<th>Coordinator: Dr Tomás San-Jose</th>
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<td>Budget from EC: EUR 1 299 997</td>
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<td>website: <a href="http://www.operha.info">www.operha.info</a></td>
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OBJECTIVES

The overall objective of OPERHA is the design, development, testing and validation of an adaptable and reversible restoration solution for structural strengthening of historical buildings in Europe and the Mediterranean Area, focused on the use of the fibre reinforced polymer. Major state-of-the-art advances are expected to be made in both the laminate and anchoring systems. The aim is to provide an integrated solution, bridging technical, architectural and socio-economic settings. Restoration work on the ancient buildings needs to be carried out with the minimum intervention necessary, while paying attention to reduce the impact on the structure during and after its strengthening.

The flexibility and integration of all the above technical, cultural, socio-economic aspects requires multidisciplinary teams. As such, the OPERHA consortium is composed of experienced professionals in architecture, engineering, sociology, archaeology and history in the field of restoration of heritage buildings all over Europe and the Mediterranean Area. The scientific and technological testing and validation will be done at lab scale. The validation of the final solution will be done in pilot proofs. These trials will be made at different real heritage buildings in the Mediterranean countries. The selection of buildings has been made on the basis of their geographical location, common use, material and structural components, seismic conditions and environmental conditions.

The work plan has been divided into seven WPs: two WPs address specific socio-economic and cultural objective, three are focused on research, technological and innovation activities and the remaining two WPs relate to dissemination and exploitation activities, and project management.
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According to the definition given in the Bologna Document 2000 "A Conservation Scientist today can be defined as a scientist with a degree in one of the natural, physical and/or applied scientific disciplines and with further knowledge in conservation (ethics, history, cultural values, historical technologies, past and present conservation technologies and practice, specific scientific aspects, etc.), which enables him/her to contribute to the study and conservation of cultural heritage within an interdisciplinary team". Taking into account this definition and broadening it, including valorisation of monumental heritage and materials in cultural heritage, we can conclude that monumental heritage needs not only sciences and technology, but also humanities. Besides, social and economical aspects play an important role in the valorisation of monumental heritage process. It is a complex task to implement this concept at university and professional/continuing education level. However, it is a necessity for conservation from an historical point of view, but also to create potential resources and social development, such as cultural tourism or industrial activities and services.

The SSA is designed for capacity building through educational and training programmes about interdisciplinary and transversal issues, which include a large part of knowledge declared in Bologna Document. The programme design is set up through an interdisciplinary group composed of 8 partners.

EU (Spain, Portugal and France), West Balkans (Croatia) and MED - DEV countries (Morocco, Argentina and Mexico). Regarding the MED and DEV countries a pilot programme is implemented with a selective process.

Additionally two studies are being carried out: an analysis of National Policies and EC Directives and a study about the socio-economic impact of the education on other professional sectors in employment.
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MedGeNet

Euro-Mediterranean Network for Genetic Services

Period: 01/10/2006 to 30/09/2008
Budget from EC: EUR 749 000
website: www.medgenet.tredueuno.it

Coordinator: Dr Michele Bianco
European Genetics Foundation

CONTEXT AND OBJECTIVES

The revolution in medical genetics and prenatal health practice during the past two decades has profoundly benefited health in many populations of the industrialised world. The success of the Human Genome project has contributed to knowledge that can help reduce birth defects mortality and disability worldwide. Genetic research has led to the identification of the genes responsible for an increasing number of monogenic disorders and the active investigation in large population cohorts of the genetic bases of the more common polygenic disorders has increased our understanding of multifactorial or ‘complex’ genetic disorders such as cancer. Unfortunately, the enormous progress in medical genetics has had little or no impact in the developing countries, where more than 80 % of the world’s population lives.

The primary objective of the MedGeNet project is to expand the human expertise in clinical genetics and cancer genetics in Mediterranean Partner Countries (MPC) through the transfer of knowledge and technology between the two rims of the Mediterranean which share a common burden of genetic diseases. In particular the following three main areas of intervention and related objectives will be covered by the project activities: Medical Diagnosis and Integrated Medical Management; Information and Communication Technology; Education for health professionals and the general public.

ACTIVITIES

The MedGeNet work plan will consist of different sets of activities:

- coordination and management tasks;
- setting up a technological platform for distant learning and knowledge transfer concerning all the main project aims;
- supporting the Integrated Medical Management approach envisaged by the project, as well as genetic telecounselling and DNA chips;
- dissemination strategy to raise public awareness and visibility.

EXPECTED RESULTS AND OUTCOMES

Concerning the first area of intervention related to Medical Diagnosis and Integrated Medical Management, a Euro-Mediterranean network of genetic telecounselling and telepathology consultation will be set up to allow clinical geneticists from European countries and MPC to work together from remote locations. In particular, a medical genetics database will be created and the introduction of new mutation screening technology into the routine of the MPC laboratories/institutes will support collaboration especially on problematic diagnosis in the field of medical genetics.

In the framework of the second area of intervention, Information and Communication Technology, a common information/communication environment will be set up in order to facilitate collaborative research, diagnostic activities, exchange of data and protocols using Internet based tools and services.

Finally, the third area of intervention concerning education for health professionals and the general public will foresee the following outputs and products:

- the extension of an already existing Remote Training Centres Network which will allow physicians, nurses and health professionals from MPC to attend highly specialised courses on genetics without requiring them to invest time and resources for travel;
- the production of educational materials aimed at improving knowledge among caregivers as well as the general public regarding genetic services and prevention of birth defects;
- the creation of a Euro-Mediterranean Federation for Genetics and Medicine and an international event for the public awareness of genetics to give visibility to project outputs and to guarantee the continuation of the MedGeNet goals and activities in the Mediterranean region.
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IMMIGR HIV TB MED

Impact of immigration on HIV and Tuberculosis epidemiology on the Mediterranean Area

Period: 01/03/2007 – 31/07/2008
Budget from EC: EUR 235,477

Coordinator: Dr Rajae Al Aouad
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CONTEXT AND OBJECTIVES

The nature of immigration to the EU has changed dramatically over the last decade, often as a direct consequence of the processes of globalisation. Immigration from Sub-Saharan Africa and from outside Africa will bring new threats from communicable disease to the health system in European and North African Mediterranean coastal countries, especially Spain in the North and Morocco in the South.

The specific objectives of the SSA is to develop the capacity of the countries involved in this project as a consortium (Morocco and Spain) to survey tuberculosis and HIV disease transmitted through Sub-Saharan and other immigrants.

ACTIVITIES AND EXPECTED RESULTS

To meet the objectives, the project will convene two workshops to bring together the consortium members accompanied by stakeholders delegates of international and national NGOs concerned with the process, representatives of health programmes, researchers from universities of medicine, delegates of United Nations Agencies and other decision makers.

The workshops aims to review
• the surveillance and epidemiologic issues and the laboratory diagnosis concerning tuberculosis and HIV/AIDS disease considering the immigration factor,
• the ethical issues related to health for immigrant populations.
• the specific requirements to take into consideration for improving the epidemiologic surveillance of HIV and tuberculosis diseases in immigrant populations.

The workshops’ outcomes will be published and disseminated through a methodology book and guidelines. At the end, a large cooperation project related to immigration and communicable diseases in Mediterranean area will be proposed for European Commission support (FP7).
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CHILD TRAUMA NETWORK

Psychological network support to violence traumatized children: disasters, conflicts

Period: 01/01/2005 to 31/12/2006  
Budget from EC: EUR 780 000

Coordinator: Prof Juan José López-Ibor  
Instituto de Psiquiatría, Hospital Clínico San Carlos (HCSC)

CONTEXT AND OBJECTIVES

The objectives of this network are to:

• conceive, carry out and benefit from the experience of a Euro-Mediterranean network, for consultation and help when intervening to give medico-psychological support to children traumatised by violence during disasters and wars;
• confront the knowledge and experiences of each country in the network, as well as harmonise action and doctrines for diagnosis, evaluation and psychological care or support;
• elaborate and produce a common handbook for teaching and practice of medico-psychological support;
• start up a country-by-country help system whereby, in the case of a major disaster and a country asks for help, needs would be evaluated and reinforcement teams sent out;
• take into account the different cultural values, gender equality and ethical issues.

EXPECTED RESULTS AND OUTCOMES

The CHILD TRAUMA NETWORK aims to achieve the following results:

• demonstrate the effective functioning of an international Euro-Mediterranean network for the psychological care and support of traumatised children;
• advance the exploration and precision of the clinical profiles of traumatised children, after taking into account cultural specificities and differences;
• advances in ethical issues and gender equality;
• elaborate common clinical tools for examination and evaluation in child psychotraumatology;
• produce a common handbook for teaching and practice in the detection, evaluation and care of traumatised children;
• produce a plan for mutual help in case of major disaster in any of the countries belonging to the network;
• possibly extend the network to other countries.

ACTIVITIES

The activities are to:

• create national networks for each country in the network;
• exchange bibliographies, specific experiences and registration techniques;
• transmission of clinical data and behaviours via internet;
• hold meetings and workshops in each partner country to define the common objectives;
• elaborate a common theory and doctrine of action;
• elaborate procedures for communication;
• prepare a plan for mutual help in case of major disaster;
• determine the specific clinical profiles of traumatised children by war or disaster, during the three phases: immediate, post-immediate and delayed-chronic;
• propose or elaborate common standard clinical tools for detection, examination and evaluation;
• select, teach and train young psychiatrists and psychologists;
• compare the different methods of care, treatment and psychological support.
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leish-Med

Monitoring risk factors of spreading of Leishmaniasis around the Mediterranean Basin

Period: 01/12/2004 to 30/11/2007
Budget from EC: EUR 600 000
website: www.leishrisk.net

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CONTEXT AND OBJECTIVES

Visceral and cutaneous leishmaniases are serious communicable diseases around the entire Mediterranean Basin, including Southern Europe. These diseases are spreading and control is challenged by three escalating risk factors: human-made environmental changes, immunosuppression (essentially because of leishmania/HIV co-infection) and parasite resistance to first line drugs, pentavalent antimonials. Trans-border multidisciplinary surveillance of these three risk factors is essential for:
• precise and integrated assessment of the risks;
• defining adequate control measures, and;
• the orientation of R&D priorities.

The general objective of this project is to create a multidisciplinary network linking European and South/East Mediterranean partners in order to document the main risk factors involved in the spread of leishmaniasis around the Mediterranean and to promote transborder control strategies. The specific objectives of the project team are:
• to review, assess and inform on current scientific knowledge on the epidemiology and control of leishmaniasis around the Mediterranean;
• to co-ordinate existing research on surveillance and control of leishmaniasis;
• to disseminate and standardise relevant tools and good practice arising from research;
• to advise national, regional and international health authorities about the most effective transborder control measures;
• to identify the gaps in current knowledge and expertise; and
• to define future multidisciplinary research to remedy the situation through co-ordinated action.

ACTIVITIES

Objectives will be achieved through:
• five workshops for the 22 Euro-Mediterranean consortium partners on the following topics: diagnostics and epidemiometry, molecular epidemiology, drugs, vaccine and environmental control;
• three short training courses open essentially for Southern Mediterranean partners, on three topics covered during the workshops: diagnosis and epidemiometry, molecular epidemiology and, GIS and environmental control;
• one international conference for dissemination of findings.

EXPECTED RESULTS AND OUTCOMES

The present project will allow the constitution of a Euro-Mediterranean and multidisciplinary group of interactive experts on leishmaniasis. It will update knowledge and know-how in surveillance and control of Euro-Mediterranean leishmaniasis and establish the bases for both long-term collaborative research, and transborder surveillance and control network. Practically, the project team expects a series of position papers and updated guidelines for surveillance and control of leishmaniasis around the Mediterranean, as well as new research proposals stemming from the Leish-MED consortium.
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ECHINONET

From country level to a pan-European perspective:
A co-ordinated approach to controlling cystic echinococcosis

CONTEXT AND OBJECTIVES

Cystic echinococcosis (CE) is a major regionally-relevant communicable disease in the whole Mediterranean region and among migrants to the EU. Its public health importance is growing while surveillance, prevention, and clinical management are still far from satisfactory. In EU Member States, CE is an orphan disease, and there is comparatively little experience with treatment. However, health services in EU partner countries are increasingly confronted with the clinical management of CE patients due to migration.

The project aims at:
• devising a standard methodology for transborder data collection and uniform data presentation in the fields of surveillance, prevention and clinical management of CE;
• identifying effective and feasible prevention measures;
• collecting data systematically from endemic (Mediterranean Partner Countries [MPC]) and non-endemic (EU) countries with respect to clinical management procedures of CE for the four treatment categories: ‘surgery’, ‘PAIR’, ‘drug treatment’, and ‘watch & wait’;
• assessing the clinical management procedures with respect to cure rate, complication rate, recurrence rate, and cost;
• making recommendations for improved surveillance, prevention, and case management and quality of care.

ACTIVITIES

To achieve the project goals, two key strategies will be employed:
• systematic data collection in a uniform format in the participating countries, with the help of trained personal (doctoral students and post doctoral students);
• carefully planned and conducted workshops to bring together the data collected from the individual participating countries, to share and analyse these data among all the partner countries and to prepare updated ‘best practice’ guidelines for surveillance, prevention and treatment.

EXPECTED RESULTS AND OUTCOMES

EchinoNET will benefit all community members because:
• prevention activities for CE in the Mediterranean area can in future be targeted, based on epidemiological evidence;
• in Mediterranean countries, treatment costs can be reduced and unnecessary interventions avoided through the development of ‘best practice’ treatment guidelines;
• in northern EU Member States, where case numbers of CE are increasing because of immigration from endemic regions, treatment quality can be improved;
• there will be a North-South transfer of epidemiological research methods and of methods for quality assurance in clinical procedures;
• there will be a North-South transfer of ultrasound technology;
• there will be a South-North transfer of treatment experience;
• there will be increased South-South cooperation in cross-border surveillance for CE; and
• there will be a South-South exchange and adaptation of techniques (e.g. PAIR).

The consortium combines extensive research expertise in the field of clinical, epidemiological and socio-economic research on echinococcosis as well as practical clinical management skills of the disease with regard to all tools (ultrasound [Italy, Turkey, Morocco 2], serology [Egypt, Morocco, Tunisia, Germany]) and treatment techniques (surgery [Portugal, Morocco 2], percutaneous cyst drainage (PAIR) [Italy, Turkey, Morocco 2], and long-term treatment with benzimidazole compounds [Germany, Italy, Turkey, Morocco 2]). This is complemented by an extensive experience in epidemiology and biostatistics [Germany]. Furthermore, some of the partners have been largely involved in the prevention of CE [Morocco 1, Spain, Algeria, Tunisia]. Finally, the consortium members are well connected to the relevant government authorities, medical associations, other national medical centers and relevant international bodies (International Society of Hydatidology, WHO) to ensure a wide local, regional and international audience for the dissemination of findings.
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**GENOMED-HEALTH**

Health of populations in the Mediterranean in the post-genomic era

**Period:** 01/04/2004 – 30/09/2005  
**Budget from EC:** EUR 152,388

**Coordinator:** Dr Sonia Abdelhak  
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**CONTEXT AND OBJECTIVES**

During the 5th Research Framework Programme (FP5), and in the first FP6 INCO call for proposals (INCO-MED and INCO-MPC respectively), only a few proposals were submitted from Mediterranean partner countries in the biomedical research domain and most of the proposals were unsuccessful. This delineates inappropriate information spreading and insufficient mobilisation of the scientific community around the Mediterranean. This may also be due to a misunderstanding of the proposed instruments, inadequate research focus or an incapacity to build up multidisciplinary consortia with convincing competencies and lack of socio-economic approach to problem solving. On another hand, in the context of the post genomic era, with the risk of widening the gap between North and South, it is crucial that the research community in the Mediterranean area evolves in its way of working, by building networks and developing an innovative, complementary and balanced partnership.

Our aim was to organise two workshops, as a specific support action to FP6 in general and to INCO-MPC in particular.

**ACTIVITIES AND EXPECTED RESULTS**

The focus of the first workshop was to inform and discuss about potential impact of genomics on health of populations in the specific context of the Mediterranean area. During this workshop, research priorities within this area and mechanisms for partnership were identified. Participants were selected on their willingness to be key actors in future research networks. The second workshop served to help selected networks on priorities identified during the first workshop, in writing proposals to be submitted to the next INCO-MPC calls. The SSA supported the specific INCO activities by a networking activity and by promoting the sharing of knowledge and expertise between European and MPC research communities.

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RABMEDCONTROL

Identifying ecological and epidemiological key factors for rabies dynamics and control in North Africa and implications for rabies status in South West Europe

Period: 01/07/2006 to 30/06/2009
Budget from EC: EUR 1 100 000
website: www.rabmedcontrol.org

Coordinator: Dr Chokri Bahloul
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CONTEXT AND OBJECTIVES

Rabies is a serious public health concern in North Africa, causing heavy social and economic burden, and its reintroduction represents a threat to Western European countries presently free of rabies in non-flying animals. This project will take a global multidisciplinary approach to draw a precise picture of the rabies epidemiology in North Africa, by identifying and quantifying epidemiological, ecological, sociological and vaccinological key factors for rabies dynamics. This will provide health authorities with recommendations based on scientific evidence for prevention and control strategies. Furthermore, despite the fact that Western European countries have almost completely eliminated canine and vulpine rabies, they continue to declare some human and animal cases mostly imported from North Africa, in addition to the presence of the disease in bats with some spillover to humans. Therefore, the study of rabies in North Africa and West Europe will determine the possible overlapping of rabies epidemiological cycles between both shores.

ACTIVITIES AND EXPECTED RESULTS AND OUTCOMES

For present project allowing to draw a precise picture of rabies epidemiology in North Africa and West Europe and to improve the control measures, multidisciplinary approaches will be followed. They can be grouped into four categories:

• WP1 and WP3 will allow the drawing up of an up to date picture of the rabies descriptive epidemiology in North Africa. WP1 will focus on standardisation of the sampling and diagnosis techniques in order to gather data from different countries which can be compared. A GIS tool will then be implemented to stress the importance of the rabies endemicity. WP3 is dedicated to molecular epidemiology tools that will draw the phylogeny of the circulating lyssaviruses in North Africa by sequencing the RT-PCR of different amplified regions inside the glycoprotein and the nucleoprotein. This phylogeny can provide a hypothetical reconstruction of the geographic and temporal evolution of the North African strains.

• WP2 and WP4, will provide milestones particularly relevant to the animal rabies reservoirs. The potential of bats as rabies reservoirs and a possible overlapping between Southern European and North African shores will be investigated in the context of WP2. 'Sociological investigations with KAP and interviews investigations' describes the overall objective of WP4, allowing the collection of key parameters of dog ethology in rural, urban and suburban areas. A special emphasis will be given to understanding the perception of rabies risk by the local population.

• The combined data from the above mentioned WPs will be analysed by computer and mathematically modeled to draw an analytical and synthetic description of rabies epidemiology. The consequent synthetic studies will highlight some targets inside the complex situation of rabies where intervention measures could be envisioned. Finally such outcomes are expected to provide health authorities — thanks to the support of international health experts — with appropriate recommendations to set up an adapted rabies control strategy (WP5).
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MULTILATERAL COORDINATION OF NATIONAL RTD POLICIES AND ACTIVITIES

INSTITUTIONAL AND POLICY SUPPORT AND DEFINITION OF S&T COOPERATION PRIORITIES

* Numbering of sections corresponds to the Work Programme
PROMEDAccess

Promotion of the participation of researchers from Mediterranean Partner Countries in European research and mobility programmes

CONTEXT AND OBJECTIVES

The PROMEDAccess project aims at increasing the involvement of universities and institutions in Mediterranean Partner Countries (MPCs) in actions open to them under the 7th Research Framework Programme (FP7) with emphasis on Marie Curie Actions, different themes in the Cooperation Specific Programme, irrespective of the instruments, and some higher education programmes dealing with research and the European Research Area.

The currently insufficient participation in these programmes of universities and institutions in Mediterranean Partner Countries (MPC) is hampering the countries own objectives as well as achievement of European policy goals with regard to research, the Euro-Mediterranean Partnership and the Neighbourhood policy.

ACTIVITIES AND EXPECTED RESULTS

PROMEDAccess will be conducted in collaboration with the National Information Points (InPs) created by the SSAs Euro-MEDANet and Euro-MEDANet2. PROMEDAccess will organise training seminars for resource persons, who will make up the nucleus of the guidance units (named “Europe units”) within the MPC institutions. These resource persons will (a) serve as relays between teaching and research staff in their institution and the InPs, (b) provide guidance to members of their universities working on projects financed by European funds, and (c) facilitate the dissemination of InP information concerning European Union (EU) calls for proposals.

Another activity is to gather information of interest to the European Union concerning Mediterranean networks of excellence in MPC dealing with FP7 and the INCO-MED priorities in order to set up a ‘partner search’ functionality.

Finally, an investigation of the difficulties in fulfilling certain eligibility criteria for FP7 actions and associated programmes will be conducted and made available to the European Commission’s DG Research as well as science managers in Mediterranean Partner Countries.
Institutional and Policy Support and Definition of S&T Cooperation Priorities

context and Objectives

It is envisaged that the proposed project will capitalise the investment of EU on the recently established National Contact Points (InPs) in Mediterranean Partner Countries (MPC) for the European Research Framework Programme (FP) and achieve the following objectives:

- To realise a mapping exercise of the national R&D programmes in order for the EC to get a view of national priorities and their possible matching with the participation opportunities in FP7. The mapping will result in a model/prototype database containing the profiles of the key players/organisations involved in the national priorities.
- To produce an assessment report on social, cultural and scientific support across the Mediterranean Countries. The InPs will ensure the verification of the data.
- To achieve the integration of InPs into the European networks dedicated to FP7 and to the European Research Area (ERA) and contribute to coherence of their work.
- To establish and implement a promotion/dissemination mechanism in order to keep the scientists, researchers and other stakeholders of the EU and MPC aware of the cooperation possibilities of identifying their counterparts for collaboration in the research projects and activities of FP7 (2007-2013).

ACTIVITIES AND EXPECTED RESULTS

The objectives will be achieved by:

- Informing and creating awareness among EU Scientific communities of the potential added value to be gained by collaborating with their counterparts in Mediterranean Partner Countries.
- Supporting the participation of the scientific and research communities in Mediterranean Partner Countries in joint research through thematic workshops well-focused on specific thematic areas of FP7 according to their needs and priorities.
- Short updating training seminars for InPs.

ERA-MED

Strengthening the European Research Area in Mediterranean Countries

Period: 01/12/2006 – 31/07/2008
Budget from EC: EUR 350,000
website: www.nisnest.gr/eramed

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ST-EAP

Science and Technology - Europe Africa Project

CONTEXT AND OBJECTIVES

The primary objective of the project is the strengthening of science and technology (S&T) co-operation among African scientists and between African and European scientists.

This objective is endorsed by both Africa and the European Union (EU) respectively in Africa’s Science and Technology Consolidated Plan of Action of NEPAD (New Partnership for Africa’s Development) and in the recently adopted EU Strategy for Africa.

The Science and Technology - European African Project (ST-EAP) aims to heighten awareness of European funding mechanisms and S&T co-operative instruments that support the creation of African/European consortia. In particular, seeks to create an increased awareness of the role of the Framework Programmes.

ACTIVITIES AND EXPECTED RESULTS

The activities intended to address these goals include workshops, conferences, dialogue with National Contact Points, the Informal Group of Liaison Officers and the S&T community of Africa. This will include focussed presentations, a website (including partnering and funding databases) and material highlighting Africa’s S&T expertise. ST-EAP is seeking mechanisms to facilitate greater EU Africa/NEPAD collaboration, and provide a greater input into future Framework Programmes and proposals for sustainability and growth of the African and EU S&T communities.

This will also promote the internationalising of the European Research Area (ERA) by contributing to the international dimension requirements for integrating and strengthening the ERA and derive benefit for the people of the participating countries through identifying and addressing S&T priorities that provide opportunities for increased economic growth and improved quality of life.

ST-EAP is coordinated by South Africa’s CSIR (Council for Scientific and Industrial Research) and the AAS (African Academy of Sciences) with input from advisors.

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CONTEX T AND OBJECTIVES

The objective of the project was to demonstrate the role of renewable energy in poverty eradication and to offer support to policy-making activities in sustainable resource management, health and public health, and enterprise development. The project supported and stimulated the activities of the European Energy Initiative for Poverty Eradication and Sustainable Development under Development Policy. International and local partnerships were mobilised to support policy making.

The partnerships engendered three essential types: Policy Partnerships, Programme Partnerships and Action Partnerships. Policy Partnerships supported the development of progressive energy policy initiatives directly through research activities and stakeholder networking. Programme partnerships initiated and supported training and capacity building initiatives. Action Partnerships laid the foundations for concrete projects including pilot projects.

ACTIVITIES AND EXPECTED RESULTS

Activities for the mobilisation of partnerships included the organisation of meetings, the financing of travel expenses for meetings and workshops, newsletters, and other information networking services. Notably, three workshops were organised in three African countries (South Africa, Senegal, Zambia) to support this activity.

Results of the partnership activities provided policy makers with the analytical tools, results and information to support targeted and effective policies. The project consortium comprised three European partners: WIP-ETA Consortium (Germany/Italy), ITDG (UK) and SEI (Sweden), coordinating the global energy and development networks “LAMNET”, “CARENSA” and “SPARKNET” and three African partners: Igloo Sugar (South Africa), ENDA (Senegal) and CEEEZ (Zambia). Moreover, other international and regional organisations supported the consortium in the organisation and creation of partnerships. These included NGOs, governmental organisations, multilateral institutions and companies.

Period: 01/01/2004 – 30/06/2005
Budget from EC: EUR 387,954
website: http://www.open-si.com/

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Institutional and Policy Support and Definition of S&T Cooperation Priorities

An analysis of the results of the INCO-MED Programmes showed that a number of participants from Mediterranean Partner Countries enjoyed moderate success from their involvement in these Programmes. Early surveys showed that Mediterranean countries would benefit from an improved understanding of the significance, the content and the participation procedures of the European Research Framework Programme (FP). The opening up of thematic priorities in FP6 to participants from this region and the willingness of the European Commission to open the European Research Area to other regions of the word made this lack of understanding a serious obstacle to achieving the desired integration.

One reason for the lack of understanding was the absence of a support infrastructure in most of the Mediterranean Partner Countries to support participation of their research teams in the FP. In fact, only Israel, Turkey, Malta and Cyprus (associated or candidate countries) had such a structure of National Contact Points (NCPs), a structure otherwise lacking in other Mediterranean countries outside the European Union.

EURO-MEDANET2
Opening up the European Research Area to the Mediterranean Countries

Period: 01/05/2004 – 30/04/2006
Budget from EC: EUR 400,000
website: www.euromedanet.gr

Coordinator: Dr Paraskevi Sachini
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CONTEX AND OBJECTIVES

An analysis of the results of the INCO-MED Programmes showed that a number of participants from Mediterranean Partner Countries enjoyed moderate success from their involvement in these Programmes. Early surveys showed that Mediterranean countries would benefit from an improved understanding of the significance, the content and the participation procedures of the European Research Framework Programme (FP). The opening up of thematic priorities in FP6 to participants from this region and the willingness of the European Commission to open the European Research Area to other regions of the world made this lack of understanding a serious obstacle to achieving the desired integration.

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ACTIVITIES AND EXPECTED RESULTS

The project worked specifically to fill this gap by designing and implementing a set of measures for the creation of a fully operational network of Information Points (InPs) in four Mediterranean countries (Algeria, Egypt, Syria and Lebanon).

The results of this project are believed to constitute a valuable benchmarking exercise in the EU’s future outreach R&D activities in the Mediterranean region.
EURO-MEDANET2

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Institutional and Policy Support and Definition of S&T Cooperation Priorities

An analysis of the results of the INCO-MED Programmes showed that a number of participants from Mediterranean Partner Countries enjoyed moderate success from their involvement in these Programmes. Early surveys showed that Mediterranean countries would benefit from an improved understanding of the significance, the content and the participation procedures of the European Research Framework Programme (FP). The opening up of thematic priorities in FP6 to participants from this region and the willingness of the European Commission to open the European Research Area to other regions of the world made this lack of understanding a serious obstacle to achieving the desired integration.

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The project worked specifically to fill this gap by designing and implementing a set of measures for the creation of a fully operational network of Information Points (InPs) in three Mediterranean countries (Morocco, Jordan and Tunisia) and the further development of an already existing NCP in Turkey.

The results of this project are believed to constitute a valuable benchmarking exercise in the EU’s future outreach R&D activities in the Mediterranean region.

EURO-MEDANET
Opening up the European Research Area to the Mediterranean Countries

Context and Objectives

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Activities and Expected Results

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MED7

Thematic workshops for the definition of the science and technology Euro-Mediterranean policy within FP7

Context and Objectives

MED 7 was aimed at the organisation of six S&T workshops to implement the RTD Monitoring Committee’s (MoCo) conclusions (S&T Barcelona Committee) on identifying scientific priorities and mechanisms for cooperation with regional impact in the short term (from 2007 and thereafter).

Activities and Expected Results

The first five workshops dealt with topics identified by the MoCo ad hoc Committee meeting in Carmona-Spain (2-4/6/2004) as cooperation priorities, namely:

1) agro-food and industrial agriculture,
2) preservation of cultural heritage,
3) health,
4) water risk management and renewable energies,
5) innovative production systems and processes.

A final assessment workshop discussed the results of the five thematic workshops and served as a synthesis workshop. The result of this consultation process provided S&T work input for the preparation of the forthcoming “INCO-MED” activities under FP7. The synthesis workshop tried to strengthen co-ordination and complementarity with activities carried out by means of Community foreign policy instruments, and to support particular joint efforts by the European Community and the EU Member States towards the opening of the ERA to other countries and regions of the world. Moreover, this action focused mostly on:

- Identification of areas with potential for enhanced co-ordination between and with the Member States, the Associated Candidate States, the Associated States and Third Partner Countries;
- Developing, promoting, organising and structuring the participation of INCO partner countries in the activities of the FP, especially in the thematic priorities;
- Definition of comprehensive international co-operation schemes including Community external and RTD policies and their instruments.
## MED7

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Given the recent signing of the Scientific and Technological Cooperation Agreement between Tunisia and the EU in June 2003, the project’s main aim was fostering the scientific, technological and innovation (STI) cooperation between Tunisia and EU in the Thematic Priority Areas mostly related with science and technology based industrial development. This was pursued through a set of specific and practical actions in order to:

- Improve STI visibility, mutual knowledge and information flow between Tunisia and EU in the fields of research, innovation and technology transfer related to the Thematic Priority Areas;
- Contribute to the improvement of researchers’ and technologists’ mobility and foster EU-Tunisia STI institutional cooperation;
- Develop a Tunisian expertise on European Community STI instruments to support local institutions (organisations and enterprises) and act as multiplier for cooperation in R&D programmes and transnational technology transfer.

To achieve the above objectives, STREN undertook the following activities:

- The creation of a dedicated web platform including three on-line interactive databases on EU and Tunisian STI results, resources and opportunities;
- The organisation of the STI thematic workshop days dedicated to scientific and technological topics related to the main FP6 thematic area priorities and one large and high level conference dedicated to the STI cooperation topics;
- The collection and dissemination of a set of international best practices in STI initiatives;
- The organisation of 3 trainings on STI management subjects and the European 6th Research Framework Programme (FP6 - 2002-2006) and a further expert exchange programme to complete the mutual knowledge of the European Research Area (ERA) concept and its implementation;
- The establishment of a network of 10 Tunisian experts who can act as support desk for the creation of new STI projects and technology transfer initiatives among EU, Tunisia and other INCO countries in the FP6 and, in future, FP7.
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ESASTAP (European-South African Science and Technology Advancement Programme) was based on the Science and Technology (S&T) agreement signed between South Africa (SA) and the European Union (EU) in 1996 and sought to 1) promote SA and EU cooperation at the bilateral and multilateral level, 2) advance S&T development within SA and beyond at Southern African Development Community (SADC) and New Partnership for Africa's Development (NEPAD) levels, 3) enhance the “internationalising” of the European Research Area (ERA) through contributing to the international dimension requirements for integrating and strengthening the ERA and 4) deriving benefit for the people of the participating countries through identifying and addressing S&T priorities that provide opportunities for increased economic growth, and improved quality of life.

The project was coordinated by SA’s Department of Science and Technology and was aligned with their strategy for S&T in SA. ESASTAP’s long-term aim, and the criteria on which the project is judged, was to increase S&T cooperation and priorities determination between SA, the EU and its member states; enhance the awareness of S&T capability in SA and of EU member states; promote SA’s knowledge and participation of the Research Framework Programmes (FPs) and other cooperation mechanisms, and increase the participation of SA and SADC/NEPAD S&T organisations in the FPs.

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**ACTIVITIES AND EXPECTED RESULTS**

The activities which addressed these goals included workshops, conferences, dialogue with NCPs (National Contact Points) and IGLOs (Informal Group of Liaison Officers) and focussed presentations with deliverables in a variety of media such as pamphlets, a website (including partnering and funding databases) and electronic and print material highlighting SA’s S&T expertise. ESASTAP sought mechanisms to facilitate greater EU-SA/SADC/NEPAD collaboration, and to provide a greater input into future FPs and proposals for sustainability and growth of the SA and EU S&T communities.

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<td><strong>ECOWAS - Economic Community of West African States:</strong> Benin, Burkina Faso, Cape Verde, Côte d’Ivoire, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo</td>
</tr>
<tr>
<td><strong>CILSS - Comité Permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel:</strong> Burkina Faso, Cape Verde, Chad, Gambia, Guinea Bissau, Mali, Mauritania, Niger, Senegal</td>
</tr>
<tr>
<td><strong>CEMAC – Communauté économique et monétaire des Etats d’Afrique Centrale</strong> Cameroon, Central African Republic, Chad, Gabon, Equatorial Guinea, Republic of Congo</td>
</tr>
<tr>
<td><strong>ECCAS - Economic Community of Central African States:</strong> Angola, Burundi, Cameroon, Central African Republic, Chad, Gabon, Democratic Republic of Congo, Equatorial Guinea, Republic of Congo, Sao Tome e Principe</td>
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<tr>
<td><strong>IGAD - Intergovernmental Authority on Development:</strong> Djibouti, Eritrea, Ethiopia, Kenya, Somalia, Sudan, Uganda</td>
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<td><strong>EAC - East African Community:</strong> Burundi, Kenya, Rwanda, Tanzania, Uganda</td>
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<td><strong>COMESA - Common Market of Eastern and Southern Africa:</strong> Angola, Burundi, Djibouti, Comoros, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, Zimbabwe</td>
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<tr>
<td><strong>SADC - Southern African Development Community:</strong> Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Mauritius, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe</td>
</tr>
<tr>
<td><strong>UMA - Union du Maghreb Arabe:</strong> Algeria, Libya, Mauritania, Morocco, Tunisia</td>
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<tr>
<td><strong>IOC – Indian Ocean Commission</strong> La Réunion (France), Madagascar, Mauritius, Seychelles</td>
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