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FOR
SCIENCE AND HIGH
TECHNOLOGY
Trieste, Italy

UNIDO

ECOLE MOHAMMADIA
D'INGENIEURS
Rabat, Morocco

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION
Vienna, Austria

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct. 27 - Nov. 7, 1997

FINAL REPORT

Dates: October 27- November 7, 1997

Venue: Institut Spécialisé de Technologies des Pêches Maritimes (ISTPM), BP 419 Cité Aghediz, Agadir, Morocco, Tel: +212 8 844170, Fax: +212 8 842820.

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Framework and Overall Objectives

Within the area of Earth, Environmental and Marine Sciences and Technologies, an ICS-UNIDO subprogramme on Monitoring of Industrial Siting and Pollution by Remote Sensing and In-Situ Automated Instrumentation is presently being carried out and a Training Course on Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas. Planning for a Monitoring Network has been scheduled for October 27-November 7, 1997 in cooperation with the Ecole Mohammadia d'Ingénieurs, Rabat, Morocco due its scientific qualification as discussed in the p. oject document.Though the Ecole Mohammadia d'Ingénieurs, has all the logistics and facilities to organize the Training Course in Rabat, it does not have a scientific ship. Thus due to a generous offer from the Moroccan Ministry of Fisheries, the Training Course has been held in Agadir at the Institut Spécialisé des Technologies des Pêches Maritimes (ISTPM).

The overall objectives are:
- To strengthen institutional and individual capacity building of selected participants from Northern and Western African countries through a dedicated workshop on Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas. Planning for a Monitoring Network.
- To assess and review updated information on computer based tools for marine pollution, modelling simulation and control.
- To evaluate and collect updated information on the state of the art of pollution monitoring and control, related instrumentation, and computer based tools.
- To discuss and prepare regional/national project proposals.

The outputs expected are:
- Train participants on the utilisation of new and advanced tools for pollution control (computer based, instrumentation, hands on applications, case studies, on going projects, demonstrations).
- A comprehensive report containing all the contributions of the resource persons, case studies and information discussed during the Training Course.
- Possible proposals for regional co-operative projects on control of industrial pollution in urban-coastal areas.

PURPOSE

The training course is aiming at improving the research and development capacity building in the region by introducing information technology concepts such as the geographical information system (G.I.S.) technology, remote sensing techniques and other computational tools for analysis, design, monitoring and follow up of coastal areas pollution. (See Appendix I).

The main lectures (background) were on:

- Monitoring systems;
- Overview on pollution modelling and simulation;
- Planning for a monitoring network;
- GIS applications
- KBES and object concepts implementation

Demonstrations were about: Safi-Morocco Oil Spill, Venice lagoon, U.S. cases, and participants contribution.

Case studies: Modelling and simulation using advanced software for real cases.

Exercises and hands on applications were including Idrisi, ArcView, Digitalisation, Remote Sensing, Automatic Meshing, and Modelling and simulation.

Trip by ship: Al Hassani Moroccan Scientific Ship.

Please see attached programme for further details (Appendix 1).

Methodology :

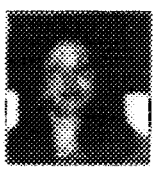
The training program is divided into a series of lectures, associated demonstrations of model software. Examples of model applications to a variety of practical problems are used to illustrate how the models can be employed to assess the impact of various management alternatives for development in coastal areas. Enough time is allocated at the conclusion of each session for question and answers. In view of the workshop format (e.g. computer-based demonstrations) publications from the refereed literature and conference proceedings will be provided to the conference organiser summarising the development, methodology, testing, and application of the model systems.

TECHNICAL PROGRAMME

Lecturers

The contributors list and coordinates is shown in Figure below. Their brief resumés are given in appendix 2.

FRANCE



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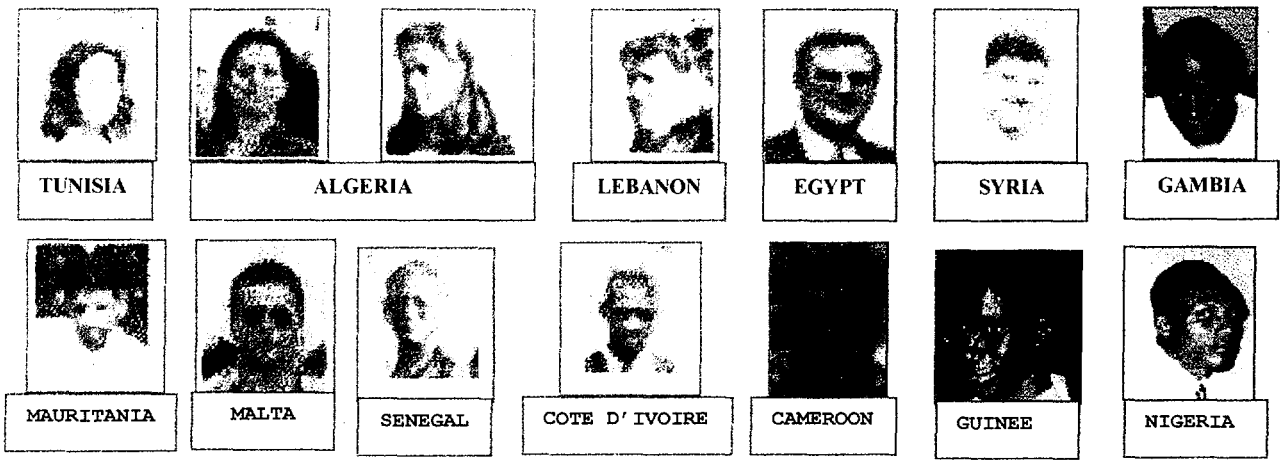
PARTICIPANTS

Fifteen participants were chosen among 50 follow criteria related to age, sex, education and profile, and past experience. They are coming from Mediterranean, West and North Africa countries. Unfortunately, one of the Nigerians could not show up, 3 additional Moroccan were then accepted for the TC. Therefore, the total number of participants was 27. The following figure shows the different countries representatives/delegates.

PARTICIPANTS (see attached list : appendix 3)

14 FOREIGN PARTICIPANTS



13 MOROCCAN PARTICIPANTS

TC Secretary

The final list of participants is enclosed (See appendix 3).

Opening Ceremony

The Workshop was opened by Prof. Bensari and Prof. Feoli, ICS Project officers, respectively Area and Associate-Area Co-ordinators. They presented the ICS history and objectives, UNIDO intervention and sponsoring , outlined the relevance of the training course and finally described the general session's content (see attached final programme, appendix 1).

Opening speeches were delivered respectively by Prof. Bensari and Feoli, Ouazar and Mr Barakat, director of ISTPM.
Professor Bensari informed on behalf of His Excellency the Prime Minister of Morocco, the high interest of the topic to be covered and the honorary presidency offered to this training course.
Mr Barakat welcomed all the participants on behalf of the Minister of Fisheries.
Prof. Feoli outlined the objectives of ICS and the role of international organisations in such initiatives.

Professor Ouazar underlined the key environmental issues, nowadays deserving attention which are numerous:

- effects of air pollution
- water pollution, agricultural effects
- land pollution
- mankind, population growth
- nuclear and chemical waste and war
- depletion of resources
- ecological effects

On behalf of the local organising committee and namely the Ecole Mohammadia d'Ingénieurs, I am pleased today to welcome you to attend "training Course on Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas "
Jointly organised with ICS/UNIDO.
The objectives as they will be discussed in detail by Prof. Ben Sari and Prof. Feoli are quite clear ; Offer a methodology and computational tools for :

- Saving resources whilst saving money
- Protecting the Environment

for a specific and broad area: Marine systems

Within the framework of this workshop, the participant will acquire knowledge on :

- Parameters, parameters identification and environmental standards
- Main governing equations
- Instrumentation/measurements, monitoring networks

He will learn about:

- Problem statement
- Problem assessment
- A series of computational tools such:
  Geographic Information Systems (GIS), Remote Sensing (RS), Numerical Methods, Object Oriented Data Bases (OODB), Knowledge Based Expert Systems (KBES)

  for handling the complexity of the environmental systems, identifying, analysing, modelling and simulating the behaviour of marine environmental systems

- The concept of integrated environmental management in general.

The approach is as follows:

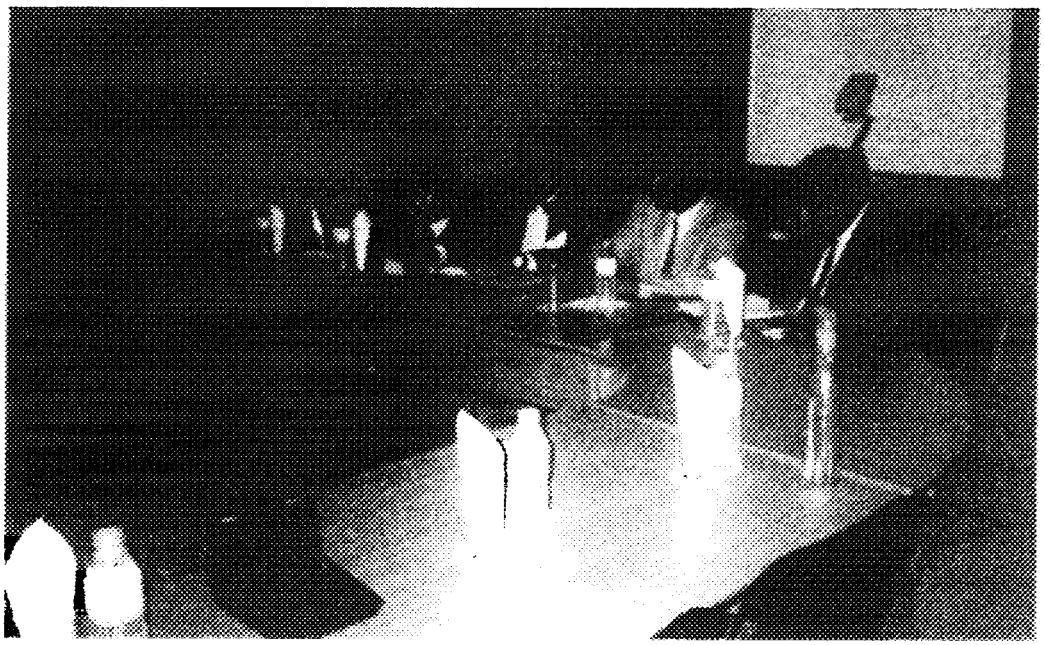
- A series of lectures/tutorials delivered by highly internationally well known scientists from America, Europe and Africa, for the background and the state of the art,
- Hands on applications using the most advanced software tools and numerical models,
- Validation tests and case studies.

The overall objective is to initiate regional and international research co-operation to combat all the bad environmental effects and to master environmental impact assessment, and develop integrated environmental management methodologies, in order to avoid the worst for the region.

Sponsorship of international organisations such as UN bodies, UNIDO, ICS is highly needed. Roving seminars like this one might enhance the regional capabilities for further studies and research.

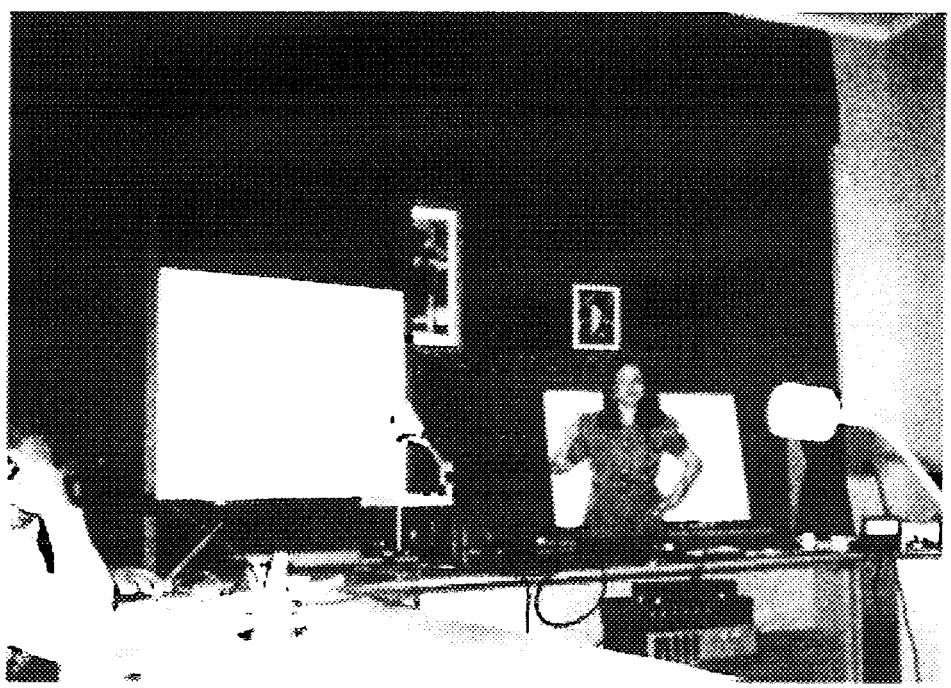
On behalf of the organising committee, I would like to thank the main sponsor ICS/UNIDO and acknowledge the partial support of the Moroccan Ministry of Fisheries through the Institut Spécialisé des Pêches Maritimes (ISTPM) and the Institut National de Recherche Halieutiques (INRH).

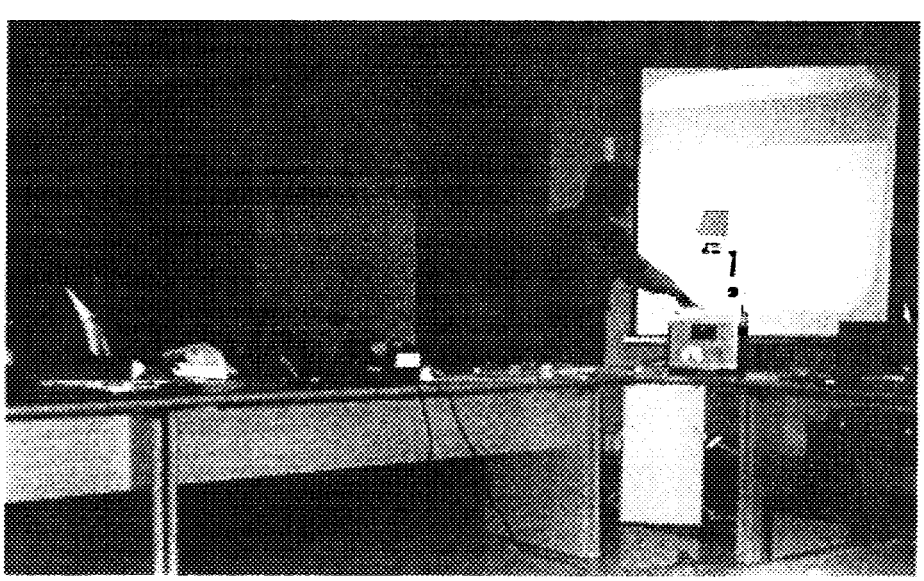
They welcomed the participants on behalf of their respective institutions, then briefed the participants about the expected outcome of the Workshop, and finally wished a successful workshop and a pleasant stay in Morocco.



Lectures

The Workshop started with general lectures for the background, then specialised topics, demonstrations and hands on applications on various conventional software and numerical models, cases studies presentation by various country papers concerning problem statements, G.I.S. and/or R.S. applications, numerical modelling/simulation, funding, regional/international co-operative projects. Detailed information can be found in (Contributors/Contributions) section.





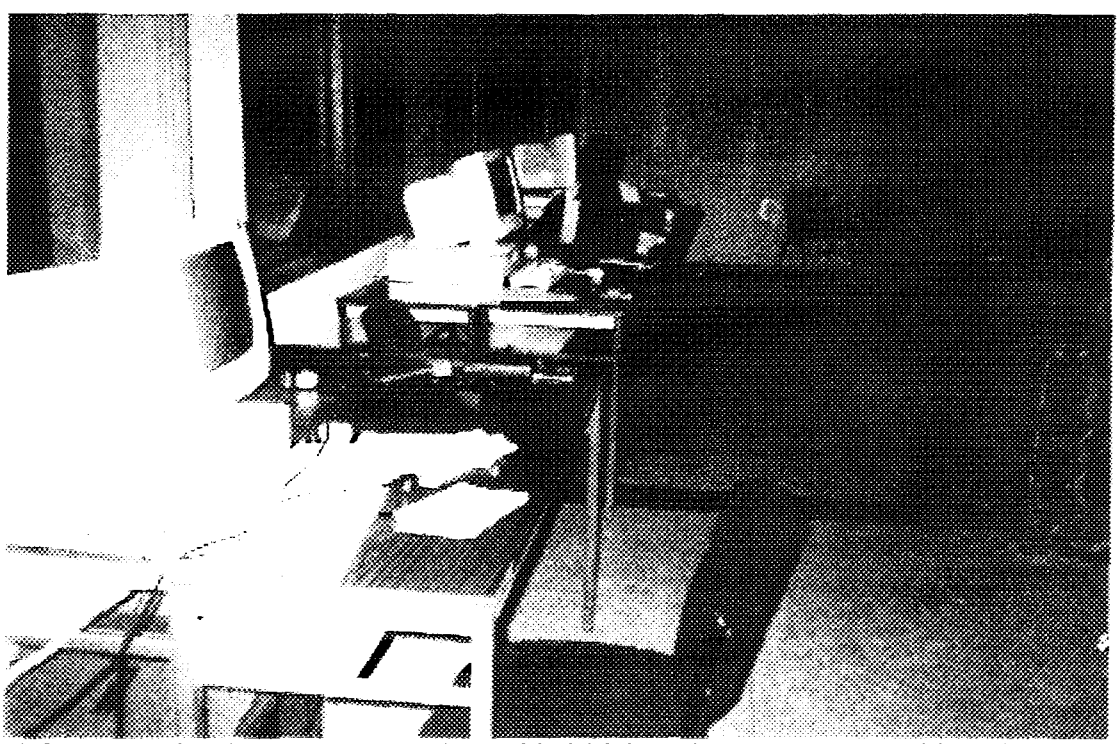
Highly advanced equipment was used for tutoring.

Hardware, Software and Audio Video Equipment

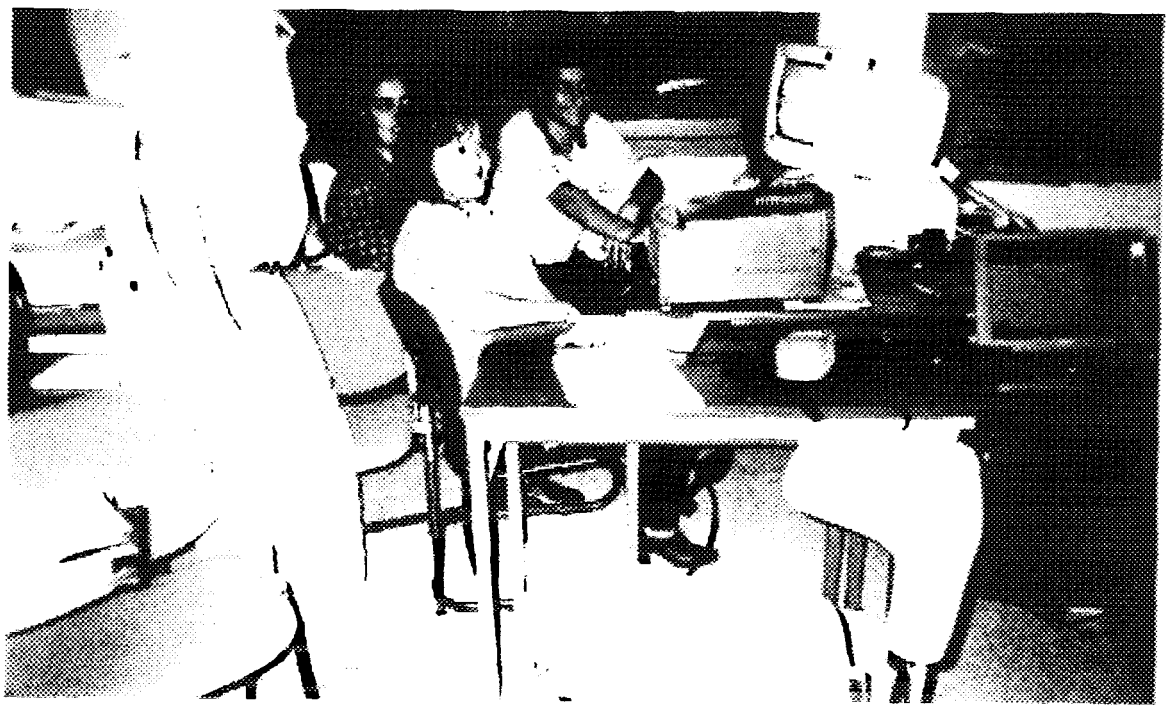
Hardware: 6 Pcs + 2 notebooks (Pentium 16 and 32 Mb, over than 166Mhz, more than 1.5 Gb hard disk), Digitizer A3, Scanner, Printers.
Operating system: Windows 95
Software:
GIS / RS: Idrisi, ArcView
Languages: C, C++, Fortran, Pascal
Overhead Projectors
In Focus Data Display

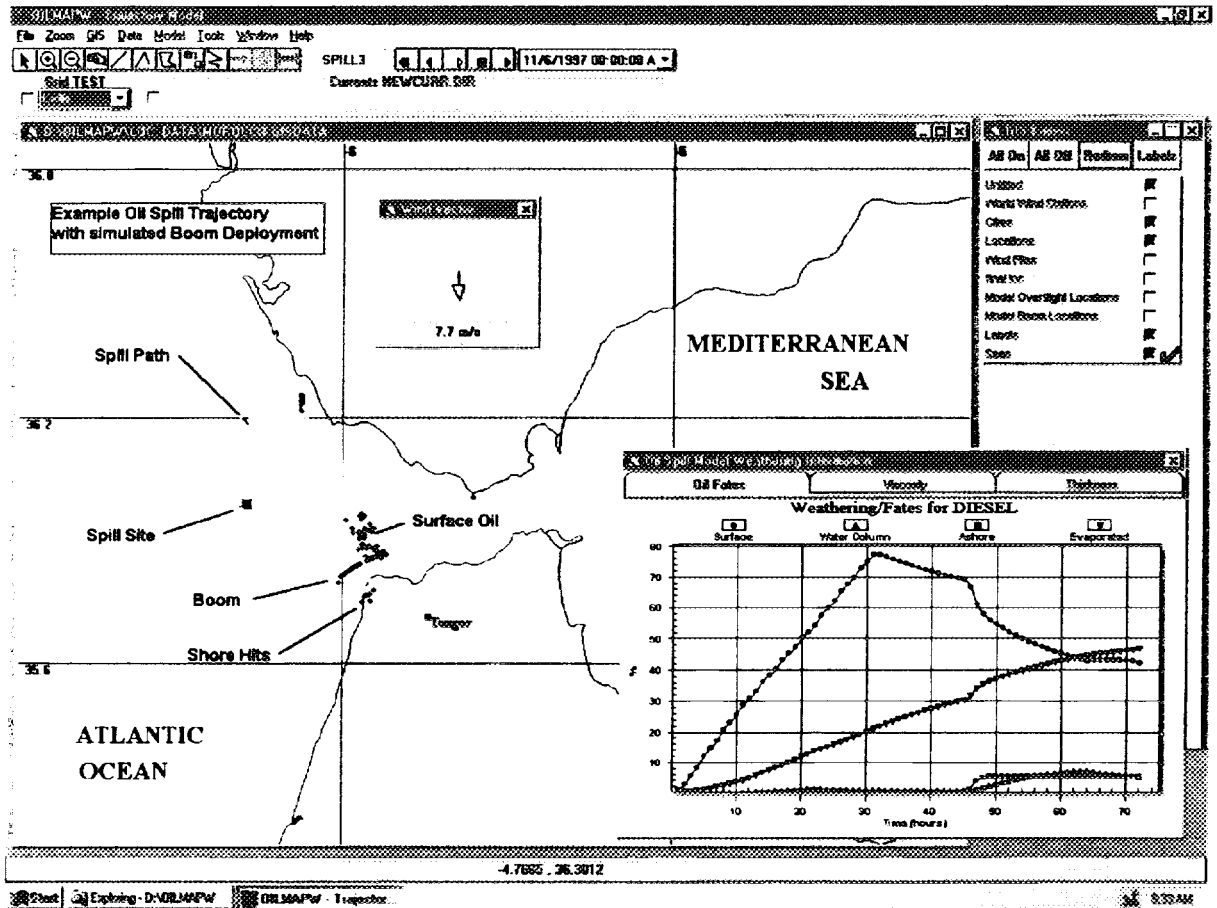
Hands on applications

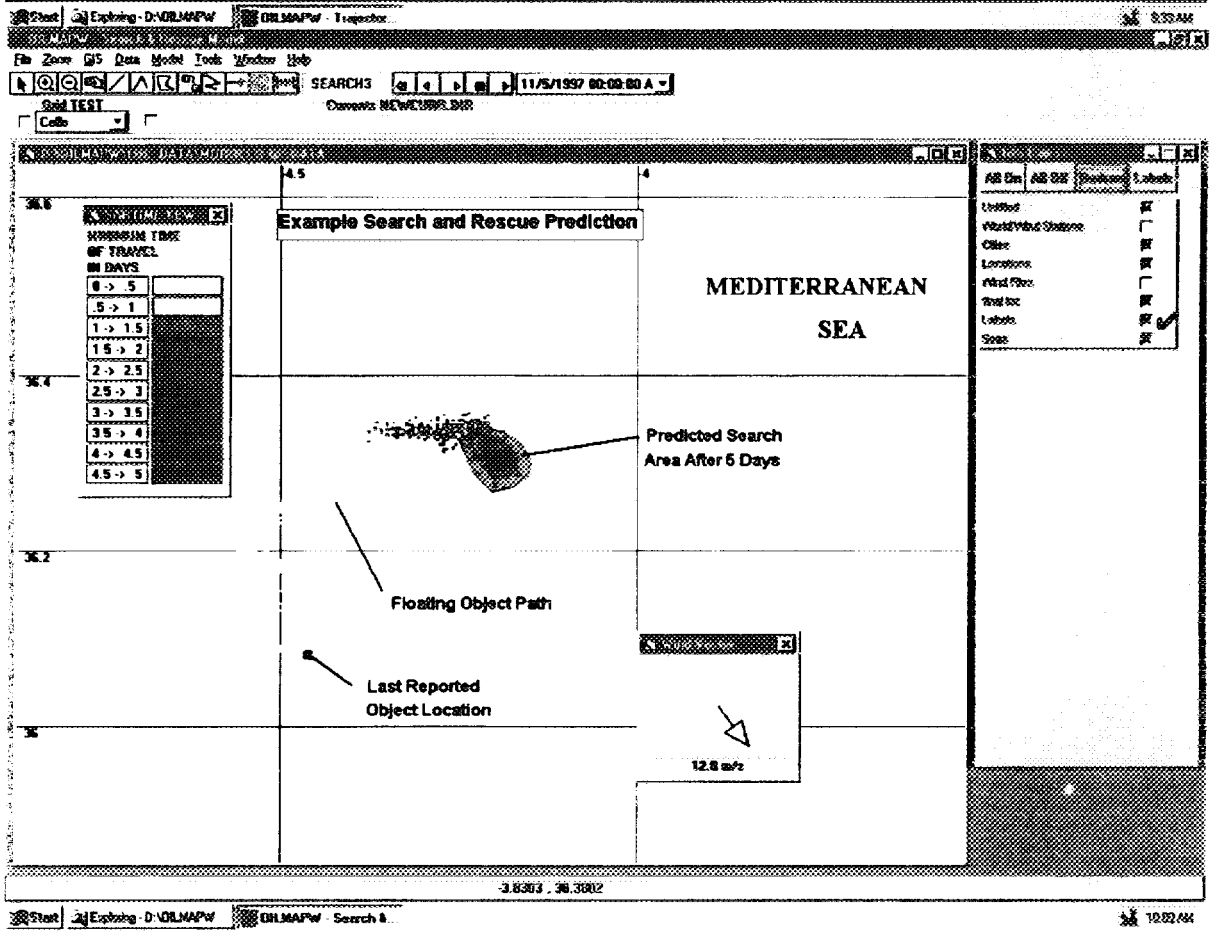
Pictures below show some equipment and a hands on session. Participants were



trained for using basic remote sensing with Idrisi and some geographic information system concepts with ArcView. After software demonstration with the overall monitoring process using experimental information and modelling, the participants went over highly advanced software for modelling and simulation purposes. A simulation run of the Safi-Morocco oil spill was particularly studied as depicted in the next figure.



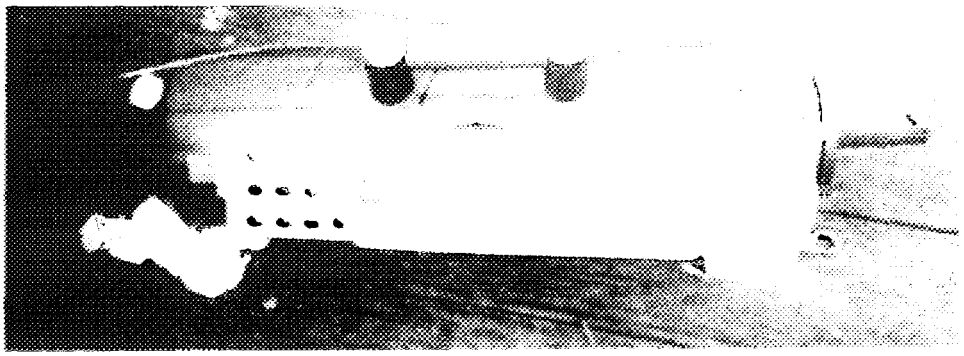

Example Oil Spill Trajectory
with simulated Boom Deployment
Spill Path
Spill Site
Surface Oil
Boom
Shore Hits
MEDITERRANEAN
SEA
ATLANTIC
OCEAN
Weathering/Fates for DIESEL

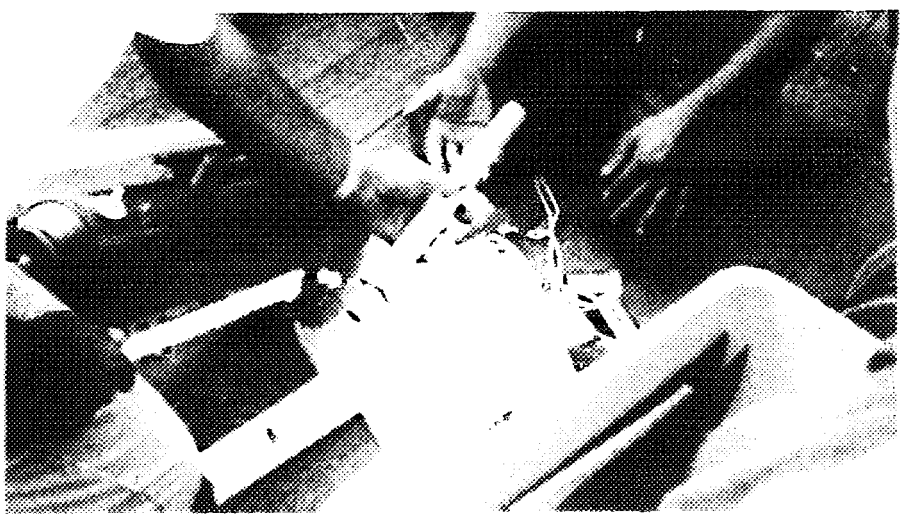

Example Search and Rescue Prediction
MEDITERRANEAN
SEA
Predicted Search
Area After 5 Days
Floating Object Path
Last Reported
Object Location

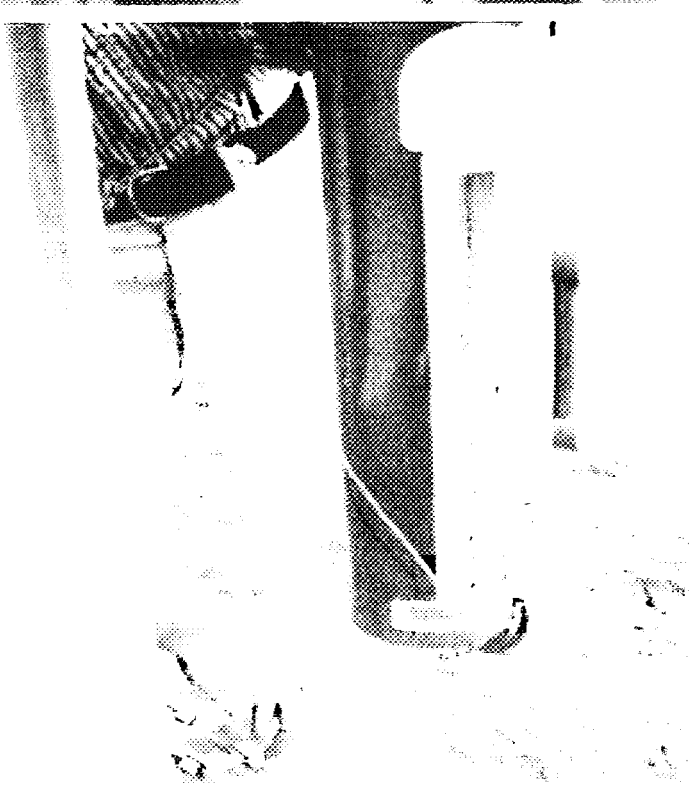
Scientific ship

A trip on the Moroccan Al Hassani scientific ship was planned on the 29th of October to illustrate and visualise the scientific equipment and measurements apparatus used for monitoring.
The picture below show the group attending the trip.

The following pictures show some equipment.







Discussions

The discussions during the Workshop were extremely thorough and open in French as well as in English. Many delicate points were dealt with at length. It was stressed that technology should be commensurate to the needs and the financial-technological capabilities of the country where technology is to be transferred.

Roundtable

The round table, chaired by Prof. D. Bensari, was on " Regional Co-operation on Oceans and Education and Training Capacity Building in Western and Northern Africa". First of all, the discussion during this round table was focused on environmental coastal areas problems, related to participants' country. Some cases are presented below. In a second step, the discussion was oriented towards the possible proposals for regional/national co-operative projects on the state and the impact of the pollution in coastal zones. The participants have expressed their high interest in such kind of initiatives. They suggested to introduce information technology concepts like the geographical information system (GIS), remote sensing techniques , and computational tools to control the marine systems at different levels.

In the following we summarise roughly the participant contributions, see Appendix 4 for more details.

Some of the participants presented the state of the art in their country. A roundtable about education under the auspices of IWCO was held. The most important points discussed were coastal erosion in West Africa, pollution prevention and control, information technologies in marine sciences, and funding issues.

In west Africa (Gambia, Senegal, Nigeria, Ivory coast, Guinea....), the most important coastal problem is coastal erosion. Co-operation and co-ordination between these countries is highly needed to understand and later master this environmental problem.

The Mauritanian participant mentioned that Nouakchout and Nouadibou cities are affected by fisheries pollution, waste water and thermal pollution. He added that the national park 'Banc d'Argan is threatened by oil spill.

The Syrian participant talked about the background radioactivity in the mariner coastal of Syria. This coastal region is free from any direct radioactivity waste discharges, the radioactivity present in this environment is mainly due to word wide fallout and radio nuclides present in the Mediterranean water due to radio active waste discharges from nuclear power plants in France and Italy. Since the coastal area in Syria is well developed with beaches used for recreation, and a large amount of fish and sea food are harvested from the area.

The Lebanese participant claimed the interest of his country on environmental marine problem due to the radioactivity, marble quarry (stone-pit) and different types of pollution caused by different Mediterranean countries.

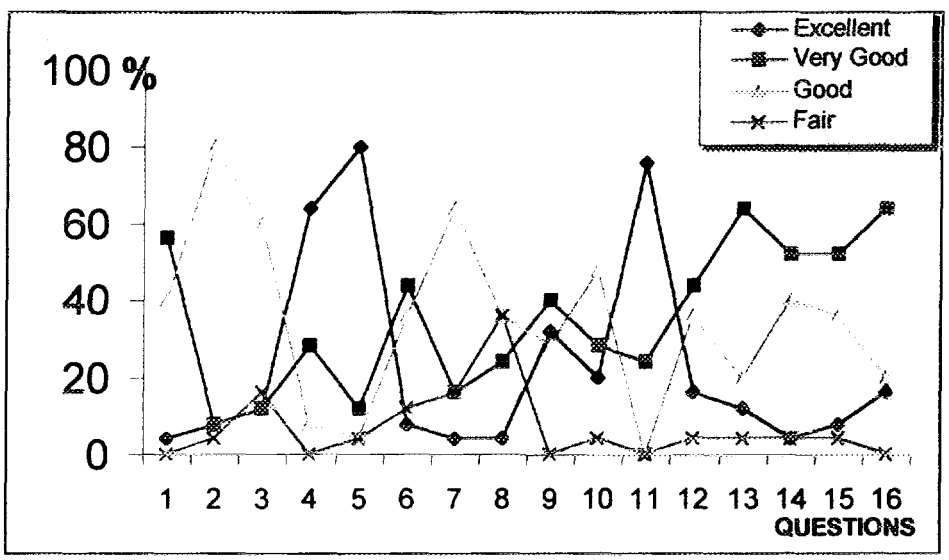
So, many of these countries intend to develop many regional programs in order to protect their marine systems, and to develop emergency services for catastrophic cases. However, some obstacles are encountered :

- the financial technological capabilities of these countries is limited
- need of materials, scientific equipment, hardware and software, computational tools....etc.

Prof. Ouazar suggested to think about research and development project that could be put within countries that have mutiual interest in specific fields. These will be submitted to international sponsors or donors such as ICS-UNIDO, European Union programmes, UNESCO, etc...

Evaluation

From the 27 distributed questionnaires, the statistical analysis show the following trend for all the analysed usual ICS questions.



CONCLUSIONS AND RECOMMENDATIONS

The participants have expressed their high interest in such kind of initiatives and suggested to push roving seminars for training purposes in information technologies applications for marine systems at different levels.

It was recommended that:

1. basic computer based tools workshops should be organised initially, and followed by specific domain workshops covering: GIS, RS, Modelling and Simulation, E.I.A. and Integrated Coastal Management;

2. more practice-oriented workshops should be specially organised for managers;

3. more workshops should be prepared in co-operation with ICS-UNIDO, and other international organisations at national level with the specific developing country directed towards scientists or decision makers and planners;

4. workshops similar to the one organised at regional level should be repeated for promoting the diffusion of knowledge among different states and the creation of a ICS network to be used for regional information and scientific exchange.

FUNDING

The total budget offered by ICS-UNIDO for the TC is of an amount of U$S 60,000. Matching funds were offered by Ecole Mohammadia d'Ingénieurs of Rabat and the Moroccan Ministry of Fisheries. The financial statement is given in Appendix 10.

Detailed Technical Contents: CONTRIBUTIONS ABSTRACTS

Prof. Driss BENSARI
L: Monitoring Networks: Management and Optimisation

Pollution reaches water, soil and air. Remote Sensing and in-situ monitoring techniques are complementary for registering air, water and soil pollution. Monitoring for environmental control is essential for establishing protocols for risk assessment, early warning and risk reduction.

The environmental control is based on computer modelling. Modelling depends on the integration of data from Remote Sensing and data gathered in site monitoring instrumentation, ground verification, maps, etc.

Professor Enrico Feoli
L: Industrial ecology ; a framework for sustainable development

Industrial ecology is a branch of ecology studying interactions between industry and environmental variables. It applies models of ecological recycling processes to change industrial production system in such a way to be most effective and less deteriorating environment. The subject of industrial ecology is the production system in all its interactions with the environment both in resource and space utilisation. Industrial ecology is working with the environmental space by keeping into account all the human factors trial may influence the productive system such as policy and market. The analogy between the ecosystem and the production system is outlined and an example of GIS application to an industrial one in order to detect industrial spatial patterns in analogy with community ecology is discussed.

Mr Alessandro BERGAMASCO :

L: THE LAGOON OF VENICE, ITS DRAINAGE BASIN AND THE COASTAL AREA - A CASE STUDY
Abstract : Introduction to the different (physical, administrative, environmental economic) aspects that influence the management of a coastal system. Pollution sources and loads. Environmental indicators. Monitoring, Data banking, GIS,

Modeling. Criteria and strategy to develop a pollution control programme (DSS) Actions for pollution control The management of the system.

L/HA: FRESHWATER QUALITY ANALYSIS THROUGH GIS APPLICATIONS
Abstract : This exercice will present a GIS application in ArcView that allows the analysis of water quality parameters measured along the hydrographic net that discharges in the Venice Lagoon. The pollutant is mostly coming from the human activities in the drainage basin (industries, agriculture,urbanization).

L: MARINE WATER QUALITY ANALYSIS THROUGH AUTOMATIC MONITORING SYSTEMS AND GIS
Abstract : In this lecture, the automatic BlueBox system that has been developed by Thetis aiming at the automatic and unattended measurement of the chemico-physical parameters in marine waters, is presented. The lecture illustrates the use of the BlueBox data in a GIS environment (ArcView) in order to produce maps of water quality in coastal areas.

Dr. Rachid El Bayad

L: Introduction to databases and geographic information systems
Database concepts, Online implementation of a database using ACCESS. GIS concepts, raster/vector objects, knowledge layers, Applications to thematics.

HA: Digitalization
Numerical cartography, practical use of a digitizer (control points, digitalisation of points, curves and regions), boundaries treatment.

Mr. PATRONO

Ecology, indicators and environmental inventory
The basic principles of applied ecology are discussed, mainly focusing on the importance, within a spatial context, of indicators, impacts, etc. Topics: fundamentals of ecology, ecological equilibria and disturbance regimes; environmental indicators; value functions; environmental inventory; thematic mapping unit.

Pollution control and rehabilitation overview
An overview of water, soil and air pollutants is presented. Topics: water pollution; point source pollution; non point source pollution; mitigation strategies; soil pollution (and desertification); accumulation and availability of heavy metals; cleaning up a former industrial site; air pollution; modelling atmospheric dispersion.

GIS and pollution modelling
The efficiency of GIS in environmental impact analysis is discussed from a general point of view. Topics: environmental impacts; spatial information and GIS as key variables in ecological analysis and EIA; pollutant flows.

GIS modelling for air pollutant dispersion
A simplified solution for air pollution modelling and mapping with a GIS is described. Topics: air pollutant dispersion from a road; air pollutant dispersion from a fuel power plan.

GIS modelling for mapping surface pollutant dispersion
The applicability of GIS spatial functions in environmental analysis is discussed, with special attention to neighbour operation and pollutant dispersion (gravity). Topics: neighbour operation in GISs; filtering, distance, area numbering, connectivity, neighbour analysis, iterations and propagation; direction matrix; digital elevation models; pollutant dispersion from a pollutant source.

GIS and Multi-criteria analysis for waste disposal siting
The combination of several criteria to locate a waste disposal site is explained using standard GIS functions. Topics: boolean logic models; binary evidence maps; index overlay with multi-class maps.

Geostatistics
The importance of geostatistical applications for pollutant mapping is described. Topics: interpolation; geostatistics; variogram estimation; model fitting; isotropy – anisotropy; kriging and co-kriging; simulated annealing; indicator kriging.

Prof. Malcolm L. Spaulding and Mr Daniel Mendelsohn:

L: A SHELL BASED APPROCH TO MARINE ENVIRONMENTAL MODELLING.

Abstract: A shell based strategy to marine environmental modelling, suitable for world wide application, is presented. The shell provides a unified framework for the application of marine environmental models. The shell includes a colour graphics based user interface, geographic information system, environmental data management tools, gridding software, interfaces to supply input and display output from the models, linkages to real time observations and selected individual or linked process models. Through the graphics interface the user can set-up an application anywhere in the world or select from areas already available in the system. The software is designed to operate on low cost, personal computer platforms (or linked to high performance computers) and to be extremely user friendly. It employs clear, concise, intuitive graphical procedures to facilitate data handling and the display and animation of model predictions. Application of the shell based system to predict hydrodynamics and water quality, oil spill trajectory and fate, and dredged material dispersal and as a platform for real time
monitoring and modeling of estuarine and coastal waters will be presented. Extension of the basic approach to other environmental modeling and monitoring problems will also be summarized.

L: A Shell Based Approach to Marine Environmental Modeling

Overview of shell based approach to marine environmental modeling, including motivation for design of system, target user community, basic software design strategy, computational platform, embedded geographic information system, graphics

user interface, environmental data handling and management tools, process models, access to external data sets, customizing system design, and worldwide applicability.

L: Three Dimensional Boundary Fitted Coordinate Hydrodynamic and Water Quality Modeling

Development and testing of a coupled three dimensional boundary fitted coordinate hydrodynamic and water quality model including background of boundary fitted approach to modeling, development of governing equations, transformation of equations to boundary conforming and sigma coordinate
systems, generation of grid system, numerical solution methodology, model testing and evaluation, and application to selected coastal and estuarine systems.

L: Application of an Integrated Hydrodynamic and Water Quality Model System (WQMAP) to Selected Coastal Problems

A demonstration of the application of WQMAP to selected environmental problems including an assessment of the impact of alternative treatment of combined sewer overflow discharges into upper Narragansett Bay, Rhode Island and modeling of the 3-D circulation and thermal plume dynamics from the once-through-cooling discharge of Brayton Pt electrical generating facility into Mt Hope Bay, Massachusetts.

HA: OILMAP and SARMAP, an Integrated Oil Spill and Search and Rescue Model

Overview and application of an integrated oil spill trajectory and fate/search and rescue model including model formulation, testing, and application to selected problems. Demonstration of applications will include oil spill simulations for the North Cape spill (January 1996) (off
the southern coast of Rhode Island) and trajectory forecasts for spills off the east coast of China. Search and rescue demonstrations will include predicting the movement of containers lost from a ship off the coast of Peru and location of individuals lost at sea. Extensions of the spill model to assess the biological impacts and natural resource damages (SIMAP and NRDAMAP) of oil and other chemicals spilled at sea will be briefly summarized.

L/HA: COASTMAP: An Integrated System for Marine and Freshwater Environmental Monitoring, Modeling, and Management

The development of a state-of-the-art integrated system (COASTMAP) to monitor, model, and manage fresh and marine water systems will be presented including motivation, system design and implementation, system testing and selected applications. Applications will include real time predictions of the movement of drifting surface buoys, modelling the impact of pollutant releases in Greenwich Bay, Rhode Island and monitoring water quality in estuarine systems.

HA: Applications of the Shell Based Methodology to Other Selected Problems

A brief summary of the application of the shell based approach to other marine environmental modelling problems will be given. These will include wave

transformations in a shallow water environment, management of dredged material in coastal waters (modelling of material transport and dispersion during dredging and open water disposal operations), and dispersion of drill cuttings and production waters from offshore oil platform releases.

Training session in the application of the model system to selected problems

This will be a training session in the application of selected models to typical environmental impact problems. It will feature a step by step presentation of the application of the model to a given problem including selection of the model domain, gridding, assembly of supporting environmental data, model calibration and verification, and evaluation of remedial alternatives.

Dr. Benjelloun Touimi:

L: Atmospheric Pollution Aspects

General tools about atmospheric and marine pollution are first underlined, then focus on air pollution modelling in low atmosphere.

Studies on air pollution presented here concern two atmospheric layers, tropospheric and stratospheric layers.

In a first part, we present some generalities on greenhouse effects, GES, aerosols, ozone hole, primary and secondary pollution, and finally some examples through graphics images illustrating numerical results obtained by specific software on atmospheric pollution modelling cases and hydrodynamic water quality modelling cases. Those can be found on the following web site: http://www.acri.fr

We focus in a second part on air quality modelling in low atmosphere, more precisely between 0 and 1500 to 2000 m from the ground. A brief description of a 3D Eulerian photochemical air quality model AZUR is given. It is performed for the simulation of air pollution in urban and semi-urban areas.

The model tracks gas pollutant species emitted into the atmosphere by transportation and industrial sources, it computes the chemical reactions of these species under varying meteorological conditions (photolysis, pressure, temperature, humidity), their transport by wind and their turbulent diffusion as a function of air stability. It has a modular software structure which includes several components dedicated to specific processes:

MERCURE, a meso-scale meteorological model to compute the wind field, turbulent diffusion coefficients, and other meteorological parameters. It is a 3D regional scale model accounting for different ground types and urban densities. It includes a complete set of physical parameterisation in clear sky.

MIEL, an emission inventory model describing the pollutant fluxes from automotive transportation, domestic and industrial activities. This model includes a mobile source inventory based on road vehicle counting together with global information on

transportation fluxes extracted from statistical population data. It uses specific emission factors representative of the vehicle fleet and real driving patterns.

MoCA, a photochemical gas phase model describing the chemistry of ozone, NOx, and hydrocarbon compounds. This model, with 83 species and 191 reactions, is a reduced mechanism well adapted to various air quality conditions (ranging from urban to rural conditions). For interpretative reasons, the identity of primary hydrocarbons is preserved.

AIRQUAL, is a 3D Eulerian model solving reactions and transport by mean wind flux and turbulent diffusion of species in the atmosphere.

A short review on the numerical schemes used to solve mass conservation equation corresponding to the different contributions of pollutant emissions, transport-diffusion, chemistry, dry deposition are given. Some methods to reduce CPU time to integrate the stiff ordinary differential equations describing the chemical transformations are discussed.

Prof. J. Louis CASSAR

The lectures included the following topics :

i) Integrated Coastal Area Management ;

ii) Conservation of specialised coastal habitats : approaches to environmental strategies involving the key stakeholders ; and,

iii) Environmental Planning & Management for conservation on the coastal zone : a systems approach.

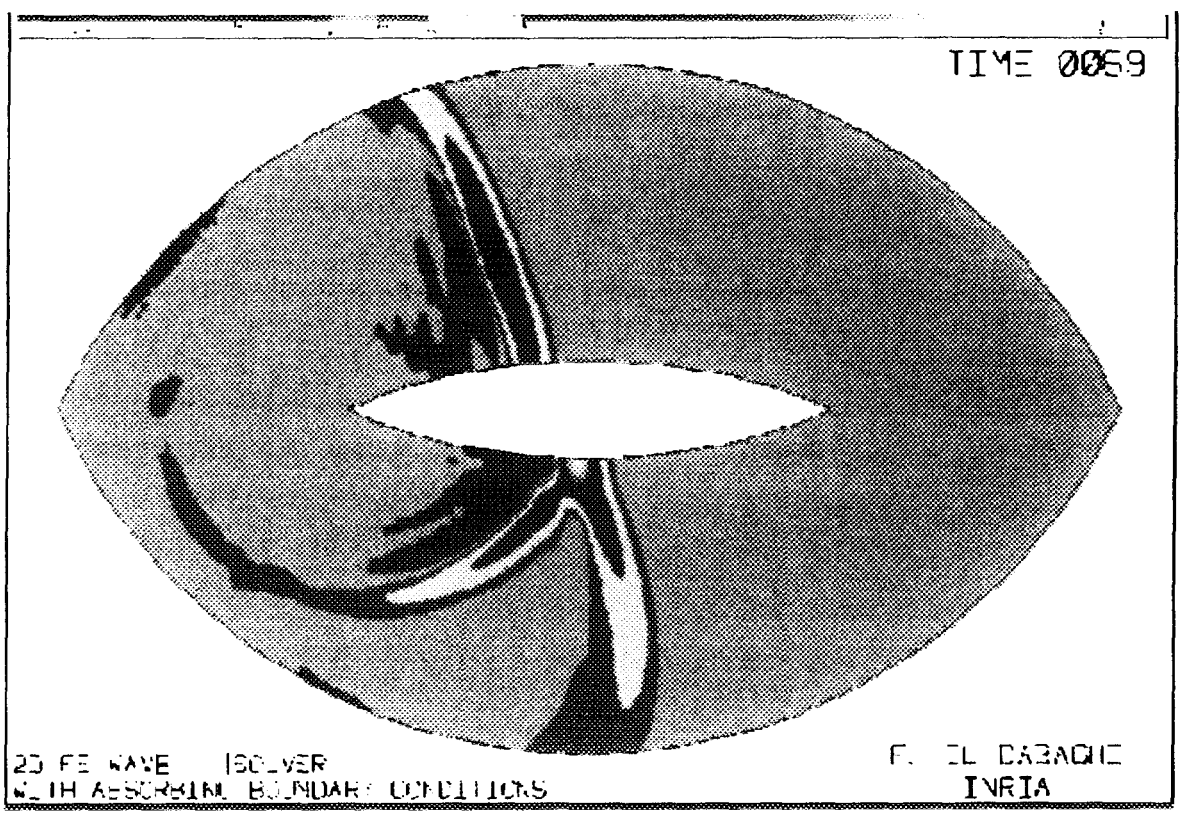
The importance of protecting Mediterranean ecosystems was highlighted, through supporting data on the region's biodiversity. The impacts by the human agency, in particular demographic growth and unsustainable land-use patterns, were addressed together with institutional constraints such as the widespread lack of legal instruments and policies, public support and financial resources.

Emphasis was made on ecosystem management and systems planning through the responsible use of coastal resources with a view to balance their demand and resolve conflicts of use, and the provision of strategic planning as a multidisciplinary tool for environmental planning and management. The proposed framework for action outlined the need for integrating nature conservation strategies with sustainable economic development. Furthermore, the decentralisation of management systems, and grassroots involvement (primarily the key stakeholders), together with multi-sectoral improvements and the incorporation of environmental education, were recognised as key components for enhanced responsiveness to environmental needs. A detailed analysis on the content of *management plans* for coastal protected areas was presented and discussed, emphasising the need that endangered habitats should not be protected in isolation, but rather form part of a cohesive national conservation area system.

Throughout the lecture sessions, the lecturer drew on his personal experiences of environmental appraisal in various locations in the Mediterranean to highlight practical examples. Two case-studies featuring environmental impacts, that in a small island state as Malta and the Aswan High Dam, were presented.

Dr. Fadi El Dabaghi

L: Some concepts for setting up virtual workshops for numerical validation solvers in engineering sciences.



The validation of computational solvers for the numerical simulation of physical phenomena problems in engineering sciences took recently an important place in this area supported by the sustained evolution of the information technologies generally, and the scientific and/or intensive computing in particular : expanding size of computer memories, incredible CPU performance unheard-of just a few years ago, graphic tools transforming results treatment, networks drastically reducing communication time between computers, etc. From the research studies to the industrial applications, as a matter of fact, this development has led that the numerical validation is more and more an essential step in all research having a technological and industrial end-use ; Undoubtedly, handling this becomes of capital importance for researchers, engineers and potential decision makers. As a major impact, one can observe the indirect rapprochement, essential today, of domains which until recently were quite separated : for example, the objective of this course. The main difficulty for handling the numerical validation resides in its

multidisciplinary character based on domains traditionally disconnected: physical and numerical modelling, experiments in laboratories, mathematics, computer sciences, etc. In order to cover this transversal character, we present the concept of *virtual* workshops for computational solvers validation ; this concept is a *dynamic* platform, friendly use and interactive on Internet that the objective consists in giving to potential participants a complete *environment* as well as possible to validate a computational solver. This *dynamic* infrastructure could be seen as an interactive data bases permitting:

- a general and specific accessible information: specification of test cases, models, meshing, solutions of reference, experimental solutions, abstracts of used methodologies, ...,
- a setting up of computer tools at the participants disposal : interactive software mainly to exploit results with interpretation and analysis tools.

This concept type allows at one and the same time to maintain the perenniality, to diffuse, to stimulate and to keep the backward memory of the state of knowledge for the workshops. And tomorrow, with the generalisation of high debit networks (> 32MBytes), the organisation of virtual workshops with video conferences becomes a reality and opens new perspectives and other applications.

To illustrate this concept that the interest covers various and multiple domains, we present a prototype application (EEDB) which has been developed at INRIA with the co-operation of Dassault Aviation to simulate a virtual workshop.

Professor Ouazar

L: Hydrodynamics and Water Quality Governing Equations for Marine Systems

Abstract: Among the environmental problems that have been and still are being caused by the discharge of various types of pollutants into the sea, the degradation of water quality due to the population growth and the industrial development world-wide.

In order to evaluate the hydro-ecological impact of potential pollution sources, scale models in large hydraulics laboratories have historically been used. However, physical models have a number of
limitations and might incur high costs. Nowadays, engineers and scientists are increasingly moving to numerical hydraulic and water quality models for such studies whenever possible. Although numerical models have a number of advantages over physical models, they also have their disadvantages.
The purpose of this lecture is to describe the basic governing equations and the study of the dynamics and transport phenomenon in marine system. Some numerical models for simulating depth-averaged flow and dispersion of pollutants in free surface flow (marinas, estuaries,....) are also presented for illustration.

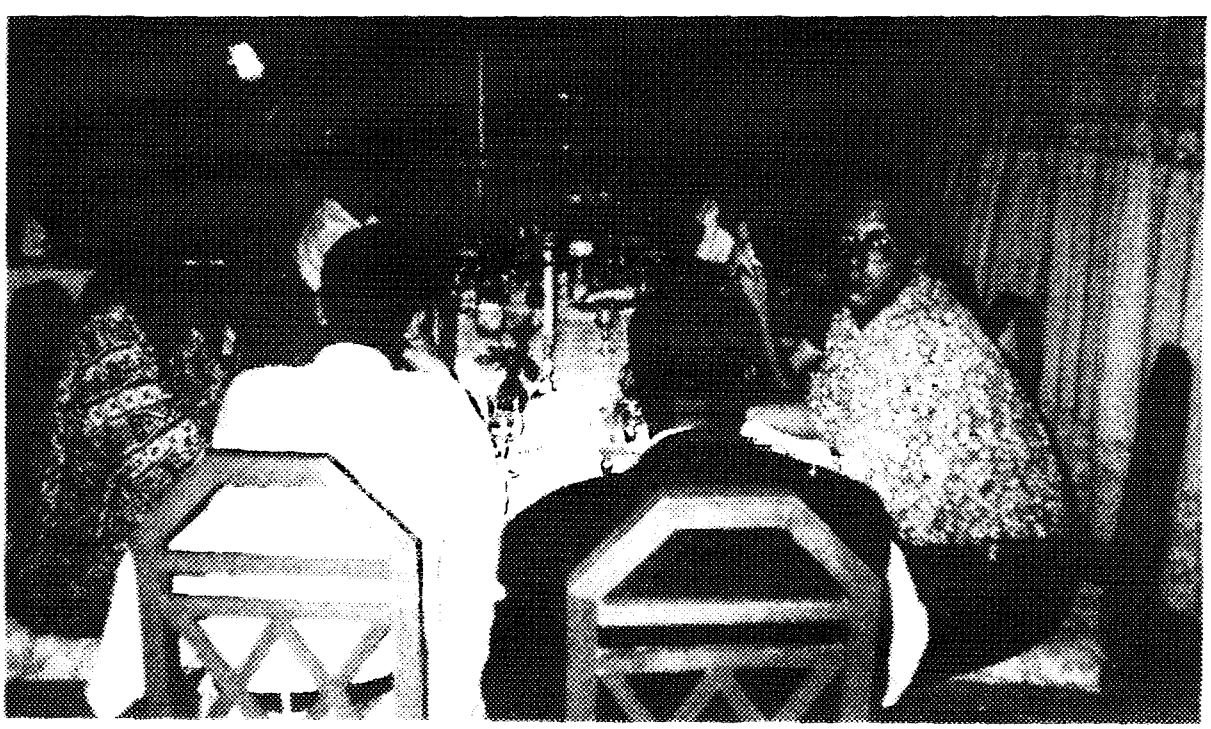
L: An Overview of Knowledge Based Exert System and Object Oriented Systems:

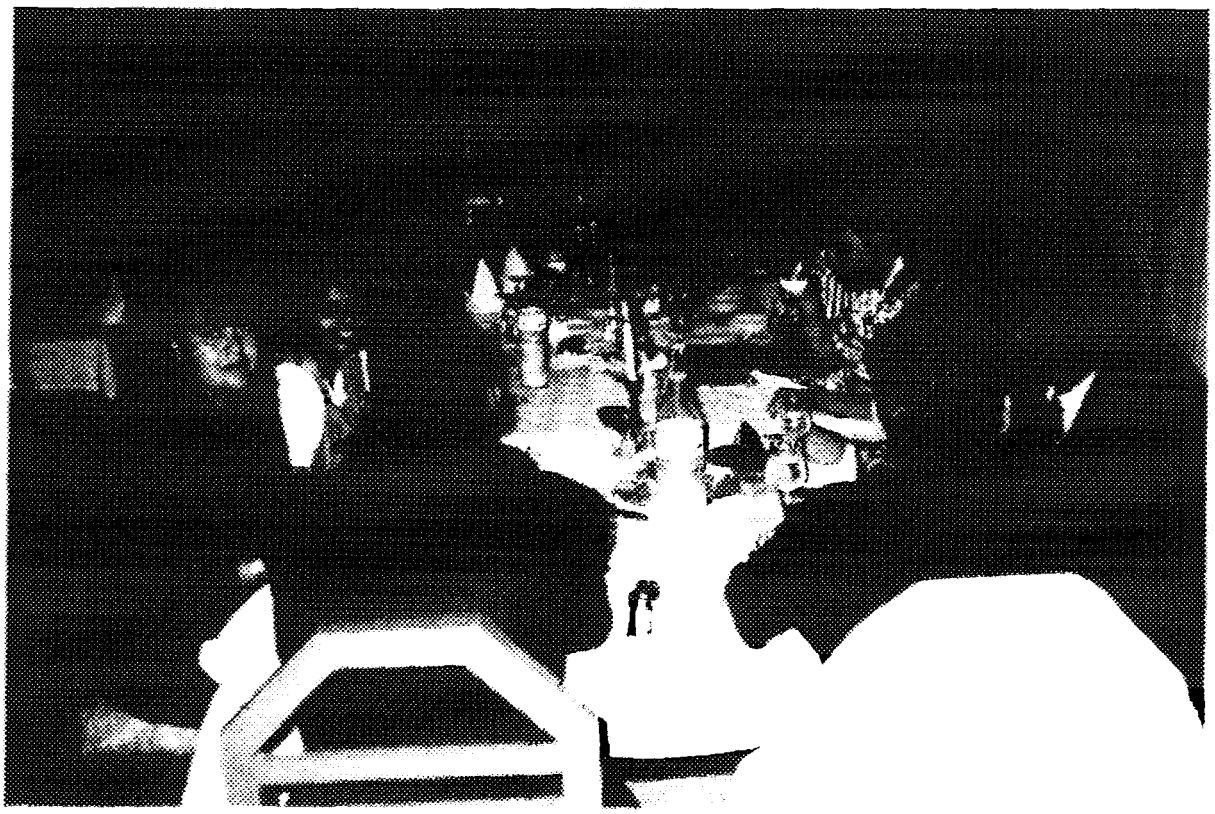
Abstract: After a discussion of engineering problems features, problem solving techniques are presented, then concepts about Artificial Intelligence, Expert System

or KBES, main components(Inference mechanism (Forward chaining, Backward chaining), Search techniques (Brute force search, Depth first, Breadth first, Heuristic search, Hill climbing (Best-First)), Knowledge representation (Rule-based, Logic, Semantic Networks, Frames, Objects), Appropriateness of a KBES approach, Development process, Conventional Programs vs KBES, Expert System Shells: Shell Selection for Engineering Purposes, available commercial shells, OOP paradigm, software life cycle for traditional and object-oriented, object-oriented design, abstraction, objects, anthropomorphism, encapsulation - information hiding, subclass, superclass, available OOP languages, steps, polymorphism, inheritance, Object Behaviour analysis steps.

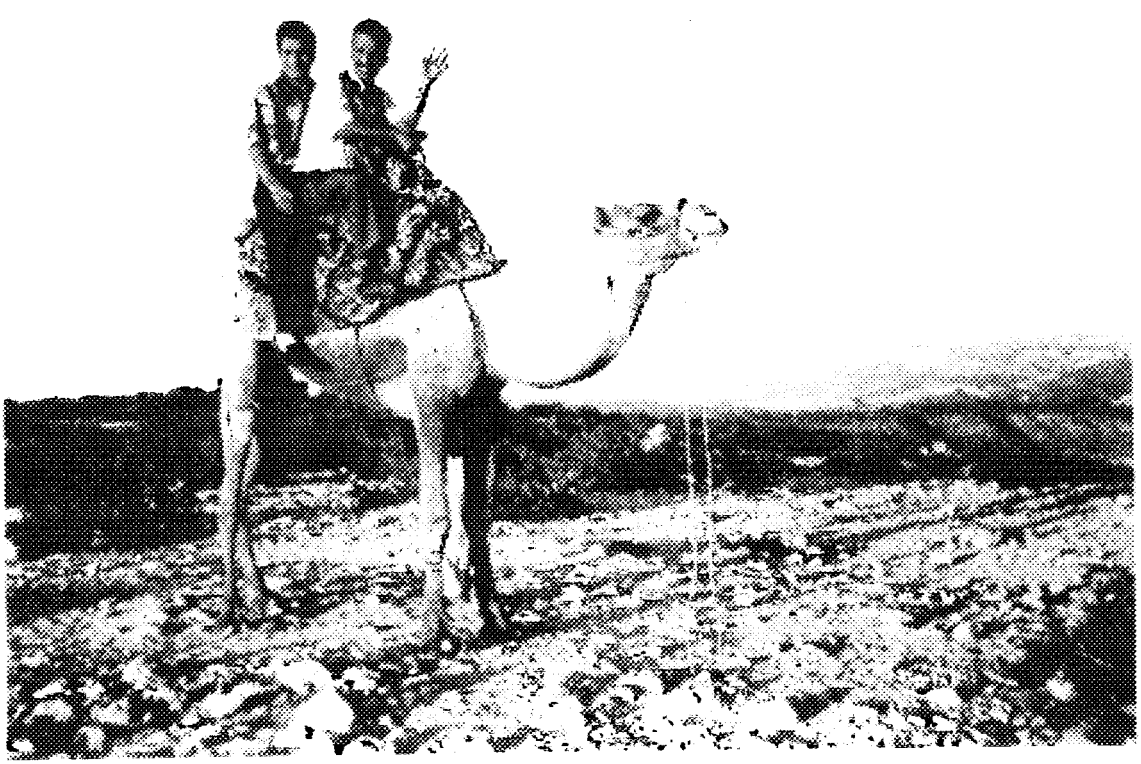
Accommodation and Food

All the participants were lodged at the training course location ISTPM (Institut Spécialisé de Technologies des Pêches Maritimes (ISTPM), BP 419 Cité Aghediz, Agadir, Morocco, Tel: +212 8 844170, Fax: +212 8 842820). The lecturers were at COS/ONE (Centre des Oeuvres Sociales de l'Office National d'Electricité (COS / ONE), Tel: +212 8 843046, Fax: +212 8 843046). All the lunches for the group were organised at ISTPM while diners were at COS/ONE. The following pictures give an idea of the facilities offered.





SOME NICE SOUVENIRS (the least not the last)



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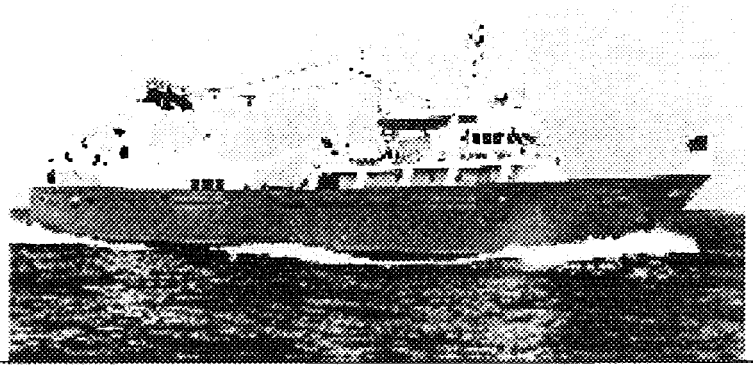
ECOLE MOHAMMADIA D'INGENIEURS

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

FINAL PROGRAM

Training Course on Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Area: Planning for a Monitoring Network

Al Hassani Scientific Ship



Institut Spécialisé de Technologie des Pêches Maritimes, Agadir, Morocco

October 27- November 7, 1997

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Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct. 27 - Nov. 7, 1997

FINAL PROGRAMME

Appendix 1

Coordination of the Training Course

ICS Coordinators :

Driss Ben Sari, Enrico Feoli: Earth, Environment and Marine Science and Technologies, ICS, Trieste, Italy.

Local Coordinator :

Driss Ouazar, Ecole Mohammadia d'Ingénieurs, LASH, Rabat, Morocco

Information :

1 Ecole Mohammadia d'Ingénieurs
Laboratoire d'Analyse de Systèmes Hydrauliques
BP 765, Agdal, Rabat, Morocco
Tel + 212 7 67 05 79, fax + 212 7 77 88 53
Email : tcics @emi.ac.ma, ouazar@emi.ac.ma

2 ICS-UNIDO
Earth, Environmental and Marine Science and Technologies
Via Grignano, 9, 34014 Trieste, Italy
tel + 39 40 22 45 72, fax + 39 40 22 45 75
Email : roa @ics.trieste.it

Presentation

The International Center for Science and High Technology (ICS), Trieste, Italy, is organizing a Training Course on Predictive Modeling of Environmental Impact of Industrial Development in Urban-Coastal Areas : Planning for a Monitoring Network, in Rabat Morocco, in collaboration with the Ecole Mohammadia d'Ingénieurs (EMI), from October 27-November 7, 1997, under the Honorary Presidency of the Prime Minister of the Kingdom of Morocco..

The course is addressed to junior scientists and Engineers in environmental problems and data analysis who have contacts with the decision makers and technical managers on the topic of their countries in supporting planning and management with a special focus on environmental quality protection, normally integrated pollution monitory control.

The main overall objectives of the courses are :

- to strengthen the building research capacity of DC through continuing education programs and workshops
- to enhance a dynamic training network in environmental applications by organizing thigh level courses/workshops and eventually news and exchange work groups.

Contents

- Main parameters/indicators and pollution sources overview
- Marine pollution modeling outline
- Pollution control and rehabilitation
- Monitoring systems : Management and Optimization
- Tools for pollution control
  - Modeling and simulation
  - Remote sensing and image processing
  - Geographic Information Systems/Data bases
  - Knowledge based Expert Systems
  - Integrated Systems
- Software Presentation (GIS, RS, KBES, Modeling and simulation)
- Hands on applications
  - Demonstration project
  - Case and/or field studies
- General discussion on action oriented research/regional research projects.

Lecturers

- Z. Benjelloun Touimi, IFP, France
- D. Bensari, ICS, Trieste, Italy
- A. Bergamasco, THETIS, Venise, Italy
- J. L. Cassar, Foundation for International Studies, Malta
- F. Dabaghi, INRIA, Paris, France
- R. El Bayad, LASH/EMI, Rabat, Morocco
- E. Feoli, ICS, Trieste, Italy
- D. Ouazar, EMI, Rabat, Morocco
- A. Patrono, ICS, Trieste, Italy
- G. Profeti, Universita degli Studi di Firenze, Florence, Italy
- M. Spaulding, ASA, Rhodes Island, USA
- D. Mendelsohn, ASA, Rhodes Island, USA
- A. Touzani, EMI, Rabat, Morocco

Methodology

The course is organized as follows:

- Introductory lectures
- Demonstrations and field trip
- Participants presentation
- Case studies and tutorials
- Technology management
- Hands on applications (Software applications)

Financial support

Selected participants are granted according to standard UN policy. Travel and full board accommodation expenses are covered by the organization (excluding participants from Morocco). Inscriptions are free of charge.

Acknowledgements

The sponsorship and partial support of the Moroccan Ministry of Fisheries and its institutions **ISTPM**(Institut Spécialisé de Technologie des Pêches Maritimes) and **INRH** (Institut National de Recherches Halieutiques), is greatly acknowledged. All the contributing participants through case studies presentations, interaction and discussion are greatly acknowledged.

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas. Planning for a Monitoring Network

DAY 1

	Date : 27/10/97, Morning Session	
08 :30 - 09 :30 Registration		
09 :30 - 10 :30 Opening Ceremony		
10 :30 - 11 :00 Coffee Break		
11 :00 - 12 :30 **L** :	Course Introduction (ICS)	BEN SARI
12 :30 Lunch		
	Date : 27/10/97, Afternoon session	
14 :30 - 16 :00 **L** :	Industrial Ecology : A Framework for Sustainable Development	FEOLI
16 :00 - 16 :30 Coffee Break		
16 :30 - 18 :00 **L** :	INRH Laboratories, Field visit	
18 :00 Closure		

DAY 2

	Date : 28/10/97, Morning Session	
09 :00 - 10 :30 **L** :	Network Monitoring Systems Management and Optimization	BEN SARI
10 :30 - 11 :00 Coffee Break		
11 :00 - 12 :30 **L** :	Hydrodynamics and Water Quality Governing Equations for Marine Systems	OUAZAR
12 :30 Lunch		
	Date : 28/10/97, Afternoon session	
14 :30 - 16 :00 **L** :	Environmental Planning and Managment for Conservation on the Costal Zone: A Systems Approach	CASSAR
16 :00 - 16 :30 Coffee Break		

L : Lecture, **CS** : Case Study,
HA : Hands on Applications, **RT** : Roundtable
PC : Participants Contribution

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16 :30 - 18 :00 **L** :	Costal Area Managment : The Case of Malta, A Mediterranean Small Island State	CASSAR
18 :00 Closure		

DAY 3

Date : 29/10/97, Morning Session

Scientific Ship

Date : 29/10/97, Afternoon session

Instrumentation / Measurements / Sampling.

DAY 4

	Date : 30/10/97, Morning Session	
08 :30 - 09 :30 **L** :	Finite Element Modeling In Computational Fluid Dynamics	DABAGHI/OUAZAR
09 :30 - 10 :30 **HA**	Automatic Meshing	DABAGHI
10 :30 - 11 :00 Coffee Break		
11 :00 - 12 :30 **L** :	Air Pollution Modeling	BEN JELLOUN
12 :30 Lunch		
	Date : 30/10/97, Afternoon session	
14 :30 - 16 :00 **L** :	Information Systems and Virtual Workshop	DABAGHI
16 :00 - 16 :30 Coffee Break		
16 :30 - 18 :00 **HA** :	Data Bases Concepts and Applications	EL BAYAD
18 :00 Closure		

L : Lecture, **CS** : Case Study,
HA : Hands on Applications, **RT** : Roundtable
PC : Participants Contribution

DAY 5

Date : 31/10/97, Morning Session		
09 :00 - 10 :30 **L** :	Geographic Information Systems (GIS)	EL BAYAD
10 :30 - 11 :00 Coffee Break		
11 :00 - 12 :30 **HA** :	Hands on Applications: Digitalization	EL BAYAD
12 :30 Lunch		
Date : 31/10/97, Afternoon session		

SATURDAY

SUNDAY

DAY 8

Date : 3/11/97, Morning Session		
09 :00 - 10 :30 **L** :	A Shell Based Approach to Marine Environmental Modeling	SPAULDING
10 :30 - 11 :00 Coffee Break		
11 :00 - 12 :30 **L** :	Three Dimensional Boundary Fitted Coordinate Hydrodynamic and Water Quality Modeling	SPAULDING
12 :30 Lunch		
Date : 3/11/97, Afternoon session		
14 :30 -16 :00 **CS** :	Application of an Integrated Hydrodynamic and Water Quality Model System (WQMAP) to Selected Coastal Problems	SPAULDING
16 :00 - 16 :30 Coffee Break		
16 :30 - 18 :00 **L** :	OILMAP and SARMAP, an Integrated Oil Spill and Search and Rescue Model	MENDELSOHN
18 :00 Closure		

DAY 9

Date : 4/11/97, Morning Session		
09 :00 - 10 :30 **L/HA** :	Oil Spill in Safi Simulation	SPAULDING
10 :30 - 11 :00 Coffee Break		
11 :00 - 12 :30 **L** :	COASTMAP: An Integrated System for Marine and Fresh water Environmental Monitoring, Modeling, and Management	SPAULDING
12 :30 Lunch		
Date : 4/11/97, Afternoon session		
14 :30 - 16 :00 **HA/CS** :	Applications of the Shell Based Methodology to Other Selected Problems	MENDELSOHN
16 :00 - 16 :30 Coffee Break		
16 :30 - 18 :00 **HA/CS** :	Application of the Model System to Selected Problems	MENDELSOHN
18 :00 Closure		

L : Lecture, **CS** : Case Study,
HA : Hands on Applications, **RT** : Roundtable
PC : Participants Contribution

DAY 10

Date : 5/11/97, Morning Session		
09 :00 - 10 :30 **L** :	Pollution Control and Rehabilitation Overview	PATRONO
10 :30 - 11 :00 Coffee Break		
11 :00 - 12 :30 **L** :	Use of GIS and Geostatistics for Flow Modelling/Distribution of Pollution	PATRONO
12 :30 Lunch		
Date : 5/11/97, Afternoon session		
14 :30 - 16 :00 **RT** :	Participants Contribution	Chair: BENSARI
16 :00 - 16 :30 Coffee Break		
16 :30 - 18 :00 **RT** :	Round Table : I.W.C.O. / International Tear of Oceans	Chair: BENSARI
18 :00 Closure		

DAY 11

Date : 6/11/97, Morning Session		
09 :00 - 10 :30 **L** :	Marine Water Quality Analysis Through Automatic Monitoring Systems & GIS	BERGAMASCO
10 :30 - 11 :00 Coffee Break		
11 :00 - 12 :30 **CS** :	The Lagoon of Venice, ITS Drainage Basin and Costal Area	BERGAMASCO
12 :30 Lunch		
Date : 6/11/97, Afternoon session		
14 :30 - 16 :00 **L** :	Presentation of ILWIS	Chair: PATRONO
16 :00 - 16 :30 Coffee Break		
16 :30 - 18 :00 **L** :	Object Concepts and Knowledge Based Expert Systems	OUAZAR
18 :00 Closure		

L : Lecture, **CS** : Case Study,
HA : Hands on Applications, **RT** : Roundtable
PC : Participants Contribution

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DAY 12

Date : 7/11/97, Morning Session		
09 :00 - 10 :30 **RT** :	General Discussion on Research/Regional Action-Oriented Projects.	Chair: BENSARI
10 :30 - 11 :00 Coffee Break		
11 :00 - 12 :30 **CC** :	Closing Ceremony	
12 :30 Lunch		
Date : 7/11/97, Afternoon session		

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CONTRIBUTORS'BRIEF RESUMES

Appendix 2

Dr. Zakia Benjelloun-Touimi , born in Casablanca on 25 of February 1955, is a french citizen, married with 3 kids She is graduated from Ecole Nationale des Ponts et Chaussées (ENPC) with a MS degree "Ouvrages d'Art" in 1984 and from the Ecole Polytechnique (X) in France with a PhD degree in Applied Mathematics in 1988.

She has obtained on June 84 a distinction from the SNCF (French railways) and from the ENPC for her contribution in a brevet deposit concerning a bridge master piece construction. Her PhD thesis was focused on Numerical Modelling for wave Propagation Phenomena in Electromagnetic applications. She was an expert engineering at MOTHESIM, French company specialised in radar topics, from 1988 till 1990 where she leads contracts with SNECMA-French Motor Aicraft Compagny. Since 1990, she joined IFP, the Petroleum French Institute, for a research's engineering position. Till 1994, she was in charge of numerical modelling aspects in reservoirs simulation and petroleum prospecting, mainly related to inverse problems. Around these activities, she co-ordinates an international consortium involving many companies and research institutes from 11 countries. Since 1994, she moved inside the IFP to the Computer and Applied Mathematics Division where she is assuming the responsibility of a transversal research action on numerical modelling in atmospheric pollution, mainly in reduced kinetic chemistry, catalyse optimisation process, stiff problems and diffusion aspects in flexible ducts. These activities are supported by contracts with environmental agencies (AirParif1, EDF2, LISA3) In this framework, she is in charge of the organisation of a permanent seminar and she is leading the MATLAB-SIMULINK EXPERT GROUP FOR THE IFP. Dr. Benjelloun-Touimi has published more than 20 papers in the above mentioned areas through international scientific journals or meetings related to Electromagnetic, Pollution and Petroleum. Besides the expertise research activities, Dr. Benjelloun-Touimi had also a training and teaching activities, the" most recent are done at the Ecole Polytechnique since 1996 and the she is supervising many PhD degree and MS degree thesis on numerical analysis and modelling related to petroleum and pollution problems.

Dr. Driss BENSARI was born in Morocco, and acting currently as a Professor of Geophysics at Mohamed V University, Rabat (Mohammadia School of Engineers)

His qualifications include geographical sciences engineer(IGN, Paris) ; Applied Geophysics Engineer (IFP, France) and PhD in Physics (Grenoble).
His professional activities include among others: Director of Moroccan National Center for (1979-1994), Director of the Département de Physique du Globe (1972-1985).

And acting as a consultant for many international 'UNESCO, UNDRO, UNIDO, UNEP and UNO) and regional organisations for many programmes : Natural Hazards , Prevention and Reduction Environment, High Education and Sciences and technology Policies.
He is:
Member of STC for INDR (1990.....)
Member elected of General Committee of ICSU (1993....)
Member of 3 Academies : AAS, TWAS and AFI
Member of Independent World Commission on the Oceans since 1996.
Moroccan General Commissioner of "Expo'98 Lisbonne (1997)

Honoured as Grand Prix du Livre Scientific (Morocco 1990).

He wrote more than 100 scientific research papers and communications in geophysics and earth sciences (35), environment and space sciences (28), oceanography (9), scientific and technological policies (18), edited 6 books on computer methods, water resources and oceanography. He is a visiting professor at Cornell University, USA and ICS associate area coordinator.

Louis F. Cassar is an environmental planner with experience in environmental appraisal and land-use evaluation. He is also a Member of the Institute of Biology (LONDON) and a Chartered Biologist.

- He has been involved as a consultant in various studies concerning the assessment of environmental impacts as well the mapping of terrestrial ecological habitats and has conducted filed research in a number of locations including Tunisia, eastern Algeria, the Nile Valley and Sicily, apart from the Maltese Islands.

- A key area of specialisation is the conservation of coastal sand dunes.

- He holds a postgraduate diploma in environmental management and a Master of Science degree in Environmental Planning and Management from the University of Malta.

- He is the Executive Director of the International Environment Institute, a conjoint Institute of the Foundation for International Studies and the University of Malta in which capacity he administers the various academic programmes of the Institute.

- He lectures within the Department of Geography and the Department of Architecture & Urban Design of the Faculty of Architecture & Civil Engineering of the University of Malta on Conservation of Natural Resources.

- Luis F. Cassar is presently on a number of international and national Boards, foremost among which are :

    - The IUCN [The World Conservation Union] Commission on Ecosystem Management, and ;
    - Centre for Environment & Development for the Arab Region & Europe [CEDARE] as *National Focal Point.*

Dr. Fadi DABAGHI is a senior researcher at INRIA in charge of two kinds of activities :

- International scientific relations : He is in charge of this activities since 94 for the INRIA Research Unit of Rocquencourt ; he boosted particularly the activities in the Mediterranean area through training, transfer and training for research actions. His knowledge of the Mediterranean area and his personal scientific relations played a major rule in the success of the workshops sponsored by the European Union in 1996 fof Training and Research in the Mediterranean area with emphasis on the International co-operation. He was an expert consultant for the National Moroccan Research Centre from 1989 to 1994. Besides ESIMEAU[1] project and CruCID[2] proposal, where he is acting as scientific co-ordinator, he participates partially in the co-ordination of two INCO-DC proposals : IMESIS and MtoM3D ; He is also co-ordinating SINTRAD[3], a euro-mediterranean training project related to environment. He organised and chaired many recent scientific meetings around Information Technology and International Cooperation : Numerical Processing in Petroleum Engineering –Tunis 1995, Software Architecture – Rabat 1996, IT for Numerical Modelling and Management in Water Resources – Rocquencourt 1996, Numerical and Physical Modelling in Engineering Sciences –Beirut 1997,
- Scientific activities : He is a member of a team involved in Computing Sciences with projects related to HPCN, CFD, CEM, etc. He leads many contracts with DRET (French Defence Ministry), Dassault Aviation and AGARD (NATO) on CFD and CEM, with IBM on HPCN. He was Chairman or Scientific committee member of many international scientific meetings related to Aerodynamics, Electromagnetic, Water Resources and HPCN. Dr. Dabaghi has published more than 3à papers in the above mentioned areas. He was acting as scientific consultant for CENT from 1991 to 1993 on numerical

modelling in mangeto-hydrodynamics. Besides the research activities, Dr. Dabaghi assumed permanently a partial teaching activities and supervised many PhD degree students at the University of Paris since 1983 mainly on Numerical Modelling and Programming and on HPCN.

Dr. Rachid El Bayad was born in Morocco. He got a PhD from the University of Luick, Belgium in Geographic Information Systems Applications to Hydrology. His past experience include software development using Pascal and Borland delphi environments. He wrote a full GIS code for Hydrology applications (HYDRO100). He is currently acting as a research associate within the LASH, Ecole Mohammadia d'Ingénieurs, Rabat. He is jointly supervising research students with Prof. Ouazar on applications of GIS and remote sensing for hydrological as well as marine applications. He is also building intelligent interfaces to numerical models developed within the LASH group.

Dr. Enrico Feoli is :

- Professor of Ecology University of Trieste, Italy
- Area Coordinator of ICS-UNIDO Earth & Marine Science and Technology
- Scientific Coordinator of international Centre for Theoretical & Applied Ecology (Gorizia)
- Member of the Scientific Committee of Third World Academy of Science (Sector Biology)
- He is Managing Several Research Projects Funded by Italy & European Union
- He is Author of More 120 Papers & Books in Community Ecology and Analysis.

Mr. Mendelsohn specialises in solving engineering problems in the marine and freshwater environment. His focus is on numerical model development and application in the fields of hydrodynamics, water quality, oil spill, fluid dynamics and heat and mass transfer. In his 12 years of experience in the field he has managed numerous projects of various sizes as well as performed as senior and project scientist. His modelling experience includes coastal, estuarine, lake and river hydrodynamics and water quality, oil spill fates, meso-scale atmospheric processes, environmental heat transfer, phase change mechanics, and thermal protection systems. His experience also includes to advanced geographical information systems (GIS) and mapping techniques. His expertis includes:

- Marine and freshwater environmental engineering
- Numerical model development and application, including finite difference, finite element, control volume and boundary fitted coordinate methods
- Numerical modeling of estuarine, coastal and ocean hydrodynamics
- Water quality modeling
- Oil spill fates modeling
- Environmental heat transfer and atmospheric thermodynamics
- Lake, reservoir and river processes
- Meso-scale meteorological modeling
- Graphical data display systems development
- Geographic Information Systems (GIS)
- Heat transfer and thermodynamics

Driss Ouazar comes from Morocco, born in Azrou, 23/12/1953. He is graduated from Ecole Mohammadia d'Ingénieurs with a degree in Hydraulic Engineering (M.S.) in 1977. He got a PhD thesis from the university of Luick, Belgium where he worked on cavitation and cavitation prevention modeling in 1982. He continued lecturing and supervising M.S. students as a senior lecturer while also acting as the head of the hydraulic department at EMI since 1983.

By the end of 1986, he was promoted full professor of Civil Engineering and Computational Methods at EMI where he is still acting as a head of the hydraulic department and supervising M.S. and PhD. students. In 1989, he has created the LASH laboratory as an associated entity to the National Research Council of Morocco (Centre National de Coordination et de Planification de la Recherche Scientifique et Technique).he supervised more than 30 MS students and 15 PhDs.

His past research encompasses development and applications of computational and experimental techniques for engineering and science especially Finite Element, Finite Volume and Boundary Element Methods for water resources, environment and hydraulics. Industrial experience highlights a program of continuing education incorporating hydraulics and environmental software for engineers and computational water resources. His areas of research interest include Computational techniques (Finite Element, Finite Volume and Boundary Element Methods, Optimisation) for engineering and scientific analysis and design with emphasis on water resources, environment, hydraulics and hydrodynamics, Computer Aided Design, Computer Assisted Software Engineering including Object Oriented Design and Implementation, Artificial Intelligence and Expert Systems especially using low-cost micro-computers . He has developed a series of research links between EMI and other Institutions all over the world. These relationships have led to collaboration in a series of publications, reciprocal visits and organization of international meetings including the very successful series of International Conference in Africa on Computer Methods and Water Resources started at Ecole Mohammadia d'Ingénieurs, Rabat, Morocco in March 1988 .

Besides the conferences, more than 40 advanced tutorials on water resources, computer aided engineering in water resources and computer cognitive sciences were delivered in collaboration with internationally well known invited speakers . The conferences were sponsored by many international and national organizations including UNESCO, IDRC, IAHR, ISCME, DFG, CNCPRST and so on.

Dr. Driss Ouazar has been recently appointed as adjunct professor at the University of Delaware, Water Resources program, USA.

He produced more than a hundred papers in scientific journals, conferences proceedings, wrote four chapters for books, and he is editor, co-editor, or in the advisory board of some internationally well known journals.
His professional societies and activities (Memberships) include among others:

Association des Ingénieurs de l'Ecole Mohammadia (A.I.E.M.), Member of the National Committee, Head Continuing Education Section (1984-1987)
International Society of Computational Methods in Engineering (I.S.C.M.E.), Member (since 1986)
International Association of Hydraulic Research (I.A.H.R.), Member
International Water Resources Association (I.W.R.A.), Member
International Association of Boundary Element Method (I.S.B.E.M), Member
Scientific Committee of El-Handassa El-Watania (National Engineering), Editorial Board; Journal edited by the A.I.E.M. association.
Co-editor and editorial Board HYDROSOFT International Journal (Software for Hydraulics, Hydrodynamics and Hydrology) now included in Advances in Water Resources.
Editorial Board member of Environmental Software (ENVIROSOFT International Journal)
Editorial Board member of Advances in Water Resources International Journal
Reviewer in Engineering Analysis International journal
Reviewer in Applied Mathematical Modeling International journal.
Participant Gibraltar Experiment sponsored by U.S. Office of Navy Research and President Hydrodynamic Modeling Committee of Morocco
Ad Hoc Committee for the study of the International Center for Hazards Mitigations under

IDNDR (UN) sponsorship, to be set up in Morocco.
STAP member for the Scientific and Technical Advisory Programme for Global Environment Facilities (GEF) under United Nations Environmental Programme (UNEP) sponsorship.
Ex Member COSTED (Committee On Science and Technology in Developing Countries), ICSU (International Council of Scientific Unions).

He had the following sponsored projects in the last five years:

- ``A Knowledge based expert system for pump selection," National PotableWater Agency, 1992.
- ``Knowledge based expert system for pumping tests," National Potable Water Agency, 1993.
- ``Defining appropriate methodologies: numerical schemes, knowledge based expert system, geographic information systems for groundwater evaluation, in relation with water supply," National Potable Water Agency, P.I., , 1993-1996.
- ``Knowledge Based System for Water Supply Projects Appraisal," National Potable Water Agency, 1996.
- "Characterization of Large Watersheds for Surface-Run-Off Water Harvesting in Support of Sustainable Human Settlement and Re-generation of Natural Vegetation in Arid and Semi-arid Regions," Avicenna Project of European Communities, 1996-1998.
- "Development of Water Resources Management tools for Problems of seawater intrusion and Contamination of freshwater resources in Coastal aquifers ," Avicenna Project of European Communities, 1995-1998.
- ``Monitoring and modeling of saltwater intrusion, implemented to Gaza Strip and Morocco," MERC project, 1994-1996.
- "FLAUBERT: Flood in Arid Units By Earth Remote Techniques; Developing of remote Sensing Techniques for Evaluating the Spatial and Temporal distribution of Hydrological Parameters in Arid Basins," INCO-DC Project of European Communities, 1997-2000.
- "ESIMEAU: Apport des Technologies de l'Information A la gestion et a la Modelisation des ressources en eaux en Zones Semi-Arides," INCO-DC, 1997-2000.
- "SINTRAD: Simulation Numerique et traitement de Données en Technologies de l'Environnement ESIMEAU: Apport des Technologies de l'Information A la Gestion et A la Modelisation des Ressources en Eaux," MED-Campus, 1995-1998.

Dr. Malcolm L. Spaulding is Chair and Professor of Ocean Engineering at the University of Rhode Island (URI), Narragansett, RI. Dr. Spaulding received his BS and PhD degrees in Mechanical Engineering and Applied Mechanics from URI in 1969 and 1972, respectively. He was awarded an MS degree in Mechanical Engineering by the Massachusetts Institute of Technology, Cambridge, MA in 1970. In 1973 Dr. Spaulding joined the faculty in Ocean Engineering at URI as an Assistant Professor. He was appointed as Associate Professor in 1978 and Professor in 1983. He assumed leadership of the Ocean Engineering department in 1992. He lead the implementation and accreditation of the BS program, the consolidation of the department at the Narragansett Bay campus, the acquisition of an 80 ft research vessel, and the development of an endowment fund for the department. He teaches courses in ocean engineering mechanics, basic coastal measurements, estuarine and coastal modeling, and ocean systems design. He has served as major professor for 10 doctoral students and 25 MS students while on the faculty at URI.

Dr Spaulding is an internationally recognized expert in marine environmental modeling with a primary focus in the areas of hydrodynamics, pollutant transport and fate, oil spill transport and fate, and the
development of integrated model systems. He is widely published in the field and has served as one of the principal organizers and chairman or co-chairman of the International Estuarine and Coastal Modeling conference series sponsored by the American Society of Civil Engineers (ASCE) (5 th in
the series to be held in October 1997 in Alexandria, VA).

Dr. Spaulding is widely travel and has lectured throughout the world. He was awarded a Fulbright Hayes Fellowship at the Leningrad Shipbuilding Institute in St Petersburg, Russia. He also served as a senior visiting scientist at the Continental Shelf Institute in Trondheim, Norway, at the
Proudman Oceanographic Laboratory in Merseyside, England, and at CEDRE (the French oil spill response organization) in Brest, France. He has lectured at major institutions worldwide including: Delft Hydraulics Laboratory (Netherlands), University of Hamburg (Germany), University of Cantabria
(Spain), Indian National Institute of Ocean Technology/ Indian Institute of Technology (IIT) at Madras (India), Chinese Academy of Environmental Sciences (China), Prince Songkla University (Thailand), Australian Institute of Marine Science (Australia), and Korean Research Institute for Shipbuilding and Ocean Engineering (Korea) to mention a few.

Dr. Spaulding has founded two consulting firms : Applied Science Associates Inc.(ASA) in 1979 and Spaulding Environmental Associates, Inc.(SEA) in 1991. ASA, with a current staff of 17, specializes in marine and freshwater environmental problems with a focus on the application of numerical modeling tools. SEA performs consulting services in support of marine environmental litigation. In recognition of its business development, growth, and commitment to excellence ASA was awarded the 1992 Entrepreneurial Success Award for Rhode Island and New England by the Small Business Administration. ASA markets its services and software worldwide and has representatives in Scotland, Indonesia and Australia.

In recognition of his contributions to business development and industrial achievement Dr. Spaulding was selected to present the 49 th Newcomen Lecture at the US Coast Guard Academy. He was also awarded the 1993 RI Governor's Science and Technology Award, Special Citation for his contributions to excellence in education and business development. In 1997 he was awarded the Edmund and Dorothy Marshall Faculty Excellence Award in Engineering by the Unvieristy of Rhode Island College of Engineering for his leadership of the ocean engineering department. Dr. Spaulding has served on numerous National Research Council (NRC) technical panels including those reviewing oil pollution research and development in the US, evaluating the status and usefulness of data collected in marine environmental assessment programs, and studying ocean technology transfer. He has recently (1996) been appointed to NRC's Marine Board and is the liaison to NRC's Ocean Studies Board. He is a member or liaison to several Marine Board committees including those on coastal engineering,
contaminated sediments, and marine education. Dr. Spaulding has also served as a member of EPA and/or state government organized model evaluation panels. These evaluation panels are set up to review the application and use of models to assist in managing estuarine systems. He has served on
panels for Narragansett Bay, Boston Harbor/Massachusetts Bay, Long Island Sound, Tampa Bay, and Peconic Bay.

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Vienna, Austria

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct. 27 - Nov. 7, 1997

LIST OF PARTICIPANTS

Appendix 3

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PARTICIPANTS CONTRIBUTIONS

Appendix 4

Participants Contributions

Syria : Samer MAMISH

Because I work in the atomic energy commission of Syria in the department of radiation protection and nuclear safety in section of marine radioactivity studies, I will speak very briefly about the radioactivity in coastal environment of Syria .

So far, the background radioactivity in the mariner coastal environment of Syria has not been studied ,this coastal region is free from any direct radioactivity waste discharges, the radioactivity present in this environment is mainly due to word wide fallout and radio nuclides present in the Mediterranean water due to radio active waste discharges from nuclear power plant in France and Italy.

Since the coast area in Syria is well developed with beaches being utilised for recreation and also as large amount of fish and sea food are harvested from the area is of great interest .

For this reason we have been working along the Syria n coast since 1990.
We have been sampling, sea water, sediment (in different) depth from 8 m up to 1100 m by Grape Sampler, marine algae and marine organisms (Fish, Shellfish, crabs, sponges et sediment samples were carried out during three expedition and now we have five stations at the main cities at the Syrian coast (Ras al basset, Lattakia Jablla, Bangas and Tartous , we collect samples every 4 months (usually during main sea sons) .
We focus on natural and artificial radio nuclides in Marine environment samples, using different methods of analysis and measurement.
What we find in this large numbers of different marine samples during 8 years that the levels of natural and artificial radioactivity in the Syrian Coast are similar to the general fallout activity levels observed for the Mediterranean region.

Egypt : Mohamed Farouk OSMAN

The Government of Egypt has issued law No 4 of 1994 concerning protection of the Environment. The objectives of this low, however has not been confined to addressing pollution problems emanations form existing establishments, but also into new establishment, factories including expansions of existing ones.

The new establishments are required to carry out an environmental Impact assessment of the establishment before embarking an the construction or the implementation of the project ore relevent expansions.
The Egyptian Environmental Affairs Agency has issued Guide-time for Egyptian Environmental Impact Assessment to help the developer in preparing of this study.
This Guide-times classified the project into 3 group which, Gray and black according to :

1) The type of the activity
2) Extend of natural resources exploitation.
3) Type of energy used to operate the establishment.

Also based on this lax. Egyptian Environmental Affairs Agency has issued Guide-times for developments in the coastal Areas.

This guidelines are of general nature indications the major frame within which the development can lake place.

Liban : Bassam Zouheir DAOUK

A propos du Liban plusieurs problèmes ce pollution existent :

- De point de vue maritime :

- Des pays étrangers viennent poser les tonnes de matières polluantes (peintures, produits chimiques dues à l'industrie, parfois même des matières à légère radioactivité) dans la mer Méditerranée.

- Deux décharges qui reçoivent journalièrement 3 à 4 milles tonnes d'ordures de toute sorte (ordure ménagère, coton, plastiques, métal verre, remblais de sols etc...) et qui malheureusement ne subissent aucun prétraitement de, classement, de recyclage, ou d'insnération, de plus la position de ces deux décharges est en pleine mer (sur la côte).

- Presque toutes les villes jettent leur eaux usées directement dans la mer, et si quelques centrales d'épuration "existent, elles ne font qu'un pré-traitement (décantation primaire)

- De point de vue sol et nappes phéatiques
Le même problème des polluants "étranges" existe dans les sols car parfois on a placé ces tonneaux dans les hautes vallées ou sur les sommets des montagnes.

- Après la guerre on a réalisé que beaucoup d'immeubles ont construit leur propre fosse sceptique mais malheureusement elles sont des puits à fond perdu et cela car la région ne possède pas d'infrastructure
  De même les anciennes infrastructures qui ont été plus ou moins atteintes par les obus sont sources de pollution.

- De point de vue atmosphère :

- La cimenterie au Liban est une grande source de pollution pour la région.
- Les réacteurs à fuel oïl qui génèrent la puissance électrique sont source de pollution aussi peuvent être utilisés à l'inverse pour estimer le rayon d'action de la source de pollution et l'arrêter, de plus savoir quelles sont les régions atteintes par cette pollution et limiter les dégâts.

Mauritanie : Aly Yahya DARTIJE

Résumé sur l'état de la pollution en Mauritanie

La Mauritanie a une superficie de 1.080.000 km^2 et plus de 700 km de côte atlantique. Depuis quelques année, du fait de l'exode rurale a cause de la sécheresse, la Mauritanie commence avoir deux grandes villes sources de pollution (Nouakchott et Nouadhibou). Aussi, le littoral mauritanien a été subdivisé en 4 zones surtout le type de pollution et la sensibilité de la zone .

Zone 1 : la baie du Leurier ou Nouadhibou diverse tous se rejets en plus de huiles usées de bateaux de pêches.

Zone 2 : le parc national du Banc d'Ayain ... un site classé patrimoine mondial du fait du biodiversité et de son eco-système unifie de part le monde. Donc cette zone ... pour le Secteur de la pêche qui est le pilier de l'économie nationale.
Les études de ... déjà effectuées prévoient que les diversements de la ville de Nouadhibou risque de retrouver au niveau de cette zone. Par ailleurs, la Mauritanie est situé sur le chemin le fond pétrolier et don risque de marée noire donc catastrophe naturelle pour notre pays.

Zone 3 : c'est la ville de Nouakchott qui ne rejette pas directement dans la mer, mais la présence du port commerciale et port pêche artisanal commencé à devenir source potentielle de cette partie du milieu marin.

Zone 4 : c'est l'embouchure du fleuve Sénégal, cette zone est caractérisé surtout par l'arrivée d'eau fleuve qui est l'objet de pollution épandage de pesticides d'autres engins civilisés par les agriculteurs et pour la lutte acridienne.

Pour enlever cette pollution de prendre des dispositions nécessaires de lutte, l'Etat mauritanien a mis en place le Centre National de Recherche Océanographique et des Pêches (CNROP) sous l'autorité du Ministère des Pêches et de l'Economie Maritime.
Aussi, le CNROP, a mis des programmes de recherche dont le suivi bactériologique et l'étude ... des zones sensibles. Par ailleurs, le CNROP a élaboré un plan d'urgence contre les incidents accidentel et particulièrement par les hydrocarbures en collaboration avec les constitutions nationales . Pour les conventions jugées utiles dans le domaine de la pollution marine.

Guinée : CAMARA,

Programme d'amélioration de l'environnement urbain et de l'assainissement de Conakry, Guinée

1- Contexte :

Conakry est caractérisé par un sous équipement notoire en matière d'ouvrage d'assainissement, une dégradation profonde des infrastructures existantes, une atteinte certaine du milieu, en particulier marin et des lacunes dans la définition des responsabilités institutionnelles pour la gestion du secteur.
Compte tenu de la croissance importante de la population urbaine et de la dégradation continue de l'environnement sanitaire, la BM a décidé de financier en priorité des actions en matière d'amélioration de l'Environnement et d'Assainissement dans le cadre de son futur projet de développement urbain, avec pour objectifs prioritaires défavorisées de la population et de réduire d'autre part les atteintes à l'environnement terrestre et marin.

La préparation d'un tel projet, compte tenu de l'ampleur des problèmes à traiter, nécessitent de développer une réflexion approfondie sur l'organisation institutionnelle sur les options technologiques à recommander, sur la manière d'impliquer de manière étroite les populations bénéficiaires à la définition des besoins et à la gestion des ouvrages d'assainissement et sur les modalités réalistes de recouvrir des coûts.

L'élaboration de ce programme d'amélioration de l'environnement urbain et de l'assainissement de Conakry a résulté d'une réflexion menée pendant 2 ans par une équipe locale en concertation étroite avec les autorités nationales, avec la participation des futurs bénéficiaires, aidés par les consultants nationaux et étrangers et encadrés par le GREA.
La R. de Guinée est un pays situés sur la côte occidentale de l'Afrique en arc de cercle entre le 7ème et le 15ème parallèle. Elle partage es frontières avec la Guinée Bissao et le Sénégal au NO, le Mali au NE, le Liberia et la Sierra Leone au SE. La capitale Conakry est constituée par la presqu'île de Kaloum et 4 îles de Loos qui protègent le port de Konakry.

DIAGNOSTIC ENVIRONMENTAL

L'état de dégradation de l'environnement de Conakry se manifeste sous plusieurs formes :

- Pollution des sols par les épandages d'eau usées d'ordures et de déchets toxiques ;
- Erosion intense liée à l'écoulement incontrôlé des eaux de pluies ;
- Inconfort lié à la surdensification de certaines zones d'habitat, au manque d'équipement sanitaire de base et l'insuffisance d'espaces libres et d'espaces verts, à la mauvaise qualité de l'habitat ;
- Pollution des eaux marines par les rejets d'hydrocarbures, d'eaux usées, de matières fécales et des déchets solides ;
- Pollution des nappes et des cours d'eau par des infiltrations provenant des décharges et des équipements sanitaires mal conçus ;
- Pollution de l'air par des émanations des véhicules mal réglés et un trafic automobile intense, poussière d'alumine et de bauxite, fumage des denrées, odeurs nauséabondes, liées au mauvais fonctionnement des services d'assainissement ;
- Pollution d'insectes d'apporter quelques éléments particuliers sur l'environnement marin de Conakry qui implique des réponses particulières aux problèmes d'assainissements.

Le problème de la qualité des eaux marines: les résultats des analyses effectuées par le projet "études côtières" en novembre 92 et février 93, indiquent un taux de pollution bactériologique assez élevé sur tous les points d'échantillonnage situés de part et d'autre de la péninsule, aux abords de la côte, les germes de pollution bioécologique à savoir les coliformes et streptocoques ainsi que des staphylocoques et champignons pathogènes sont présents en grande quantité dans les échantillonnage avec des teneurs préoccupants dans la zone de Douka. Plus au large des côtes, la pollution reste insérable au sud de la péninsule alors qu'ailleurs, les taux de dilution sont en général acceptables. En tenant compte des effets de marées et des courants littoraux, on note que la zone littorale la plus polluée correspond aux zones les plus densément peuplées (Matoto, Matane) et à celle disposant d'un égout (Kaloum). On peut dire cependant que la relative qualité des eaux littorales est dûe au fait que les rejets actuels sont multiples et de faible quantité en raison de la vétusté du réseau et de sa faible extension. La situation serait considérablement modifiée si les rejets étaient concentrés en un seul émissaire sans traitement préalable alors que parallèlement l'extension du réseau potable augmentera le volume d'eaux usées. Il a été précisé dans cette étude que les conditions de reproduction des bactéries nocives sont favorables et qu'un écoulement permanent d'eaux usées pourrait atteindre les mangroves les plus proches de Conakry. Or la qualité des eaux littorales de Guinée constitue une priorité économique absolue tant en raison de l'importance des zones humides littorales (rizières) que des réserves halieutiques qui se concentrent à proximité de la mangrove.

Depuis plus d'une année, les eaux côtières sont particulièrement chargées en résidus d'hydrocarbures provenant du rejet brut et incontrôlé d'houilles usagées et de fuel lourd. A cette pollution continu s'est ajoutée une marée noire et les effets n'ont toujours pas été complètement maîtrisés. La dispersion de la nappe a précipité le fuel lourd à une profondeur inférieure mais celle-ci est toujours présente. Cette pollution marine encourage les navires à vidanger et nettoyer leurs soutes près des côtes sans risque d'être démasqués. Par contre, le préjudice au niveau de la pêche artisanale et des chalutiers est incontestable. Au niveau du port malgré la convention de Marpol et la tenue récente d'un séminaire à ce sujet, les camions continuent à vidanger directement dans les eaux du port.

1- Pollution de la nappe phréatique et des navigots

La multiplication des fosses et puits perdus mal conçus constitue une source de pollution potentielle de plus en plus grave pour s nappes d'eau souterraines. Ces nappes composées de 7 grandes cuvettes communiquent entre elles et constituent de ce fait un seul réservoir d'eau potable. Cependant le risque de pollution est imminent puisqu'on a déjà détecté des coliformes focaux aux forages de Kamkibo et de Bassia. L'origine de la pollution ne vient pas seulement des infiltrations des eaux usées domestiques mais également des eaux de lessivage, des ordures et des rejets de produits toxiques sur le sol. La protection sanitaire des réserves souterraines en eaux potable dépend de la mise en place de solution technologiques de collecte et de traitement des effluents liquides.

En plus du manque aigu d'infrastructures et services de base, il faut noter l'insuffisance de conscience collective par rapport à l'assainissement surtout dans l'habitat groupé économique. La mauvaise hygiène e l'eau et des aliments consommés, l'insuffisance de l'hygiène corporelle chez les enfants qui ne se lavent pas les mains au savon après défécation.
Il faut enfin rappeler que la dégradation de l'aspect des espèces publics et l'accoutumance aux pratiques insalubres est un facteur de développement de comportement anti-urbains et antihygiénique particulièrement dans les zones à bras revenus.

DIAGNOSTIC TECHNIQUE
Déchets industriels et toxiques

Ils concernent essentiellement les déchets contaminés biologiquement des hôpitaux, des laboratoires et de l'abattoir. La station d'incinération de l'hôpital Ignace Deen ne fonctionne pas et tous les déchets hospitaliers sont rejetés directement dans la benne située à l'extérieur de l'hôpital ou sur le sol lorsque celle-ci déborde. Les résidus des ... établissements sont également sans contrôle.
Quant aux autres déchets solides industriels seules les crèches de la brasserie sont récupérées. Tous les autres déchets sont soit brûlés soit déversés sur la décharge de la manière non équipés à cet effet, soit rejetés en mer sans contrôle et ceci malgré un code de l'environnement particulièrement bien préparé.

Côte d'Ivoire : KINDJA Assoum

I- Présentation de la Côte d'Ivoire

La Côte d'Ivoire est située en Afrique de l'Ouest est limitée du Nord par le Mali et le Burkina-Fasso, au Sud par l'Océan atlantique, à l'Est par le Ghana, à l'Ouest par la Guinée et le Libéria.
Elle a une superficie de 322 462 km^2. Pour une population de 13 500 000 habitants dont 2500 000 se trouve à Abidjan, capitale économique.
Le climat est de type équatorial avec 4 saisons :

- une grande saison pluvieuse de Mai à Juillet ;
- une saison sèche d'Août à Septembre ;
- une grande saison sèche de Décembre à Mars avec néanmoins quelques pluies.

Il y souffle deux types de vents, la mousson et l'harmattan.
Les températures sont :

Minimum	22 à 28°C
Moyenne	24 à 28°C
Maximum	36 à 37 °C

Le taux d'humidité est de 80% dans le sud.
La précipitation moyenne est de 2000 mm.
L'apport en eau douce est constituée d'eau de surface 39 km2 et d'eau souterraine 38 km^2
C'est un pays essentiellement agricole :
1^{er} producteur mondial de cacao, 2° de café ;
Gray cultive également d'autres cultures entre autre le palmier à huile, le coton, l'hévéas.
La pêche artisanale et industrielle fait également partie des activités du pays.
Bien qu'à vocation agricole, la CI a à lon actif un certain nombre d'industries, agro-industries, industries métallurgiques, plastic, chimiques, raffinerie.

II- La zone côtière de la Côte d'Ivoire. Hydrologie

Elle s'étend sur une parcours de 566 km d'Ouest en Est, [avec une largeur moyenne entre 20 à 35 km en bordure de l'Océan atlantique. Sa largeur dans la zone d'Abidjan est de 22 km].
Elle est traversée à ce niveau par une important canyon sous-marin (le trou sans fond).
La surface totale de cette zone est de 12.200 km2.
Deux des quatre principaux fleuves aboutissent en mer, les autres transitent par les trois systèmes lagunaires (± Brié, Aby, Grand-LAHOU).

Les lagunes se rencontrent sur 60% du littoral et contient environ 1200 km^2.

NIGERIA : AKA

National Centre for Remote Sensing (NCRS), JOS Nigeria

1. HISTORY OF EXISTENCE

1.1-The National Centre for Remote Sensing (NCRS) is a parastal under the National Agency for Science and Engineering Infrastructure (NASENI), under the Federal Ministry of Science and Technology of the Federal Republic of Nigeria.
Launched into existence in 1982 but assumed full responsibilities in 1993 after the Celebration of the International Space Year (ISY), owing logistic in fund procurement.

2. GEOGRAPHICAL LOCATION

2.2- We are located on the Jos plateaux, an aver higher than 2000 m above Sea Level (AL), right on the Jos-Bukuru expressway, Kilometer 11, Jos, Nigeria.
Operationally we maintain an observation station in Panyam, Mangu Local Government Council, Plateau State. Panyam is a very important geographical location on the Jos plateaux because of its extinct volcano extension and topography above sea level. Our office located at Bukuru near Jos.

3. OPERATIOAL FUNCTIONS

3.1- We are charged with the taste of Aerospace Network Development and Management in the Country, Nigeria as well as regulating the Bilateral/Multilateral Information/Technical Aid cooperation between Nigeria and other Nations, with respect to Aerospace Technology transfer and Administration.

3.2- Also we are charged with the affairs of designing developing and launching into space, our own satellite payload.

3.3- Again, to formulate our own Scientific and Technological Aerospace Packages for the Economic and Manpower development of our Country, Nigeria, through hands-on training and Workshop/Conference Organization from time to time

3.4- At full range, we are to Nigeria, what NASA is to North America (USA) ; what CNES is to France and what ESA is to Europe.

4. CURRENTS PROJECTS

4.1- Presently, there is an on-going project on Environmental Monitoring of the North-Eastern part of the Country using Remote Sensing and GIS (technologies. This project centre on land resources impact of drought and desertification as well as land degradation - an EIA approach.

4.2- Proposals are being formulated and sent to the FGN/UNDP (Federal Goot of Nigeria/United Nations Development Programme of the Environmental Impact Assessment of the..

4.3- Petroleum and Natural Gas operations in the South-Western (SW), South-eastern and the Eastern part of the country (where the Oil activities are dominant) i.e. the Niger Delta of Nigeria (off shose & Oushore).

4.4- Petroleum and Natural Gas activities have serious bearing in the land and water pollution of the Niger Delta. It affects the Vegetations Seriously, the Agricultural and human settlements of the affected operation sites. Fishes elimination and other marine and natural habitat including air pollution.

Senegal : BALDE Pathé

La baie de Haun, jadis zone de pêche privilégiée, site favori de l'industrie touristique sénégalaise est aujourd'hui le théâtre d'une pollution massive et diverse (pollution industrielle et urbaine, pollution due au village de Haun, etc ...) offrant ainsi une spectacle désolant . Les belles plages qui battaient les records d'affluence sont devenues quasi impraticables, la rareté de jouissance fait de plus en plus senti. L'industrie touristique et les activités halieutiques s'en trouvent sérieusement affectées - Pourquoi ?

La baie de Ham et sa zone d'influence qui part du port autonome de Dakar jusqu'au village traditionnel de Mbao sur une longueur de presque .. concentrant 81,5 % des industries implantées au niveau national.

Algeria : Magda MEBIROUK

L'Algérie pays à superficie importante, là où les industries tout éparpillées un peu partout au niveau du pays et surtout au niveau des grandes villes, les problèmes de pollution sont d'une grande ampleur, concernant surtout la contamination marine qui se répercutent sur la dégradation des ressources marines et qui posent des problèmes de pollution et de radioactivité.

La gravité du problème s'accentue d'avantage surtout qu'on fait que les stations d'épuration que sa soit au niveau des usines ou à la périphérie des villes sont minimes par rapport à la production industrielle nationale des différentes unités industrielles installées ; tel que l'industrie pétrolière, raffinerie, textiles et l'industrie du papier.

Le peu de station d'épuration d'eau usées domestique combinés aux non traitements des eaux usées aggrave la situation auparavant, le Gouvernement algérien n'a pas donné beaucoup d'importance ç ce secteur. Par rapport aux autres secteurs industriels, mais ces dernières années un plan d'urgence a été mis en place pour remédier à cette situation, ainsi des spécialistes dans le domaine de l'environnement afin de préserver les ressources marines.

Et prévenir une pollution de n'importe qu'elle origine soit-elle.

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Appendix 5: Testimonials

Mesdames, Messieurs,

Je voudrais remercier au nom des participants l'organisation des Nations Unies pour le Développement Industriel (ONUDI), le Centre International des Sciences et des Hautes Technologies (ICS) ainsi que l'Ecole Mohammadia d'Ingénieurs (EMI) de Rabat, le Gouvernement marocain et la Direction de l'Institut Spécialisé de Technologie des Pêches Maritimes d'Agadir d'avoir permis l'organisation de cet important Cours International sur : ***"Modélisation Prédictive de l'Impact Environnemental du Développement Industriel dans les Zones Côtières Urbaines - Planification pour un réseau de surveillance".***

Ce cours a été particulièrement enrichissant pour beaucoup d'entre nous, tant pour l'importance des informations disponibles que pour la compréhension des mécanismes en rapport avec l'application des modèles.

L'organisation d'une telle rencontre ne pourrait se faire sans quelques difficultés.

Heureusement, avec la volonté de bien faire des organisateurs, les critiques sont facilement mineures.

Il faudrait simplement à l'avenir, que les exposés soient précédés de la distribution des documents qui les concernent.

Avec l'espoir de participer avec vous à d'autres cours du même genre, nous vous prions, de transmettre nos sincères remerciements à tous les responsables de l'ONUDI et de l'ICS.

Thank you very much for your attention

Au nom de tous les Participants

Pathé Baldé,
Sénégal

Driss Ouazar

De: Daniel L. Mendelsohn [mendo@appsci.com]
Envoyé: Thursday, November 13, 1997 2:31 PM
À: Driss Ouazar
Objet: RE: Example plots from course.


MOROCCO.ZIP

Driss,

Thanks very much again for your kind hospitality during our visit. Your energy and attention to running the show made the trip not only successful but fun.

As we discussed before I left, I have attached two bitmaps images (.BMP format files) as examples of the lectures Malcolm and I gave. Please examine the figures and let me know if you have any trouble with them. If these are not what you had in mind, also let me know and I can create additional or alternate figures for your document.

I look forward to the technical papers that Malcolm has requested. >From my discussions with your collegues, the work you are doing at the Institute sounds very interesting. Have you done much work with the problem of flooding/drying cells or marsh storage volumes in a 2D or 3D hydrodynamic model?

Best regards to Ahmed, Rashid, Said, and yourself,

Daniel L. Mendelsohn

Driss Ouazar

De: Malcolm Spaulding [spauldng@mistral.oce.uri.EDU]
Envoyé: Tuesday, October 07, 1997 6:43 AM
À: ouazar@emi.ac.ma
Cc: mendo@appsci.com; ncs@appsci.com
Objet: Training session

Driss

On behalf of Danny, Nicole, and myself I would like to extend our sincere thanks to you and your staff for your warm hospitality. Your hard work, consideration, and thoughtfulness made our trip a very nice experience.

Following up on our conversations I would request that you send us a copy of the following material.

1. List of conference participants names and addresses.

2. Copies of papers you and your students have done on finite volume hydrodynamic and pollutant transport modeling. We are very interested in developing this type of model as an alternative to our boundary fitted coordinate finite difference approach.

Thanks in advance for sending the requested material.

Best regards,

Malcolm

Malcolm Spaulding
Chairman, Department of Ocean Engineering
University of Rhode Island
Narragansett Bay Campus
Narragansett, Rhode Island 02882

phone: 401-874-6139
fax: 401-874-6837
email: spaulding@oce.uri.edu
home page: http://www.oce.uri.edu

Driss Ouazar

De: Andrea Patrono [adypat@ics.trieste.it]
Envoyé: Tuesday, November 18, 1997 4:01 PM
À: ouazar@emi.ac.ma
Objet: from Trieste

Hi
I got your mail. Sorry, I forgot that matter. I still have two pretty busy days but I'll send you by mail abstracts and summary of my CV (+/-15 lines are OK?!?) ASAP.
BTW, I would like to ask you (and/or Prof. B.sari) as organizer if you can send me a letter (to the ICS address) just mentioning my contribution / partecipation to the course; about the ICS workbook, I would like to have also your and ASA ppt presentations as discussed in Agadir.
Thank you. Hear from you.
Regards
Andrea

FOUNDATION FOR INTERNATIONAL STUDIES
at the University of Malta

INTERNATIONAL ENVIRONMENT INSTITUTE

November 3, 1997

For the kind attention of:
Professor Driss Ouazar

fax: 00212 7 778853

from: Louis F Cassar
Director, IEI

Dear Driss,

Re: Agadir Training Course

I am writing to thank you for your kind hospitality during my brief, but useful, mission to Agadir. I do hope that our encounter will serve as a prelude to forging a lasting link between our respective institutions. Lastly, well done for a successful training course.

With every good wish.

Yours sincerely,

Louis F Cassar

Old University Building, St. Paul Street, Valletta VLT 07 - Malta. Tel: (356) 234121-2; Fax: (356) 230551

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Appendix 6: List of documents

LIST OF DOCUMENTS

Authors	Subject
Benjelloun Zakia Dabaghi	*Cas de la Pollution Atmosphérique*
Bensari Driss	*Monitoring Networks : management and Optimisation.*
Bergamasco A., Silvano Piola and Marco Deligios Barbanti Andrea, Bondi A., Gasparoni Francesco and Morandi Davide Bergamasco A., Pesaresi, M.	*Model oriented GIS For marine and Coastal Environmental applications* *Blue Box : A system for long term unattended environmental monitoring of marine basins – Prototype architecture and test results.* *Elaborazion di Dati Landsat –TM per lo Studio dell' Evoluzione della linea di spiaggia: Il litorale del Cavallino (Venezia)*
Cassar Luis F.	*Environmental Planning for Conservation on the Coastal Zone A.*
El Bayad Rachid	*Système d'Inforpmation Géographique*
El Dabaghi Fadi	*Quelques concepts de mise en place d'ateliers virtuels de validation de solveurs numériques dans les sciences de l'ingénieur.*
Feoli Enrico - Asbjornsen Odd Andreas - Chouinard Yvon and Brown Michael S. - Ehrenfeld John R., Sc. D. - Heeney David - Hermansen John - Socolow Robe and Valerie Thomas - Wernick Iddo K. and Ausubel Jesse H.	*Industrial Ecology : A Framework for Sustainable Development.* - *Life Cycle Assessment (LCA) & System Boundaries.* - *Going Organic – Converting Patagonia's Cotton Product Line* - *A strategic Framework for Product Policy and Other Sustainable Practices.* - *Development and demonstration of sustainability indicators for the Ontario transportation sector* - *Ecology as Model and Inspiration for Industrial Ecology* - *The Industrial Ecology of Lead and Electric Vehicles* - *Some Directions for Research May 1997 – Pre Publication Draft*
Ouazar Driss, Taïk Ahmed and Chakir Mustapha	*Hydrodynamics and Water Quality Governing Equations for Marine Systems.*
Ouazar Driss	*An Overview of Knowledge Based Expert Systems*
Patrono Andrea	*Pollution Control – Rehabilitation Overview – GIS and Geostatistisc – Flow Modelling – Distribution of Pollutants.*

Spaulding Malcolm L.	- *Oil Spill Trajectory and Fate Modeling : State of the Art Review* - *A Shell Based Approach to Marine Environmental Modelling*
Spaulding M.L. Howlett E. Anderson E. and Jayko K.	*Oil spill Software with a Shell Approach.*
Spaulding Malcolm L., and Hawlett Eoin	*Application of SARMAP to Estimate Probable Search Area for Objects Lost at Sea.*
Spaulding Malcolm L. Isaji T. and Wowlett E.	*MUDMAP : A Model to Predict the Transport and Dispersion of Drill MUDS and Production Water.*
French Deborah P. and Rines Henry M.	*Validation and Use of Spill Impact Modeling for Impact Assessment.*
French Deborah P., Rines H. M. and Masciangioli Panfilo	*Validation of an Orimulsion Spill Fates Model Using Observations from Field Test Spills.*
Howlett Eoin, Anderson E. and Malcolm L. Spaulding	*Environmental and Geographic Data Management Tools for Oil Spill Modelling Applications.*
Howlett Eoin, Mendelsohn Daniel, Swanson Craig and Spaulding Malcolm	*An Integrated Water Quality an Oil Spill Model System.*
Mendelsohn D, H vlett Eoin and Swanson Craig	*WQMAP in a Windows Environment*
Muin Muslim and Malcolm Spaulding	- *Application of Three-Dimensional Boundary-Fitted Circulation Model of Providence River.*
King Brian and Delicity McAllister	*The Application of "MUDMAP" for Investigating the Dispersion of Producted Water Discharge from "Harriet A" on Australia's Northwest Shelf.*
Opsihinski Thomas and Spaulding Malcolm L.	*COASTMAP : An Integrated System for Environmental Monitoring and Modeling ; Selected Applications.*
Swanson Craig J., Spaulding Malcolm L. and Isaji Tatsusaburo	*DREDGMAP : A PC Based System to Predict the Fate of Dredged Material.*
Swanson J. Craig and Mendelsohn Daniel	*Application of WQMAP to Upper Narragansett Bay, Rhode Island*

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POCKET MONEY/EXTRA INCURRED COSTS

Appendix 7

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ATTESTATION

EL BAKKARI Mohammed, participant to the above mentioned TC training course acknowledges receipt of 1100.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: EL BAKKARI Mohammed

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Attestation

I Kyrian Ezbunwa AKA, acknowledge receipt of US$ 20 from Prof. D. OUAZAR for visa reimbursement within the framework of the above mentioned TC.

Signature :

Kyrian Ezbunwa AKA
NCRS
NIGERIA

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ATTESTATION

REGRAGUI Aziz, participant to the above mentioned TC training course acknowledges receipt of 1000.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: REGRAGUI Aziz

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ATTESTATION

TAIK Ahmed, participant to the above mentioned TC training course acknowledges receipt of 1100.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: TAIK Ahmed

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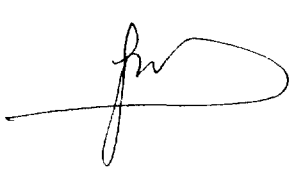
ATTESTATION

SAADALLAH Mohamed, participant to the above mentioned TC training course acknowledges receipt of 1100.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: SAADALLAH Mohamed



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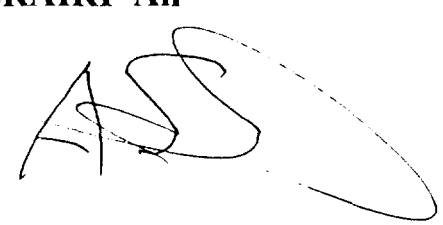
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

SRAIRI Ali, participant to the above mentioned TC training course acknowledges receipt of 1000.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: SRAIRI Ali



INTERNATIONAL CENTRE FOR
SCIENCE AND HIGH TECHNOLOGY

ECOLE MOHAMMADIA
D'INGENIEURS

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

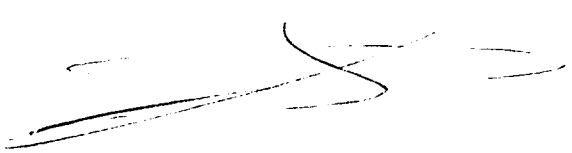
Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

CAMARA Abdoulaye, participant to the above mentioned TC training course acknowledges receipt of 2300.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: CAMARA Abdoulaye



INTERNATIONAL CENTRE FOR
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UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

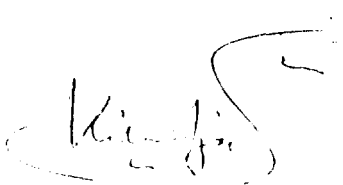
Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

KINDJA Assoum, participant to the above mentioned TC training course acknowledges receipt of 2200.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: KINDJA Assoum



INTERNATIONAL CENTRE FOR
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ECOLE MOHAMMADIA
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UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

MAMISH Samer, participant to the above mentioned TC training course acknowledges receipt of 2200.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: MAMISH Samer

INTERNATIONAL CENTRE FOR
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Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

GALEA Herman, participant to the above mentioned TC training course acknowledges receipt of 1600.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: GALEA Herman

INTERNATIONAL CENTRE FOR
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Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

OSMAN Mohamed Farouk, participant to the above mentioned TC training course acknowledges receipt of 2400.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: OSMAN Mohamed Farouk

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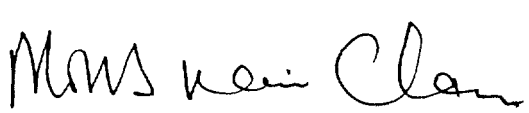
DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

CHAM Muhammad Nasir, participant to the above mentioned TC training course acknowledges receipt of 2000 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.



Signature: CHAM Muhammad Nasir

INTERNATIONAL CENTRE FOR
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ECOLE MOHAMMADIA
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UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

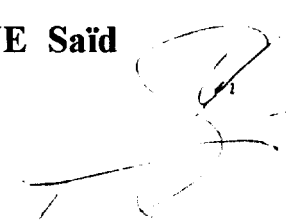
Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

BELAOUANE Saïd, participant to the above mentioned TC training course acknowledges receipt of 1100.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: BELAOUANE Saïd



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DEVELOPMENT ORGANIZATION

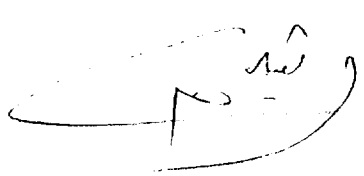
Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

GOUZA Rachid, participant to the above mentioned TC training course acknowledges receipt of 1100.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: GOUZA Rachid



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UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

AQID Naïma, participant to the above mentioned TC training course acknowledges receipt of 1100.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: AQID Naïma

INTERNATIONAL CENTRE FOR
SCIENCE AND HIGH TECHNOLOGY

ECOLE MOHAMMADIA
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UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

KAZAOUI Youssef, participant to the above mentioned TC training course acknowledges receipt of 1100.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: KAZAOUI Youssef

INTERNATIONAL CENTRE FOR
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UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

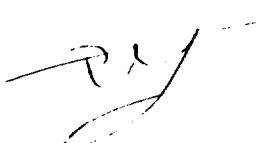
Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

BALDE Pathé, participant to the above mentioned TC training course acknowledges receipt of 1800.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: BALDE Pathé



INTERNATIONAL CENTRE FOR
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D'INGENIEURS

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

DAOUK Bassam Zouheir, participant to the above mentioned TC training course acknowledges receipt of 2200.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: DAOUK Bassam Zouheir

Bassam Daouk

INTERNATIONAL CENTRE FOR
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ECOLE MOHAMMADIA
D'INGENIEURS

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

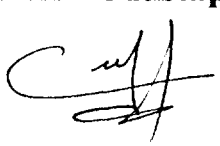
Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

CHAKIR Mustapha, participant to the above mentioned TC training course acknowledges receipt of 1100.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: CHAKIR Mustapha



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D'INGENIEURS

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

DJAMA Theodore, participant to the above mentioned TC training course acknowledges receipt of 2200.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: DJAMA Theodore

INTERNATIONAL CENTRE FOR
SCIENCE AND HIGH TECHNOLOGY

ECOLE MOHAMMADIA
D'INGENIEURS

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

SAAÏDA Illou, participant to the above mentioned TC training course acknowledges receipt of 2200.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: SAAÏDA Illou

INTERNATIONAL CENTRE FOR
SCIENCE AND HIGH TECHNOLOGY

ECOLE MOHAMMADIA
D'INGENIEURS

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

AKA Kyrian Ezebuma, participant to the above mentioned TC training course acknowledges receipt of 1000.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

01/10/97

Signature: AKA Kyrian Ezebuma

INTERNATIONAL CENTRE FOR
SCIENCE AND HIGH TECHNOLOGY

ECOLE MOHAMMADIA
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DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

MEBIROUK Magda, participant to the above mentioned TC training course acknowledges receipt of 2000.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: MEBIROUK Magda

INTERNATIONAL CENTRE FOR
SCIENCE AND HIGH TECHNOLOGY

ECOLE MOHAMMADIA
D'INGENIEURS

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

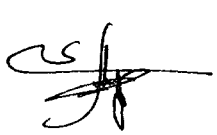
Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

YAHYA DARTIJE Aly, participant to the above mentioned TC training course acknowledges receipt of 4318.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: YAHYA DARTIJE Aly



INTERNATIONAL CENTRE FOR
SCIENCE AND HIGH TECHNOLOGY

ECOLE MOHAMMADIA
D'INGENIEURS

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

BOUM'HANDI Naïma, participant to the above mentioned TC training course acknowledges receipt of 1000.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: BOUM'HANDI Naïma

INTERNATIONAL CENTRE FOR
SCIENCE AND HIGH TECHNOLOGY

ECOLE MOHAMMADIA
D'INGENIEURS

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

Cl. LYAMOULI Lahcen, participant to the above mentioned TC training course acknowledges receipt of 1000.0 Dhs for the pocket money and/or extra incurred expenses allowed within UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: Cl. LYAMOULI Lahcen

INTERNATIONAL CENTRE FOR
SCIENCE AND HIGH TECHNOLOGY
Trieste Italy

ECOLE MOHAMMADIA
D'INGENIEURS
Rabat Morocco

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION
Vianna, Austria

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 , Nov. 7, 1997

Attestation

I Muhammad Nasir CHAM, acknowledge receipt of US$ 44 from Prof. D. OUAZAR for extra incurred costs within the framework of the above mentioned TC.

Signature : Mohammad Nasir Cham

Muhammad Nasir CHAM
National Environment Agency
GAMBIA

INTERNATIONAL CENTRE FOR
SCIENCE AND HIGH TECHNOLOGY
Trieste Italy

ECOLE MOHAMMADIA
D'INGENIEURS
Rabat Morocco

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION
Vianna, Austria

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 , Nov. 7, 1997

Attestation

I Muhammad Nasir CHAM, acknowledge receipt of US$ 100 from Prof D. OUAZAR for extra incurred costs within the framework of the above mentioned TC.:

namely possible flight Dakar-Banjul in case I cannot use my existing prepaid ticket and I will send a proof to Prof. OUAZAR. Otherwise, I declare herewith that I will reimburse him if I use the existing ticket.

Signature : Muhammad Nasir Cham

Muhammad Nasir CHAM
National Environment Agency
GAMBIA

INTERNATIONAL CENTRE
FOR
SCIENCE AND HIGH
TECHNOLOGY
Trieste, Italy

ECOLE MOHAMMADIA
D'INGENIEURS
Rabat, Morocco

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION
Vienna, Austria

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct. 27 - Nov. 7, 1997

Appendix 8: Salaries/Pocket Money / Extra Incurred Costs

INTERNATIONAL CENTRE FOR
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ECOLE MOHAMMADIA
D'INGENIEURS

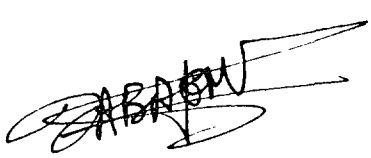
UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

This is to acknowledge receipt of US$ 300 salary as a contributor to the above-mentioned training course, following the UNIDO/ICS policy, US$ 106 pocket monney, and US$ 658 for travel expenses reimbursement , i.e. a total of US$ 1070 from Prof. Driss OUAZAR .

Signature: Dr. Fadi DABAGHI
INRIA, Rocquencourt, France



INTERNATIONAL CENTRE FOR
SCIENCE AND HIGH TECHNOLOGY

ECOLE MOHAMMADIA
D'INGENIEURS

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

This is to acknowledge receipt of US$ 150 salary as a contributor to the above-mentioned training course, following the UNIDO/ICS policy, US$ 106 pocket monney, and US$ 658 for travel expenses reimbursement , i.e. a total of US$ 920 from Prof. Driss OUAZAR .

Signature: Dr. Zakia Benjelloun Touimi
IFP, Paris, France

INTERNATIONAL CENTRE FOR
SCIENCE AND HIGH TECHNOLOGY

ECOLE MOHAMMADIA
D'INGENIEURS

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

This is to acknowledge receipt of US$ 150 salary as a contributor to the above-mentioned course, following the UNIDO/ICS policy from Prof. Driss OUAZAR.

Signature: Prof. F. Louis CASSAR
Foundation for International Studies at the University
MALTA

INTERNATIONAL CENTRE FOR
SCIENCE AND HIGH TECHNOLOGY

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

ECOLE MOHAMMADIA
D'INGENIEURS

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

This is to acknowledge receipt of 3 days salary, 4 days pocket money and/or extra incurred costs, as a contributor to the above-mentioned training course, following the UNIDO/ICS policy, i.e. a total of US$ 729,2 from Prof. Driss OUAZAR .

Malcolm L. Spaulding

Signature:
Prof. M. Spaulding
University of Rhode Island, USA

INTERNATIONAL CENTRE FOR
SCIENCE AND HIGH TECHNOLOGY

ECOLE MOHAMMADIA
D'INGENIEURS

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct.27 - Nov. 7, 1997

ATTESTATION

This is to acknowledge receipt of 3 days salary, 4 days pocket money and/or extra incurred costs, as a contributor to the above-mentioned training course, following UNIDO/ICS policy, i.e. a total of US$ 573 from Prof. Driss OUAZAR .

Signature: Daniel Z. Mendelsohn
Daniel Mendelsohn
Applied Science Associates
Rhode Island, USA

INTERNATIONAL CENTRE
FOR
SCIENCE AND HIGH
TECHNOLOGY
Trieste, Italy

ECOLE MOHAMMADIA
D'INGENIEURS
Rabat, Morocco

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION
Vienna, Austria

Training Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct. 27 - Nov. 7, 1997

Appendix 9: Invoices

digitem

6, rue Réaumur
Quartier des Hôpitaux - 20100 Casablanca
Tél. : (02) 29.77.33 / 38 / 40
Fax : (02) 29.77.57

Casablanca le, 30/10/1997

EMI
RABAT

FACTURE N° 97/MA/241

N°	DESIGNATION	QTE	P.U / H.T	P.T / H.T
1	**Micro-ordinateur Pentium MMX à 200 Mhz** . Plug and Play BIOS . Mémoire RAM 32 Mo EDDO extensible à 256 Mo . Mémmoire caxhe : 32 Kb primaire 256 Ko Pipeline Burst . Disque dur 2,1 Go PCI Enhaced.IDE . Lecteur disquette 3" ½- 1,44 MO . Carte graphique accélératrice S3 Trio64V+bits PCI de 1 Mo EDO extensible à 2 Mo . Clavier AZERTY . Ecran 15" SVGA couleur NI à synschronisation automatique 1 parallèle (bidirectionnel ECP/EPP) - 2 séries compatibles 16550 . Logiciels pré-installés: WINDOWS 95, Client Works 2.3 with DMI, Digital's Easy Networks Setup, Netscape Navigator, Microsoft's Internet Browser, Adobe Acrobat Reader **. 3 emplacements PCI/ISA** **. 4 storage de baies** @ 1* 3,25 pouces demi-hauteur, accessible par l'avant (unité de disquette 1,44 Mo installé @ 2* 3,25 pouces demi-hauteur, accessible par l'avat @ 1* 3,5 pouces, extraplate, interne	2	15 920,00	31 840,00
2	**VENTURIS FX 5166 PENTIUM MMX** **Micro-ordinateur Pentium MMX à 166 Mhz** . Plug and Play BIOS **. Mémoire RAM 32 Mo EDO extensible à 256 Mo** **. Mémoire cache :** **32 Kb primaire** **256 Ko Pipeline Burst** **. Disque dur 2,5 Go PCI Enhanced.IDE** . Lecteur disquette 3" ½- 1,44 Mo . Carte graphique accélératrice S3 Trio64V+ bits PCI de 1 Mo EDO extensible à 2 Mo . Clavier AZERTY	2	13 750,00	27 500,00

ROYAUME DU MAROC

MINISTERE DES PECHES MARITIMES
ET DE LA MARINE MARCHANDE

INSTITUT SPECIALISE DE TECHNOLOGIE
DES PECHES MARITIMES
AGADIR

المملكة المغربية

وزارة الصيد البحري
والملاحة التجارية

المعهد المتخصص
لتكنولوجيا الصيد البحري
أگادير

TOTAL DES DEPENSES CONCERNANT LES PARTICIPANTS AU "TRAINING COURSE" A L'INSTITUT DE TECHNOLOGIE DES PECHES MARITIMES D'AGADIR

****

PERIODE DU 27.10.1997 AU 07.11.1997

****

I) Frais d'hebergement :.....23.080,00 DHS

II) Frais de réstauration comprenant :
- Nourriture, Pauses - Café :.....35.100,00 DHS

3) Frais de Transport :.....1.512,00 DHS

TOTAL = 59.692,00 DHS

...Arrêté à la somme de :CINQUANTE NEUF MILLE SIX CENT QUATRE VINGT DOUZE DIRHAMS./.

Reçu en espèces le montant ci-dessus ci-dessus le 07/11/97

L'Intendant

TEL. 84.41.70 - 84.43.18 / FAX: 84.58.58 / TELEX: 82659 M / B.P. 479 - AGADIR

TAK VOYAGES

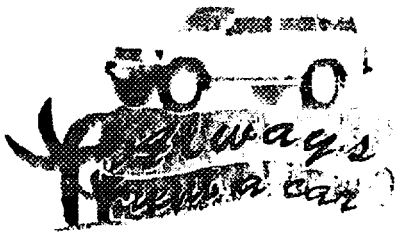
TOURISME AVIONS BATEAUX TRAINS AUTOCARS

RABAT LE 30.10.97

ATT MR OUAZAR DISS

-CAMARA ABDOULAYE	CONAKRY	8733 DH
-CHAM MOHAMED	BANJUL	10647 DH
-OSMAN FAROUK	CAIRO	10220 DH
-YAHYA DARTIJE	NOUAKCHOT	6171 DH
-KINDJA ASSOUM	ABIDJAN	10347 DH
-DJAMA THEODORE	DOUALA	13887 DH
-BALDE PATHE	DAKAR	7003 DH
-EKUWEN AMMANUEL	LAGOS	10523 DH
-AKA KYRIAN	LAGOS	10523 DH
-BERGAMSCO	ITALIE	8506 DH
-DAOUK BASSAM	BEIRUT	15584 DH
-GALEA	MALTE	3967 DH
-CASSAR	MALTE	4597 DH
-ILLOU SAADIA	TUNIS	4069 DH
-SPAULDING+MENT	USA	23470 DH
-SPAULDING NICOLE	USA	1445 DH
-GALEA	AGADIR	1180 DH
-MAMISH	AGADIR	1180 DH
-MAMISH	DAMAS	13625 DH
-CASA-GADIR-CASA X 5		5875 DH
-RABAT-AGADIR-RABAT X 4		1356 DH

1 BIS AV.IBN SINA AGDAL RABAT - TEL: 77 16 84- 77 13 51 FAX: 77 70 68
PATENTE :25705735- C/B .BCM 074C000071 RABAT AGDAL



أوليوز كراء السيارات

Always rent a car

Agadir le 07 NOV 97

ECOLE MOHAMEDIA D'INGENIERIE

IF 06900207

T C MOROCCO OCT27 - NOV07

FACTURE 3544

LOCATION VEHICULE R21 (9629 12 6) DU 25/10 AU 07/11

13 JOURS DE LOCATION	5 750,00
TOTAL FACTURE	5 750,00

ARRETEE LA PRESENTE FACTURE A LA SOMME DE :

CONQ M%ILLE SEET CENT CINQUANTE DHS.

DONT TVA 20% CPR : 958,33

Always Rent a Car C.N.S.S. N° 12118 - R.C. N. 1202 - I.F. 06900207 - PATENTE N° 48303602 - CPTE BANCAIRE W.B. 601010101/7100 AGADIR

AGADIR SIEGE
Rue Ghamata
à côté de l'hôtel Mahabia
Tél. B. (08) 84 60 61 / 62
(08) 84 07 49
Fax (08) 84 50 37

Stand CASABLANCA
Aéroport
Tél. : (02) 53 81 86
Tél. Mobil : (02) 15 26 35

STand AGADIR
Aéroport
Tél. : (08) 83 93 24
Tél. Mobil : (02) 17 79 52

CASABLANCA
64, Av. My Hassan 1er
en face hôtel BASMA
Tél. (02) 22 59 40/22 56 62
Fax (02) 22 56 58

MARAKECH
Complexe Kawkab
Centre Guéliz
Tél. : (04) 44 62 27
Fax : (04) 43 09 38

VILLAGE DE L'ELECTRICIEN
COS - ONE - AGADIR

AGADIR, LE 07 NOVEMBRE 1997

FACTURE 315/97

DOIT	ECOLE MOHAMMEDIA D'INGENIEURS TC-MAROCCO AGADIR OCT27/NOV07 1997		
[illegible]	PERIODE	NOM	NBRE PAX
	25/10au07/11/97		20
DEVIS REF :	FICHE TECHNIQUE N° :	B.COMMANDE N° :	
OBJET :	HEBERGEMENT & RESTAURATION 20 PAX/SPONSOR ICS/UNIDO		

QTE	DESIGNATIONS	P.U.	TOTAL
02N	SEJOUR	200,00	400,00
13E/02	SEJOUR	180,00	4 680,00
05N	SEJOUR	180,00	900,00
10N	SEJOUR	300,00	1.800,00
02N	SEJOUR	180,00	360,00
06N	SEJOUR	220,00	1.320,00
03N	SEJOUR	220,00	660,00
03N	SEJOUR	180,00	540,00
03N	SEJOUR	220,00	660,00
02N	SEJOUR	180,00	360,00
74	P'DEJEUNER	20,00	1.480,00
103	REPAS	80,00	8.240,00
06	REPAS	120,00	720,00
152	REPAS	60,00	9.120,00
	BOISSONS		1.800,00
	TELEPHONE/FAX		113,50
ARRETEE LA PRESENTE FACTURE A LA SOMME DE : TRENTE TROIS MILLE CENT CINQUANTE TROIS DIRHAMS 50CTS//.			33.153,50

VILLAGE DE L'ELECTRICIEN AGADIR

COS / ONE CONSTRUCTION
VILLAGE DE L'ELECTRICIEN
AGADIR
Le

BD MOHAMED SAADI - B.P. 3175 - 80 005 - AGADIR - TEL. : 08 84.31.06 / 08 / 09 FAX :84.30.73 - TLX : 81601

OUDAM ALKAL

Agadir Bureau

AU CAPITAL DE 200.000 DHS. Rue de l'Entraide Nationale (Talborjt) - AGADIR Tél. 82.22.23 & 82.05.98 - Fax 82.40.49
389 -B.P. Ple 17-Compte Banque Populaire Agadir 21 211.100.7454.0011- N° d'Ident255655 06900188 Patente n° 48315500

Bon Comptant № 02385

OUAZAR code 383

Agadir, le 03 - 11 - 1997

Désignation	P. U.	T.V.A.	Prix Total
photocopies A4	0,80		36,00
	T.V.A	20%	7,20
	T.T.C		43,20

Agadir Bureau
Rue de l'Entraide National
Tél 822223 Fax 824049
AGADIR

Commande N° .... du .... Signature

Agadir le 6/11/1997 OUAZAR

99 tirage photos (form) 2 135
73 Developpement 30
02 FL ... 35
06 photocopies ... 06
37 tirage photos ... 2, 74
01 FL ... 24 ... 3, 50

total = 375

... facture à la somme de trois cent soixante quinze DHS

رقم ..... No ..... في Le 07/11/1992

Bon pour ..... ورقة لأجل

50,00 DH Super

à M ..... إلى السيد

Signature ..... الإمضاء

07/11/94

ورقة لأجل

اصالة 38.41

DH -300,00-

à M ..... إلى السيد

SIGNATURE

رقم ..... No ..... في Le ..... 19 ..

Bon pour ..... ورقة لأجل

Supplication

à M ..... إلى السيد

Signature

رقم ..... No ..... في Le 03 11 93 19

Bon pour ..... ورقة لأجل

1 gâteau d'anniversaire 4 Kg à 100,00 DHS quatre cent DHS

2 Kg Petits fours à 100,00 DHS Deux cent DHS

600,00 DHS

LA MAISON DU PAIN
Boulangerie Patisserie Café
Laiterie Complète Traiteur
Avenue N°19 Av. Hassan II
Tél: 84.07.09 Fax: 82.33.60
AGADIR

à M ..... إلى السيد

Signature ..... الإمضاء

Epi[illegible] du Centre
Imm
Tél

FACTURE N° 40[illegible]3

Le 3-11-97

QUANTITE	DESIGNATION	P.U.	MONTANT
6	COCA	890	5340
	[illegible]		600,00
			6134,0

Sidi Ben othmane. Centre

N° ________ رقم

Le Fl 7/11/97 في

BON pour ________ ورقة لأجل

1110,00 # DH

à M. ________ الى السيد

Signature إمضاء

[illegible] في N° [illegible]

Le 6-11 19 97

BON POUR ________ ورقة لاجل

[illegible]

cent cinquante DH [illegible]

à M ________ إلى السيد

Signature

tel 839004

```
QN AGALLAT
.
QN JFKLLAA CMNLLAT AGALLAT
.ATLBMXS AT/021103
RFI
BAH AGAAT16373
   /PAX/
NM01 SPAULDING          .IT01 SS
PA01 JFK
PN   843071/01152300
TA01 ONE AGADIR
RT   JFK/CMN/AGA
FD   AT202/02NOV/AT431/02NOV
TK01 2178394789
   /BAG01/
TN01 AA232758    .CT01 BU01XXX
BI01 SAMSONITE
BW   04/UNK
CN01 CLOTHES
   /OSI/
FI   FWD AGA
END OF REPORT


0010
+11021101
```

ROYAL AIR MAROC
ESCALE..AGADIR.....
.....BORDEREAU DE RESTITUTION.....
NOM.TAIK AHMED..... NO DOSSIER.AGAAT16373
NO C.I.N./PASSEPORT I129238.....
ADRESSE.SECTEUR 8 BLOC D 1 HAY RIYADH RABA.....
.....TEL .....
OBS..TRANING COURS/ IMPACT sur l'ENVIRONNEMENT..(ICS_EMI
.....
NOMBRE BAGS...01..... POIDS.....
NUMERO ETIQUETTE(S) BAG(S).....
DATE ..02 NOV97..... AGENT..AGA.....

SIGNATURE DU PASSAGER .....

LIMITED RELEASE

- ☐ FRAGILE & UNSUITABLY PACKED-Release applies to damage
- ☐ PACKAGING INADEQUATE-Release applies to damage and loss of contents
- ☐ PERISHABLE-Release applies to spoilage resulting from delay

RECEIVED DAMAGED

☐ HANDLE BROKEN	☐ STRAP BROKEN	☐ TORN	☐ DENT
☐ SCRATCH	☐ OTHER _____		
☐ TOP	☐ BOTTOM	☐ SIDE	☐ END

Release applies to damage.

☐ VOLUNTARY SEPARATION _____

In consideration of carrier(s) transporting my property (described above), which has been damaged previously or which is deemed by governing tariffs to be unsuitable for transportation as checked baggage, I hereby release carrier(s) from liability resulting solely from such pre-existing damage or unsuitability (as designated above by "X").

_____ _____

▲ Passenger's Signature ▲

BAGGAGE CLAIM CHECK

Baggage checked subject to Conditions of Contract or Tariffs, including Limitations of Liability therein contained. This is not the luggage ticket (baggage check) described in Article 4 of the Warsaw Convention or the Warsaw Convention as amended by the Hague Protocol 1955.

tel 839004

```
QN AGALLAT
.
QN JFKLLAA CMNLLAT AGALLAT
.ATLBMXS AT/021103
RFI
BAH AGAAT16373
   /PAX/
NM01 SPAULDING          .IT01 SS
PA01 JFK
PN   843071/01152300
TA01 ONE AGADIR
RT   JFK/CMN/AGA
FD   AT202/02NOV/AT431/02NOV
TK01 2178394789
   /BAG01/
TN01 AA232758    .CT01 BU01XXX
BI01 SAMSONITE
BW   04/UNK
CN01 CLOTHES
   /OSI/
FI   FWD AGA
END OF REPORT


0010
+11021101
```

ROYAL AIR MAROC
ESCALE..AGADIR.....
.....BORDEREAU DE RESTITUTION.....
NOM.TAIK AHMED..... NO DOSSIER.AGAAT16373
NO C.I.N./PASSEPORT I129238.....
ADRESSE.SECTEUR 8 BLOC D 1 HAY RIYADH RABA.....
.....TEL .....
OBS..TRANING COURS/ IMPACT sur l'ENVIRONNEMENT..(ICS_EMI
.....
NOMBRE BAGS...01..... POIDS.....
NUMERO ETIQUETTE(S) BAG(S).....
DATE ..02 NOV97..... AGENT..AGA.....

SIGNATURE DU PASSAGER .....

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☐ HANDLE BROKEN	☐ STRAP BROKEN	☐ TORN	☐ DENT
☐ SCRATCH	☐ OTHER _____		
☐ TOP	☐ BOTTOM	☐ SIDE	☐ END

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_____ _____

▲ Passenger's Signature ▲

BAGGAGE CLAIM CHECK

Baggage checked subject to Conditions of Contract or Tariffs, including Limitations of Liability therein contained. This is not the luggage ticket (baggage check) described in Article 4 of the Warsaw Convention or the Warsaw Convention as amended by the Hague Protocol 1955.

رقم N° ....

في .... Le 5. 11. 1997

ورقة لأجل

BON pour gasoil

100 DH

à M .... إلى السيد

Signature ... ALLASRY

STATION MOBIL NAHDA

Avenue ... AGADIR

CNSS ...

الإمضاء

Payé

رقم N° ....

في Le 25/10/97 19

Bon pour .... ورقة لأجل

1000,00 DH

à M .... إلى السيد

Signature الإمضاء

AJAFARL M'hamed

Boucher

Centre Sidi Aïdi - Settat

R. C. 5416

Tél : (03) 40 . 29 . 74

Recettes	Date ________	Dépenses

Exc Sonne bilbue

24 pax

Avance 1000,- dhs reçue de Mr OUAZAR

Reste : avant des clts

TOTAL . . .

Mme

~~ch~~ 200 → 180
st 220 → 220
Appt 300 → 300

P. Dej 20
Dej / Din 80
60

LE MIRADOR
TERRASSE PANORAMIQUE
LA RENAISSANCE
Ascenseur avec Consommation
CAFE - SODA ou THE
10 dh
Nº 000650 Serie B

LE MIRADOR
TERRASSE PANORAMIQUE
LA RENAISSANCE
Ascenseur avec Consommation
CAFE - SODA ou THE
10 dh
Nº 000651 Serie B

LE MIRADOR
TERRASSE PANORAMIQUE
LA RENAISSANCE
Ascenseur avec Consommatior
CAFE - SODA ou THE
10 dh
Nº 000653 Serie E

LE MIRADOR
TERRASSE PANORAMIQUE
LA RENAISSANCE
Ascenseur avec Consommation
CAFE - SODA ou THE
10 dh
Nº 000652 Serie B

12,00 شيابان
14,00 قهوة
2600

280 قهوة
50 ملبس
30 خبز
360

5 - 11 - 97
STATION MOBIL
ESSAADI
Route d'Agadir Tél : 35.35.60/61
CHICHAOUA
Nº 108027
M. ....

QTE	Désignation	P U	Total
	Super Sans Plomb		
	Super		90,00
	Essence		
	Gasoil		

Net a Payer

رقم Nº ....
Agadir في Le 31/10/97 19
Bon pour .... ورقة لأجل
3 photocopie 97
PAYE
à M .... إلى السيد
Signature الإمضاء

ARSMOK
29, Rue 29 Février Nouveau Talborjt
Tél. : 84.89.00

Patente : 48316223

Agadir, le 27/10/97

BON

N° 000497

M.

Quantité	Désignation	P.U.	Total
01	cafetière tristate 003	300.00	300.00

ARSMOK
29 Rue 29 Février
Nouveau Talborjt Agadir
Tél. 84.89.00

Epi... du Centre
... II
... AGADIR

FACTURE № 40821

Le ....

M : ....

QUANTITE	DESIGNATION	P. U.	MONTANT
4	CAFE		134.50

Le 27/10/97 N° رقم

BON Pour ورقة لأجل

Sup 360,00 Dh

STATION MOBIL OCÉAN
Bd. Mohamed V - AGADIR
N° Patente 48305002
Tél

à M. .... السيد

Signature

M .... السيد

N° ....
Le 01-11-97

BON

Quantité	DESIGNATION	Prix U.	Prix Total
	Accessoires		250,00
			250,

MOUNA ACCESSOIRES
9 Rue Taraboulous (Q.I.)
Agadir Tél: 84-35-68

N° .... رقـم

AGADIR à 01 . 11 . 1997 في

BON Pour .... تـوصـيـل مـن اجـل

1 FILM AGFA 30,00

M .... السـيـد :

Signature امضـاء

Agadir Bureau

S.A. AU CAPITAL DE 200.000 DHS. Rue de l'Entraide Nationale (Talborjt) - AGADIR Tél. 82.22.23 & 82.05.98 - Fax 82.40.49
R.C. 1589 -B.P. Ple 17-Compte Banque Populaire Agadir 21 211.100 7454 0011- N° d'Ident255655 05000188 Patente n° 48315500

Bon Comptant

№ 02413

M .....

Agadir, le 5 / 11 / 1997

Quantite	Désignation	P. U.	T.V.A.	PrixTotal
03	Rames p. photocopie 21x27	56,00		168,00
		TVA 20%		33,60
				201,60

Agadir Bureau
Rue de l'Entraide National
Tél 822223 Fax 824049
AGADIR

Bon de Commande N° ..... du .....

Signature

Station Mobil des Sports
Av. Hassan II - AGADIR
Tél. 82-25-77

N° ..... le 14/11/97

Bon Pour ..... برقة رجل

HAMADA COPIER

Signature et cachet

S/S MOBIL des SPORTS
Av. Hassan II - AGADIR
Signature et cachet du Pompiste

S/S MOBIL ATLAS
Avenue Mohammed V
Tél: 84.02.82 - AGADIR
Patente: 48304610

200,00

S/S MOBIL ATLAS
AVENUE
TEL

SEREP
Aéroport Dakar - Yoff
Sénégalaise - Restauration - Publique

DAKAR, le 27/10/92

Facture de M.N. Clan N° 000255

DESIGNATION	QUANTITE	PRIX	TOTAL
Brochette de Poisson	01	2300	2300
Coca - Cola	01	700	700
			3000

LE CAISSIER,

LE CLIENT,

US $ 1 = 590 CFA Francs

SEREP
Aéroport Dakar - Yoff
Sénégalaise - Restauration - Publique

DAKAR, le 27/10/92

Facture de M.N. Clan N° 000257

DESIGNATION	QUANTITE	PRIX	TOTAL
PDS Express	01	1300	1300
Jus d'Orange	01	500	500
			1800

LE CAISSIER,

LE CLIENT,

US $ 1 = 590 CFA Francs

SOJ.GE.PRES
HOTEL AEROGARE
ADRESSE : 45, RUE DE THIONG
TEL : 20-11-97
TEL B : 21-68-60

FACTURE N° : 000014119

DATE FACT : 27/10/97
N° CLIENT : 000011657
PRENOM : MUHAMMAD MASIR
NOM : CHAM
N° CHAMBRE : 8
TYPE CHAMB : SINGLE

MODE DE RGLMT : ESP

SIGNATURE

CODE	DESIGNATION	MONT	QT	VALEUR
LOC	LOCATION	15600	1	15600
TEL	TELEPHONE	2040	1	2040
	BASE TAXABLE ---------->			15600
	TOTAL HORS TAXE ---------->			17640
TXT	TAXE TOURISTIQ	400	1	400
TVA	T.V.A.	10	1	1560
TIM	TIMBRE	200	1	200
	TOTAL DES TAXES ---------->			2160
	MONTANT T.T.C ---------->			19800

US$ 1 = 590 CFA francs

Restaurant SAFI N° 118
Chez Hassan LAHDOUDI
Porte du Port AGADIR
Tél : 82-27-81

Restaurant SAFI N° 118
Chez Hassan LAHDOUDI
Porte du Port AGADIR
Tél : 82-27-81

AS l'Accueil du Sud

Imprimerie Papeterie - Matériel Informatique - Mobiliers et Fournitures de Bureaux
Topographiques - Techniques et Toutes Sortes de Réparations

de:00000000	Facture N°50.291/97DU 03/11/97
COMMANDE N° B.L N° 6048-6049	

EF.	DESIGNATION	QTE	P.U H.T	TVA %	MONTANT HT
	BLOC NOTE P.F.	150	4.50	20,00	675.00
	BADGES	150	7.50	20,00	1125.00
	CARNETS DE RECUS SICOPA	3	13.50	20,00	40.50
	CARNET REPAS	4	6.50	20,00	26.00
	MARQUEUR	4	12.00	20,00	48.00
	POCHETTE FEUTRE P./TRANSPARE	1	65.00	20,00	65.00
	CARTOUCHE POUR IMPTIMANTE	1	475.00	20,00	475.00
	BOITE AGRAFES	1	4.50	20,00	4.50
	CUTER	1	18.00	20,00	18.00
	COLLE UHU	4	18.00	20,00	72.00
	RLX. DE SCOTCH	2	4.50	20,00	9.00
	ENVELOPPE OPAL	150	0.45	20,00	67.50
	POST-IT	1	12.00	20,00	12.00
	BLANCO	1	16.00	20,00	16.00
	PHOTOCOPIE FORMAT A4	358	0.50	20,00	179.00

TOTAL HORS T.V.A	MT T.V.A	TOTAL T.T.C
2.832,50	566,50	3.399,00

Arrêtée la présente facture à la somme de :
TROIS MILLE TROIS CENT QUATRE VINGT DIX NEUF DIRHAMS, 00 CENTIMES

Sce. Commercial : Avenue Khalid Ibn Al Walid N° 9 Bloc F 16 - Cité Dakhla Agadir - Tél : [redacted] 22.48.06 - Fax : 22.48.17
R.C. 3849 - C.N.S.S. 2276758 - T.V.A. 258067 - Patente 49210214 - [redacted] - Cpte Bancaire - B.P. : 212115012673000 4 - Agadir

Bab's
Atelier des Arts Graphiques
R C : 22706
2 bis, RUE D'IFNI TALBORJT AGADIR
C. B. BPA 212163695297 0003

Agadir, le .....

FACTURE N° 0075/87

M ..... **DOIT**

Quantité	Désignation	P. U.	Total
100	Stylos de luxe imprimés deux couleurs marron + rouge + cadres sérigraphiques	12,00	1200,00
		Total	1200,00

Arrêté la présente facture à la somme de Mille deux cents DH's

BAB'S
Atelier des Arts Graphiques
Talborjt AGADIR
Tél: 84.62.44 / 84.65.23

FACTURE

Réf :

Doit : C I S H T

Objet : Séjour en PC

Date : 25/10/97 AU 07-11-97

Nbre : 14 Personnes

ARRANGEMENT

Hébergement		Période
312 DBL	20 000 x 2N = 40 000	DU 25 AU 27/1…
206 + 207	18 000 x 2 x 13N = 468 000	DU 25 AU 07/1…
205	18 000 x 5N = 90 000	DU 25 AU 30/1…
BW 2	30 000 x 6N = 180 000	DU 26 AU 01/1…
218	18 000 x 2N = 36 000	DU 27 AU 29/1…
525	22 000 x 6N = 132 000	DU 01 AU 07/1…
524	22 000 x 3N = 66 000	DU 02 AU 05/1…
214 DBL	18 000 x 3N = 54 000	DU 02 AU 05/1…
529	22 000 x 3N = 66 000	DU 3 AU 06/…
210	18 000 x 2N = 36 000	DU 5 AU 07/…

RESTAURATION

7 dîn 80 → 560
20 déj 60 [1200]
Bonus 1558

P. déj	2 000 x 74 = 148 000
REPAS	8 000 x 96 = 768 000
	12 000 x 06 = 72 000
	6 000 x 152 = 912 000
Boissons	180 000
Phone / FAX	113 5…

HOLIDAYS SERVICES

HOLIDAYS SERVICES MAROC

PROFORMA INVOICE 01

Date : 04/11/97 / AGADIR

Bank : Banque Marocaine du Commerce Extérieure (BMCE) , AV. Général Kettani Agadir,
Account n° 010 01 210 00 600 96/27

Beneficiary : **Grp. OUAZAR x 25 pax 04/11/97**	Client : **SELF** Address : M. OUAZAR

DESIGNATION	AMOUNT
Soirée Bérbère (KasbahTassila)	
170,-Dhs x 25	**4.250,- dhs**
CONDITIONS OF PAYMENT *Avance déja payé: 1.000 ,- Dhs * Reste à payer : 3.250,- Dhs	
CANCELLATION CHARGES CANCELLATION OF ONE OR SEVERAL PARTICIPANTS *Between 07 and 03 days before departure date dhs 330,-/pax *From the second day 50% of the invoice (or in the case of no-show) CANCELLATION OF THE TOTAL GROUP *Between 07 and 21 days before departure date : 150,- dhs per person *Between 03 and 07 days before departure date : 30% of the amount of the proforma invoice *Less than 3 days before departure, 50% of the amount of the invoice	
TOTAL	**4.250,- DHS**

Signature

M. OUAZAR

Signature

Holiday services

* <u>Accueil</u>
  - Akrim Souad — أكريم سعاد
  - El Askari Rachid — العسكري رشيد
  - Moumou Taib — موسى [redacted] الطيب
* <u>Photocopie</u>
  - Essaadani Hassan — السعداني حسن
  - Amghar Rachid — امغار رشيد
  - (Eddor) [redacted] Ahmed — (البدر) احمد
* <u>Chauffeur</u>
  - Alkhamli Mohammed — الخملي محمد
  - Chakir Brahim — شاكر ابراهيم
  - Chauffeur d'INRH — سائق INRH
* <u>Repas</u>
  - Mebarek Kathiri — مبارك كثيري

AGADIR ce 30 octobre 1997

ABDOULAYE CAMARA
Guinée

Objet : séminaire sur la modélisation de l'impact environnemental du développement industriel dans les zones côtières et urbaines.

Le programme conçu par le comité local d'organisation prévoyait le départ du séminariste le lundi 27 octobre 1997 à 15H. Il s'est avéré par la suite qu'une mission d'état du président Ivoirien Pierre à Conakry à la même heure a retardé le vol de 3H de temps. La correspondance n'a donc pas pu être rattrapée à Casablanca où l'avion est arrivé seulement vers 23H. Les dépenses effectuées à ce sujet sont les suivantes :

- Transport Taxi Aéroport casablanca Aéroport → 50 dollards
- Frais d'hôtel et Manger de la nuit et le petit déjeuner 60 dollards.

A partir de Conakry, le séminariste à son tour de l'aéroport a emprunté un taxi qui a coûté 30.000 FG, soit 15.000 F CFA.

Vous en souhaitant bonne réception, accepter Messieurs l'expression de ma profonde gratitude.

digitem

6, rue Réaumur
Quartier des Hôpitaux - 20100 Casablanca
Tél. : (02) 29.77.33 / 38 / 40
Fax : (02) 29.77.57

Rabat le 17/11/97

Ecole Mohammadia d'Ingénieur
LASH

Facture N°17/11/97/MM/3
Location de matériel et Prestations de Services

Art	Désignation	QTE	Prix Unitaire TTC	Prix Total TTC
1	Location Micro-ordinateurs Durée: 3 semaines	12	3 500,00	42 000,00
2	Location Serveur Durée: 3 semaines	2	7 800,00	15 600,00
3	Location Vidéo-Projecteur Durée: 3 semaines	1	7 000,00	7 000,00
4	Location Imprimantes Durée: 3 semaines	3	3 800,00	11 400,00
5	Location Portable Durée: 3 semaines	2	4 000,00	8 000,00
5	Transport et Installation sur Site à Agadir Durée: 3 semaines	1	40 000,00	40 000,00
6	Assistance pendant toute la période du Congrés Durée: 3 semaines	1	36 000,00	36 000,00
	Total TTC			**160 000,00**

Arrêté la présente facture à la somme de Cent Soixante Mille Dirhams
Toutes Taxes Comprises

digitem
179, Av. My. Hassan 1er
Tél. 20.56.91/92 93
Fax: 20.36.30 - Casablanca

Aly. Yahya Dartige
Centre National de Recherches
Océanographiques et des Pêches
Mauritanie

Le 29.10.97

Au
Prof Driss Lhazan

Objet: Remboursement

Monsieur,

Suite à nos conversations téléphoniques j'ai l'honneur de vous demander de bien vouloir me rembourser les frais que j'ai eu à dépenser au cours de mon voyage.

* 1. billet aller/retour Nouadhibou – Nouakchott 140 $US
* 1. billet taxi Agadir au [illegible] l'aéroport 250 DH
* 2 nuits à Nouakchott 40 x 2 80 $US

Dans l'attente d'une suite favorable veuillez accepter mes remerciements.

N.B: photocopie documents ci-joints

Remerciements

[signature]

مؤسسة العرف

ETABLISSEMENT EL AOURF

FOURNITURE DROGUERIE, QUINCAILLERIE, PLOMBERIE, ELECTRICITE & PEINTURE

165, Rue Oued Ziz (Q.I.) AGADIR - Tél. 84.47.21 - Fax 84.62.84

FACTURE N° : 381/97 Agadir, le 28/10/97

M

QUANTITE	DESIGNATION	P.U.	TOTAL
2	Rallonge 4P+T	50,00	100,00
6	m Cable souple 3x1,5	4,50	27,00
2	Fiche mâle 2P+T	8,50	17,00
2	" femelle 2P+T	9,00	18,00
		TOTAL	162,00
	Dont T.V.A 20% = 27,00		

R.C. : 87665 - I.F. T.V.A. : 256306 - PATENTE : 48113340 - C.N.S.S. : 2134740 - C.B./ 01200392557291 B.M.C.I.

NADAF s.a. ناضاف ش.م.

AU CAPITAL DE 2.055.000 DHS

مطبعة - وراقة - مكتبة

Imprimerie - Papeterie - Librairie

115, BD S. M. HASSAN II - AGADIR

R.C. MARRAKECH 3965

N° D'IDENT. T.V.A. 252.181 - C.N.S.S. 1835696

PATENTE N° 48312530 - I.F. 06900036

☎ Imprimerie 82.03.08 - 84.32.46
Papeterie 84.37.43 - 84.31.21

COMPTANT N° 00145 H

Agadir, le 5.11.97

Centre International PENI

01	Colle Stik GM	8500	8500
01	feutre Noir	1500	1500
01	Bte d'agrafes	350	350
03	[illegible]	7700	23100
			27450

[illegible]

Fourniture Générale
43, Av. Kennedi Talborjt
Tél: 84.55.82 - AGADIR
COMPTOIR SUD ATLAS

FACTURE

le 4/11/97

2	[illegible] - 3x2+T	4500	9000
2	[illegible] - 4x2+T	5500	11000
2	Triplette [illegible]	700	1400
1	[illegible]	8000	8000
		=	274,00

[illegible]

Globenet

Nouvelles Technologies de l'Information

Informatique, Réseaux, Télécommunications

Ecole Mohammédia des Ingénieurs
M. Rachid EL BAYAD

RABAT

Facture

NUMERO	DATE	REFERENCE	PAGE N°
FA97095	28/10/97		1

Référence	Désignation	Qté	P.U. Net	Montant HT
CPC	Cable pour Modem/PC	1	150,00	150,00

BASE	TAUX	TAXE
150,00	20,00%	30,00

TTC	ACOMPTE	NET A PAYER
180,00		**180,00**

Globenet
Av. Hassan II - AGADIR

Dans le cas où le paiement intégral n'interviendrait pas à la date prévue par les parties, le vendeur se réserve le droit de reprendre la chose livrée et de résoudre le contrat.

DATE DE REGLEMENT	MONTANT	CONDITIONS DE REGLEMENT
28/10/97	180,00	Règlement par :
		Echéance :

Arrêtée la présente facture à la somme de :
Cent quatre-vingts Dirhams

INTERNATIONAL CENTRE
FOR
SCIENCE AND HIGH
TECHNOLOGY
Trieste, Italy

ECOLE MOHAMMADIA
D'INGENIEURS
Rabat, Morocco

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION
Vienna, Austria

Course on
Predictive Modelling of Environmental Impact of Industrial Development in Urban-Coastal Areas

Agadir – Morocco, Oct. 27 - Nov. 7, 1997

Appendix 10: Financial Statement

TC-Morocco Expenses (Invoices attached)

1 US$=9,5Dhs

	Lecturers	Participants	Total	% Participants	Total (US$)
ISTPM	3110	56582	59692,00	94,79%	6283,37
ONE	19240	13913,50	33153,50		3489,84
TAK	43898	123148	167046,00	73,72%	17583,79
POCKET MONEY	10800	42500	53300,00	79,74%	5610,53
OTHER COSTS/Extra		19828,4	19828,40	100,00%	2087,20
Diner			4250,00		447,37
Transportation			40000,00		4210,53
Digitem			160000,00		16842,11
Local expenses			23681,50		2492,79
Organisation			59700,00		6284,21
	Total		**620651,40**		**65331,73**