Sida Evaluation 99/7

Environmental Projects in Tunisia and Senegal

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and Economic Cooperation

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Executive summary

Sida requested the Swedish Environmental Protection Agency to evaluate Swedish environmental support to Tunisia and Senegal during the last 10 years. For this purpose Sida selected six projects in Tunisia and five in Senegal, all in the field of the environment. The projects in Tunisia were: two for training personnel working at sewage treatment plants, three for technical support and studies for constructing wastewater treatment plants, and one for the development of a regional environmental action plan. The projects in Senegal were: one for the development of a National Environmental Action Plan, one to hold a seminar for implementation of this plan, one to work out a system for environmental monitoring, one for the rehabilitation of sewage systems in three cities, and one for environmental studies in industry.

Sida (and formerly BITS) has financed environmental projects in Tunisia and other countries for a number of years. Swedish consultants have carried out these projects. In Tunisia some 25 projects have been supported over the last 20 years at a cost of SEK 32 million, and in Senegal five projects since 1991 at a cost of SEK 9.7 million.

Projects evaluated

TUN0041	Training in water and sanitation techniques for the personnel at sewage treatment plants
TUN0042	Training in water and sanitation techniques for the personnel at sewage treatment plants
TUN0441	Supervision and quality control at construction and delivery of equipment to sewage treatment plants in Kasserine and Mahdia
TUN0451	Inspection and quality control at construction of sewage treatment plants in the city of Gabès
TUN0461	Feasibility study for the construction of waste water treatment plants in three cities
TUN0551	Land use and environmental protection close to rivers of Hamman, Blibane, Hallouf and Hamdoun
SEN 0011	to develop a National Environmental Action Plan
SEN 0012	Seminar for the implementation of a National Environmental Action Plan.
SEN 0021	Environmental Monitoring
SEN 0031	Rehabilitation of sewage system in Kaolack, Louga and Saly-Portydal
SEN 0051	Environmental investigation within industry

Evaluations of projects provide Sida with an instrument to measure results achieved in the projects and to improve the quality of future projects financed by Sida.

The conference in Rio in 1992 was the starting point for environmental work in Senegal while in Tunisia it was the cholera epidemic of 1969. This is the reason why the conditions and character of work done in the field of environment have been quite different in Tunisia and Senegal. The work has also been carried out in different ways and has been in progress much longer in Tunisia than in Senegal. Tunisia has had institutions operating in the environmental field for almost 30 years while Senegal is in the phase of establishing its institutions and developing strategies for their operations. The two countries have also reached very different social, economic and technical levels.

A major constraint for the implementation of the environmental measures proposed in the programmes is the poor economic situation of the two countries. International financing will be

necessary, and the financing community declared at the Rio conference that they are prepared to support developing countries, but a normal prerequisite is that pre-feasibility studies should be presented by the applicants. During their long programmes of support in the fields of sewage and environmental action, BITS and Sida have supported Tunisia and Senegal to help the countries receive international financing for different investments.

In Senegal the main questions are the environmental and sustainable utilisation of limited, and already partly overexploited, natural resources by a rapidly expanding population, sanitary problems due to poor management of drinking water supplies, uncontrolled discharge of municipal and industrial sewage and solid waste. The problems are very evident in the capital city, Dakar. In the Senegalese national environmental protection action programme, it was pointed out that further assistance would be required in the field of family planning to reduce birth rates.

In Tunisia support from Sida has been important for developing and planning the sustainable development of Tunisia's most important industry, the tourist industry. Further development will be required in the fields of the environment; solid waste and re-use of treated sewage water.

The development of the two Environmental Action Programmes, the national programme in Senegal and the regional programme in Tunisia is a good example of the transfer of conceptual know-how and a methodology with the aim of developing environmental programmes, as opposed to the delivery of detailed final products. Programmes developed with a mutually agreed strategy for solving identified problems and defined measures for defined time perspectives are very good strategic environmental instruments for recipient countries. This methodology will act, and has already acted, as a catalyst in the processes involved in the new environmental programmes undertaken by the countries themselves. Examples are the development of programmes for new regions, for different sectors and at regional and local levels.

The type of Swedish support and co-operation mentioned above has been of strategic importance for the recipient countries to enable them develop a sustainable environment and sustainable national resources.

The regional environmental programme for Sousse in Tunisia has given the parties involved a better understanding of the effects of collective pressure on the environment, of cost-awareness of environmental protection, and of direct effects on the region's economic development

In Tunisia active work is being done in the legislative field and the laws are being improved in line with developments in the country. The establishment of the Ministry of Environment and Planning in 1991, the reorganisation of ONAS in 1993 and the establishment of CITET are all results of active work in the environmental field. In this connection the Swedish support has been of importance.

Senegal also has environmental legislation but the possibility of enforcing this legislation is very weak. However a proposal for a new environmental protection act will be presented to the Senegalese parliament within the next twelve months.

The aim of supporting sewage systems is to provide environmentally sustainable water supplies and sewage systems. Training in water and sanitation techniques for the personnel at sewage treatment plants is important since it transfers and maintains know-how in the operation of plants with the aim of achieving optimal treatment results and low operating costs.

Swedish support in the field of wastewater has contributed to the establishment of a National Sewage Authority (ONAS) in Tunisia and a similar authority in Senegal. In Tunisia this has also contributed to the establishment of the Technical Environmental Education Centre (CITET), which co-operates with other French-speaking counties in Africa, e.g. Senegal.

The work in respect of collection and treatment of wastewater in Tunisia has been successful; the support for studies by Swedish consultants has given Tunisia the possibility to obtain support from other donors to construct sewage and wastewater treatment plants. Senegal is a poor country, the educational levels are low, and there is a lack of institutions and infrastructure; the collection and treatment of wastewater is only at the starting point in Senegal.

In Senegal the environmental impact caused by industry is considerable and it is important to improve matters. The present environmental legislation does not provide the enforcement instruments required to make it possible to make demands on the industries to protect the environment. The country is poor and foreign companies own the industries to a great extent. This makes it possible for the industries to exploit the country if there are no international agreements or co-operation in this field.

To improve the skills of local staff it is important that international and local staff co-operates actively in the projects; the local consultants should not merely have special individual components to perform that are separate from the project as a whole. Regular seminars and evaluations of technical questions as well as training are important for the local staff to enable them to keep up with technical and scientific developments and to improve their skills.

To achieve optimal results from projects it is important that the project goal has a higher priority than (is stipulated before) the cost ceiling, i.e. that there is flexibility in the financing. It is important that there are ways that permit review and revision of original project plans and cost ceilings. It must be possible to take unforeseen events or a desirable revision of the project programme into consideration, as well as decisions on additional funding, during the course of a project without unnecessary time-consuming administrative procedures.

The support to Tunisia in the field of wastewater treatment could concentrate in the future on the transfer of know-how to maintain and upgrade existing levels. Seminars, national and international, would be valuable.

In Senegal investments were made in the 1980s in piping and wastewater treatment plants in Kaolack and Louga. These systems did not function well. That is why Senegal asked Sida/BITS for support to work out a way to recondition the systems. It was shown that very few people, 2 – 4 per cent of the population, were connected to the piping system and the flow to the treatment plant was too low for treatment to be possible. The consultant who was contracted pointed out that firstly measures to increase the number of connections must be taken, and then investments to recondition the wastewater treatment plant could be made. This seems quite reasonable.

The evaluation team agrees that in many cases the problems with waste and wastewater have to be solved in stages. This can be done for example by first constructing piping and disposing the collected wastewater in a safe way into the sea and later, when the economic situation in the country improves, by treating it in a wastewater treatment plant. In smaller towns and on the outskirts of larger cities it can also often be beneficial to use other systems for taking care of latrines (night soil) instead of piping, for example composting with organic household waste, and using this as a fertilizer in agriculture. It would have been valuable to carry out an Environment Impact Assessment to evaluate different systems for the treatment of latrines (night soil), household water and garbage to identify the most cost-efficient system.

To achieve positive results it seems important that there are well-developed national, regional and local environmental plans that are strongly supported by all ministries, regional and local authorities, industries, and the people concerned and their representatives. With these environmental plans as a base, it is possible to carry out the different projects that are specified in the different plans.

It seems important to give support to a limited number of fields and to stick to these fields for a long period of time. The recipient country also seems to appreciate continuity in the form of the same consultants and their staff, and a long presence, especially during critical periods, also appears important to the local institutions.

The transfer of knowledge has high priority in co-operation with recipient countries. The transfer of knowledge is time-consuming and expensive but will pay in the long run. We consider that co-operation in the field of transfer of knowledge should be of a long- term character and that the goal of the training strategy should be that the recipient country is given support to develop teaching resources of its own in order to secure sustainability in the training.

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1 The development context of the project - general

Sida requested the Swedish Environmental Protection Agency to evaluate Swedish environmental support to Tunisia and Senegal during the last 10 years. For this purpose Sida selected six projects in Tunisia and five in Senegal. The focus on environmental problems in Tunisia came into being for the first time in the 1960s as a result of an outbreak of cholera. The focus on environmental problems in Senegal was initiated in the 1990s, when the UN Conference took place in Rio in 1992.

In chapter 6, the Tunisian projects, and chapter 7, the Senegalese projects, the development context of the different projects evaluated is presented in detail.

2 The evaluation; methodology

2.1 Reasons for the evaluation; scope and focus of the evaluation

Sida, and formerly BITS, has financed environmental projects in Tunisia and other countries for a number of years. Swedish consultants have carried out these projects. In Tunisia some 25 projects have been supported over the last 20 years at a cost of SEK 32 million and in Senegal five projects since 1991 at a cost of SEK 9.7 million.

Evaluation of projects supported by Sida is an instrument for Sida to measure results and quality achieved in projects undertaken and to improve the quality in future projects. For this purpose Sida commissioned the Swedish Environmental Protection Agency to evaluate 11 projects in Tunisia and Senegal. It is intended that the findings and recommendations in respect of these projects shall be used as inputs in similar projects in other countries as a means of improving their quality and content. They can also be used to influence the quality of services provided by the consulting companies.

The projects have been evaluated from the following points of view:
- To what extent are the projects relevant to the recipient country and to Sida's overall aim of its assistance to the country?
- Have the results really been achieved?
- Different aspects of the long term effects – the sustainability for the recipient country;
- Cost efficiency of the work of the consultant and the recipient country.

Objectives for the evaluation and products to be presented
- Information on results achieved through the projects.
- Assessments of the extent to which the projects have had an impact on the co-operating authorities and the country's environmental policy, strategy and work
- Assessments of the professional quality of the services provided
- Recommendations for improvements to similar projects
- Information on international resources allocated in the countries' budgets by international financing bodies
- Information on gender effects within the projects
- Information on the environmental administrative structure

In Tunisia the Ministry of Environment has been the counterpart for one projects i.e. the development of an environmental action programme for greater Sousse and The National Sewerage Agency for five studies, training and technical assistance.

In Senegal the Ministry of Environment, previously the Ministry of Tourism and Environment has been the counterpart for three projects i.e. the development of an environmental national action programme, an environmental monitoring programme and a study on the rehabilitation of four waste-water treatment plants. One project, comprising an inventory of industrial discharges of solid waste, fluid waste and air emissions, has been carried out in co-operation with the Ministry of Industry.

2.2 Approaches and methods used in the evaluation

Mr Ulf von Brömssen and Mrs Kajsa Sundberg have performed the evaluations, both members of the staff of the Swedish Environmental Protection Agency in Stockholm. The estimated cost of the evaluation amounts to 255.000 SEK. The visit to Tunisia was made in March 23-27 and the visit to Senegal during a week in September 7-15, 1998.

The evaluation consisted of six steps.

- Studies and analysis of background material i.e. documents provided by Sida
- Interviews with Sida and consultants who have participated in the projects
- Interviews with authorities concerned and field visits in Tunisia and Senegal
- Preparation of a report according to structure provided by Sida
- Discussion of draft report with selected persons in Senegal and Sweden
- Delivery of final report to Sida

The persons interviewed in Tunisia as well as in Senegal have been selected with the aid of Sida, the Swedish Embassy in Tunis, the Swedish consulate in Dakar and the consultants who have taken part in the projects. Civil servants at different levels in the public organisations who are involved in and responsible for the projects have been interviewed at site. The interviews made have concentrated on the projects' relevance, the efficiency of project implementation, the results, the quality and effects achieved, long term impact, sustainability, cost effectiveness and also side-effects. The institutional structure, including the roles and responsibilities of different authorities in the environmental field, has also been studied.

The interviews have followed a model based on Sida's Terms of Reference for evaluations, see appendix 1.

2.3 Limitations of the study

As some of the staff who participated in the projects now have other duties, it has not always been possible to obtain first hand information.

As staff and organisations benefit from collaboration and financial support from Sida, some information may be too positive. However we have gained the impression that the Tunisians and the Senegalese interviewed have been sincere to a great extent and have provided both critical and constructive ideas.

3 Findings – general

In chapter 6, the Tunisian projects, and chapter 7, the Senegalese projects, the development context of the different projects evaluated is presented in detail.

When evaluating the results of the projects financed by Sida, it is important to take into account that Tunisia has experience of some 30 years of environmental work. Senegal on the other hand has only very recently started its work on the environment. Results from the environmental projects will be seen more rapidly in Tunisia, while results will take a longer time to be visible in Senegal since the environmental concepts that have been developed will have to become established, accepted and implemented in the daily work of the different sectors of society.

A major constraint to the implementation of the environmental measures proposed in the programmes and projects supported by BITS/Sida in Tunisia and Senegal is the poor economic situation of the two countries. International financing will be necessary, and the financing community declared at the Rio conference that they are prepared to support developing countries, but a normal prerequisite is that pre-feasibility studies should be presented by the applicants.

In Tunisia support from Sida has been important for developing and planning the sustainable development of Tunisia's most important industry, the tourist industry. Further development will be required in the field of the environment, solid waste and re-use of treated sewage water.

In Senegal the main questions are the environmental and sustainable utilization of limited, and already partly overexploited natural resources, by a rapidly expanding population, sanitary problems due to poor management of drinking water supplies, uncontrolled discharge of municipal and industrial sewage and solid waste. These problems are very evident in the capital city, Dakar. The necessity to reduce the birth rate has been pointed out in the Senegalese national environmental protection action programme. It was pointed out that further assistance would be required in the field of family planning in order to reduce birth rates.

Co-operation between the Swedish consultants, the experts from the Swedish Environmental Protection Agency and the national environmental protection authorities of the recipient countries has worked well. Interdisciplinary knowledge and experience from different fields of environmental work has resulted in programmes adapted to national needs and greater know-how at different levels in the administrations in the two countries.

Concerning gender aspects, it has not been possible to find any direct effects on women since this issue has not been requested in the projects and thus not treated in the projects evaluated.

Institutions
During the last 30 years Tunisia has developed institutions in the field of the environment that are now well established. Senegal, on the other hand, is in a phase of initial organization. Swedish support in the field of wastewater has contributed to the establishment of the National Sewage Authority (ONAS) in Tunisia and a similar authority in Senegal. In Tunisia this support has also contributed to the establishment of the Technical Environmental Education

Center (CITET), which co-operates with other French-speaking counties in Africa, e.g. Senegal.

Laws
In Tunisia active work is being taking place in the legislative field and the legislation is being improved in line with developments in the country. The establishment of the Ministry of Environment and Planning in 1989, the reorganization of ONAS in 1993 and the establishment of the technical education institute, CITET, are all results of active work in the environmental field where Swedish support has been of importance.

The present environmental legislation in Senegal does not provide the possibility to take legal action against those who do not follow the law. However a proposal for a new environmental protection act will be presented to the parliament within the next twelve months.

Environmental plans and monitoring
The development of the two Environmental Action Programmes, the national programme in Senegal and the regional programme in Tunisia, are good examples of the transfer of conceptual know how and a methodology with the aim of developing environmental programmes, as opposed to the delivery of detailed final products. Programmes developed with a mutually agreed strategy for solving identified problems and defined measures for defined time perspectives provide a very good strategic environmental instrument for the recipient countries. This methodology will act, and has already acted, as a catalyst in the process with new environmental programmes undertaken by the countries themselves. Examples are the development of programmes for new regions, for different sectors and at regional and local levels. The type of Swedish support and co-operation mentioned above has been of strategic importance for the recipient countries to enbale them develop a sustainable environment and national resources.

The regional environmental programme for Sousse in Tunisia has given the parties involved a better understanding of the effects of collective pressure on the environment, of cost-awareness of environmental protection, and of direct effects on the region's economic development.

The final report fom the Senegalese PROMOSEN project "Towards a National Environmental Monitoring Programme" presents a detailed proposal and estimated costs for a national environmental and monitoring programme. However, the programme is considered to be too expensive by the Senegalese. It needs to be reviewed and priorities need to be set for gradual implementation over the next few years. The new monitoring programme should be integrated into the National Environmental Action Programme, the PNAE programme. This is a process that the Senegalese would like Sida to support. The Senegalese environmental monitoring institute, CSE, has already designed a number of project plans, which would be of great value in connection with an application for financial support from Sida and other external financing bodies.

Education and seminars
Training in water and sanitation techniques for the personnel working at sewage treatment plants is important in order to transfer and maintain know-how. The Tunisians considered that the training courses for technicians at the sewage treatment plants have been very relevant and cost-efficient. The evaluation team agrees with this assessment, taking into account the

positive and sustainable treatment results at the sewage plants in Tunisia. The results of the training courses are considered to support sustainability in wastewater treatment and the protection of bathing water quality at the coastal tourist resorts.

The UNEP intention of nominating ONAS as a resource organization for Mediterranean regional training in this field is an indication that the training efforts have proved to be successful.

The levels of attainment in the field of wastewater treatment in the Tunisian institutions have improved, largely due to the Swedish support, and are now of good standard. During recent years the staff at ONAS in Tunisia have constructed 10 plants without technical assistance and they have found that the plants function well. ONAS has also worked out the operational instructions.

The seminar held in Senegal to implement the National Environment Action Plan has served to get the plan accepted among different actors in society as a base for the future environmental work. This is important and will facilitate the implementation of the plan.

Wastewater plants
During their long programmes of support in the fields of sewage treatment and environmental action programmes in Tunisia and later in Senegal, BITS and Sida have provided a basis for the two countries for their formulation of applications to international financing bodies. With the aid of this Swedish support both countries have received international financing for different investments.

The work in respect of collection and treatment of wastewater in Tunisia has been successful; the support for studies by Swedish consultants has given Tunisia a basis to obtain support from other donors to build sewage and wastewater treatment plants

In Senegal the work on collection and treatment of wastewater is only at the starting point. Senegal is a poor country, the educational levels are low, and there is a lack of institutions and infrastructure. This is the reason why it will take rather a long time to construct conventional sewage systems to serve the cities, and to operate them. People find even modest fees for water and sewage difficult to afford.

Industry and the environment
The environmental impact caused by industry in Senegal observed by the evaluation team is considerable and needs to be improved. Existing environmental legislation does not provide the instruments to make it possible to enforce the law and make the industries protect the environment. The country is poor and to a great extent foreign companies own the industries and they often take very poor responsibility of environmental consequences caused by their production. This makes it possible for the industries to exploit the country if there are no international agreements or co-operation in this field.

The project "Environmental investigation within industry" initiated a programme of co-operation between the Ministry of Environment and the Ministry of Industry in Senegal. However we found that there are only limited possibilities to take the environment into consideration at the Ministry of Industry.

4. *Conclusions and Recommendations*

The evaluation team considers that international support for development of National, Regional and Local Environmental and Physical Plans is of strategic importance for a sustainable development of environment and natural resources. The evaluation team recommends further support for following up and for further development within this field of strategic environmental planning.

Belonging seminars to make the above mentioned Plans accepted among different actors in society are also of strategic importance for the receiving countries. The evaluation team recommend that support to carry out this kind of studies and seminars will promote successful environmental development in the receiving countries.

To be successful in Tunisia and Senegal in the work of achieving sustainable development, it is important to support co-operation between environmental institutions and other parts of society at national, regional and local level as well as between different ministries, industries and schools. More international co-operation is also important.

To achieve optimal results from projects it is important that the project goal is given higher priority than the cost ceiling, i.e. that there is flexibility in the financing. It is important that there are ways that permit the review and revision of original project plans and cost ceilings. It must be possible to take unforeseen events or a desirable revision of the project programme, as well as decisions on additional funding, into consideration during the course of a project without unnecessary time-consuming administrative procedures.

To improve the skills of local consultants it is important that the consultants and local staff co-operate actively in the projects; the local consultants should not merely have special components to carry out that are separate from the project as a whole.

Regular seminars and evaluations of technical questions as well as training are important for the local staff to enable them to keep up with technical and scientific developments and to improve their skills.

The evaluation team considers that the projects in Tunisia and Senegal, as well as projects in general concerning sewage piping and treatment, would benefit from discussions prior to international support on the following objectives:

- carrying out Environmental Impact Assessments
- analysis of the following factors which are of importance for an environmentally sustainable water supply and sewage system:
- Factors which allow a good level of hygiene and do not jeopardize health;
- Factors that conserve and make maximum use of nutrients in wastewater, sludge, latrines, organic waster as well as of treated sewage water (for example include the re-use of treated wastewater for irrigation purposes);
- Factors that do not cause environmental damage in the short or long term perspective
- Factors that are reliable at all stages, in all types of weather and at all times of the year;
- Factors that are practical and easy to understand for those using and managing the system.

Future support to Tunisia in the field of wastewater treatment should concentrate on the transfer of know-how and upgrading through national and international seminars.

In Senegal investments were made in the 1980s in piping and wastewater treatment plants in Kaolack and Louga. These systems did not function well. This is the reason why Senegal asked Sida/BITS for support to work out a way to recondition the systems. It was shown that very few people, 2 - 4 per cent of the population were connected to the piping system and the flow to the treatment plant was too low to make treatment possible. The consultant who was contracted pointed out that firstly measures to increase the number of connected must be taken and then investments to recondition the wastewater treatment plant could be made. This seems quite reasonable.

The evaluation team agrees that the problems with waste and wastewater must often be solved in stages. This can be done for example by first constructing piping and disposing of the collected wastewater in a safe way into the sea, and later, when the economic situation in the country improves, treating it in a wastewater treatment plant. In smaller towns and on the outskirts of larger cities it can often also be beneficial to use other systems for taking care of latrines (night soil) instead of piping, for example composting with organic household waste, and using this as a fertilizer in agriculture. It would have been valuable to carry out an Environment Impact Assessment to evaluate different systems for treatment of latrines (night soil), household water and garbage to identify the most cost-efficient system.

When a recipient country has not built up its skills and know-how, it is valuable to receive technical assistance when constructing wastewater treatment plants and equipment to guarantee good quality. This was the situation in Tunisia when the country received this kind of support, but it will not be relevant in the future. In Senegal this kind of support would be valuable for several years to come.

5 Lessons learned

Transfer of knowledge has high priority in co-operation with recipient countries, when taking into account the long time perspectives. Transfer of knowledge is time-consuming and expensive, but will pay in the long run. Co-operation in the field of transfer of knowledge should therefore be continuous. The goal of the training strategy should be that the recipient country develops teaching resources of its own in order to secure sustainability in the training process. It is also important that there is training at all levels.

Environmental Development Plans and Physical Planning constitute an important tool when structuring practical measures for the work to achieve sustainable development. It is important to secure support from different sectors in society, from national, regional and local authorities, from other people concerned and their representatives. These plans will also serve as a base to verify the need of support from international funding organisations.

To achieve positive results, it seems important that there are well-developed national, regional and local environmental physical action plans that are strongly supported by the ministries concerned, regional and local authorities, industries and the people concerned and their representatives. With an environmental physical action plan as a base, it is much easier to

implement the action programme with its different priorities. It seems important to give support to a limited number of fields and to stick to these fields for a long period of time. Recipient countries prefer continuity in their co-operation with foreign companies or agencies for a period of years. The learning process in respect of local conditions and the feedback of experience from projects implemented in the recipient country takes a long time, as does establishing personal networks and building up trustful relationships.

To obtain sustainability it is valuable to have a limited number of development areas for co-operation projects in a country and to work with them over a long period of time. This also makes it easier to motivate external financiers to make contributions in the area. The Swedish projects with pre-studies, design syudies, procurement and construction controls of water-water treatment plants constitute a good example. Today Tunisia has a competent and effective agency (ONAS) and a large proportion of its local communities are connected to treatment plants. The regional PVGS project has already generated knowledge so that two new studies to draw up environmental physical plans are in progress in two regions.

To improve environmental support to developing countries

- To achieve optimal results from projects given support, it is important that the project goals are clearly stipulated.
- All environmental projects should have a clearly defined component in which goals and contributions for the transfer of knowledge are specified. The goal for the transfer of knowledge is given high priority by Sida and should therefore guide and not limit the contribution in situations where the transfer of knowledge proves to be more time-consuming than estimated in project proposals. The goal of transfer of knowledge should primarily guide flexibility in the financing during the implementation of the project.
- Greater and better integration in the project of personnel from the recipient country and the donor country is required.
- Swedish personnel working in French speaking countries generally need to improve their knowledge of the French language
- Mutual understanding between donor and recipient countries on administrative procedures for the payment and financing of projects would prevent a great deal of misunderstanding and delays between the parties
- Sida should promote active co-operation between environmental and industrial authorities as well as international co-operation in donor countries
- Sida should consider support in the form of juridical experts to improve the possibilities of enforcing the environmental legislation in Senegal
- It is recommended that ONAS plans and holds training programmes at regular intervals to upgrade the professional skills of different categories of its staff in line with international developments. It is recommended that Sida supports these types of upgrading courses.

6 Tunisia

6.1 Planning context

In Tunisia support by Sida has been important for developing and planning for a sustainable development of Tunisia's most important industry, the tourist industry. Further development will be required in the field of environment; solid waste and reuse of treated sewage water.

The problems caused by wastewater were observed at the end of the 1960s when there was a cholera epidemic, and the work of building wastewater treatment plants then started. A national programme for wastewater treatment was initiated in the late 1970s and a national agency for sewage treatment, ONAS, L´Office National de l´Assainissement, was established in 1974. Since then Sweden has supported Tunisia with technical assistance in the field of environment protection and wastewater treatment, mainly through BITS.

Today Tunisia is a country in which the environmental policy and the environmental institutions are well developed. Under (MEAT) the Ministry of Environment and Planning or Ministrère de l´Environnement et de l´Aménagement du Territoire there are four agencies (see also appendix 3c):

- (ANPE), The National Environmental Protection Agency or Agence Nationale du Protection de l´Environnement
- (ONAS), The National Institute for wastewater Treatment or l´Office National de lÁssainissement
- (CITET) Tunis International Centre for Environmental Technologies or Centre International des Technologies de l´Environnement de Tunis
- (APAL) The Environmental and Planning Agency or Agence de Protection et Amenagement du Litoral

The Ministry of Environment and Planning was established in 1991, with regional offices in Sfax, Sousse, Béja, Kairouan and Tozeur.

ANPE has given priority to the following four fields:

1. Environment protection studies within industry and agriculture; an Environmental Impact Assessment has to be presented to ANPE before a new project is started;
2 Control of emissions, production etc. It is intended that an emission tax will be introduced to finance the control function; the control function will also include how the work conforms to conventions. A depollution fund ("Fonde de depollution") has been set up with funds from the government and industry. It lends money at a low rate of interest and co-operates with ONAS;
3 The legal field including information to the public, schools etc;
4 Solid waste.

OTED is part of ANPE. The work at OTED is to find indicators for Tunisian conditions in respect of water, soil, biodiversity, industry, areas of high ecological value etc. This work is to finish in July this year. Observers have already started their work and annual reports on the environment are being published.

The National Organisation for Waste Water Treatment, ONAS, was founded in 1974 and was modified in 1993 when it was given the task to protect all kinds of water. When ONAS started its work, it concentrated on wastewater treatment in the big cities and the tourist resorts at the seaside. Then came the work in smaller and medium size towns, also situated in the inland parts of the country where protection of the ground water is important. The majority of the people in Tunisia live along the coast.

From the start in the 1960 ies the development of wastewater treatment plants in Tunisia have grown to 30 plants in 1991, 52 in 1998. ONAS plans to have 75 plants in operation by the year 2001.

The aim of wastewater treatment is to:

1 improves the sanitary conditions under which the people live and to protect the people;
2 protect the environment (and natural resources); which means meeting Tunisian standards, which are different for different types of water: normally biological treatment with BOD-reduction is sufficient, but if the water is intended to be used as drinking water and if there is a risk that emissions eutrophicate the water, treatment to reduce P and N is also required;
3 economise with water as a resource; 120 000 000 m^3/year is treated to be re-used for irrigation, e.g. for cultivating cotton; however only about 25 % is used for irrigation. However there is more than 20 years' experience of irrigation in Tunisia and there are specific rules in respect of salinity.

CITET, The National Institute for wastewater Treatment was founded in 1997. ONAS co-operates with CITET in the fields of education, research and technology and about 20 persons a year get training in the field of wastewater treatment. They study economics, technology and languages for three months and then spend six months at a plant to obtain practical experience. The training is intended for Tunisia and other French-speaking countries in Africa. Before CITET was founded, ONAS provided similar training programmes for 5 - 6 years with assistance from BITS/ASDI.

Limited rainfall in Tunisia makes it important to re-use the treated wastewater for irrigation. It can be stored in ponds or infiltrated into the ground water. The re-use for irrigation has not yet become common practice and most treated wastewater is discharged into the sea. As the biologically treated water contains rather large amounts of nitrogen and phosphorus, long outlet pipes have been built to avoid problems on the coast. This applies to Monastir, Sousse and Djerba. There is Tunisian standards for discharges of treated wastewater.

A special problem when re-using the treated wastewater for irrigation purposes is salinity. In the north of Tunisia the salinity of the ground water is low but it is important to keep the salinity of water used for irrigation under observation.

International co-operation to protect the environment is important. As Tunisia has signed the Barcelona Convention which, among other things, deals with questions about the Mediterranean Sea, and all other conventions on the Mediterranean Sea, the country helps to reduce he environmental impact on the sea.

The Ministry of Health is responsible for health and transmission of infectious diseases related to waste water, which means that it is important with co-operation between the Ministries of Health and Environment.

6.2 Regional Environmental Action Plan for Greater Sousse - Plan Vert du Grand Sousse

6.2.1 Programme context, development, history, and description of the project

The background to the project
The most important environmental problems in the Sousse area are developments in the urban living environment, industrial pollution, problems with solid waste, erosion problems in connection with changes in farming methods, and non-authorized habitation.

In 1992 the Tunisians approached Sweden with a request for support to draw up an environmental and development plan for the Sousse region, the so-called "PVGS - Plan Vert du Grand Sousse". The aim of producing an environmental and development plan was to safeguard the sustainable use and development of the region's natural resources, natural environment and urban environment, and industry and commerce, mainly tourism and industry. The objective of the plan is to develop a strategic environmental and development plan with specific environmental and development goals in the region in a 5, 10 and 20 years' perspective. The project shall also develop a concrete action plan, which specifies in detail the priority projects required to fulfil the environmental, and development goals in the region. It shall also be possible to use the environmental and development plan in other regions in Tunisia and to integrate it into the national environmental plan.

The client for the project has been Tunisia's Ministry for the Environment and Regional Planning. BITS/Sida supplied the external development co-operation funding. The assignment was implemented by the Swedish consultants company RUST VA-PROJEKT AB, now VAI VA-PROJEKT AB.
The total duration of the project was estimated at 29.3 man months distributed over a project period of 17 months. The cost for fees amounted to SEK 3.1 million and overhead expenses to SEK 0.4 million. The Tunisian contribution amounted to 60.000 Tunisian dinar, which corresponds to some SEK 420,000.
The assignment contained three components

- Documentation and analysis of the current status of the environmental sector and other sectors
- Production of an overall, strategic regional environment and development plan including the identification of 37 project proposals to realise the plan
- Development of an action plan containing 12 projects, studied in detail and ranked in order of priority, which constitutes the final report for the "environment and development plan for the Souse region"

6.2.2 Findings

The assessments and recommendations of the evaluation
Fulfilment of the project plan's objectives and time schedule

The objectives of the project plan have been fulfilled in a satisfactory way and, in general, the time schedule has been kept. The problem identification within the Sousse area has been performed satisfactorily and has been appreciated by the client. Support and acceptance of the objectives and priorities have been obtained in major seminars. Representatives of different parties concerned have attended these at different levels during the course of the project.

In general there have been no problems in co-operation between the recipient and the consultant, suppliers and development co-operation agency. Certain language problems have occurred since it has been difficult to understand some of the participating Swedish experts, for example at the major meetings. In general Swedish experts need to improve their French.

The Tunisian partners in co-operation have been two local consultants. The first was replaced with satisfactory results.

We would like to stress the great importance of the support gained in discussions, of working jointly on the PVGS in large seminars with the various parties concerned. It has been possible to solve many problems and to produce a plan supported by all parties concerned. It has also permitted the creation of internal networks between agencies and officials who were previously often isolated from each other.

Total cost, cost-efficiency, and funds for implementation
The Tunisians are satisfied with the BITS/Sida contributions to projects related to the environment, where the PVGS study is one example.
The Swedish financing does not seem to have led to any major problems, but the disbursement procedure is experienced as slow and can be improved.
The assessment of the recipient country is that the Project for PVGS has been worth the money, but that the total amount is high.
Funds have been allocated for the implementation of proposed measures by obtaining international credits for some projects. The work on financing the others is in progress.

Equality between women and men
Both men and women work at many of the agencies we visited. As institutes of higher education have a gradually increasing number of women graduates, the participation of women in the public sector will increase. There is an explicit objective to appoint women to management posts in the environmental administration and to work to improve the living conditions of the sick, women and children. We have not been able to distinguish any special treatment in respect of gender aspects within the project most probably since this was not regarded to be part of the projects terms of reference.

Aspects of the transfer of knowledge
The project has generated concrete and measurable aspects in the work of environmental conservation. It has been customary to draw up individual plans without consulting other agencies. There is a lack of experience of co-ordinated planning and co-operation in practical work. Experience of projects with practical environment conservation work, with taking concrete action to solve problems, has provided new experience for many.
The project has given those responsible a better feeling of the importance of the effects of collective pressure on the environment as well as a better cost-awareness that protection of the environment has a direct effect on economic development.

Where co-operation with local consultants is concerned better integration and involvement of Tunisian personnel in the projects is necessary in order to achieve a better transfer of knowledge in both technical and organisational subjects. In the short-term project perspective this is perhaps not optimal from the cost point of view but should be discussed within the donor agency taking into consideration the long term goals.

There is a great need and desire for further education for local personnel to enable them to keep up with international technical and scientific developments in the projects they are working in.

Further education - if the projects are to have a substantial and sustainable impact, regular seminars should be held, according to the Tunisians, on the evaluation of the projects implemented. Developments in the field of the environment have proceeded further in Tunisia than in most other countries in Africa. It is therefore important that the knowledge and experience of the Tunisians is kept up to date and developed both for the needs of the country and for the possibility to pass on this knowledge further through education programmes in Tunisia and other countries in the region, mainly in Africa.

Implementation of the PVGS plan
The Tunisians have taken valuable initiatives for the implementation of the plan. For example they have formed a consultative group containing management representatives from the various local authorities in order to guarantee researchers and funding for the projects. Tunisia itself has started projects in two other coastal towns for the production of similar regional environment and development plans (Plans Vertes).

Other aspects
The Tunisians presented the idea that Swedish companies with experience of working in Tunisia should utilise the possibility to co-operate on strict business conditions on the international market with their Tunisian partners.

Recommendations on the follow-up of projects
If the projects are to have a substantial and sustainable impact, Sida should consider funding regular seminars in the recipient country. Such seminars could include an evaluation of the planned projects, which have been implemented and if and to what extent Sida's various objectives have been fulfilled.

There is a great need and desire on the part of the Tunisians for further complementary post education for local personnel. This would enable them to keep up with international technical and scientific developments in the projects they have worked in (for example the planning project PVGS, and design operation and maintenance of treatment plants). This is a precondition for the Tunisians to pursue and develop work in this field.

Lessons learned
The Tunisians claim that they give priority to Swedish financing of projects with a great amount of transfer of know-how in order to build up knowledge in the country. Other donors are approached for financing construction projects.The pilot project PVGS which can be and already is repeated in other places by the Tunisians themselves is a good example of successful transfer of knowledge. All environmental projects should have a clearly defined component in which goals and contributions for the transfer of knowledge are included.

More and better integration in the project of personnel from the recipient country and the donor country is required.

To achieve optimal results from projects it is important that the project goal is stipulated before the cost ceilings, i e that there is flexibility in the financing. It is important that there are ways, which permit the examination and revision of original project plans and cost ceilings. It must be possible to take into consideration unforeseen events or a desirable revision of the project programme, as well a decisions on additional funding, during the course of a project without unnecessary time-consuming administrative procedures.

6.2.3 Summary of findings PVGS

The development of the PVGS, the Regional Environmental Action Plan for Greater Sousse, has resulted in a well structured action program supported by all parties concerned and has:

- given the Tunisians a planning tool, which they have already applied in ongoing development of two Environmental Action Plans for two regions
- created active internal networks between agencies and officials , previously working rather isolated from each other
- produced experience of coordinated planning and cooperation with different actors in practical work on development of environmental action programs
- given the parties involved a better understanding of the effects of collective pressure on the environment, of cost-awareness of environmental protection and direct effects on the regions economic development
- resulted in implementation of some of the projects with the use of international financing and funds allocated from the Tunisian budget.

6.3 *Project: Training in water and sanitation techniques for the personnel at sewage treatment plants in Tunisia*

6.3.1 Programme context, project development, history, description

Since the late seventies, BITS has supported technical assistance to Tunisia in the field of environmental protection, especially for feasibility studies, design and construction of sewage treatment plants for the protection of human health, water resources and the coastal environment. In order to secure an optimal operation of these new stations, Swedish assistance was given for in-service training courses for the technical personnel at these stations. Training courses were supported by BITS in 1980, 1987 and in 1990. As a basis for discussions for further co-operation between Tunisia and Sweden in the field of environment protection, BITS undertook an evaluation of the training courses in 1990. The evaluation presented here is a complementary evaluation of the training projects presented in a new standardised format which has been requested by Sida since 1996 for all Sida projects.

The project history
At the request of the Tunisian waste-water authority ONAS, BITS was requested to give support in the field of in-service training of technical staff working at waste-water stations. The courses were successful and were repeated twice.

1980	Kairouan	40 pupils	Granstedt
1987	Choutrana in Tunis	30 pupils	PURAC
1990	Sousse South	30 pupils	PURAC

Funding of the training courses: BITS (SEK) and ONAS (Dinars)

1980	BITS	no information	ONAS	no information
1987	BITS	1.840.000	ONAS	30.000
1990	BITS	1.645.000	ONAS	no information

The in-service training courses were intended to give the two groups of staff, engineers and technicians, elementary knowledge in the field of environmental protection of water resources; technical and practical knowledge of treating different types of sewage water; economic aspects; and management of waste-water treatment plants. Most of the participants had a background of a one-year basic training course in wastewater treatment in Tunis.

The duty of the Swedish consultant was to supply the course programme, external teachers, course literature and demonstration material, while ONAS was to supply an administrative co-ordinator, lecture rooms, and travel expenses, local transport facilities, and lodging and meals for the teachers.

The courses comprised the following topics: treatment techniques, laboratory techniques, mechanics and maintenance, electricity, security issues, and protection for personnel. The participants were divided into two groups and each given five weeks of training.

In its positive evaluation ONAS states that the training courses have given the participants:
- more knowledge
- supplementary experience from specialists in different fields
- high level applied knowledge for everyday technical and management problems and duties
- updated knowledge for older ONAS staff members

- access to training course literature

***6.3.2 Findings**:* information, analysis of findings, evidence of achievements

For parties and organisations active in the Environmental Sector, See Annex 3c

Achievement of objectives, obtained results and effects
The teachers and the participants considered that the students had assimilated the courses in an appropriate way in view of their theoretical and practical experience. Those achieved the best test results were those with the best background knowledge, which is therefor, a desired prerequisite.
The management and good results at the wastewater treatment plants have resulted in good bathing water quality at the coastal bathing resorts. In respect of water use and treatment, the tourist industry is sustainable. The fact that the Tunisians themselves subsequently established similar training courses supports our opinion that the Sida training courses have been of great value.
About 100 members of the ONAS staff have been given additional upgraded training in the three training courses during the ten-year period 1980 - 1990. Almost all of the participants have remained on the ONAS payroll.

Unforeseen results of the project
The improved levels of professionalism and the high status of ONAS has facilitated the recruitment of staff into the sewage and garbage-handling sector, which traditionally has been a field of very low status.

The UNEP nomination of ONAS as a resource organisation for Mediterranean regional training in its field is a result of the high quality of ONAS training programmes. Co-operation has been established with Senegal in this field of training.

The evaluation team considers the confidence of UNEP as a result of the Tunisian management and development of the Swedish-Sida initiative and long-term support from Sida for sewage treatment and training.

Quality of rendered external services
The Tunisians considered that the teachers were in general very competent, although in a few individual cases they had too much theoretical knowledge rather than practical experience to discuss problems. Some of the Swedish teachers could however have had a better knowledge of the French language.

Financial aspects
ONAS considers that the costs of the training courses were rather high. In order to reduce the costs, ONAS is considering the possibility of requesting foreign inputs only in areas in which Tunisian resources are not available, taking into account both external costs and the possibility to release key ONAS staff, with heavy workloads, from their daily duties.
The evaluation team appreciates the difficulties in planning and performing training courses in Tunisia with external teachers, and the ambition to supply a full team of qualified teachers. The courses are considered cost efficient in relation to the long-term results achieved.

Co-operation between recipient and consultant, supplier and financing agency
In general co-operation has been good. The problems that have occurred could have been avoided by better planning. The delay in concluding the contract caused difficulties in providing teachers at short notice.

The project's impact on co-operation between the Tunisian parties concerned
All staff trained has remained on the payroll of ONAS, almost all in operative waste works positions. The professional image of ONAS is very high in Tunisia.

Aspects on the transfer of knowledge
The training course projects have been highly appreciated for their ability to optimise the use of the theoretical courses and practical applications at the place of work of the course participants. It was possible to apply the new knowledge acquired immediately in the daily work.

New funding allocated to new training courses
In 1990, after the end of the last course, the Tunisians raised the question of continuing the programme, taking into account new environmental demands. The new training courses requested were intended to improve the ability of participants to optimise the operation of the treatment stations in order to achieve better results at optimal costs.
Hitherto this project has not developed into a joint project with Sweden

Assessment of gender aspects in the project
Gender aspects were not part of the projects at this time, and no information is available to the evaluation team in this matter, since there is no statistics available regarding women.

The possibility of the recipient to perform similar projects itself
Today ONAS has the professional capacity to perform part of the training courses. One limitation is that it is difficult for the ONAS professional and management staff to find time for extensive training. External professionals should be utilised for specialist topics and local professionals should cover the remaining parts.

6.3.3 Summary of findings

- The training courses for staff at the Tunisian treatment plants were considered by the Tunisians to have been very pedagogical and useful.
- Today similar courses are run by CITET, Tunis International Centre for Environmental Technologies, financed by Sweden and Germany.
- The in-service training courses offered in the field of wastewater treatment have been relevant, appropriate and cost-efficient.
- The results of the training courses are considered to support sustainability in wastewater treatment and the protection of bathing water quality at the coastal tourist resorts.
- Swedish personnel working in French speaking countries generally need to improve their knowledge of the French language
- It is recommended that ONAS plans and holds training programmes at regular intervals to upgrade the professional skills of different categories of their staff in line with international developments. It is recommended that Sida supports such upgrading courses.
- The in-service training of basic theory by national teachers should be combined with experts with high levels of theoretical knowledge and extensive practical experience in their fields.

- The UNEP intention of nominating ONAS as a resource organisation for Mediterranean regional training in this field is an indication that the training efforts have proved to be successful.

6.4 Technical assistance: Wastewater Treatment plants

6.4.1 Programme context

In 1990 ONAS applied to BITS for support for technical assistance for supervision and quality control in respect of construction work and deliveries of equipment to sewage treatment plants in Kasserine and Mahdia (TUN0441) and in the city of Gabès (TUN0451).

Scandiaconsult was responsible for the planning and design of these wastewater treatment plants. The Swedish company Purac was contracted to construct and deliver the plant in Kasserine, a Belgian company was contracted for the plant in Mahdia.

The work of the Swedish consultant was to supervise and assure the quality of the construction of the buildings, to test materials and equipment, to check equipment on delivery, and to test the equipment when it was put into operation. The consultant also had the task of writing operation instructions for the future staff at the plants. The construction of the plant in Gabès was estimated at two and a half years, half a year longer than the other plants. This was due to the fact that a more advanced technique was selected as the levels of pollutants are rather high in Gabès since many industries are situated there.

In 1992 ONAS applied to BITS for support for feasibility studies for the construction of wastewater treatment plants in three cities, Bizerte, El Kef and Borj Cedria (TUN0461). ONAS wanted services to carry out the feasibility studies for the construction of waste-water treatment plants in the three cities, to invite tenders and to examine the offers received. The services from Scandiaconsult International AB also included the training of one engineer from ONAS at the company's office for a period of one month. The subject of the training was the construction and dimensioning of waste-water treatment plants.

Wastewater treatment has been adapted to local conditions. Chemical treatment is not used as it is intended that the treated water shall be used for irrigation purposes and the content of nutritious substances is also useful for this purpose. However when implementing the projects some difficulties to find places to store the water meant for irrigation arose.

A Dutch consulting company had drawn up a master plan for the waste-water treatment system in Grand Bizerte in co-operation with a local consulting company. The plant in Bizerte is part of this plan. It shall treat waste water (36 000 m^3/d with 9 500 kg BOD_5/d) coming from Bizerte and its suburbs, in all 182,000 inhabitants (in the year 2010).

The plant in El Kef shall treat 6 000 m^3/d waste water with 3 000 kg BOD_5/d coming from 67,000 inhabitants (in the year 2010).

The plant in Borj Cedria, a city to be built, in a first stage, for 40,000 inhabitants and with beds for 7,000 tourists, shall treat waste water from a town of that size.

6.4.2 Findings

The projects' relevance

The tourist industry in Tunisia is of great value and important for the country and hence it is vital that the conditions are attractive to the tourists - which includes high hygienic standards, clean water to drink and to swim in, and tidy surroundings. As it rains very little in Tunisia it is also important to re-use waste water for irrigation purposes. These aspects are naturally also important for the Tunisian people.

The wastewater treatment plants that have been constructed in Tunisia are designed on the basis of conventional techniques. The investments in wastewater treatment plants are relevant for the development of the country.

Efficiency of project implementation

The financing part of the projects has required a great deal of effort. Sometimes it has taken rather a long time for BITS to decide on grants. This has had the result, for example, that a project in which a consultant shall provide technical assistance has started long before it has been possible to sign a contract with the consultant. This has had the consequence that the consultant has not taken part in the important initial stage of the project.

The central and the regional representatives of the Tunisian ONAS have not always been of the same opinion when it comes to the need of technical assistance. At the regional ONAS there are members of staff who consider their own organisation to be efficient and that decentralisation makes it easy to implement their projects.

Sometimes the role and responsibility of the consultant has not been quite clear, which has led to delays in some cases.

It has sometimes been difficult to solve practical problems which have arisen during the implementation when the technical assistance is only in the form of short visits for a couple of days once or twice a year. The local representatives of ONAS feel that it is of greater value to be given assistance over a longer period of time, when the plant starts to operate, and also to receive assistance from different kinds of specialists. However it turned out to be useful that the consultant who provided technical assistance during implementation was the same as the one who designed it: he was well acquainted with the solutions which had been chosen and could easily change details if necessary. The co-operation with Swedish companies is considered valuable and their staff competent.

From the gender point of view the projects are valuable since efficient and hygienic water and sewage systems and waste management relieve the pressure especially on women. Several women have also become project leaders in this field and women have been among those studying at CITET.

The contacts with the Swedish banks about credits have also worked out very well; they have sent money immediately when they have received the bills.

Results and effects achieved

The wastewater plants which have been constructed (and those under construction) upon basis of Swedish studies have been built where there have been no plants before. The plants reduce the great number of outlet zones to just one, which has been selected with regard to the environment. The discharge of matters causing biochemical oxygen demand (BOD) to the sea has also been reduced which is positive from environmental point of view. The treated wastewater also has a quality that makes it possible to re-use the treated water for

irrigation purposes. However only a minor part is used for irrigation at the moment as it turned out that it was not possible to construct the pipes and ponds where they were planned. This is partly due to administrative difficulties in finding areas for pipes and for ponds to store the water in. Better co-operation between different authorities in the country would prevent these kinds of problems.

The Swedish support in the field of wastewater has contributed to the establishment of the National Sewage Authority (ONAS) in Tunisia. It has also contributed to the establishment of the Technical Environmental Education Centre (CITET), which co-operates with other French-speaking countries in Africa, e.g. Senegal.

The work in respect of collection and treatment of wastewater in Tunisia has been successful; the support to carry out studies by Swedish consultants has given Tunisia a basis to get support from other donors to construct sewage and waste water treatment plants.

The level of attainment in the field of wastewater treatment in the Tunisian institutions has risen and is now comparatively high. During recent years the staff at ONAS has constructed 10 plants without technical assistance and they have found that the plants function well. ONAS has also worked out the operational instructions.

Side-effects.
Sweden has supported Tunisia in building wastewater treatment plants since the 1970s. To a great extent the same companies and persons have worked with the projects since then. This means that the persons involved know each other well and this has made the transfer of knowledge from the Swedish companies to the Tunisian staff at ONAS easy and efficient. The wastewater treatment plants, which were constructed earlier, turned out as pilot projects. As the plants evaluated in this study solve the same kind of problems and are of similar construction they can not be considered as pilot projects.

The legislative work is active and the laws are improved in line with developments in the country. The establishment of the Ministry of Environment and Planning in 1989, the reorganisation of ONAS in 1993 and the establishment of CITET are all the result of active work in the environmental field in which the Swedish support has been of importance.

Cost effectiveness
It is difficult to evaluate the cost-effectiveness of technical assistance, as it is not possible to compare with a situation without this assistance at the level of competence that existed at the actual time. However it seems as if the technical assistance for the development of wastewater treatment has promoted good knowledge and serious interest in this field in Tunisia.

Sustainability
The establishment of ONAS and the National Institute for Waste Water Treatment, (CITET) has contributed to maintaining the results of the projects. So does also the economic and social plan, which is drawn up every fifth year (Un plan de developpement economique et sociale = "plan quinqenal").

Training, which is part of the project when the plant starts to operate, is important for sustainability, as is regular training during operation. To keep up qualifications and to improve professional skill seminars, national and international are important. Also visits for the teachers at CITET and for those responsible for the operation of plants of a month's

duration to modern plants in Sweden and other countries to obtain experience of new techniques are valuable. However for this purpose it is necessary to have French-speaking tutors at the plants visited. Co-operation between plants in different parts of Tunisia is also important, but has hitherto not been very common.

Contacts and the provision of information to a large public need to be improved. There is a programme of co-operation with Canada to produce information for this purpose and also for teachers and students.

Other findings
The plants in Gabès, Kasserine and Mahdia, the last mentioned was visited, are now operating.

The construction of the plants proceeded well and no serious problems occurred that caused delays. The decentralised organisation made it easy to solve problems on site.

The regional staff pointed out that it would be especially valuable that the consultant who provided technical assistance was attending the projects at certain periods of it:

phase 1	projecting;
phase 2	inviting tenders;
phase 3	purchasing and selection of contractor; when examining the tenders the consultant ought to work together with ONAS ;
phase 4	during the construction period, about 6 months, the consultant ought to be on site all the time;
phase 5	at the meetings when ONAS takes over the plant from the contractor the consultant ought to be present;
phase 6	there are always problems when starting up and visits by the consultant are necessary then to help solve these problems.

The plant in Bizerte *(TUN0461)* is situated beside the coast and has discharged a great deal of wastewater directly into the sea. Now sewage pipes have been constructed relatively close to the beach and a pipe has been placed under the "river", linking the two parts of the town. The pipes go to a plant further inland where the water is cleaned, primarily in respect of biochemical oxygen-consuming substances (BOD). It is intended that the treated water shall be used for irrigation purposes and the silt for fertilising and soil improvement purposes. Due to the ownership situation in the area surrounding the treatment plant (the army has large areas of land) it has not been possible to lay pipes to build a storage dam for the water yet. A place further inland has recently been found to which the water shall be led and stored and hopefully be used for the irrigation. To the extent it is not possible to use water for irrigation purposes, it will be discharged into watercourse, which eventually flows into the sea. The Tunisian side considers that it will be sufficiently treated when it reaches the coast.

The recipient country considered that it would be valuable if the expert giving the technical support stayed a longer time on site (one week) at critical phases of the project (as opposed to short jet-set visits). The presence of the expert can be of decisive importance for the outcome of parts of the project, for example for inspections, negotiations and writing contracts.

6.4.3 Summary

The work in respect of collection and treatment of wastewater in Tunisia has been successful; the support to carry out studies by Swedish consultants has given Tunisia a basis to get support from other donors to build sewage and waste water treatment plants. The Swedish support has contributed to the establishment of ONAS and subsequently of CITET.

The level of attainment in the field of wastewater treatment within the Tunisian institutions has improved, considerably due to the Swedish support, and is now comparatively high. During recent years the staff at ONAS have constructed 10 plants without technical assistance and they have found that the plants function well. ONAS has also worked out the operational instructions.

The support to Tunisia in the field of wastewater treatment could concentrate on the transfer of know how in the future to maintain and upgrade it. Seminars, national and international, would be valuable.

It is important to keep up competence in the field of wastewater treatment and to obtain experience of new techniques. To do so it would be valuable for the teachers at CITET and those responsible for the operation of plants to attend seminars and visit modern plants in Sweden and other countries for a month or two. However for this purpose it is necessary to have French-speaking tutors at the plants visited. Co-operation between plants in different parts of Tunisia is also important, but has not hitherto been very common.

The work in respect of collection and treatment of wastewater in Tunisia has been successful; the support from other countries and the long period of support by the same consultants seem to have been important factors for this success.

Today the Tunisian institutions and their staff have achieved high professional levels in the field of wastewater treatment and their need seems mainly to be to solve the problem of financing projects. However it is important to maintain and improve the professional skills. One way to support this is to give seminars in co-operation with ONAS and CITET, in which Swedish and other international experts can take part, and also to have an exchange programme in which Tunisian experts can spend a month at plants in other countries in order to obtain experience. It is important that there are French-speaking staff at these plants.

Contacts and the provision of information to a large public need to be improved and there is a programme of co-operation with Canada to produce information for this purpose and also for teachers and students.

7 Senegal

7.1 Programme context - Senegal

Senegal is a country with some 8 million people, a hot climate, a very flat topography, and great differences in annual precipitation, 400 - 1600 mm, although most parts of the country are very dry with sandy soils. The country is dominated by agriculture, extensive cattle farming and the most important cash crop in the vast dry areas is peanuts for oil production. Known mineral resources are scarce. Examples of current but limited exploitation are phosphate mining, fishing and the tourist industry. Natural resources being investigated are marble, iron, gold and off-shore oil. The natural resources are already partly overexploited. The environment is suffering from severe strains caused by problems such as a very strained economy, a rapidly increasing population, and the extensive migration of people to the capital, Dakar, which now has almost 2 million inhabitants or 20% of the national population. There are also sanitary problems due to poor management of drinking water, uncontrolled discharge of municipal and industrial sewage and solid waste.

The most important environmental problems are related to the poor urban environment in the country, especially in the capital of Dakar. The problems are generated by human impact on the groundwater by direct infiltration into the soil by latrine (night soil) and untreated household water, and an over-exploitation of groundwater leading to sea-water intrusion. Further problems are municipal and industrial solid waste, waste water and air emissions. In the Dakar area there is degradation of the marine environment by seashore erosion, and pollution of the seawater by municipal and industrial wastewater. The rural areas are affected by severe deforestation due to charcoal production and overgrazing, and the coastal areas suffer from sea water intrusion due to the over-exploitation of groundwater and the mangrove environment.

In 1991 Senegal had very limited experience of environmental issues. A poor economic situation due to a rapidly growing population and an uncontrolled migration into the urban areas especially into the capital Dakar has created a poor social environment. It has also led to extensive pollution, and the depletion of natural resources, i.e. soil, forests, fresh and marine waters, made the government aware of the environmental problems.

In 1990 the Ministry of Environment and Tourism was established. The Ministry and its Department of the Environment operated with very limited resources, less than 10 persons. See Annex No 4c. However the Rio Conference in 1992 stimulated many of the third world countries to investigate their environmental situation and to present an action programme to rectify their problems.

The existing environmental legislation was enacted in 1983. Unfortunately this legislation has several deficiencies which has limited its implementation in a severe way. This is very evident where dealing with industrial pollution is concerned. New environmental framework legislation has been developed and shall be presented to Parliament in December 1998. It will be easier to supplement this legislation with new legislation. Among the immediate advantages of the new, proposed legislation are requests for impact assessments and the easier implementation of measures against industrial pollution.

Due to a lack of assessments and basic information on social conditions, natural resources, the environmental situation and future developments as well as strategies and measures to

master the situation, and a weak institutional structure, there has been little interest on the part of international donors to offer support in the field of environment.

At the World Conference in Rio de Janeiro in 1992 on sustainable ecological development, each participating country was urged to present a national environmental action plan for the country's environment. If this document were produced, international donors would subsequently show an active interest in supporting the countries in this field.
In 1992 the PNAE programme for sustainable development was presented.

7.2 Two projects: PNAE - Towards a National Environmental Action Plan - the PNAE plan and Seminar for the implementation of the PNAE-plan

7.2.1 Programme context, project development, project history, project description

In connection with the approaching conference a Swedish consultant firm, SCC Int-ScandiConsult International, offered the Ministry of Environment and Tourism in Senegal assistance in developing a National Environmental Action Plan - the PNAE programme for sustainable development - to be presented at the conference in Rio. To finance the preparation of the PNAE programme, Senegal requested financial support from Sida (formerly BITS) to cover the external costs of the Swedish Environmental Protection Agency.

Senegal presented the PNAE-project, financed by BITS, in Rio. After the conference this report was given further input at a seminar which had the aim of achieving a consensus among the parties responsible on environmental objectives and an action programme including listed activities.

Terms of Reference for Project SEN 0011, the National Environmental Action Plan.
- an assessment of the national environmental situation
- a strategy for environmental measures to be undertaken
- an analysis of the present environmental situation in Senegal
- an evaluation of the impact on the environment of the economic and social situation
- a proposal for a long-term environmental strategy
- a proposal for an action plan in a medium perspective

Terms of Reference for Project SEN 0012, the seminar for the implementation of the PNAE Programme:
- presentation in Dakar of the National Environmental Action Programme to the Senegalese authorities by a Swedish expert
- preparation of a four-day seminar to harmonise sectoral studies with national objectives and to implement the plan with all parties involved.
- the results of the seminar should result in a modified action programme
- a separate final report on the seminar

Terms of Reference for Project SEN 0021 PROMOSEN - Towards an Environmental Monitoring Programme
- to a arrange a seminar to bring together available relevant information, and make quality assessments of the environmental institutions
- make an inventory of the government's environmental strategy and priorities
- develop a comprehensive environmental monitoring programme

- present and discuss the programme at a workshop, select environmental sectors to be studied in pilot projects.
- final report to be presented to the ministry

The consultant should consider the importance of involving the Senegalese side in order to achieve the best conditions for the transfer of knowledge and experience in this field of applied strategic environmental work.

The field visit programme is presented in Annex 4a. The administrative environmental structure is presented in Annex 4c. The external financing organisations are presented in Annex 4d. An assessment of ongoing studies with international financial support is presented in Annex 4d.

In the first phase SCC Int made a brief assessment of the historical, present and future development of the country's social, agricultural, industrial, environmental and economic development, which was presented in a pedagogical way with graphs showing developments over time. This overview created interest and discussion at a seminar in Dakar attended by different ministries and departments. In the second phase the Swedish experience of environmental strategies was presented through the participation of the Swedish Environmental Protection Agency. This Swedish structure was applied initially in the work. After a first draft a Senegalese delegation visited Sweden and made a field trip in which the river Dalälven was followed from its source to the sea. The delegation also had meetings to discuss legislation, administration and practical environmental measures with administrations at different levels and with representatives of different sectors of society, for example industry, farming, forestry, energy, transport. Finally, the Senegal project members according to Senegal conditions rewrote the Senegalese draft plan. The ANPE plan was now the mental property of the Senegalese and not a product of foreign experts. The Plan was subsequently further developed and acceptance and support for it was obtained from the ministries at a three-day seminar in Dakar. Final reports were finally delivered to BITS as stipulated in the terms of reference

7.2.2 Findings

Transfer of knowledge for a national strategy
The pressure on natural resources in Senegal is very intense. A poor country such as Senegal depends on its natural resources for the survival of its present population. We feel that the government has also taken its responsibility for future generations. Sustainable development and a sustainable environment require public co-operation based on public awareness of the problems. Senegal has given priority to information and education of its entire population in all sectors. The idea is that the public will then become aware of the problems and take positive initiatives and cooperate in making the optimal use of their common resources over time.

The interaction between Swedish governmental financial support through Sida to the export of Swedish services to developing countries in the field of sustainable ecological development and co-operation between Swedish consultants and the Swedish Environmental Protection Agency has proved to be very successful in Senegal.

The development of the ANPE plan has acted as a catalyst in Senegal on the work on domestic environmental development and implementation supported by external donors.

There is evidence that the ANPE plan has been developed on a regional and local scale for five years through a USAID project.
A number of problems presented in the ANPE plan have been investigated by externally financed projects. See Appendix 4d.

Treatment of gender aspects
The evaluators feel that women have a strong position in Senegalese society.
No special attention to gender aspects has been noted in the project reports. One example of evidence of the position of women in the environmental work is the implementation of the ANPE programme, which is a political and social process. A great number of people, men and women, in national, regional and local committees have participated in developing and implementing the Environmental Action Programmes in various sectors and at different administrative levels in Senegalese society. Men and women have participated in proposing and deciding on subjects relevant for both men and women.
Another indication is the co-ordination of the international conference on Climate Change in Dakar in 1998 by non-governmental women's organisation.

Adminstrative aspects and cost-efficiency
Delays of payments, due to administrative procedures within the Ministry of Finance in Senegal have caused some delays to the projects. Information on the routines has now improved the situation.

Sida has caused considerable delay and frustration by its lack of decisions on the implementation of projects proposed in the PROMOSEN study. However, according to Sida no formal requests of support have been submitted from the Senegalese authorities. More information to the cooperating countries about the application and decision procedures might reduce misunderstandings.

Co-operation between the administrative bodies of the recipient party has improved. One indication is the establishment of an interim inter-ministerial body for co-ordinating applications for and financing environmental projects. Another indication is co-operation in developing regional and local environmental development plans. This is also an evidence of transfer of new knowledge and capacity within the administration to enable staff to undertake similar tasks on their own.

Costs and cost-efficiency are considered to be reasonable in the projects undertaken by SCC Int. Co-operation between the Swedish team and the Senegalese party has been very satisfactory and the knowledge of the French language possessed by the Swedish team has been satisfactory for the mission undertaken.

7.2.3 Summary of findings Senegal

- The ANPE plan has through external financing during four years been broken down into regional as well as to local plans all over the country
- A sustainable development and a sustainable environment require public cooperation based on public awareness of the problems. The national strategy of Senegal comprises transfer of knowledge by giving priority to information and education of its entire population in all sectors.
- the development of the National Environmental Action program has acted as a catalyst in Senegal on the work on domestic environmental development and implementation supported by external donors

- Mutual understanding of donor and receiving countries on administrative procedures on payment and financing of projects prevents a lot of misunderstanding and delay between the parties
- Cooperation between the Senegalese administrative bodies has improved considerably due to the ANPE project

7.3 The PROMOSEN project, "Towards a National Environmental Monitoring Programme"

7.3.1 Programme context; the development context of the project, the projects history, description of the project

In the ANPE - Towards a National Environmental Action Plan, two projects were given priority to be started. One of those was to develop a National Environmental Monitoring Programme - the PROMOSEN project.

The main objectives of the PROMOSEN project were to make an inventory of the environmental resources of priority and to develop a national environmental monitoring programme.

The programme consists of four parts.

1. A basic programme taking into accounts international rivers, conservation of biodiversity, climatic change.
2. A special programme of project character covering demographic changes, urban development, urban drinking water resources, atmospheric pollution, solid waste, pesticides, charcoal management.
3. A structure for the management of the PROMOSEN
4. A project for an educational programme

The final report proposes localities for monitoring stations, type of equipment, investment and current costs.

The Environmental Monitoring Centre in Senegal, the CSE - Centre de Suivi Ecologique, was established in 1986. The period up to 1993 has been a period of consolidation. The institute has a staff of some 40 people out of which 27 are technicians. Computer hardware has been supported by DANIDA, Denmark. Software has been supported by UN-funding. CSE produces interpretations of satellite photographs in the form of maps, photos and reports. Self-financing is expected in the future by exporting products to other African countries and to institutions in Senegal.

7.3.2 Findings

The Terms of Reference concludes a concentration on water and soils, an inventory of the governments environmental strategy and priorities, environmental information, resources and quality of institutions working with environmental monitoring, development of a monitoring programme and educational and financial requirements.

The PROMOSEN report has concentrated on presenting a short state of the art on the environmental situation, a new comprehensive program, including selection of monitoring field sites, equipment and costs. The report, however, deals to a great extent with complex and expensive basic data collection at new local monitoring stations to be equipped all over

the country. The total final costs are considerable for a country like Senegal. Although not in the Terms of Reference, an alternative option might have been presented, in the form of a low cost alternative, looking into the governments areas of priority, existing monitoring resources, necessity of complementary resources to the existing facilities and consequently a slower development of the development of the national monitoring programme.

The Senegalese representatives considered that the existing monitoring facilities have not been taken into enough consideration in order to keep the costs down. Neither does the PROMOSEN provide a strategy for long-term funding after the termination of the two years implementation period, but this later subject seems to fall outside the Terms of Reference of the mission.

The PROMOSEN project has however successfully assessed available information on most environmental resources and presented a comprehensive basis for a future development of a national monitoring programme in Senegal. The PROMOSEN report has been of great use for the Department of Environment. The Government's National Strategy, for example, contains a five-year programme with valuable input from the PROMOSEN report as a base.

Hitherto no annual report has been published on the environmental situation in Senegal. However, a first annual report will be published in this year 1998.

After the delayed delivery of the final report in December 1996, CSE – the Environmental Monitoring Centre has discussed the possibilities of Sida financing part of the investments presented in the PROMOSEN. Hitherto Sida is considered by the Senegalese part not to have given any information or promises for negotiations or financial support.

Today the PROMOSEN report is considered to be in need of a complete revision as a basis for future implementation. The PROMOSEN report needs to be updated both technically and otherwise. CSE has developed a strategic plan for the period 2000 - 2005, and has already implemented some of the recommendations given in the PROMOSEN. Although not carried out fully, the environmental monitoring is considered hitherto to be the best developed in Africa south of the Sahara.

The PROMOSEN should be integrated into the PNAE programme. This is a process that the Senegalese would like Sida to support. CSE has already designed a number of project plans, which would be of great value in connection with an application for support to Sida.

7.3.3 *Summary of findings*

- The total final cost for the implementation of the proposed environmental monitoring programme is considerable for a country like Senegal.
- Although not in the Terms of Reference, an alternative option might have been presented, in the form of a low cost alternative programme concentrating on fewer areas of priority and supplementing existing facilities.
- The PROMOSEN project has successfully assessed available information on important environmental resources and presented a comprehensive basis for a future development of a national monitoring programme in Senegal
- The PROMOSEN is an important environmental tool, which should be integrated into the PNAE programme. Today however the PROMOSEN report is considered to be in need of a complete revision as a basis for future.

7.4 Environmental investigations within industry

7.4.1 Programme context; the development context of projects, the project's history, description of the projects

In Senegal, especially in the area of Dakar, there are a large number of industries, which produce large amounts of solid waste and discharge pollutants into the air as well as into the sea without sufficient pre-treatment and often without any treatment at all.

In 1996 the Ministry of Industry applied to Sida for support to carry out

- an inventory of solid waste and discharges into the air and water from industries in Senegal with its point of departure in the environment;
- a proposal to the Ministry of Industry for an environmental database for different kinds of solid wastes and discharges from industries and a way of processing these data;
- a proposal for a plan for the Ministry of Industry to reduce the amount of environmentally hazardous industrial waste.

7.4.2 Findings - information, analysis, findings related to terms of reference, evidence and analysis presented

The project's relevance

The environmental impact caused by industry in Senegal is considerable and it is important to improve matters. The present environmental law does not provide the enforcement instruments, which make it possible to place demands on the industries to protect the environment. The country is poor and foreign companies own the industries to great extent. This makes it possible for the industries to exploit the country if there are no international agreements or co-operation in this field.

In the national environmental plan of action of September 1997, it was stated that, where industries were concerned, there were deficiencies in handling chemicals and in the controls of discharges of effluents. This was also apparent when visiting industrial areas in Dakar. The project proposes ways to start to handle these problems.

Efficiency of project implementation

The first step of the study included visits to a great number of industries (26 industries), national and local authorities, companies collecting and recycling solid waste and providing diagnoses of the actual situation from an environmental point of view and of occupational safety and health. The industries and their production were described as well as the kinds of solid waste and discharges into the air and water produced by the industries and the working conditions for the staff; and summarised conclusions and recommendations were presented for each industry. The second step consisted of in-depth studies of six different industries chosen in consultations between the Ministry of Industry and the consultant. The final step of the study presented a strategy to reduce industrial pollution to protect the environment.

The study has been carried out in a methodical way and has indicated difficulties due to the lack of adequate environmental legislation and control.

Results and effects achieved

The study has been carried out methodically and forms a basis to continue the work to reduce the environmental impact caused by the industries.

The study has helped to show deficiencies in the present environmental law. This has resulted in a proposal to a new law, which will provide better instruments to intervene the industries to protect the environment.

The country is poor and the industries are to great extent owned by foreign companies. To avoid that the industries and their owners exploit the country there is a need to co-operate with other countries and to have international agreements in this field, which has only recently started. For instance Senegal organised a meeting in October 1998 for African countries in Dakar to prepare the meeting in Buenos Aires under the UN Climate Convention in November this year. Sweden through Sida supported this meeting. This kind of support is important to reach sustainability.

The standard of the industries' environmental work is very different, some of them attain the same level as Swedish industries while others are quite the opposite.

Cost-efficiency
The study has been carried out methodically and is well worth the cost.

Sustainability
As the study has recently been finished the work to realise it has not yet started. To reach sustainability it is important to undertake measures to reduce the environmental impact from industry.

Other findings
The project "Environmental investigation within industry" initiated a co-operation between the Ministry of Environment and the Ministry of Industry in Senegal. However we found that the possibility to take environmental consideration at the Ministry of Industry is limited.

7.4.3 Summary

As the study has recently been finished the work to realise it has not yet started. However it has shown that it is important to support

- The reduction of the environmental impact from industry.
- Active co-operation between environmental and industrial authorities in the country.
- International co-operation.
- A new environmental protection act, that makes it possible to demand adequate measures from the industries to protect the environment.

7.5 *Wastewater treatment plants*

7.5.1 Programme context; the development context of projects, the project's history, description of the projects

In 1994 the Ministry of Rural Development and Water (Ministère du développement rural et de l'hydraulique) applied to BITS for support for a study for the rehabilitation and strengthening of the sewage system in three cities, Kaolack, Louga and Saly-Portudal

Kaolack has got 135,000 inhabitants, Louga 45,000 and Saly-Portudal is a seaside resort dependent on tourists visiting the many hotels there. All these tree cities are growing rapidly.

The wastewater treatment plants in Kaolack, Louga and Saly-Portudal were built in the 1980s with the aid of Italian funding and know-how. However they do not function well. That is why Senegal has asked for support from Sida (BITS) to let a consultant propose solutions to these problems. The consultant's work consists of:

- a diagnosis study;
- a study proposing for the restoration and extension of the sewage system and the waste-water treatment plants to be carried out in two steps, a pre-study followed by a basis for tendering;
- a report defining the alternatives available to the Senegalese government for the national programme to restore the sewage system. The report is also to contain different proposals on how to act, specifications of equipment necessary for the operation of the plants, programme for the control of quality during implementation as well as a programme for the training of the management staff.

7.5.2 Findings - information, analysis, findings related to terms of reference, evidence and analysis presented

The projects' relevance
It is important to bring about and maintain a good level of hygiene and sufficient protection of the environment in the growing cities in Senegal. This requires knowledge among people living there, an adequate supply of drinking water, ground water that is not polluted or containing high levels of nitrate, satisfactory handling and treatment of household waste water, faeces & urine (night-soil) as well as refuse/garbage. From the gender point of view the projects are valuable since efficient and hygienic water and sewage systems and waste management relieve the pressure, especially on women.

The plants in Kaolack and Louga receive very little wastewater as only 2% and 4 % respectively of the population are connected to the sewage system and the plants are no longer in working order. There are also problems caused by garbage which blocks up the sewage. Hitherto it has been too expensive for most people to be connected to the sewage system and therefore only about ten connections per year have been made in recent years.

In Saly-Portudal the plant receives much more wastewater than it has been built to treat, as far more hotels have been built and connected to the sewage system than originally planned. Hence, the plant needs to be extended.

As it rains very little in Senegal it is important to re-use the treated wastewater for irrigation. It can be stored in ponds or infiltrated into the ground water. Re-use for irrigation has not yet become common and was not part of the project.

Efficiency of the project implementation
The survey of the existing sewers and plants seem to have been carried out in an adequate way and the existing problems have been well described.

Results and effects achieved

In Senegal the work with collection and treatment of wastewater is only at the starting point. Senegal is a poor country, the educational levels low, and there is a lack of institutions and infrastructure. That is why it will take rather a long time to construct conventional sewage systems to serve the cities and to operate them. Even modest fees for water and sewage are difficult to afford for people. Sp far the construction works have not yet started because of the absence of funds. ONAS has, however, been in contact with several donors to discuss possible financing.

The consultants points out that the laws and institutions are not strong enough, that there are problems caused by lack of knowledge of hygiene among the inhabitants, lack of organisation for collecting garbage and lack of money to be connected to the sewage system.

The project provides a basis to improve the standard of living with the aid of better hygiene. The consultant proposes that connections to the sewage system should be increased considerably. This work should start with connecting institutions, schools and similar big users of water to the sewer system. When this is done the wastewater treatment plant should in a second step be reconditioning and a technique suitable for the conditions ought to be used. This seems quite reasonable.

The evaluation team agrees that in many cases the problems with waste and wastewater has to be solved in steps. The second step could be implemented when the economical situation in the country improves.

When a piping system does not already exist it is valuable to carry out an Environment Impact Assessment (EIA) to evaluate different systems for treatment of latrine (night soil), household water and garbage to see what system had been most cost-efficient before starting to build a sewer system with piping. In smaller towns and in the outskirts of lager cities can many times be beneficial to use other systems for taking care of latrine (night soil) instead of piping, for example composting latrine together with organic household waste, and using this as fertilizer in agriculture. An EIA will help to make a sustainable and cost-efficient choice

Cost effectiveness
It is not possible to form an opinion of the cost effectiveness of the project before the measures proposed by the consultant have been carried out. To be able to cope with problems caused by unsatisfactory wastewater handling it is important for Senegal to get international financial support. The Swedish support to this kind of studies can form the necessary basis to get this.

Sustainability
The establishment of ONAS in Senegal is quite recent. The knowledge among the inhabitants about environment protection, sewerage system and similar still need to increase to get a sustainable development in these fields.

To maintain a sewerage system it is important that it is possible for people to finance the connection and the yearly fees. The fees for water pay the distribution of fresh water as well

as collecting and treating the wastewater. People in Senegal have difficulties to afford even modest fees for water and sewage.

Other findings
UNICEF in Senegal carries out campaigns about the importance of environment protection and preserving water resources like "Ensemble, préservons notre environnement" and "L´eau, c´est la vie". You find these texts for instance on the front page of exercise books for school children.

A French non-governmental organisation has supported a part of a living area in Rufisque to build a low technology wastewater treatment that was meant to be taken over and handled by the people living in this area. However, when visiting it, this plant was not looked after well and did not function well.

7.5.3 Summary

In Senegal the work with collection and treatment of wastewater is only at the starting point. The country is poor, the educational levels low, and there is a lack of institutions and infrastructure. That is why it will take rather a long time to construct sewage systems to serve the cities and to operate them. To that one must add that even modest fees for water and sewage are difficult for people to afford.

To be able to cope with problems caused by unsatisfactory wastewater handling it is important for Senegal to get international financial support. The Swedish support to this kind of studies can form the necessary basis to get this.

When a piping system does not already exist it is valuable to carry out an Environment Impact Assessment (EIA) to evaluate different systems for treatment of latrine (night soil), household water and garbage. That gives information about what kind of system would be most sustainable and cost-efficient. Quite often a piping system leading to a conventional wastewater treatment plant would be best. In smaller towns and in the outskirts of lager cities it can many times be beneficial to use other systems for taking care of latrine (night soil), for example composting latrine together with organic household waste, and using this as fertilizer in agriculture.

When carrying out an EIA to find environmentally compatible water supply and sewage system the following criteria are important:

- The system must allow a good level of hygiene and must not jeopardise health; routes of disease transmission must be cut off;
- The system must conserve and make maximum use of resources (for example that includes the re-use of treated waste-water for irrigation);
- The system must not cause environmental damage in the short or the long term;
- The system must be economically reasonable;
- The system must be reliable at all stages, in all types of weather and at all times of the year;
- The system must be practical and easy to understand for those using and managing it.

Sida

Terms of Reference

1997-10-01

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TERMS OF REFERENCE FOR THE **EVALUATION OF ENVIRONMENTAL PROJECTS IN SENEGAL AND TUNISIA**

1 BACKGROUND

Sida (former BITS) has over a period of some years supported a number of environmental projects in Senegal and Tunisia (~~Appendix B~~). In Tunisia some 25 projects of different size have been executed to a value of 31,8 msek between the years of 1979 and 1997. The last project in Tunisia, TUN0551, was finalized during Spring 1997. In Senegal five projects have been supported to the amount of 9,7 mkr from 1991 until today, whereof one is on-going (SEN0051). As can be seen from the enclosed list many of the projects escpecially in Tunisia concern wastewater/sewage treatment and improvements in such systems. In Tunisia the feasibility studies and supervision of construction of waste water treatment plants have been implemented in connection with Swedish credits for the delivery of equipment and construction.

The main counterpart in Tunisia has been ONAS - ~~Organisation~~ National de l'Assainissement. One of the later projects " Watershed Development in 4 Rivers in Sousse" has been executed in cooperation with the Ministry of Environment and Physical Planning and the regional authorities in Sousse.

In Senegal the Ministry of Tourism and Environment has been the counterpart for three of the projects. In the two last projects the counterpart has been Ministère de l'Hydraulique and Ministère de l'Energie, des Mines et de l'Industrie respectively.

Copies of approval documents for the projects that have been selected for an evaluation can be found in Appendix C. Most of the projects have been executed by the Swedish consultant firm Scandiaconsult. One project has been implemented by RUST-VA Consulting company (TUN0551) and two projects by Purac (TUN0041 and 0042).

2 PURPOSE AND SCOPE OF THE EVALUATION

The main purpose of the evaluation is to evaluate the results that have been achieved through the projects. The evaluation should also assess to what extent the projects have had any impact on the cooperating authority and the country's environmental policy, strategy and work. Futhermore an assessment should be made of the professional quality of the services provided. The findings and recommendations are expected to be used as a reference for and input in similar

that enables publication without further editing. Subject to decision by Sida, the report will be published and distributed as a publication within the Sida Evaluations series.

The evaluation assignment includes the production of a Newsletter summary following the guidelines in **Sida Evaluations Newsletter – Guidelines for Evaluation Managers and Consultants** (Annex II) and also the completion of **Sida Evaluations Data Work Sheet** (Annex III). The separate summary and a completed Data Work Sheet shall be submitted to Sida along with the final report.

- improvements in capacity at involved institutions and the transfer of knowhow

- changes/improvements undertaken as a result of the projects

* Delineate the main objectives of the projects evaluated.

* Evaluate the achievement of objectives and products as defined in BITS/Sida's approval, reasons for non-attainment of objectives taking into consideration possible changes in circumstances.

* Evaluate the reasons for high/low achievement of objectives with regard to organisational, administrative, financial, institutional and other factors.

Side-effects

* Examine the unintended effects which the projects have led to, especially with regard to

- use of the projects as pilot projects and diffusion of knowhow and information to other parts of the country and other institutions

- Changes in legislation.

- Identification/elaboration of new projects

- Effects, positive and/or negative, on the roles of men and women

- Further orders placed with the Swedish companies financed commercially or by other donors.

- Positive and/or negative effects which were not foreseen during the planning of the project.

5. Cost-effectiveness

* Assess if the objectives have been reached in a cost-effective manner, examining both the donor and recipient side (activities, outputs and results in relation to costs).

6. Sustainability of results

* Valuate the long term effects or impact that the projects have given with regard to capacity building and institutional strengthening

* Valuate improvements made with long term effects

* Valuate continued training (in particular after TUN0041, 0042)

Projects evaluated

Date of dec.	Volume	Project	Name
Tunisia			
88-01-28	1 780 000 SEK	TUN0041	Training in water and sanitation techniques for the personnel at sewage treatment plants
90-03-13	1 646 000 SEK	TUN0042	Training in water and sanitation techniques for the personnel at sewage treatment plants
90-01-12	888 000 SEK	TUN0441	Supervision and quality control at construction and delivery of equipment to sewage treatment plants in Kasserine and Mahdia
91-01-29	696 000 SEK	TUN0451	Inspection and quality control at construction of sewage treatment plants in the city of Gabès
92-06-30	6 131 395 SEK	TUN0461	Feasibility study for the construction of waste water treatment plants in three cities
94-06-14	3 537 000 SEK	TUN0551	Land use and environmental protection close to the rivers of Hamman, Blibane, Hallouf and Hamdoun
Senegal			
91-09-16	1,940,000 SEK	SEN 0011	to develop a National Environmental Action Plan Environmental National Action Plan.
92-10-07	351,100 SEK	SEN 0012	Seminar for the implementation of a National Environmental Action Plan.
93-06-18	1,493,459 SEK	SEN 0021	Environmental Monitoring
94-04-07	3 769 000 SEK	SEN 0031	Rehabilitation of sewage system in Kaolack, Louga and Sly-Portydal
96-05-15	2 174 690 SEK	SEN 0051	Environmental investigation within industry

Their project number will refer to the projects.

13.00 Déjeuner

15.15 Un chauffeur de l'Ambassade viendra vous chercher à l'hôtel pour vous accompagner à l'ANPE

15.30 ANPE (Agence Nationale de la Protection de l'Environnement)
Visite chez Mme Fathia Mezhoud, Directeur de la Coopération
Rue de Cameroun (par la rue de Médina)
Tel. 847.122, poste 220 (Mme Mezhoud)
Tél. 840.221 M. Hamrouni
Fax. 848.069

17.00 Visite à l'ONAS M. Abid

18.30 Visite chez M. Hedi Kefi, Kvaerner Aqva Sweden (PURAC)

Mercredi 25 mars

6.30 Un chauffeur de l'Ambassade viendra vous chercher pour vous accompagner à la Gare

7.10 Départ de la Gare de Tunis, train direct pour Sousse (environ 2 heures)

Chambres réservées à l'hôtel Taj Marhaba

Visite de courtoisie chez M. le Gouverneur de Sousse
M. Mohamed Soudani (à confirmer)

Directeur Régional du Littoral Central,
M. Abdelhamid Ben Afia

ONAS, M. Lahouar

Jeudi 26 mars

Direction Régionale du Littoral Central
M. Abdelhamid Ben Afia

Visite à la station d'épuration de Mahdia (ONAS)

Retour à Tunis par train

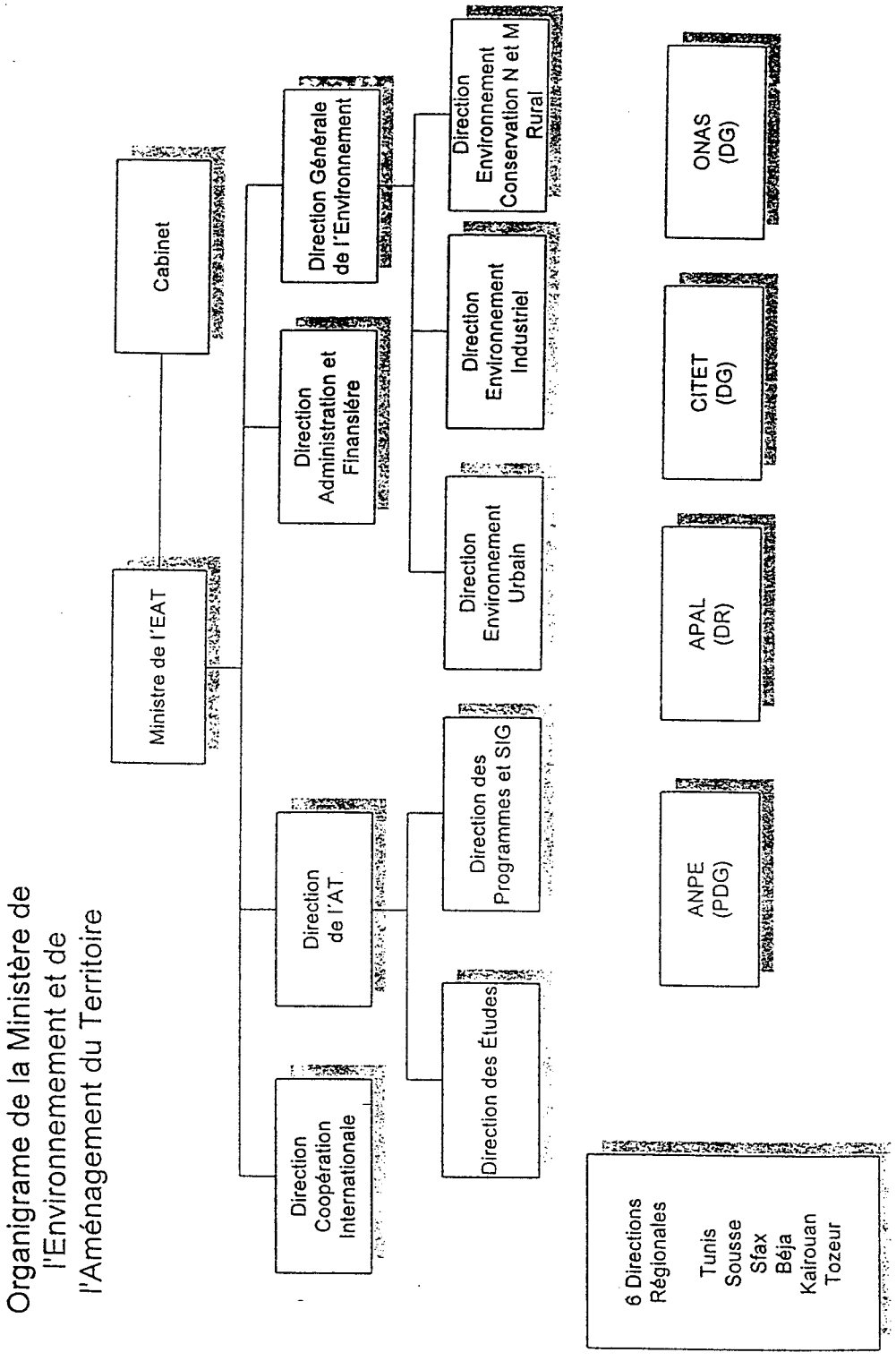
Vendredi 27 mars

8.30 Déjeuner-réunion à la Résidence de l'Ambassadeur,
Catherine von Heidenstam, et M. Sporrong
5, rue Jebel Aures, Notre Dame Tunis
près de l'hôtel Hilton

13.20 Retour en Suède

Environmental institutions in Tunisia

Organisation chart for the Ministry of Environment and Planning and the agencies subordinate to the ministry, ANPE, ONAS with 3 regional offices, CITET and APAL.



MEAT	- Ministère de l´Environnement et de l´Amenagement du Territoriare
ANPE	- Agence National de la Protection de l´Environnement
APAL	- Agence de Protection et Amenagement du Territoire
CITET	- Centre International des Technologies de l´Environnement de Tunis
ONAS	- Organisation National de l´Assainissement

Field mission programme in Senegal 7 - 15 September 1998

Mission: Evaluation of Sida-supported environmental projects in Senegal
Evaluating team: Mr Ulf von Brömssen, Mrs Kajsa Sundberg of the Swedish Environmental Protection Agency

Monday 7/ 9 20.00	Arrival Dakar from Stockholm
Tuesday 8/9 10.00	Department of the Ministry of Environment and Protection of Nature 23 Rue Calmette, tel 8-210725 Mr Bakary Kante, Director of the Department of Environment, Mr Pathé Baldé ass. director, Mr Aliman Ba, Mr Cheikh Sylla Interview on the three projects. the National Environmental Action Plan, The Environmental Seminar in 1992 and the Environmental Monitoring Programme - PROMOSEN
15.00	Ministry of Industry, 104 Rue Carnot, tel 8-211542 Mr Baal, environmental co-ordinator at the ministry, Mr Habib Saw Interview on the project on Industrial sewage emissions,
Wednesday 9/9 08.30	Department of the Ministry of Environment and the Protection of Nature Mr Kante and Mr Balde
10.30	ONAS - the sewage water authority, Cité TP No 4, Hann, tel 8-323996, std 8-323534 Mr Abdoulaye Sene, Dir. General Interview on the project on treatment of municipal sewage at four sites
14.30	Scandiaconsult Int, Mr Mohammed Affendi Interview on SCC Int projects in Senegal
Thursday 10/9 09.00	DHA, Department of Water and Sewage, Cité TP No4, Hann, tel 8-324279, 8-321906 Mr Madio Fall, Dir de la Dir de la Hydraulique et de l´Assainissement DHA Interview on the administrative structure of fresh water supply and sewage
10.30	SGPRE - Service section for Planning and Development of Water Resources, Service de Gestion et de Planification des Resources en Eaux Mr Gora Ndiaye and Mr Namadou Sarr (dir. Mrs Aastou Faye Fall on vacation), TEL 8-222154 Interview on utilisation, depletion, recharge and planning of groundwater resources
15.00	Meeting with Scandiaconsult Int, Hotel Sofitel, Mr Mohamed Effendi Interview on the projects on sewage water treatment

Other reports – Senegal

"Plan National d´Action pour l´Environnemnt" carried out by the Ministry of Environment in Senegal.

Draft of "Projet de Code de l´Environnement", a proposal to a new environmental law, suggested by the Ministry of Environment in Senegal.

Kristina Kuhnel, 1996; National Environmental Action Plan and Seminar for the implementation of the PNAE Plan. (Senegal) Sida Evaluation Report. Kontrakt SEN 0011 and 0012. In Swedish

Environmental institutions in Senegal

Compare Appendix 4c(1)

ORGANIGRAMME DE LA DIRECTION DE L'ENVIRONNEMENT ET DES ETABLISSEMENTS CLASSES

Projects supported by other donors – Senegal

Externally financed implementation of studies mainly initiated by the ANPE programme

- Groundwater
Replenishment rate of Senegal's groundwater resources, as a base for future management of sustainable groundwater exploitation.
Nordic Fund through the World Bank

- Biodiversity
Conservation and improvement of biodiversity in the Green Belts in Senegal, along and at the mouth of river Senegal.
UNEP

- Energy production to combat deforestation
Training in forest management, forest plantation and charcoal production and utilisation
World Bank

National Plan against desertification
A national action plan and 10 regional action plans will be developed
CTZ - Germany

- International environmental conferences organised and hosted by Senegal in Dakar 1998
- October 1998: Co-operation between African countries and industry to improve their capacity in negotiations on the UN convention on Climate Change
- November 1998: Management of Wetlands in humid climates
- December 1998: The 2nd conference on the convention on desertification
World Bank

- Interim inter-ministerial committee for co-ordinating financing of environmental projects

-
The CONSERE Committee has initiated the financing of 10 regional environmental action programmes as one part of the implementation in the ANPE report
USAID

- Treatment of urban sewage

Master Plan for sewage and storm drainage water for 19 cities
NDF - Nordic Development Fund, consultant SCC Int

Sida Evaluations - 1999

99/1 Renewable Energy Technologies in Asia: A Regional Research and dissemination Programme. Smail Khennas and Teresa Andersson
Department for Research Cooperation, SAREC

99/2 Strengthening Publishing in Africa An evaluation of APNET. Lars P Christensen, Cecilia Magnusson Ljungman, John Robert Ikoja Odongo, Maira Sow, Bodil Folke Frederiksen.
Department for Democracy and Social Development

99/3 Paper, Prices and Politics. An evaluation of the Swedish support to the Bai Bang project in Vietna,m. David Vincent, Nguyen Quoc, Ngo Minh Hang, Allan Jamieson, Nicholas Blower, Mandy Thomas, Pham Quang Hoan, Do Thi Binh, Adam McCarty, Hoang Van Hoa, David Pearce, Derek Quirke, Bob Warner.
Department for Evaluation and Internal Audit

99/4 A leap of Faith. A stroy of Swedish aid and paper production in Vietnam - the Bai Bang project, 1969-1996. Alf Morten Jerve, Irene Nörlund, Astri Suhrke, Nguyen Thanh Ha
Department for Evaluation and Internal Audit

99/5 Sida-Supported Programme within the African Energy Policy Research Network, AFREPREN. Frede Hvelplund, Ernst Worrell
Department for Research Cooperation, SAREC

99/6 Masters Programme in Land Management. Swedish support channelled through The Royal Institute of Technology (KTH) to participants in Central and Eastern Europe. Jim Widmark
Department for Central and Eastern Europe

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