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ECOTOXICOLOGY AND MARINE ECOLOGY STUDIES IN POST-WAR KUWAIT

DP/KUW/92/003

Report of the Evaluation Mission*

Prepared by:

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* This document has not been edited.

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I. EXECUTIVE SUMMARY

This report is the one-year post terminal evaluation of the project (DP/ KUW/92/003) and the evaluation was conducted from Feb. 16 through Feb. 22 1997.

A. Background

This project was conceived right after the Gulf War where millions of barrels of the partially combusted oil from destructed oil wells and oil processing facilities were released into the environment. The potential impact and risk of the pollutants called international as well as domestic attention. For the Kuwaiti Government, it was necessary to carry out a long term program to tackle problems such as movement and accumulation of toxic pollutants in the environment (air, soil and sea) and to investigate their effect upon the environment and on humans. To execute this research project, the Government wanted to strengthen the capability of the Kuwait Institute of Scientific Research(KISR) with assistance from UNDP/UNIDO systems. Environmental Science Department and Marine Biology Department of KISR were involved in this project.

B. Finding on project identification and design.

The strategy of the project implementation consisted of two stages.

- Short term international consultants made assessment of capability of KISR, identified the most appropriate research subject, and prepared the job description of the follow up field missions.
- The short term consultants, two highly regarded scientists, Dr. Richard Stephenson from England and Dr. Peter Saenger from Australia were assigned to cover the ecotoxicology and marine biology areas respectively in the fall of 1993.
  After the fact finding mission, the consultants identified two programs to be pursued. One was the establishment of the Bioassay lab. program in the Ecotoxicology area and the other was Coral Reef Ecology study program in the marine biology area.
- The project on the establishment of Bioassay Laboratory was a kind of institutional building type project, which would provide important infrastructure to KISR in the Department of Environmental Sciences.
- The Coral Reef ecological program was a kind of straight forward academic research program which would build a research capacity in Marine Biology at the Department of Mariculture and Fishery.

Two experts highly recognized in their field, Mr. Fred Abram from England and Dr. Peter Harrison from Australia were recruited and sent on mission for 13 and 11 months respectively, for the establishment of the bioassay lab and for the conducting the coral reef project during the period Nov. 1994 - Dec. 1995.

The processes for identification and formulation of the project were very desirable and

effective.

The project needed experienced international consultants from initiation to execution of the project in collaboration with the counterparts who are qualified but needed experience in establishing and running the center according to the international standards.

C. Findings on general results

The findings were:

- The Bioassay Laboratory opened officially in Nov. 1995 as the first one in the Gulf region. At this facility a research project of Environmental Science Department, VR004P - Toxicity and Bioaccumulation of Crude Oil and Partially Combusted Oil by Selected Marine Organisms in Kuwait has been conducted.
  However, it was found that the Bioassay Laboratory needed more substantial program from KISR/Government to strengthen the capacity, hardware and software which would make this facility the "fully equipped and fully operational" center of excellence in the region.

The start up of the bioassay lab provided additional infrastructure in upgrading the capacity of the research program in KISR as well as in Kuwait.

- The Coral Reef Ecology study was successfully and remarkably well carried out. The project results have raised scientific and public awareness of Kuwait's coral reef and highlighted the need for proper management of this unique natural asset.
- The above two programs were expected to be closely linked to each other in toxicity evaluation of toxic pollutants on marine organisms. However, this did not occur, mainly because of the delays in the construction of the bioassay facility.
- General results were very satisfactory considering the fact that this kind of project was newly initiated at KISR where management and staff might not have had much knowledge and concept about the new fields.

D. Main problems faced by the project

There were many main problems faced by the project.

- Particularly the Bioassay laboratory and ecotoxicology program and the foreign consultant had faced more serious problems compared to the Coral Reef study project.
  The laboratory premises were delayed for a six month in completion, it was available in late May 1995 and officially opened in the following November.
  The program was more of an institutional building type project, and the delays of the physical facility caused serious delays in starting training and conducting research projects.
- Both projects had faced lack of funding at the start of the mission. Therefore, there were delays in obtaining necessary equipment and apparatus. The Coral Reef project obtained its own research budget in the latter period of the mission.

- The Bioassay Laboratory should have secured the budget for only setting up the laboratory, not for conducting the research project.
- Both projects had faced a shortage of full time counterpart personnel to be trained. Most counterparts were part time personnel who tended to be less responsible.
- The experts under the circumstance have accomplished the work to be carried out under their terms of reference.

However, these kinds of problems could be encountered often in developing countries where there is not much understanding of the nature of work involved and where there is a lack of experienced personnel.

E. Conclusion

- The project is very important and useful in petrochemical based economy as well as in environmental protection in Kuwait.
- The project was soundly identified and designed.
- There were many problems faced such as delays in building construction, short of logistic support and personnel.
- The international consultants assigned to the field did their best to achieve the project objectives.
- Despite many difficulties, this project achieved the most important immediate objectives, and laid the ground for further development in the limited time of 12 months.
- Follow-up program, especially for the Bioassay lab., will be seriously necessary to be fully equipped.

F. Recommendation

- Follow up program would be very desirable to sustain and to consolidate what was already done, and the follow up program at this point for the Bioassay Lab will make the quantum progress of capability from the laid ground.
- Initiation of follow up program by UNDP/UNIDO is highly recommended.
- The follow-up program should be different from the previous format of formulation and implementation.

If more specifically suggested ;

- Identify and designate the National Project Director(NPD).
- Identify and assign one Chief Technical Advisor(CTA).
- Send National project Director abroad for a study Tour with the Chief Technical Advisor.
- Joint formulation of project with NPD and CTA.
- Secure budget for the project.
- Secure budget for staff training abroad.
- Secure a monitoring mechanisms for progress.
- Arrange a twining arrangement with other foreign laboratories.

II. PROJECT CONCEPT AND DESIGN

A. Context of the project

As pointed out in the project document, the destruction of oil well and petrochemical industries during the occupation of Kuwait in 1991 resulted in millions of barrels of oil being released into land and sea (Arabian Gulf). The massive oil slicks as well as burning oil well products drew international attention to the effects and risks caused by those pollutant to human and the environment. While some of the pollution problems have been taken care of by the immediate action from the Kuwaiti government after the liberation, there was a strong need to set up long term scientific program to measure the effects of the pollutants, and then movement in the environmental compartments: soil, air and water.

The government of Kuwait, in collaboration with UNDP, was taking advantage of the UN system to make use of the diverse capabilities of the system for the protection of the environment.

Based on this interagency cooperation, UNDP had requested UNIDO to assist Kuwait Institute of Scientific Research(KISR) in planning its studies for monitoring the chemical pollutants in the eco-system, assessment of risk and possible clean up methods.

B. Project document

1. The problem and technical approach

The problem as stated in the project was that the research capability, facility as well as personnel were not adequate in the country to carry out the work necessary to assess the risk of the pollutant to the ecosystem. Also, a long term study plan particularly for the effect of petroleum hydrocarbons upon the ecology was to be established. As the technical approach, the project focused on providing international advisory services to the Kuwait Institute of Scientific Research(KISR) for strengthening the capability in environmental studies and establishment of long term research projects.

2. Objectives, Indicators and Assumptions

The document stated the developmental and immediate objectives. The developmental objective was clearly stated in the program document. It stated, "to make the country's environment (land, air and marine) free of toxic pollutants caused by damage to industries, oil wells during the war (Gulf war)".

It also stated that the immediate objectives were to assist the Kuwait Institute of Scientific Research (KISR) with the assistance of international consultants to set up long term research studies in monitoring, movement and accumulation of toxic pollutants, their breakdown in the environment and carry out model systems to eliminate/minimize the toxic effects on human, animal, crops and aquatic life.

The document did not specify the monitoring mechanism for the tracking of major project milestones and recognition of any difficulties or constrains. The document did not

contain any detailed work plan. It was believed that the approach of the project was such that the recruited international consultant would make an assessment of capabilities of the institute, identify the most necessary research area, and prepare a detailed work plan.

3. Beneficiaries

The immediate beneficiaries will be the Kuwait Institute for Scientific Research(KISR) which would benefit from developing capability to study the fate of pollutants in the ecosystem. In the long run the country will be benefitted in making the environment free from pollution by toxic chemicals.

4. Modalities of execution

The document did not clearly differentiate the role of UNIDO and UNDP. It stated that all activities would be coordinated through the UNDP office with UNIDO as the executing agency, but it did not specify the National Project Director and detailed terms of reference for each organization.

III. PROJECT IMPLEMENTATION

A. General Approach

The general approach of the project was that UNDP/UNIDO would provide international experts and along with KISR staff would provide capacity building in the environmental and marine ecology research area.

1. UNDP/UNIDO would provide

- o International consultant to assess and review the capability or KISR to address the environmental problem.
- o International consultant to identify the most important areas to start with.
- o International consultant to prepare the detailed work plan or research plan.
- o International consultant to conduct the study with KISR counterpart.

2. KISR would provide facilities, equipment and some personnel to be trained, as well as the research budget.

B. Specific activities

1. The project was designed and implemented in two stages.

1) The first stage was that two highly regarded scientists were recruited for a short term mission to assess, identify the important areas to cover and, prepare the job descriptions for long term mission consultants.

- o Dr. Richard Stephenson (England) was assigned to cover ecotoxicology area from Oct 11/93 - Oct 30/93 (DP/KUW/92/003/11-01).
- o Dr. Peter Saenger (Australia) was assigned to cover marine biology from Sept 24/93 - Oct 21/93 (DP/KUW/92/003/11-02).

The short term mission consultants identified and recommended the important and necessary areas to tackle.

- o Dr. Stephenson in ecotoxicology strongly recommended the establishment of Bioassay Laboratory program
- o Dr. Saenger in marine biology recommended the Coral Reef Ecological Study.

It seemed that the Bioassay Laboratory was an institutional building type program, and coral reef ecological study was a long term academic research type program.

Both scientists prepared the job description for following up international consultant 11 M/M each.

It seemed that Dr. Saenger for marine ecology prepared a very detailed research plan. And Dr. Stephenson listed activities which were too ambitious to conduct within 11 month.

2) At the second stage of the 11 months foreign consultants for long term field mission were recruited and assigned to the area of ecotoxicology and marine biology.

The consultants were:

Dr. Fred Abram from England was assigned to cover ecotoxicology as well as to set up the Bioassay Laboratory from Nov/94-Dec/95 (DP/KUW/92/003/11 -03). Dr. F. Abram's main assignment were :

- o Providing advice on the equipping and starting-up of a recently built Bioassay Laboratory.
- o Initiating and establishing "routine" acute and chronic bioassays with algae, invertebrates and fish suitable for assessment of effluents and pollution incidents.
- o Initiating a research program, involving laboratory, model ecosystem and ultimately field monitoring studies to determine the potential for chronic toxic effects of petroleum hydrocarbons in the Gulf Region.
- o Training KISR staff in the field of aquatic toxicology and aquatic hazard assessment.

Dr. Peter Harrison from Australia was assigned to execute the Kuwait coral reef ecological research project from Feb/95-Dec/95 (DP/KUW/92/003/11-04). The main activities of his assignment were :

- o Surveying the major coral reef communities in Kuwait to provide quantitative baseline data on the status of these reefs, against which past and future changes to these communities could be compared.
- o Studying the patterns of reproduction and growth of ecologically important selected coral species.
- o Conducting the ecotoxicological assessment of coral reef with environmental pollutants such as heavy metal, oils etc.
- o Identifying reef communities of high conversion value, and formulating management plans for these reefs.
- o Training KISR personnel.

2. Inputs

- o UNDP : total $ 354,000 for international consultants.
- o KISR(Kuwait)
  - Physical facility : 400 m2 floor space for Bioassay Laboratory
  - Personnel : Five researchers and technicians(Two full time)were assigned to ecotoxicology program.
    Three part time researchers and technicians were assigned for the coral reef study.

  - Research Budget : Research found : 31,000 KD for Coral reef(including salaries)

3. Level of commitment of KISR

Based on the reports prepared by the two field mission international experts, the commitment of KISR to the projects were rather short of expectation. This was due to the fact that:

- o The research funds were not yet allocated when the consultant was ready to start the mission.
- o Especially, the construction of bioassay lab building was delayed for 6 months.
- o Most of Counterpart staff or technicians assigned to the project were part-time based.

C. Quality of monitoring and backstopping

It seemed that this project was heavily dependent upon the foreign experts provided by UNDP/UNIDO from project formulation to execution of the work plan. Also it was found that there was no noticeable, actual designated National Project Director for the project at KISR. The reason seemed to be that there were two programs, one was in the ecotoxicology area and the other in the marine biology area which were managed by different Divisions, Division of Environment and Division of Food Resources of KISR.

Also, there was no record of tripartite review held between KISR/UNIDO/UNDP. UNIDO backstopping officer never made the site visit for the project. However, the backstopping officer had frequent contact with the international expert and made suggestion and comments on the direction and results of the project. In the mean while, UNDP/Kuwait also had frequent contact with foreign experts and supported them in securing the project budget from KISR.

IV. PROJECT RESULTS

A. Relevance : yes

The purpose, approach, modality of execution and the selected recipient institution were valid, especially at the second stage: input of the foreign experts were very desirable to formulate and execute program.

B. Efficiency : less than expected

The project as well as the consultants were encountered with problems such as delay of building construction of Bioassay Lab, not timely delivery of study budget and shortage of personnel, etc. This problem had inhibited the full utilization of foreign experts, and lowered the efficiency.

C. Outputs

The most important outputs achieved are:

1. KISR has opened the Bioassay lab the first of its kind in the Gulf region.

- Bioassay Lab is a new and very important infrastructure to KISR as well as to Kuwait in the environmental research activities.
- Environmental Science Dept has established a long term five year research project.
- The Bioassay Laboratory is currently utilized for some research project of Environmental Science Department of KISR (VR004P-Toxicity and Bioaccumulation of Crude Oil and Partially Combusted Oil by Selected Marine Organisms in Kuwait).

2. The successful execution of coral reef study.

It provided new information on the status of Kuwait coral reef communities including baseline data against which past and future changes in these communities can be assessed. It's result have raised scientific and public awareness of Kuwait coral reef and highlighted the need for management.

Some outputs mentioned in the project documents did not occur, especially in Bioassay Laboratory. For example,

- Detailed Assessment of movement of chemical.
- Risk assessment of toxic pollutant Laboratory model system.

It was because of the fact that

- The project document was prepared before the international consultant actually formulated the detail project. Based on this, UNIDO rightly recommended initial fielding of one expert (Mr. Saenger for two months) to assess the situation.
- Those "outputs which did not occur" could not be expected in the limited time frame

of 11 months.

- o It seems that the full activities will occur and eventually the outputs will be achieved during the 5 year research project period.

D. Immediate objectives

The immediate objective of this project was to strengthen the capability of the Kuwait Institute of Scientific Research (KISR) in the environmental research area. It was achieved by:

1) Setting up of a bioassay laboratory and conducting the research project with the facility.

2) Successful conducting of a coral reef ecological study such as marine biology program.

The coral reef study seemed to have achieved the immediate objectives more than the bioassay project. The reason seemed to be:

Coral reef study was a more academically oriented research project

Establishment of bioassay laboratory was an institution building oriented project which are more time consuming. Particularly, the construction of the bioassay laboratory building was delayed for more than 6 months so that there were limits of utilization of foreign experts to set up the lab., to train the personnel and to conduct more sophisticated studies using fish or other marine organisms.

E. Development objectives

The start up of the Bioassay Laboratory, and the capacity built through the coral reef study would play a very important role in the assessment of safety of chemicals as well as studies on marine biology in Kuwait. Those were directly related to the development objective of the project to make the country's environment free from toxic pollutants caused by the damage to industries and oil wells during the war.

F. Effectiveness

The effectiveness in terms of utilization of foreign experts could have been increased if the 11 months period of field mission could have been divided into 2 or 3 periods with the readiness of host organization(KISR).

According to the report, the experts had to spend time and effort to secure the funds, equipment and/or to wait for the physical facility to be ready.

G. Capacity building

The main objective of the project was the capacity building in the research capability of

KISR.

H. Impact

The project has had much positive impact scientifically, as well as socio-economically on Kuwait and other countries in the Gulf Region.

First, Bioassay Laboratory program

- o Opening up of the Laboratory has added another very important infrastructure to KISR as well as to Kuwait.
- o This will not only increase the quality of research activity of KISR in environmental study, but will also be utilized by industries and regulatory agencies of Kuwait in the production and management of chemicals.
- o This facility will test the toxicity of chemicals, by-products, and waste on aquatic life (e.g. fish) following international guidelines.
- o Also this Lab would act as a center of excellence in the Gulf region and be shared by other countries.
- o The opening of the Bioassay Lab. seems to have given the "can do" spirit to the scientists of KISR.

Second, Coral reef ecological study : This project provided a strong foundation for future research projects in KISR.

- o The coral reef surveys provided baseline data against which future changes can be measured.
- o Kuwait's coral reefs are important because they are major centers for marine biodiversity and are highly productive ecosystem. Also these are important habitat for commercial fish species.
- o Also the results of the project have raised scientific and public awareness of Kuwait's coral reef, and highlighted the need for management of the national asset.

I. Sustainability

Sustainability of the project was the key issue specially in this project where the dependancy on foreign consultants was very high. In the case of the coral reef study, the project stopped. However, one of the counterparts to the consultant is pursuing a higher degree under the consultant at the Southern Cross University in Australia. Therefore, when he returns to Kuwait after his study the know-how's will be secured in Kuwait. In the case of bioassay lab. additional effort of KISR would be necessary to keep and operate the laboratory even though it was utilized by a research team from the Environmental Science Dept. As one of the key staff members trained by the consultant had left the institute, certain shortage of technical specialty in this area is expected.

J. Follow-up

Since the project was formulated and executed by foreign consultants in 12-14 months, establishment of bioassay lab. In particular is one of the institutional building projects which needs a longer time and continuous budget input to reach a certain level of excellence. Now the bioassay lab. has just opened. It needs a new program to operate and upgrade the capacity of the lab. up to achieve the center of excellence in the Gulf region. Therefore, follow-up activity from UNDP/UNIDO will be essential in order to consolidate what has been achieved already.

V. CONCLUSIONS

1. The project is very important and useful in petrochemical based economy as well as in environmental protection in Kuwait.

2. The project was soundly identified and designed.

3. There were many problems, such as delays in building construction, shortage of logistic support and personnel.

4. The international consultants assigned to the field did their best to achieve the project objectives.

5. Despite many difficulties this project achieved the most important immediate objectives, and laid firm ground for further development in the limited time of 12 months.

6. Sustained support by a follow-up program through establishment of the first center of excellence in marine ecotoxicology is necessary for the benefit of Kuwait and the Gulf region.

VI. RECOMMENDATIONS

1. New Ecotoxicology lab. has opened at KISR first in its kind in the Gulf region. It was very significant in environmental research. From now the maintaining and upgrading of the lab. will be more important than start up of the lab. A following programs are strongly recommended.

- o KISR and Government should provide an annual budget to operate and maintain the lab.
- o KISR should establish an action plan to upgrade its capacity as Bioassay lab.
- o Especially KISR should recruit young and responsible biologist and technicians, and assign them on a full time basis to the Bioassay Lab just for maintenance and upgrading. There is no professional biologist assigned to the lab.
- o KISR should provide the staffs with study tour and further training abroad to achieve the center of excellence in the Gulf region.
- o UNDP/UNIDO should provide additional foreign consultants for upgrading the capability.
- o UNDP/UNIDO should provide a twining arrangement with other higher standard foreign laboratories to reach internationally recognized laboratory in relatively short period of time.

2. Coral Reef Project was successfully carried out, however,

- o KISR/Government should reactivate the coral reef project as soon as the young scientist returns to KISR from abroad.
- o When the coral reef project has been formulated, it must be linked with the Bioassay Lab. or ecotoxicology project.

The backstopping officer from UNIDO should make a site visit for the project.

3. If there will be similar project planning or implementation in the future, recommended actions are :

- o Identifying and designate National Project Director (NPD).
- o Identifying one Chief Technical Advisor (CTA).
- o Providing the NPD with study tours.
- o Joint formulation of the project with NPD and international experts or CTA.
- o Securing training of staff abroad.
- o Securing research budget of executing institute.
- o Securing a monitoring mechanism for the progress of the project.
- o Planning to take a longer project time when the project would be more a capacity building type.

VII. LESSONS LEARNED

1. This project was more like a capacity building and/or institutional building project. It seems that UNDP expect 11 M/M of fielding a consultant is not enough to achieve all expected outputs. Judging from experience, it will take more time and need more input to get good results.

2. In this project, it looked like UNDP/UNIDO as well as the consultants were more active in initiation, formulation, and execution than the recipient country and institute. It would be more desirable and successful if the nationals (recipient) were in front and active, and supporters (donor) were in the background. Ownership of the project by the stakeholders of the country should be encouraged in the next phase of the project.

ASSIGNMENT ITINERARY

Feb. 16 (Sunday) : - Arrived Kuwait
- Meeting with Nemine Guirgis, UNDP Res. Rep. A.I. and Mayada Homad, Senior program assistant
- Meeting with Dr. Suleiman Almator, Director Mariculture Fisher Department KISR

Feb. 17 (Monday) : - Meeting with Dr. Saleh M. Al-Muzaini, Acting Director, Environmental Science Dept.(ESD) KISR
- Meeting with Dr. Mohammed Mutwalli, Ecotoxicology Lab, Supervisor
- Tour of KISR Environmental Sci. Dept. facility
- Tour of KISR Bioassay Laboratory
- Tour of KISR Mariculture Fishery Dept.

Feb. 18 (Tuesday) : - Meeting with Dr. Muzaini at ESD, KISR with Dr. Harrison
- Visit to Ministry of planning

Feb. 19 (Wednesday) : - Meeting with Dr. Mohammad H. Al-Attar, Deputy Director General Research for Life and Environmental Sciences
- Visit to MFD for Coral Reef Project with Dr. Harrison
- Visit to Bioassay Laboratory with Dr. Harrison
- Make debrief at UNDP

Feb. 20 (Thursday) : - Leave for Vienna Austria

Feb. 21 (Friday) : - Debrief at UNIDO, Chemical Industry Branch with Dr. Yong-Hwa Kim, Dr. Sugavanam.

Feb. 22 (Saturday) : - Leave for Korea

LIST OF PEOPLE MET DURING THE MISSION

Ms. Nemine Guirgis : Resident Representative, A.I. UNDP/Kuwait

Ms. Mayada Homad : Senior Program Assistant, UNDP/Kuwait

Dr. Mohammad H. Al-Attar : Deputy Director General Research / Life and Environmental Science

Dr. SalehM. Al-Muzaini : Department Manager / Environmental Science Dept.

Dr. Sulaiman M. Almatar : Department Manager Mariculture & Fisheries Dept.

Dr. Mohammed E. Metwally : Assoc. Research Scientist Environmental Science Dept.

Dr. Peter Harrison : Reference Mission Expert. Center for Coastal Management, Southern Cross University, Uismore NSW Australia

Dr. B. Sugavanam: Chief, Agrochemicals Unit, Chemical Industries Branch, UNIDO, Vienna

Dr. Yong-Hwa Kim: Industrial Development Officer, Backstopping officer of the project, UNIDO, Vienna

MATERIALS REVIEWED DURING THE MISSION

- Project document
- Final report of short term consultants (92/003/11-01)
- Final report of short term consultants (92/003/11/02)
- Progress and final report of field mission expert (92/003/11-03)
- Progress and final report of field mission expert (92/004/11-04)
- List of on-going and finished project in Environmental Sciences Departments
- Brochures of Environmental Sciences Department/KISR
- Brochure of Mariculture and Fisheries Department/KISR
- Brochure of Kuwait Institute for Scientific Research(KISR)

TERMS OF REFERENCE

Evaluation Mission
Project KUW/92/003-Ecotoxicology and Marine Ecology
Studies in Post-War Kuwait

Background

The above-mentioned project came to an end in December 1995. As it was considered one of the innovative and particularly unique projects in Kuwait, UNDP in consultation with the Government, decided to conduct a post-terminal project evaluation to assess its impact and sustainability.

Setting of the project :

The destruction of oil wells and oil processing facilities during the occupation of Kuwait in 1991 resulted in millions of barrels of oil being released in to the Arabian Gulf. The potential impact of these massive oil slicks focused international attention on the fate of Kuwait's marine environment and its coral reefs. The main aim of this project was to plan studies for monitoring chemical pollutants and the effect of petroleum hydrocarbons upon the ecology of the marine environment. The project was designed to set up long term research studies in monitoring movement and accumulation of toxic pollutants, their effect upon, and their breakdown, in the environment, and to carry out model systems to eliminate/minimize the toxic effects to humans, animals, crops and aquatic life.

Two highly qualified consultants were recruited for a one month period to prepare for a longer term technical assistance to KISR in tackling the above problem. They reviewed the programmes and the capacity within KISR to deal with the ecological disaster and prepared a report selecting critical areas where ecotoxicology and marine ecology expertise were most needed. Technical assistance was recommended for setting-up long-term research studies at KISR on the ecology of Kuwait's coral reefs. The importance of establishing a bioassay laboratory to conduct testing and research in aquatic toxicology was also identified. The project's success criteria included providing information on the status of Kuwait's coral reef communities and assistance to raise the scientific and public awareness on major problems facing these reefs at present. Success criteria also included the establishing of a fully equipped and operational bioassay laboratory.

Purpose :

The purpose of this one-year post-terminal evaluation is to evaluate the impact the project had on the Environment and Earth Science department at KISR and assess the situation following the completion of the project. Answers to the following questions could be addressed : Did the project achieve its objectives and what were the contributions of the two consultants (based on their job descriptions) to the outputs of the project ? What were the main facilitating and constraining factors that influenced the project and what

recommendations can be made to remedy them in the future ? Has KISR acquired the necessary expertise to carry out ecotoxicology work in studying the fate of the various pollutants ? As a result of the project, is KISR conducting multidisciplinary experimental investigations on the impact of oil pollution on marine biota and ecology ? To what degree are the results and outputs of the project sustainable ?

The evaluation will also draw lessons for future interventions within the framework of Kuwait's Country programme, in particular how to address key dimensions of sustainable human development.

Issues to be covered :

Project concept and design :

The mission should consider whether :

- The studies on the effect of petroleum hydrocarbons upon the ecology of the marine environment were conducted and the approach used was sound ;
- The beneficiaries (The Kuwait Institute for Scientific Research) and the users of the project results were identified ;
- The objectives and outputs were stated explicitly, precisely and in terms that are verifiable (as per project document) of measurable ;
- The objectives were achievable, and the relationship between the objectives, the outputs, the activities and the inputs was clear, logical and commensurate, given the time and resources available ;
- A work plan was included in the project document and whether it was followed.

Implementation Management :

The mission should consider the following ;

The quality and timeliness of the inputs :

The quality and timeliness of the activities :

The quality and timeliness of the responsiveness of project management to changes in the environment of the project ;

The quality and timeliness of monitoring and backstopping by all parties to the project.

Availability/quality of counterparts.

Commitment of KISR.

Results and Sustainability :

- Did the project produce its outputs effectively and efficiently ; the quality of outputs and how they are being utilized ; whether the project achieved its objectives ;
- The effect the project had on KISR staff in the Environment and Earth Science department and on KISR in general. Any unforeseen effects should be enumerated ;

Lessons learned :

The consultant should consider any significant lessons that can be drawn from the

experience of the project and its results mainly anything that worked well and that can be applied to other projects in Kuwait and the region ; and anything that has been negative so as to avoid it in future.

Composition of the Mission ;

The mission will be composed of a qualified internationally recruited consultant, not directly involved in the design and/or implementation of this project, who will be selected by UNDP in consultation with the concerned authorities.
Good communication skills are essential in English and knowledge of Arabic is useful.

Timetable and Itinerary of the Evaluation :

It is proposed to start this exercise in mid-November 1996 for a period of ten days. The consultant will be briefed in Kuwait by the UNDP office and shall receive all documentation pertinent to this project. Upon leaving the country, he/she will debrief the UNDP Resident Representative and the concerned Government authority prior to finalizing the draft report. The draft report should be completed in the field, so that there is an opportunity for additional consultation as necessary. The consultant will complete the Project Evaluation Information Sheet (PEIS) and present the final report as per structure in the UNDP Evaluators Handbook. The final report should be submitted within two weeks after the end of the field visit.

Consultations ;

The mission will maintain close liaison with the UNDP Resident Representative in Kuwait, the concerned agencies of the Government, available members of the international team of experts in the country, and the counterpart staff assigned to the project. Although the mission should feel free to discuss with the concerned authorities anything relevant to its assignment it is not authorized to make any commitments on behalf of the UNDP or UNIDO.

Material available for Review by the Mission :

* Fifth Country Programme document
* Project Document
* All progress and final technical reports of the two consultants.
* Reports in KISR on relevant subjects.
* Nigel Downing's reports on the Coral Reefs in Kuwait (1991)
* UNDP Evaluators Handbook
* Project Evaluation Information Sheet (PEIS)