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214. table map

RESTRICTED

XP/MOZ/92/124
August 1993
ORIGINAL: ENGLISH

ENVIRONMENTALLY SUSTAINABLE INDUSTRIAL DEVELOPMENT
XP/MOZ/92/124/11-52
MOZAMBIQUE

Terminal report

Prepared for the Government of Mozambique
by the United Nations Industrial Development Organization

Based on the work of Mariusz Suchorowski
Junior Expert in Information Systems

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Supervising officer: Peter N. Pembleton

United Nations Industrial Development Organization
Vienna

Local currency: Meticais (Mt)
1 US dollar = 3,700 Mt (August 1993)

LIST OF ABBREVIATIONS

EEIS - Energy and Environment Information System
ESID - Environmentally Sustainable Industrial Development
INTIB - Industrial and Technological Information Bank
MIE - Ministry of Industry and Energy
NEC - National Environment Commission
PCP - Primary Contact Point (of the EEIS)
REED - Referral Database on Energy and Environment
SADCC - Southern African Development Coordination Conference
SCP - Secondary Contact Point (of the EEIS)
SMI - Small- and Medium-Scale Industries
UEM - University of Eduardo Mondlane

ABSTRACT

Preparatory Assistance for the formulation and implementation of an ESID Programme in Mozambique - XP/MOZ/92/124.

This report presents results of the work undertaken by the Junior Expert in the Republic of Mozambique, during the period 28.04-28.08.1993. The objective of the work was to establish a computerized information system containing technical information needed to facilitate the assessment of environmental impacts of industrial activity and to identify appropriate national mechanisms and institutions for disseminating information to SMIs, in line with UNIDO/INTIB's methology for establishing an Energy and Environment Information System (EEIS).

It is recommended to establish a national EEIS network in support of the objectives of an ESID programme in the country and to continue utilizing REED for textual data. The REED software should be improved to facilitate mailing procedures and to enable handling enquiries.

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INTRODUCTION

This report presents results of the work undertaken by the Junior Expert in the Republic of Mozambique, during the period 28.04-28.08.1993. The objective of the work was to establish a computerized information system containing technical information needed to facilitate the assessment of environmental impacts of industrial activity. The activities were carried out under the auspices of the Ministry of Industry and Energy (MIE) in Maputo.

The main activities outlined in the project document were:

(2.1) identification and consolidation of existing data from Government sources;
(2.2) preparation of questionnaire for collection of data from the field;
(2.3) field work to collect data;
(2.4) consolidation of collected data;
(2.7) preparation of and participation in a workshop;
(2.8) draft user's manual.

Activities 2.5 and 2.6 (i.e. development, design and implementation of a new information system) were not carried out by the Junior Expert due to MIE's acceptance of the UNIDO/INTIB Referral Database on Energy and Environment (REED) as a tool for managing the consolidation of existing and recording of new information as required by the project. Annex 1 is the Job Description for this post.

The activities were carried out with the cooperation of three national counterparts.

In addition to carrying out the above-mentioned activities and because activities 2.5 and 2.6 were not necessary, the following tasks were undertaken:

(Add.1) adjustments to the REED application and extensions to the user's manual;

(Add.2) identification of appropriate national mechanisms and institutions for disseminating information to SMIs, in line with UNIDO/INTIB's methology for establishing an EEIS.

Section 1 describes the tasks of data collection and consolidation. Section 2 is devoted to the development of the REED software. Section 3 gives details about the survey for the Energy and Environment Information System. Recommendations contains conclusions concerned with further steps to be taken to utilize the results of the project.

1. DATA COLLECTION AND CONSOLIDATION

A. Organization of existing data from Government sources

One of outputs of the preparatory assistance for an ESID programme was formulated to establish an information system for the acquisition and organization of data related to environmental degradation due to industrial activities. The REED application, developed by UNIDO/INTIB, was installed, following the agreement of the Ministry of Industry and Energy.

The first tasks undertaken were identification, consolidation and organization of existing data from local industry and Government sources.

The Ministry of Industry and Energy has taken the initial steps for the creation of an Industrial Information Centre. This followed a proposal presented by a project on Industrial Policy and Institutional Adjustments (DP/MOZ/86/014). Two main data bases were developed under the DP project covering information on legislation and industrial statistics.

LEGIS is a textual data base, using CDS/ISIS, of national legislation, mainly related to industry and energy, with over 900 records for the period of 1974 to 1990. Many of these records contain state interventions in industrial plant.

All records from LEGIS were exported, converted and incorporated into REED. Due to the time-consuming nature of other, more important tasks, only a few of these records were edited to meet the REED validation criteria.

The other data base of the Industrial Information Centre, using PARADOX, contains a directory of industrial firms and plants, approximately 1600 series of "macro" level data (industrial and agricultural production, foreign trade, national accounts), and

hundreds of series of "micro" level data (firms and plant data mainly related to production, capacity and personnel);

In the opinion of the Senior Information Expert many of these records still require verification and editing. 843 records on industrial plant with addresses, telecommunication data, and numbers of employees were exported, converted and incorporated into REED. The records covered the following sectors: agro-industry, chemical industry, packaging, metallurgy and textiles.

The records were extracted in ASCII format and imported into the REED application, after processing by a small CDS/Pascal program which was specially prepared. After review of the list of companies by the environment engineer counterpart, it was found that there were numerous important omissions.

80 industrial installations were selected, as a representative cross-section of industries, for mailing invitations to attend the Seminar on Industrial Development and Environment. For all invited institutions the <ESID> term was entered into the "Comments" field.

In addition to the above material, the ESID expert had visited over 40 industrial and environment organizations and the details on his contact persons and addresses had been collected in an ASCII file. Other items of information, mainly studies and reports on environment from southern African countries had been obtained. Both institutional and bibliographic records from this material were entered into the REED application.

B. Training in the use of REED and preparation of the questionnaire

The national information counterpart had very little experience with data bases. He was trained in the use of the REED application, with special attention to data entry and

search/browse procedures. Little by little other facilities were explained: report generation, export functions, and backup/ restore procedures.

A full presentation of REED was given to the Senior Information Expert and some national personnel of MIE. It was suggested to continue with legislation and other textual data bases using the REED system.

A questionnaire, based on the REED data entry worksheets, was prepared to collect data from the industrial facilities (Annex 2). Waste-related tables were created to facilitate completing information on the residuals (Annex 3). The questionnaire and the supporting tables were translated into Portuguese.

Following some problems experienced during initial visits, the questionnaire was modified by adding explanations and/or examples for all questions.

The questionnaire included information related to three record types of REED:

1) INSTITUTION: address, telecommunication, name of director and/or contact person, infrastructure, number of employees, sales volume, productivity, and brief description of the activities;

2) PROCESS: names and volumes of final product, types and quantities of raw material, energy and water consumption, installed capacity, electric energy and steam generation, waste oil utilization, operation and shutdown hours, patent data, and brief description of the process;

3) WASTE: composition and volume of residuals, disposal method, hazard level, treatment method, and technology applied to reduce wastes, and brief description of the wastes.

C. Collection of data from the field

The National Environment Commission (NEC) was visited at the beginning of the project to see if they could provide access to additional sources of information. NEC had previously mailed a questionnaire on industrial wastes to 63 industrial plants and received over 20 answers. Data gathered by the NEC was not sufficient for the project purposes but in some cases completed information collected by the previous project.

Difficulties in collecting data from plants experienced by project personnel under DP/MOZ/86/014 and by NEC, led to the conclusion that entrepreneurs were usually not willing to complete questionnaires sent by mail. Even if a questionnaire was returned, the information was not adequate.

It was therefore agreed that plant visits were necessary. As it was difficult to travel in the country, the visits were restricted to Maputo Province (it is estimated that about 60% of Mozambican industry is located in the province of the capital city).

The MIE team prepared a list of plants, representing the following sectors: food processing, chemical, metalo-mechanical, metallurgical, building materials, packaging, textile, wood, and shoes industry. Most of the plants visited were medium- or large-scale industries, in many cases suspected of polluting the environment.

During the visits, the objectives of the ESID programme and the concept of the Energy and Environment Information System were presented. The CLEANTEC DATA paper from INTIB and the EEIS Status Report were handed to all interviewed persons.

The project team faced several problems. Although meetings were arranged, entrepreneurs were usually not able to complete the

questionnaire on-the-spot. Difficulties with telephone communication often meant that it was necessary to visit the same plants several times. Many industrialists didn't recognize the importance of pollution issues. Some of them were afraid to provide information about their wastes. Plants which had previously completed the NEC questionnaire were not generally willing to provide missing information.

The process of entering the information into REED was especially time-consuming because of translating the names of raw material and the classification of wastes. It was impossible for both the national engineer and environment counterparts to assist in plant visits but they were able to help in editing the data collected. The first concentrated on correcting information related to industrial production while the latter dealt with waste related data.

Some of the data was obtained from the questionnaires collected under the DP/MOZ/86/014 project.

A total of 72 plants were visited but only 60 questionnaires (Annex 5) were received to date due to the problems mentioned above.

Around 180 records were created or modified following the plant visits. For all the records on institutions, the <visited> term was entered into the "Comments" field.

D. Conclusions from data collection

No data identified from Government sources was directly related to environmental aspects. All the information about wastes were collected from the plant visits, either by enquiry or observation, but without the assistance of technical counterparts. Therefore the results cannot be considered complete, rather as indicative of the composition and fate of the

residuals or of the industrial processes, e.g. energy and raw material input. Although the plants visited represent all the main sectors of Mozambican industry, their number and location are not enough to assess, in quantitive terms, industry-related degradation in the country.

Three tables were produced from the data collected, outlining the industrial sectors covered by the plant visits, the method of waste disposal and the level of hazard of the wastes (Annex 6). The tables were presented during the Workshop on Energy and Environment Information System (see section 3.C).

Most of the wastes are released into water systems, dumped or end up in various forms of storage. In many cases plant personnel did not respond to questions about the fate and/or the level of hazard of the wastes generated. Either they were not aware of the damage caused by wastes or were afraid of penalties for damaging the environment.

Very few enterprises recycle their wastes or apply technologies to reduce the volume of residuals.

Printouts containing information about the wastes and the electric energy and steam generation were presented to representatives of Southern African Development Coordination Conference (SADCC) (Annex 16), undertaking studies on air pollution. They considered the data collected as very useful and rather unique in developing countries.

2. DEVELOPMENT OF THE REED SYSTEM

A. Adjustments for the decentralized information collection

The version 1.1 of the REED application has been installed in around 20 different units of UNIDO. The centres are linked to a mainframe, where all the information is merged.

The PC software is based on the CDS/Micro-ISIS shell. All the system functions are available from menus. The main functions - edit, browse, search and display - are implemented by means of a special supporting software, which facilitates the use of the REED data base, and is especially devoted to non-experienced users. The main idea of the facilities provided is to support a user in all possible system functions.

During the project implementation, REED was upgraded and modified to adjust it to decentralized (i.e. external to UNIDO headquarters) information collection and/or dissemination.

The system is expected to be installed for data collection in remote centres like Mozambique. From time to time, the information gathered should be sent to Vienna for verification and/or further processing. For this reason, a special function was implemented to select records which were created or modified after the previous submission to Vienna. The procedure ends by copying the output file to a floppy disk. The diskette can then be sent to Vienna.

Before generating the export file, the system produces a backup of the data base, so if the process fails it is possible to return to the previous status.

The user has access to main functions of the system, i.e. data entry, information retrieval, and sorting/printing services. Some limited facilities in relation to the indexes are possible.

To protect against data destruction or loss, procedures which prepare a security copy of data and to restore data from this copy were prepared.

To simplify selection of all required functions, a special DOS menu containing the options described above, was prepared.

B. Improvements to the software

The REED software was reviewed as to its various functions, some weak points of the system, and from the point-of-view of the further development requirements.

REED ver.1.1 is based on version 2.3 of the CDS/Micro-ISIS shell. Version 3.0 of CDS/Micro-ISIS is now available and problems detected under version 2.3 have been fixed and some new features implemented. REED was therefore adapted to work with the ISIS ver. 3.0. This required simple modifications to the message file and some of the supporting CDS/Pascal programs.

Original REED formats were not sufficient to display or print the information required, especially from the point-of-view of links between records. Therefore five new display formats, which enable the selection of appropriate information, were prepared for each record type. The message file was modified to allow the new formats to be selected from a menu when browsing or displaying records after a search.

A software procedure was implemented to simplify the process of report generation. The menu-driven philosophy used for the procedure was developed especially for non-experienced users. One can choose between the output of a given query or a range of records. For either choice, it is possible to select the information to be printed. Print and sort worksheets were prepared for seven record types. All compulsory fields of these worksheets contain pre-defined values. If necessary,

modifications to one or more of the page layout parameters, e.g. print format or output file name, are possible. These changes, however, are temporary and apply only to the current print run.

The translation of REED into other languages is under consideration and therefore it is recommended that all system messages should be in message files. Otherwise, whenever modification of a particular message is required, the source program must be modified and recompiled. Messages in English were found in a few programs and moved to the message file.

Other errors of REED found either by INTIB or by the expert were corrected as follows:

- The field "Audit Name" was part of the tables supporting browse/search functions, but it was impossible to enter the name because of its absence in the data entry worksheet - this was corrected.
- Other data entry worksheets were also corrected, especially the help messages. Most of these errors were detected during the translation of the worksheets into Portuguese. Some other modifications were suggested by the national engineer counterpart to facilitate data entry process.
- Two programs implemented for the search facilities were corrected.

The REED system will be distributed with an installation diskette. A special installation procedure (containing all necessary parameter files and programs) was therefore created, which prepares all the necessary directories for the REED application. The following installation parameters may be specified: the hard disk where REED is installed; the path to REED, so that REED needn't be installed only in the \ISIS directory; and the name of the centre where the installation is made.

C. Preparation of the user's guide

A new user's guide was prepared to reflect modifications to the software. The guide is based on the manual written for the previous version of REED, and now contains some extensions and new sections: How to Install the System; Getting Started; Sort/Print Facilities; and Configuration Requirements.

It is recommended to use the guide together with the REED software to obtain a maximum learning curve. The manual covers mainly the REED extensions implemented in CDS/Pascal. To obtain information on standard functions, one can refer to the CDS/Micro-ISIS manual prepared by UNESCO.

D. Translation of the application to Portuguese

Due to the time-consuming nature of data consolidation and collection it was decided that translation of the documentation and application to Portuguese should be undertaken as part of a subsequent project. The information counterpart had a good knowledge of English, so there was no immediate need for the task. However, staff of the MIE and the Senior Information Expert were able to start with translation, as they were not involved in the process of data collection.

The message file of the REED application consists of two parts. The first 54 records contain standard ISIS messages. The other part consists of messages applied in the supporting software. The standard messages for the version 2.3 of ISIS are available also in Spanish. Therefore, this part was translated into Portuguese by the national staff. The International Senior Expert translated menu titles, names of fields and help messages in the data entry worksheets.

3. ENERGY AND ENVIRONMENT INFORMATION SYSTEM

A. Presentation of the EEIS project at the Seminar

To be able to implement an effective national strategy for the ESID programme, it is essential to have a supporting information infrastructure with a network for collection and dissemination of knowledge.

Studies undertaken by the DP/MOZ/86/014 project led to the conclusion that there was a gap between existing supply of and demand for industrial information to enterprises in Mozambique. Plant visits under the project XP/MOZ/92/124 confirmed the finding. To fill the existing gap UNIDO proposed to set up the Energy and Environment Information System (EEIS), as an extension of the Industrial and Technological Information Bank network. The system should be targeted at small- and medium-scale industries for which the lack of information is especially noticeable.

On May 27 the project held a Seminar on Industrial Development and Environment. The immediate objective of the seminar was the adoption of an ESID strategy by Government and industry and the establishment of the EEIS in Mozambique was formulated as one component. One of the seminar´s three working groups, coordinated by the expert, discussed this proposal (Annex 8).

The functions of institutions which would be distribution nodes and their expected outputs and activities to establish the network, were explained to participants.

The participants were then asked to reflect upon the feasibility of the EEIS in Mozambique and to recommend issues to be addressed in a future information programme for the country, a programme which should support the compatible goals of industrial development and environmental concern (Annex 9).

The participants recognized that there were very few sources of information in their country and complained of a lack of technological and environmental information. A major shortage of human resources to look for and study available information, means that very few enterprises are aware of and can subsequently adopt new technologies.

Mozambican industrialists still don't recognize the importance of environmental issues and should also be made aware of the value of information to assist in the process. Pamphlets, radio, television could fill this gap. From time to time awareness-raising meetings should be organized.

The participants discussed the possibility of using existing institutions dealing with knowledge dissemination in an information programme to obtain maximum impact and cost savings. They suggested that the National Environment Commission should be connected to INTIB and that SMIs and other users of the system could then have access to information through NEC. It was felt that NEC could be the Primary Contact Point for the EEIS.

The participants doubted if enterprises would be able to pay for information but they felt that some symbolic payment should be made by end-users while the Government should subsidize the main part of the activity. Mozambican enterprises expect foreign support, especially from the United Nations. UNIDO projects should also support the programme.

After the discussions, three INTIB data bases were demonstrated - REED, Micro-Metadex^{PLUS}, and Industrial Development Abstracts. The participants considered that the REED application was a very powerful data collection tool.

B. EEIS survey

The main objective of the survey was to assess the feasibility of the EEIS in Mozambique and to introduce the project to institutions which could be contact points of the system.

With the assistance of the MIE team, a list of 17 potential network participants was prepared. They were selected from among active industrial and trade associations, consulting companies, research institutions, and Government departments dealing with enforcement of environmental regulations.

To facilitate explanation of the system structure, the draft "Terms of Reference for EEIS Survey" was translated into Portuguese (Annex 10) and a draft sketch of the proposed network was drawn (Annex 11).

All organizations were visited and interviews conducted. During these visits, the objectives of the EEIS, as a part of the ESID programme were presented. Functions of INTIB, PCP and SCPs were explained in detail, and benefits to end-users and especially to intermediaries underlined.

The main question asked by those interviewed related to payment mechanisms. The feeling was that enterprises would be willing to pay for technological but probably not environmental information. Some persons suggested to apply laws or regulations before setting up the network, to encourage payment.

Only one of the institutions visited showed any real commercial interest. Most were interested to join the system if the income generated would at least cover the input costs.

The institutions were asked to characterize their activities and their links to SMIs and other industries. For all potential contact points two tables were completed (Annex 12):

1) capabilities: customer base, marketing channels, information services, technical expertise, consultancy/translation, commercial interest;
2) advantages and disadvantages.

The latter item was completed with the support of the MIE team. The information collected was passed to counterparts and included in REED.

The results were analyzed and four organizations proposed which could be a PCP according to the EEIS criteria, namely: National Environment Commission (NEC), Industrial Information Centre (CII), Mozambican Chamber of Commerce, and Projects and Management Consultants (Austral).

After comparison of their current technical capacities and levels of effectiveness, NEC seemed to be the most appropriate organization which could immediately carry out this function (Annex 13). It is the only national institution dealing with environment, and with representatives in all provinces, so that industries from the whole country are already aware of its objectives and activities. NEC has a good information technology infrastructure and numerous personnel, educated in the area of energy and environment.

C. Workshop on Energy and Environment Information System

The participants at the workshop represented two main groups - institutions which could be contact points of the EEIS (i.e. potential intermediaries) and representatives of industry, especially SMIs to which the EEIS project is targeted (i.e. potential end-users) (Annex 14).

In the first part of the workshop, the expert presented the objectives of the Preparatory Assistance project and activities undertaken to establish a computerized information system for the acquisition of data related to environmental degradation. Some

details on organization of existing data from Government sources and on collection of data from the field were given to the participants. The expert presented some conclusions on the information collected related to wastes (Annex 6), while the national engineer counterpart presented information related to energy aspects. The activities undertaken during the EEIS survey were then introduced to the participants.

All invited institutions received the draft "Terms of Reference for EEIS Survey" and a list of subjects to be discussed, which were:

1. Type of information on energy and environment required by SMIs.
2. Contacts with SMIs - existing mechanisms and other carriers.
3. Means of dissemination and distribution of the industrial/ environment information.
4. Secondary Contact Points:
   - structures, organization, start up and development;
   - required support/action at short, medium and long terms.
5. Promotional efforts required to raise awareness of industrial environment issues.
6. Means to be used for SMIs to realize their need for information and to join the network.
7. Charging structures and payment mechanisms; criteria to be applied.
8. Information carriers in the country which could be used to draw the attention of the industrial community to the issues related to energy and environment.

The main discussions centred around the identification of appropriate national mechanisms for disseminating information to SMIs and other EEIS users (Annex 15).

It was felt that SMIs are usually concerned about their earnings and not about energy consumption or the impact of their activities on the environment. They require training and education about the necessity to look for information concerning

the economic benefits from, for example, energy saving measures.

Most SMIs are not members of industrial or trade associations and it is not easy to reach this group. Therefore the role of SCPs is especially important for an effective information system. It was pointed out that training for their staff in information management is required. The general feeling was that the existing infrastructure could be utilized for promotional efforts without additional resources and that all available means should be used for communication, i.e. telephone, fax, mail, mass media, brochures, bulletins, and personal contacts.

Representatives of the Informatics Centre of the Eduardo Mondlane University offered their experience and equipment to assist training programmes that might be required.

All accepted that information has a value and should in principle be paid for but at the moment SMIs don't feel the need for it. Subsidies were therefore felt to be needed in the initial phase to promote and educate the potential customer base. There is no experience about information pricing but it was felt that the charging should be flexible. Some information should be subsidized or given free to those who cannot afford full market prices. Also the idea of adding a percentage to existing membership fees had many followers.

During the workshop, three INTIB data bases were demonstrated to those who were interested - REED, Micro-Metadex^{PLUS}, and Industrial Development Abstracts.

The workshop was considered as an important event and 2 television stations and a newspaper reported on the discussions. The EEIS was believed to be necessary for the development of Mozambican industry.

RECOMMENDATIONS

I. DATA COLLECTION AND CONSOLIDATION

1. To complete the knowledge collected of industrial processes and their residuals, information should be collected from other provinces. Due to problems experienced with this kind of activity, it is suggested that the plants selected should be visited.

2. Due to the time-consuming nature of more important tasks not all the records imported into the REED application from existing Ministry data were validated. These should be edited to enable a variety of search indexes.

3. Information about industrial installations in the: metalo-mechanical, leather, wood, and building materials sectors should be obtained and verified.

4. It is recommended that the information centre at the MIE continue to use the REED application, which is a powerful data collection tool, for legislation and future textual data bases.

II. DEVELOPMENT OF THE REED SYSTEM

1. Data entry would be drastically improved if the subfields in record structure are eliminated.

2. The validation procedures in REED ensure high quality data. However, a much higher standard of data entering/updating may be achieved if the fields linking records are available during the data entry process, and direct access from source records to target ones is possible during data entry and update processes.

3. Provide functions which automate standard office work, especially connected with mailing procedures. This requires that a mailing subsystem is designed and connected to REED.

4. Implement a subsystem for handling enquiries, with three basic functions:
   1) to register the incoming queries and relevant answer;
   2) to check whether a given query has anything to do with some enquiries already stored in the data base which would facilitate the preparation of an answer;
   3) to analyze the flow of queries and their source to better understand the users of the REED system and their information needs.

5. The translated elements of the software should form the basis for a Portuguese version of REED. It is, however, recommended that the messages already translated be revised. Some other elements of the system should be translated, i.e. validation tables, display formats, and a bi-lingual thesaurus created.

6. The user's manual should be translated to Portuguese.

7. The "Waste Components Codes" field of the WASTE record type is compulsory. The list of available codes seems to be incomplete and should be revised by a chemical engineer. Some omissions have also been found in tables "Generic Waste Type" and "Waste Source".

III. SETTING UP OF THE EEIS

1. It is recommended to establish a national EEIS network in support of the objectives of an ESID programme in the country. This requires decision on which institution should be the Primary Contact Point.

2. To establish an effective and profitable information system,

the training of the staff of potential SCPs in information management is required.

3. The future customers must feel the need for information. Therefore an information culture must be developed through a process of education. To draw the attention of the industrial community to the issues related to energy and environment, all possible means currently available should be utilized, i.e. mass-media, bulletins, brochures and meetings.

DOCUMENTS USED

1. XP/MOZ/92/124 - Mission Report, Maputo 1-16 May 1993; UNIDO, 1993
2. XP/MOZ/92/124 - Mission Report, Maputo 15-24 August 1993; UNIDO, 1993
3. Ecologically Sustainable Industrial Development Strategies. A Methodological Framework; UNIDO, 1992
4. Environment, Technology and Sustainable Development. Proceedings of the Africa International Conference - Maputo, Nov 25-29 1991; University of Eduardo Mondlane, Maputo, 1992
5. Final Report on the Industrial Development and Institutional Adjustments; UNIDO, 1993
6. REED 1.1 - User's Manual; UNIDO, 1992
7. Technical Assistance to the Industrial Information Centre, MIE. Project Formulation Framework; Maputo, 1993

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ANNEX 1

JOB DESCRIPTION
XP/MOZ/92/124/11-52

Post Title: Expert in Information Systems (Associate/Junior)

Duration: 4 work months

Duty Station: Maputo, Mozambique

Starting Date: February/March 1993

Purpose of Project: The preparatory assistance (PA) will result in the elaboration of an environmentally sustainable industrial development (ESID) programme in Mozambique, the implementation of which (in the main phase) will provide the Government with the necessary institutional infrastructure, expertise and equipment for achieving its objective of ESID. The PA will also undertake preliminary work relating to the implementation of the full scale project viz. the establishment of an information system to assess in qualitative and quantitative terms, the extent and nature of industry-related degradation in Mozambique.

Duties

In relation to the establishment of a computerized information system, utilizing the REED application to be installed by a UNIDO staff member, the consultant is required to:

- assist counterpart personnel in data collection and organization covering industrial facilities, their individual processes, the types and quantities of material inputs, the composition and volume of residuals (wastes), the current fate of the residuals, and associated information relating especially to pollution prevention measures in place;
- assist in the training of counterpart information officers in the use of the REED application, data entry procedures, the verification/validation and output procedures;
- assist in the preparation of a questionnaire, based on the REED data entry worksheets, which will be used to collect data from the industrial facilities;
- accompany counterpart personnel to the industrial facilities to collect the information;
- make minor adjustments to the REED application and extensions to the user manual as required to facilitate data entry and output;
- liaise with ongoing environment information activities and if re-

quired, reformat existing ISIS databases and incorporate into the REED application and validate

- organize and participate in a workshop for NEC and MIE representatives on the REED application;
- assist in the Seminar to Government officials at the end of the project;
- liaise with the UNIDO Information Section officer in Vienna, to report progress.

Qualifications

1st-level degree in information science/informatics.

Experience with micro-ISIS and knowledge of the UNIDO REED application essential.

Background Information: See project document

ANNEX 2

QUESTIONNAIRE PREPARED FOR DATA COLLECTION

QUESTIONARIO SOBRE INSTITUICOES - MOCAMBIQUE 2ºtrimestre 93

NOME ORIGINAL DA INSTITUICAO:

NOME DA INSTITUICAO (EM INGLES):

DIRECTOR (posicao, primeiro nome, apelido):

ENDERECO:

TELECOMUNICACAO (tel, fax, telex, e-mail...):

PESSOA A CONTACTAR:

NUMERO DE TRABALHADORES (MULHERES = ...):

VOLUME DE VENDAS (em valor ou quantidade):

PRODUCTIVIDADE:

ESTATUTO DA EMPRESA (privada, estatal,...):

INFRA-ESTRUTURAS (pontes, rios, jardins, centro medico...)

RESUMO (unidades fabris; nivel de mecanizacao):

QUESTIONARIO DO PROCESSO INDUSTRIAL

NOME DO PROCESSO: _____

_____

PERIODO REPORTADO: _____

"INPUTS":

AGUA (Nome do Recurso, Volume, Unidade): _____

_____

OUTROS RECURSOS NATURAIS OU MATERIAS PRIMAS (Nomes, Volume, Unidade)

_____

_____

_____

_____

ENERGIA (Fonte, Unidade, Consumo): _____

VOLUME DE PRODUCAO (Nomes, Numero Produzido, Unidade) : _____

_____

_____

_____

_____

_____

SUBPRODUTOS: _____

CAPACIDADE INSTALADA: _____

PRODUCAO PROPRIA DE ENERGIA ELECTRICA (S/N, Utilizada na Producao, Outra Utilidade): _____

_____

RESIDUOS QUENTES: _____

UTILIZACAO DA ENERGIA ELECTRICA / VAPOR (No processo produtivo ou outro de tipo de utilizacao, Quantidade): _____

_____

_____

PRODUCAO DO VAPOR (Elemento Aquecedor, Capacidade, Fonte de Energia, Unidade, Quantid.Cons., Horas Operadas, Vapor Produzido)

_____

GERACAO DE ELECRICIDADE (Elemento Gerador, Capacidade, Fonte de Energia, Unidade, Quantidade Cons., Horas Operadas, kWH): _____

_____

_____

UTILIZACAO DOS RESIDUOS DE OLEO (Tipo de Utilizacao, Unidade, Consumo, Materiais Reciclados): _____

_____

NUMERO DE HORAS DE OPERACAO (Operacao, Quebras de Horas):

_____

DADOS SOBRE PATENTES (Numero, Pais, Data): _____

RESUMO : _____

_____

_____

QUESTIONARIO SOBRE RESIDUOS

DESCRICAO DO TIPO DOS RESIDUOS: _____

_____

_____

COMPOSICAO: _____

METODO DE DEPOSITO (Tabela 1): _____

METODO DE TRATAMENTO (Tabela 2) : _____

NIVEL DE PERIGO (Tabela 3) : _____

VOLUME DE PRODUCAO DOS RESIDUOS (Nomes, Unidade, Volume): _____

_____

_____

FONTE DE RESIDUOS (Tabela 4): _____

_____

TIPO GENERICO DE DESPERDICIOS/RESIDUOS (Tabela 5): _____

_____

APLICACAO TECNICA PARA A REDUCAO DOS RESIDUOS : _____

_____

_____

_____

COMPONENTES DOS RESIDUOS:

PRIMARIA (Tabela 6): _____

SECUNDARIA (Tabela 6): _____

COMENTARIOS : _____

_____

_____

_____

RESUMO : _____

_____

_____

_____

ANNEX 3

WASTE-RELATED TABLES

TABLE 1

	METODOS DE DEPOSITO	DISPOSAL METHODS
1	Biodegradacao	Biodegradation
2	Tratamento biologico	Biological treatment
3	Combinacao ou mistura	Blending or mixing
4	Enterro controlado	Controlled landfill
5	Injeccao profunda	Deep injection
6	Incineracao no mar	Incineration at sea
7	Incineracao na terra	Incineration on land
8	Enterro	Landfill
9	Armazenamento permanente	Permanent storage
10	Tratamento fisico quimico	Physico-chemical treatment
11	Pre-tratamento	Pretreatment
12	Libertacao para os mares	Release into seas
13	Libertacao para os sistemas de agua	Release into water systems
14	Solidificacao	Solidification
15	Restringimento de superficie	Surface impoundment
16	Tratamento dos residuos urbanos	Urban waste treatment
17	Tratamento de agua urbana	Urban water treatment

TABLE 1

	METODOS DE TRATAMENTO	TREATMENT METHODS
1	Regeneracao acida	Acid regeneration
2	Componentes catalisticos	Catalyst components
3	Materias inorganicos	Inorganic materials
4	Tratamento de terra, agricultura	Land treatment, agriculture
5	Metais	Metals
6	Materia organica nao solvel	Non-solvent organic matter
7	Residuos de controlo de poluicao	Pollution control residues
8	Solventes	Solvents
9	Usos como fuel	Use as fuel
10	Oleo usado	Used oil

TABLE 3

	NIVEL PERIGOSO	HAZARD LEVEL
1	Cancerigenico	Carcinogenic
2	Corrosivo	Corrosive
3	Ecotoxico	Ecotoxic
4	Explosivo	Explosive
5	Nocivo	Harmful
6	Gas inflamavel	Inflammable gas
7	Liquido inflamavel	Inflammable liquid
8	Solido inflamavel	Inflammable solid
9	Irritante	Irritant
10	Mutagenico	Mutagenic
11	Oxidante	Oxidising
12	Reactivo	Reactive
13	Combustao expontanea	Spontaneous combustion
14	Teratogenico	Teratogenic
15	Toxico venenosos	Toxic - poisonous
16	Gas toxico	Toxic gas

TABLE 4

	FONTE DE RESIDUOS	WASTE SOURCE
1	Alcool, destilacao de bebidas espirituosas	Alcohol, spirits distilling
2	Producao de aluminio	Alumina production
3	Metalurgia do aluminio	Aluminium metallurgy
4	Industria de alimentacao animal	Animal feed manufacture
5	Produtos baseados em asbestos	Asbestos-based products
6	Produtos de asbestos - cimento	Asbestos-cement products
7	Montagem,instalacao de condutores electricos	Assembly, wiring
8	Materiais de plastico basico	Basic plastic materials
9	Pilha, bateria	Battery, dry cells
10	Fabricacao de cerveja	Beer brewing
11	Branqueamento, tintuaria,pintura	Bleaching, dyeing, printing
12	Ferro fundido, forno de carvao	Cast iron, coke oven
13	Produtos ceramicos	Ceramic products
14	Industria de cloro	Chlorine industry
15	Industria de vestuario	Clothing manufacture
16	Carvao e produto de carvao	Coal and coal products
17	Operacaoes de carvao	Coking operations
18	Materiais de construcao	Construction materials
19	Industria de Leitaria	Dairy industry
20	Produtos detergentes	Detergent products
21	Industria de bebidas	Drink manufacture
22	Condutores electricos, cabos	Electric wire, cables
23	Producao de electricidade	Electricity production
24	Industria de electrodos	Electrode manufacture
25	Componentes electronicos	Electronic components
26	Gorduras/detergentes	Fats/detergents
27	Industrias de ligas de ferro	Ferro-alloy industry
28	Fundicao de metais ferrosos	Ferrous metal foundries
29	Fabricacao de fertilizantes	Fertilizer fabrication
30	Quimicos acabados	Finished chemicals
31	Comercio de peles	Fur trade
32	Armazenagem de produtos gasosos	Gas products storage
33	Industria de vidro	Glass industry
34	Producao de cola	Glue production
35	Instalacoes hidraulicas	Hydraulic facilities
36	Quimicos industriais	Industrial chemicals
37	Producao de tinta de escrever	Ink production
38	Metalurgia do zinco e chumbo	Lead and zinc metallurgy
39	Cal, cimento e gesso	Lime, cement, plaster
40	Tiragem a maquina	Machining
41	Carnes, matadouros	Meat, slaughterhouses
42	Trabalho com metal	Metalworking
43	Exploracao de minas e pedreiras	Mining & quarrying
44	Fundicoes de metais nao ferrosos	Non-ferrous metal foundries
45	Metalurgia nao ferrosa	Non-ferrous metallurgy
46	Instalacoes nucleares	Nuclear facilities
47	Industria de gorduras e oleos	Oils and fats industry
48	Quimicos organicos	Organic chemicals
49	Aplicacao de tinta	Paint application

TABLE 4

	FONTE DE RESIDUOS	WASTE SOURCE
50	Producao de tintas	Paint production
51	Industria de polpa e papel	Paper pulp fabrication
52	Producao de cartao, papel	Paper, cardboard production
53	Produtos de cartao, papel	Paper, cardboard products
54	Produtos de perfumes	Perfume products
55	Armazenagem de produtos de petroleo	Petroleum products storage
56	Refinacao de petroleo	Petroleum refining
57	Petroleo, industria de carvao	Petroleum, coal industry
58	Petroleo, gas natural	Petroleum, natural gas
59	Farmaceuticos, pesticidas	Pharmaceuticals, pesticides
60	Laboratorios fotograficos	Photographic laboratories
61	Tratamento fotografico	Photographic treatment
62	Placas fotosensiveis	Photosensitive plates
63	Materias plasticos	Plastic materials
64	Pos e explosivos	Powders and explosives
65	Metalurgia de metais preciosos	Precious metals metallurgy
66	Aco Primario	Primary steel
67	Impressao e publicacao	Printing & publishing
68	Aco bruto	Raw steel
69	Industria da borracha	Rubber industry
70	Engenho de serrar & paineis de madeira	Sawmills & wood panels
71	Calcado, produtos de couro	Shoes, leather products
72	Produtos de sabao	Soap products
73	Industria de acucar	Sugar industry
74	Tratamento de superficie	Surface treatment
75	Fabrica de curtumes, curtimento	Tanneries, tanning
76	Eliminacao textil, cardacao	Textile combing, carding
77	Processamento textil	Textile processing
78	Instalacoes termais	Thermal facilities
79	Tratamento termal	Thermal treatment
80	Produtos de madeira e mobiliario	Wood and furniture products

TABLE 5

	TIPO GENERICO DE RESIDUO	GENERIC WASTE TYPE
	GASOSOS	**GASEOUS**
1	Pilha, Bateria	G: Battery, electric cell
2	Residuo de biocida	G: Biocide waste
3	Investigacao Quimica	G: Chemical research
4	Preservativos quimicos para a madeira	G: Chemical wood preservers
5	Clinico e Medicinal	G: Clinical and medical
6	Materiais de Limpeza a seco	G: Dry cleaning materials
7	Emulsoes	G: Emulsions
8	Producao de Energia	G: Energy production
9	Restos de limpeza do equipamento	G: Equipment cleaning rests
10	Natureza do explosivo	G: Explosive nature
11	Material domestico	G: Household materials
12	Tintas de escrever, cores e tintas	G: Inks, dyes, paints etc
13	Tratamento de Superficies Metalicas	G: Metal surface treating
14	Solvente organicos	G: Organic solvent
15	Substancias PCB,PCT,PBB	G: PCB, PCT, PBB substances
16	Farmaceuticos	G: Pharmaceuticals
17	Materiais fotograficos	G: Photographic materials
18	Tratamento de Superficies plasticas	G: Plastic surface treating
19	Resinas, Latex e colas	G: Resins, latex, glues etc
20	Restos de limpezas de tanques	G: Tank cleaning rests
21	Residuos de Alcatrao	G: Tarry residues
22	Tratamento de aguas residuais	G: Waste water treatment
	LIQUIDOS	**LIQUID**
23	Biocidas	L: Biocides
24	Investigacao quimica	L: Chemical research
25	Preservativos quimicos para a madeira	L: Chemical wood preservers
26	Clinico e Medicinal	L: Clinical and medical
27	Tratamento por aquecimento de cianeto	L: Cyanide heat treatment
28	Cianeto saleavel	L: Cyanide tempering
29	Materiais de Limpesa a seco	L: Dry cleaning materials
30	Emulsoes	L: Emulsions
31	Restos de Limpesa do equipamento	L: Equipment cleaning rests
32	Natureza do explosivo	L: Explosive nature
33	Material domestico	L: Household materials
34	Mistura de agua-hidrocarbono	L: Hydrocarbon-water mixes
35	Tintas de escrever, cores e tintas	L: Inks, dyes, paints etc
36	Residuos de permutacao de ioes	L: Ion-exchange residues
37	Liquidos com metais	L: Liquids with metals
38	Tratamento de superficies metalicas	L: Metal surface treating
39	Oleos minerais	L: Mineral oils
40	Organicos nao-metalicos	L: Non-metal organics
41	Mistura agua-oleo	L: Oil-water mixes
42	Solventes Organicos	L: Organic solvent
43	Substancias PCB, PCT, PBB	L: PCB, PCT, PBB substances
44	Farmaceuticos	L: Pharmaceuticals

TABLE 5

	TIPO GENERICO DE RESIDUOS	GENERIC WASTE TYPE
	LIQUIDOS	LIQUID
45	Materiais fotográficos	L: Photographic materials
46	Fito-farmaceuticos	L: Phytopharmaceuticals
47	Tratamento de Superficies plasticas	L: Plastic surface treating
48	Restos de controle de poluicao	L: Pollution control rests
49	Resinas, latex, colas, etc	L: Resins, latex, glues etc
50	Solo, terra e argila	L: Soil, sand, and clay
51	Restos de limpeza de tanques	L: Tank cleaning rests
52	Residuos de alcatrao	L: Tarry residues
53	Oleos vegetais	L: Vegetable oils
54	Outras aguas residuais	L: Wastewaters other
	LAMA	SLUDGE
56	Sebo animal, gorduras, cera	P: Animal soap, fat, wax
57	Cinzas e outros restos queimados	P: Ashes and cinders
58	Pilha, Bateria	P: Battery, electric cell
59	Residuo Biocida	P: Biocide waste
60	Residuo clinico	P: Clinical wastes
61	Tratamento a calor de cianide	P: Cyan. de heat treatment
62	Tempera de cianide	P: Cyanide tempering
63	Tintas de secar ar, ceras,tintas,etc	P: Inks, dyes, paints etc
64	Residuos de permutadores ionicos	P: Ion-exchange residue
65	Tratamento de superficie Metalicas	P: Metal surface treating
66	Inorganicos nao metalicos	P: Non-metal inorganics
67	Substancias PCB,PCT,PBB	P: PCB, PCT, PBB substances
68	Materiais fotograficos	P: Photographic materials
69	Tratamento de superficies plasticas	P: Plastic surface treating
70	Restos de controle de poluicao	P: Pollution control rests
71	Resinas,Latex, colas,etc	P: Resins, latex, glues etc
72	Lamas de esfregadeira de gases	P: Scrubber sludges
73	Lama de esgoto	P: Sewage sludge
74	Lamas com metais	P: Sludges with metals
75	Materiais catalisticos gastos	P: Spent catalyst materials
76	Residuos de alcatroes	P: Tarry residues
77	Tratamento de aguas residuais	P: Waste water treatment
	SOLIDO	SOLID
78	Sebo animal, gorduras , cera	S: Animal soap, fat, wax
79	Cinzas e outros queimados	S: Ashes and cinders
80	Pilha, Bateria	S: Battery, electric cell
81	Investigacao Quimica	S: Chemical research
82	Contentores contaminados	S: Contaminated containers
83	Equipamento contaminado	S: Contaminated equipment
84	Residuo de descarbonizacao	S: Decarbonization residue
85	Produtos de cianeto	S: Cyanide addition
86	Natureza e pilhas	S: Electric cell

TABLE I

	[illegible]	[illegible]
	SOLIDO	SOLID
87	Materias texteis	1: Woven cloth materials
88	Tintas de escrever, tintas, tintas,etc	1: Inks, dyes, paints etc
89	Po ou poeira metalica	1: Metallic dust or powder
90	Tempera nao cianidrica	1: Non-cyanidric tempering
91	Inorganicos nao metalicos	1: Non-metal inorganics
92	Substancias PCB, PCT, PBB	1: PCB, PCT, PBB substances
93	Farmaceuticos	1: Pharmaceuticals
94	Materias fotograficos	1: Photographic materials
95	Restos de controle de poluicao	1: Pollution control rests
96	Resinas, latex, colas, etc	1: Resins, latex, glues etc
97	Solo, terra e argila	1: Soil , sand and clay
98	Materias catliticos gastos	1: Spent catalyst materials

TABLE 5

	CODIGO DOS COMPONENTES DOS RESIDUOS	WASTE COMPONENTS CODES	
1	Acidos solidos/solucoes	Acids, solid/solutions	C23
2	Aminas alifaticas	Aliphatic amines	C44
3	Metais alcalinos ou de terra alcalina	Alkaline or alkaline earth metals	C22
4	Antimonio, compostos de antimonio	Antimony, antimony compounds	C13
5	Aminas aromaticas	Aromatic amines	C45
6	Aromaticos,compostos Organicos Poli-/Heterociclicos	Aromatic, poly-/heterocyclic organic compounds	C43
7	Arsenico, compostos arsenicos	Arsenic, arsenic compounds	C8
8	Asbestos (po/fibras)	Asbestos (dust/fibres)	C25
9	Azidas	Azides	C31
10	Bario, compostos de bario	Barium, barium compounds	C15
11	Solucoes basicas,forma solida	Basic solutions e.g. solid	C24
12	Berilio, compostos de berilio	Beryllium, beryllium compounds	C1
13	Substancias biocidas/produtos farma	Biocides,phyto pharmaceuticals	C34
14	Cadmio, compostos de cadmio	Cadmium, cadmium compounds	C11
15	Cloratos	Chlorates	C29
16	Compostos de Cromio (VI)	Chromium (VI) compounds	C3
17	Compostos de Cobalto	Cobalt compounds	C4
18	Congeneres de policlorinatado-furano	Congenors of polychlorinated dibenzo-furan	C49
19	Compostos de Cobre	Copper compounds	C6
20	Creosotos	Creosotes	C36
21	Eteres	Ethers	C46
22	Substancias explosivas	Explosive substances	C47
23	Solventes Halogenatados	Halogenated solvents	C40
24	Compostos hidrocarbonetos,en ativo (outros	Hydrocarbons sulphur compounds (other)	C51
25	Substancias infecciosas	Infectious substances	C35
26	Cianidos inorganicos	Inorganic cyanides	C21
27	Compostos inorganicos de Fluor	Inorganic fluorine compounds	C20
28	Sulfuretos inorganicos	Inorganic sulphides	C19
29	Isocianetos, tiocianetos	Isocyanates, thiocyanates	C37
30	Chumbo, compostos de chumbo	Lead, lead compounds	C18
31	Mercurio, compostos de Mercurio	Mercury, mercury compounds	C16
32	Carbonilos de Metal	Metal carbonyls	C27
33	Compostos de Niquel	Nickel compounds	C5
34	Cianidos orgânicos	Organic cyanides	C38
35	Compostos de nitrogenio organ	Organic nitrogen compounds	C44
36	Solventes organicos (outros	Organic solvents (other)	C41
37	Compostos de organologenio	Organohalogen compounds	C42
38	PCBs/PCTs	PCBs/PCTs	C32
39	Perclorates	Perchlorates	C30
40	Peroxidos	Peroxides	C28
41	Compostos farmac.(...) veterinarios	Pharmaceutical,veterinary compounds	C33
42	Fenois, compostos de fenol	Phenols, phenol compounds	C39
43	Fosforo, compostos de de fosfor	Phosphorous, phos. compounds	C26
44	Congeneres dibenzo-p-dio in policlorinatado	Polychlorinated dibenzo-p-dioxin congenors	C50
45	Selenio, compostos de selenio	Selenium, selenium compounds	C9
46	Prata, compostos de prata	Silver compounds	C10
47	Compostos organicos de enxofre	Sulphur organic compounds	C48
48	Telurio, compostos de telurio	Tellurium, tellurium compounds	C14
49	Talio, Compostos de Tal.	Thallium, thallium compounds	C17

TABLE 6

	[illegible] DES [illegible]PINENTES DES PECIOLES	WASTE COMPONENT CODES	
59	Estaño, compostos de estaño	Tin compounds	C12
51	Derivados de vanadio	Vanadium compounds	72
52	Zinc, compostos de zinco	Zinc compounds	7*

ANNEX 4

NEW TERMS PROPOSED FOR WASTE-RELATED TABLES

GENERIC WASTE TYPE

SOLID
1) fibre and cotton wastes
2) fibreglass
3) glass
4) non-metal organics (wood - sawdust)
4) rubber dust
5) wheat dust

SOURCE OF WASTE

1) agricultural tools
2) meals production
3) wheat milling

WASTE COMPONENTS

1) Aluminium compounds
2) Bohr compounds
3) Calcium compounds
4) Carbonates
5) Inorganic sulphur
6) Iron compounds
7) Oils wastes
8) Organic wastes
9) Resins
10) Silicon compounds

ANNEX 5

PLANTS WHICH RESPONDED TO QUESTIONNAIRE

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ANNEX 6

RESULTS OF THE PLANT VISITS

INDUSTRIAL SECTORS	NUMBER OF PLANTS	%
BUILDING MATERIALS	5	8
CHEMICALS	7	12
ELECTRICAL INDUSTRY	1	2
ENERGY SECTOR	2	3
FOOD PROCESSING	12	20
METALLURGICAL	7	12
METALWORKING	7	12
PACKAGING	5	8
PULP AND PAPER	1	2
RUBBER	4	7
TEXTILES / CLOTHING	7	12
WOOD, WOOD PRODUCTS	4	7

DISPOSAL METHOD	NUMBER OF PLANTS	%
BIODEGRADATION	4	7
BLENDING OR MIXING	3	5
CONTROLLED LANDFILL	4	7
INCINERATION ON LAND	6	11
LANDFILL	5	9
PERMANENT STORAGE	6	11
PHYSICO-CHEMICAL TREATMENT	2	4
RELEASE INTO SEAS	7	13
RELEASE INTO WATER SYSTEMS	3	5
NO ANSWER	*13*	*24*

HAZARD LEVEL	NUMBER OF PLANTS	%
CARCINOGENIC	1	2
CORROSIVE	8	15
ECOTOXIC	2	4
EXPLOSIVE	1	2
HARMFUL	8	15
INFLAMMABLE GAS	1	2
INFLAMMABLE LIQUID	2	4
INFLAMMABLE SOLID	6	11
IRRITANT	4	7
OXIDIZING	3	5
SPONTANEOUS COMBUSTION	1	2
TOXIC - POISONOUS	1	2
TOXIC GAS	1	2
NO ANSWER	*17*	*31*

ANNEX 7

CHANGES MADE TO THE SOFTWARE

1. CDS/Pascal program UPLOAD was modified and batch procedure EXPORT.BAT prepared to enable selection of records which were created or modified after the previous submission to Vienna. Two new subdirectories were created:
   - EXPDATA - to keep the data base backup and the export file;
   - EXPMENU - to keep the system menu of the export function.

2. Batch procedure CPDISK.BAT was prepared to facilitate copying the export file to a diskette.

3. Two batch procedures BKP.BAT and RSTBKP.BAT to produce a security copy of data and to restore data from this copy were created.

4. A special DOS menu containing the following options was prepared:
   - main functions of the system;
   - export data;
   - copy exported data to a diskette;
   - recovery function;
   - backup function;
   - restore from backup.

   Batch procedures EN1.BAT, EXPORT.BAT and RCVRY.BAT were implemented to enable access to appropriate options of the system. In order to avoid accidental run, the export function is password protected.

5. The REED application was adapted to work with the ISIS ver. 3.0. First 54 records of the message file were exchanged with these from the new version. Several supporting CDS/Pascal, which were incompatible with the version 3.0, were modified.

6. New display formats were prepared, five for each record type:

- REC - standard format to display main information;
- fREC - full format;
- rREC - reference format - links to other records;
- aREC - address of institution or contact person;
- pREC - proof format - all fields preceded by their tags.

Note: REC is a 3-letter record type, e.g. INS, PRC, WAS.
The message file was modified to allow the new formats to be selected from a menu when browsing or displaying records after search.

7. CDS/Pascal program PRINTS was prepared to simplify the process of report generation. Print and sort worksheets were prepared for seven record types: BIBLIOGRAPHY, INFORMATION, INSTITUTION, MEETING, EXPERT, PROJECT, TRAINING. All compulsory fields of the worksheets contain pre-defined values. For each of the above record types a print format was created: inxREC. The descriptions of tables used to select the information to be printed are located in the message file.

8. Messages in English, found in three CDS/Pascal programs: CHECK, RECVRY and UPLOAD, were moved to the message file.

9. The field "Audit Name" was added to AUDIT record type. This required modification of data entry worksheet AUD1.FMT and appropriate display formats.

10. Several data entry worksheets, mostly the help messages, were corrected to facilitate data entry process.

11. Two CDS/Pascal programs BUILDQ and SELWRD, implemented for the search facilities, were corrected.

12. An installation procedure INSTALL.BAT (containing all necessary parameter files and programs) was implemented. The procedure prepares all the necessary directories for the REED application. The following installation parameters may

be specified:

- the hard disk where REED is installed (e.g. C:);
- the path to REED (e.g. \ISISDATA), so that REED needn't be installed only in the \ISIS directory;
- the name of the centre where the installation is made (e.g. MOZ1).

ANNEX 8

International Seminar on Industrial Development and the Environment

Agenda for Group B--Environmental Information Systems and Data Bases

Preamble:

Information is crucial to selecting appropriate technologies, negotiating equitable terms with suppliers of equipment, 'know-how' and services, and achieving an effective transfer of technology to developing countries.

Industry is being transformed from an energy-intensive and materials-based productive process to an increasingly flexible information- or knowledge-based activity with corresponding changes in the patterns of global productivity.

Agenda 21, in all its chapters, was extensively concerned with the provision of information and improving the 'enabling environment' (i.e. institutional infrastructure). Subsequent international initiatives, such as the Basel Convention, the Montreal Protocol and the International Programme on Chemical Safety as well as UN-sponsored activities are equally concerned with the collection and/or provision of information.

In this context, participants in this Group are asked to reflect upon the following questions and recommend issues to be addressed in a future information programme for the country, a programme which should support the compatible goals of industrial development and environmental concern.

- 1) What are the national information sources?--i.e. who is already involved in industry and/or environment information collection and/or dissemination and what type of information do they cover (media of storage and transmission).

Information should not necessarily be seen in its high-tech sense. Traditional means of knowledge raising and transmission will probably be most appropriate.

(NB: a print-out of institutions already visited could be prepared which includes a brief abstract. This could form a basis for discussion and participants may be asked to point out omissions).

- 2) What are the information carriers in the country?--i.e. existing mechanisms which could be used for raising awareness for a wide industrial audience (e.g. newsletters from industrial associations, regular awareness-raising seminars). The objective here is to achieve maximum benefit with minimum cost--such information carriers should be utilized.

- 3) What (types of) information is (are) required by industry in relation to development/environment?--this will have an impact on gaining access (sourcing) to appropriate sources of information as well as on products which could carry the information.

- 4) How should industrial/environment information be distributed?--i.e. which of the existing insitutions dealing with knowledge dissemination and which information carriers should be utilized to obtain maximum impact and cost savings. Related to this issue, how would a national network function and who would maintain it or be the main liaison?

- 5) What promotional efforts are required to raise awareness of industrial environment issues, including their economic benefits at micro- and macro levels?--information intermediaries need sensitization on the availability of information sources; industrialists (especially small- and medium-scale entrepreneurs) should be made aware of the value of information.

- 6) What charges should be made for information products and services?--what are existing charging levels (if any)? Information should not be given free of charge--some form of subsidization is required which could be built into a range of services (i.e. some products could be sold at full market prices to those that can afford it--income so generated could offset reductions in cost so that other end-user groups pay a minimum price. Another option would be to add a percentage to existing membership fees which would cover the costs of information provision.

Special attention should be placed on using information mechanisms and carriers that really work in the national context. Care should be taken to avoid the misconception that electronic means of accessing sources of information/data bases are likely to run into trouble due to a poor telecommunications infrastructure and/or little budget to pay the costs of such access.

Participants should be realistic--information sources can be provided for local use on PCs (demonstration of Micro-METADEX plus should be given) and attention drawn to the Guide to Sources of Information and the Energy & Environment Series.

Another important point that should be made concerns data/information interpretation/translation--most information is in English and in the form of statistics or abstracts. Most end-users, unless information specialists, will have problems with this, therefore intermediaries are required. Such intermediaries must have language abilities, technical expertise and knowledge of informatics as well as be able to reach a wide industrial audience. Also, most end-users in the small- to medium-scale industrial sector may not be able to articulate or recognize their need for information, so intermediaries will have to play a pro-active, educational role as well.

As it is unlikely that any one institution will have all of these qualifications, participants should think in terms of a network of qualified partners. One institution, preferably one with a strong information mandate and long-standing experience, should take a co-ordinating role. As there should be a pricing strategy included in the programme (to allow the network to become self-sustaining in the medium-term), that one institution must be in the private sector--in most countries, Government agencies cannot charge for information

or information products/services. In the case of the EEIS in Hungary, a Governmental institution 'launched' a private company to handle the financial side of the network.

ANNEX 9

SEMINAR ON ENVIRONMENTALLY SUSTAINABLE INDUSTRIAL DEVELOPMENT

Maputo, 27/05/1993

Group B - Energy and Environment Information System

List of Participants:

Mariusz Suchorowski	UNIDO - Proj. XP/MOZ/92/124 (coordinator)
Orlando Melembe	UNIDO - Proj. XP/MOZ/92/124
Joost Van Buuren	Univ. of Eduardo Mondlane (rapporteur)
Arao Nhancale	Provincional Dir. of MIE - Maputo
Joao Eduardo Macucha	Provincional Dir. of MIE - Gaza
Joao David	Ministry of Mineral Resources
Benedita Penicela	MABOR - Tyres Manufacturing Plant
Carlos A.C. Simbine	SOGERE - Beer and Refrigeration Society
Eduardo J. Nhancule	HIDROMOC - Hydraulic Equipment Company
Humberto F.A. Pereira	CSM - Iron and Steel Company
Jacinto Mutemba	Union of Tanners
Palmira P. Francisco	ACTIVA - Assoc. of Entrepreneurial Women

I. Presentation of a Concept for Sourcing and Disseminating Environment Information - by Mariusz Suchorowski

1. Introduction.

2. Description of the Referral Database on Energy and Environment (REED) system.

3. Purposes of the Industrial Technological Information Bank (INTIB).

4. Presentation of other INTIB products:
   1) Micro-METADEX^{PLUS} - metallurgical data base;
   2) Industrial Development Abstracts - UNIDO studies and reports;
   3) Industry and Environment: A Guide to Sources of Information;
   4) Energy and Environment Series.

5. Reasons of setting up an Energy and Environmental Information System (EEIS).

6. Description of the EEIS:
   1) functions of a Primary Contact Point (PCP);
   2) Secondary Contact Points (SCP) as distribution nodes.

7. Proposed outputs and activities.

Outputs:
1) Survey of industrial pollution;
2) EEIS network established.

Activities:
1) Information and data collection;
2) Collection of non-statistical national information using the REED application;
3) Development of reference guides of information sources of information;
4) Construction of EEIS information system in simple modular form;
5) Establishing of a data link between NEC GIS department and MIE data bases;
6) Preparation of manuals on the use of the system;
7) Training course on the use of the system;
8) Dissemination of information to scientific and business community.

II. Discussion on the Following Questions:

1) What are the national information sources?

The participants recognized that there were very few sources of information in the country. They mentioned about two institutions which were involved in industry and/or environment information dissemination as printed material:
- CEDIMO - Mozambican Information Centre provides some information (historical, trade, commerce, organizations, international monography, statistics, scientific for students), computers are being installed;
- library of the University of Eduardo Mondlane.

Two other institutions collect information:
- the National Environmental Commission (NEC) - computerized information;
- National Directorate of Statistics.

2) What are the information carriers in the country?

At the moment there are no existing mechanisms which could be used for raising awareness for a wide industrial audience. Prof. Joost van Buuren pointed that for example in the university there is much information but accessability is very complicated and time-consuming.

3) What information is required by industry in relation to development/environment?

The participants complained of a lack of technological and environmental information (like cleaning technology, pollution control).

A major shortage of human resources to look for and study available information, means that very few enterprises are aware of and can subsequently adopt new technologies.

4) How should industrial/environment information be distributed?

The participants tried to answer which of the existing institutions dealing with knowledge dissemination should be utilized to obtain maximum impact and cost savings. They suggested that NEC should be connected to INTIB. The small- and medium-scale industries and other users of the system could have access through NEC. It was felt that NEC could be the Primary Contact Point for the EEIS. The information could be distributed on diskettes and as printed material.

During the plenary discussion, general director of NEC, Dr Ferraz, pointed out that Maputo is only a part of the country. The situation of other provinces is much more complicated. The system should be so constructed that Secondary Contact Points would cover the whole country, by sectors and geographically.

5) What promotional efforts are required to raise awareness of industrial environment issues, including their economic benefits at micro- and macro- levels?

The participants agreed that in developing countries all industrialists (not only small- and medium- but also large-scale entrepreneurs) should be made aware of the value of information. Pamphlets, radio, television could fill this gap. From time to time awareness-raising seminars should be organized.

6) What charges should be made for information products and services?

Participants were not sure if enterprises would be able to finance realization of the programme. Some symbolic payment should be made by end-users but the Government should support the activity. Mozambican enterprises expect foreign donation, especially from the United Nations. Other UNIDO projects should also support the programme.

III. Demonstration of INTIB Data Bases:

1. Referral Database of Energy and Environment
2. Micro-Metadex^{PLUS}
3. Industrial Development Abstracts

Participants were especially interested in the REED system. Some of them sat at the computer and checked if information about their companies was correct. They considered the REED application was a powerful data collection tool.

ANNEX 10

TERMS OF REFERENCE FOR EEIS SURVEY (IN PORTUGUESE)

United Nations Industrial Development Organization

SISTEMA DE INFORMAÇÃO DE ENERGIA E MEIO AMBIENTE (SIEA)

1. ÂMBITO

Existe uma lacuna entre a oferta e a procura de Informações de, Energia e Meio Ambiente para as Pequenas e Médias Indústrias (PMI) nos países em desenvolvimento, bem como nos países emergentes de economia de mercado. A experiência da **Organização para o Desenvolvimento Industrial das Nações Unidas** (UNIDO) na disseminação da Informação, e a gama de informações à disposição da UNIDO, coloca a Organização numa posição única para preencher esta lacuna.

A UNIDO decidiu, portanto, instalar um **Sistema de Informação de Energia e Meio Ambiente** (SIEA) dirigida às PMIs, como uma extensão da rede do **Banco de Informação Industrial e Tecnológico** (INTIB).

O SIEA fornecerá um número de serviços chaves, incluindo a rápida provisão de informação relevante e actual, e a instituição de mecanismos de alto impacto para a comercialização, distribuição e promoção da informação que corresponda às capacidades de cada país participante na disseminação de informação.

É, portanto, crucial para o sucesso do SIEA que cada país participante tenha um **Ponto de Contacto Primário** (PCP) eficaz, e que é escolhido na base das capacidades pré-existentes provadas em disseminar informação. Capacidade provada na gestão de informação e com programa de informação com staff e orçamento, bem como a capacidade de funcionar como um serviço de informação para a indústria, no contexto nacional.

O SIEA será um Projecto com fim não lucrativo, mas irá operar sobre uma base de pagamento de uma taxa.

O sistema é concebido para complementar, e não concorrer com as iniciativas nacionais e internacionais existentes.

É em seguida, indicada a metodologia proposta para a instalação da rede de distribuição para o sistema de informação.

2. DESCRIÇÃO DO SIEA

Na fase 1 do projecto, a UNIDO identifica oportunidades para o estabelecimento de sistema de informação dirigido principalmente às PMIs nos países em desenvolvimento. Na fase 2, serão estabelecidos sistemas pilotos nos países com centro de informação que expressaram um interesse em participar no projecto

durante a fase 1. Estes centros de informação jogarão também um papel crucial na instalação do sistema.

Em cada país, o sistema funcionará do seguinte modo:

- O SIEA será coordenado por um ponto de contacto primário (PCP) que deve ser um centro de excelência que já forneça serviços de informação de alta qualidade. O PCP será o nó mais importante no processo de disseminaçãc da informação de energia e meio ambiente do INTIB para as PMIs e para outros utilizadores finais para quem esta informação seja de interesse.

  O PCP manterá as partes relevantes das bases de dados da UNIDO de modo a que muitas questões ao sistema possam ser respondidas no país (a longo prazo, não se espera que o PCP necessite de enviar mais do que 20% das questões ou INTIB em Viena). Se a infraestrutura de telecomunicações permitir, o PCP terá também ligações electrónicas para Viena.
  O PCP fornecerá esta informação sobre uma base comercial. Em adição à disseminação de informação, monitorará o uso do sistema, coordenará a rede, organizará o "Marketing" e promoção, e administrará a parte comercial do sistema.
  Em troca dos serviços, o INTIB fornecerá pacotes de dados relevantes, apoio logístico e de "Marketing".

- Cada país terá uma rede de *10-15* pontos de contacto secundários (nós de distribuição) ou PCSs, que irão gerar, recolher e enviar as questões ao PCP. Não se prevê que os PCSs possuam a informação fornecida pela UNIDO, antes eles servirão como intermediários. Os PCSs consistirão portanto, de organizações que estão em contacto com as PMIs e outras indústrias, tais como Camâras de Comércio, Associações Comerciais e Departamentos de Governo encarregues de fazer cumprir as regulamentações ambientais, mas também Universidades, Instituições de Investigação e Empresas de Consultoria.
  Dois aspectos são de particular importância:

- Espera-se que os PCSs joguem um papel pró-activo na promoção do uso do sistema, com uma meta do número de questões a serem geradas (produzidas) por ano, bem como outros factores relacionados que podem ser usados para medir o sucesso relativo do projecto.

- Os PCSs devem ser escolhidos tendo em vista atingir economias de escala ao alcançar os potenciais utilizadores finais, e. g., através das listas de membros das associações industriais e comerciais.

- Espera-se que as PMIs e outros utilizadores do sistema paguem a informação que lhes fôr prestada. Os mecanismos de pagamentos, estrutura de preço e lucro divididos entre os diferentes participantes no SIEA serão decididos na discussão entre a UNIDO e PCPs.

A fase piloto agora em curso e o objectivo dos requisitos do levantamento, têm o duplo propósito de avaliar a praticabilidade do SIEA, e de identificar os mecanismos nacionais apropriados para a disseminação da informação para as PMIs e outros utilizadores do SIEA num número limitado de países. Para fazer isto, é essencial a ajuda das organizações locais com um bom conhecimento das instituições locais e do sector das PMIs. É desejável que esta ajuda seja fornecida por um futuro PCP, que necessitará então de cooperar com a rede de distribuição nacional, e que terá o benefício primário do Sistema de Informação.

O resultado final destas actividades seria um compromisso escrito das instituições identificadas, do PCP e dos PCSs intermediários, a participarem num SIEA piloto.

3. BENEFÍCIOS PARA OS PCSs INTERMEDIÁRIOS:

Associação de Comércio e Indústria - A introdução de uma nova gama de serviços de interesse para os seus membros, irá aumentar a viabilidade e atractividade da associação, e a sua firmeza como um sector representativo.

Centros de transferência de Tecnologia - Funcionando como um nó de distribuição para o SIEA, será um recurso adicional e aumentará a sua eficácia.

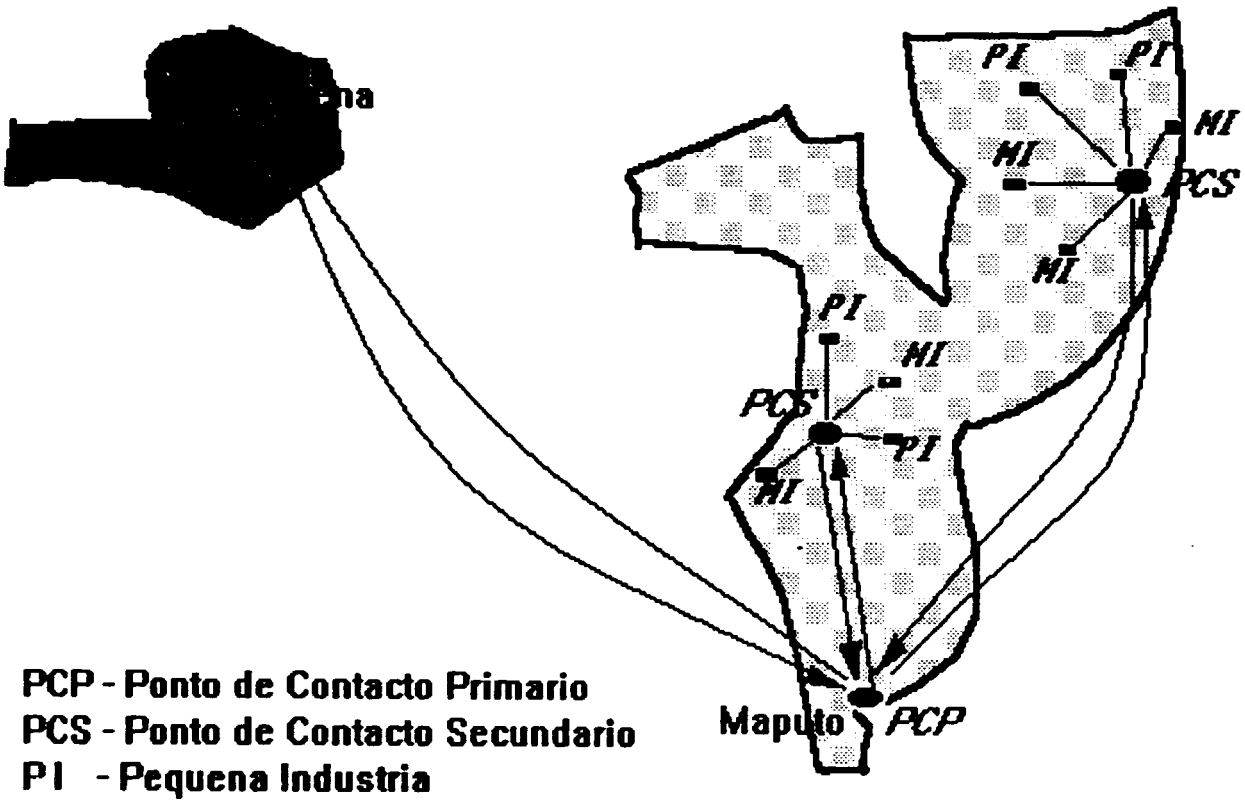
Centros de Informação - Encarregando-se da distribuição dos SIEA, isso reforçará a sua gama de realizações, e poderá aumentar o uso dos serviços existentes e aumentar os seus clientes.

Agências Encarregues do Cumprimento da Lei - Encarregadas de fazer cumprir as legislações ambientais, elas podem estar interessadas também em fornecer conselhos positivos à indústria sobre como atingir os objectivos preconizados.

ANNEX 11

SKETCH OF THE PROPOSED NETWORK

Estrutura funcional da rede do Sistema de Energia e Meio Ambiente



PCP - Ponto de Contacto Primario
PCS - Ponto de Contacto Secundario
PI - Pequena Industria
MI - Media Industria
UNIDO - United Nations Industrial Development Organization

ANNEX 12

EEIS SURVEY

NETWORK MEMBERS: CAPABILITIES

INSTITUTION: Industrial Information Centre (CII)

CONTACT PERSON: Arlindo Moiane, tel.426062

CUSTOMER BASE	industrialists, government staff, academics
MARKETING CHANNELS	mail, fax, telex
INFORMATION SERVICES	addresses, industrial statistics, legislation; in the future: bibliographies, technologies and others, as possible or required
TECHNICAL EXPERTISE	2 local and 1 foreign; local staff required training
CONSULTANCY TRANSLATION	limited translation capability (mainly from English to Portuguese)
COMMERCIAL INTEREST	none at present

ADVANTAGES	DISADVANTAGES
▪ it is intended to be the centre of the national information system on industry and energy	▪ it is being implemented slowly, as a by-product of some technical assistance projects; ▪ a project formulation framework for a specific t.a. project has been prepared; its execution depends on external funds

INSTITUTION: Chamber of Commerce

CONTACT PERSON: Arlindo Mabuiangue, tel. 492210/1

CUSTOMER BASE	about 500 members in Maputo and Beira; trade and industry
MARKETING CHANNELS	international marketing; export marketing; mail, fax, telex, EMS (express mail); "Trade directory" issued every year
INFORMATION SERVICES	trade information (demands, offers); relevant information about all members (in files)
TECHNICAL EXPERTISE	1 lawyer, 2 economists; some people will be trained for working with computers; 2 PCs will be received by the end of 1993;
CONSULTANCY TRANSLATION	1 translator (English); 1 consultant for legal aspects
COMMERCIAL INTEREST	no lucrative objectives; information is given free

ADVANTAGES	DISADVANTAGES
▪ there is a branch in Beira, by the end of 1993 also in Nampula ▪ number of members has been growing, especially small-scale industries ▪ it's in the phase of computerization of information ▪ covers a wide range of economy: traders (75% of members, manufactures (15%), services (10%) ▪ very good marketing services	▪ no service or information on environment ▪ at the moment no computerized information

INSTITUTION: National Environmental Commission (NEC)

CONTACT PERSON: Francisco Mabjaia, tel. 465143

CUSTOMER BASE	industries, agriculture, mining, fishing and other economic sectors;
MARKETING CHANNELS	"Mocambiente" - bimonthly magazine; monthly bulletin; e-mail (!), mail, fax, telex, EMS; journalists being CNA's contact persons (Noticias, radio, TV, AIM); industrial and trade associations
INFORMATION SERVICES	environment information; lots of printed material; data bases: Infoterra (UNEP), Geographic Information System, Invent Model - Waste Survey (data from questionnaires), system for ozone; legislation
TECHNICAL EXPERTISE	1 CTA from UK, 1 engineer, 1 lawyer, 2 economists, 4 biologists, 5 geographers, 1 agronomist, 1 physicist, 1 sociologist - most of them trained for informatics; some people are being trained in Europe
CONSULTANCY TRANSLATION	no consultancy; very good translation capabilities - English, French, German
COMMERCIAL INTEREST	none

ADVANTAGES	DISADVANTAGES
■ staff of 80 people in Maputo ■ 3 men in each province ■ the only national institution dealing with environment ■ very good infrastructure ■ personnel is well educated and trained in the area of energy and environment ■ very good political acceptability ■ industries are aware of its activities and objectives ■ good perspectives to expand its network of organizations in the whole country	■ they think they shouldn't charge for information, products and services ■ they are afraid to be a SCP because of loosing the authority

INSTITUTION: Industrial Training Centre (CFI)

CONTACT PERSON: Carlos Ferreira (General Director), tel. 424600

CUSTOMER BASE	unemployed (70% of customers), managers from industries, and other economic areas - fishing, etc.;
MARKETING CHANNELS	pamphlets radio, TV, newspapers; fax, telex, mail
INFORMATION SERVICES	the main activity is training for: marketing, human resources, finances, production, project management
TECHNICAL EXPERTISE	several experts in the areas of their activity; 9 national and several foreign consultants; 5 computer experts; about 30 part-time experts
CONSULTANCY TRANSLATION	consultancy on: marketing, human resources, finances, production, project management;
COMMERCIAL INTEREST	none

ADVANTAGES	DISADVANTAGES
▪ has branches in Nampula and Beira ▪ number of workers: - Maputo - 23 full-time 100 part-time - Beira - 3 full-time - Nampula - 1 full-time ▪ most of managers of industrial enterprises are customers of CFI ▪ very good infrastructure and equipment: - 30 PCs in Maputo - 6 PCs in Beira - 6 cars	▪ its activity doesn't aim at any commercial interest ▪ its vocation is, at the moment, mainly directed to training ▪ for the EEIS, a specific staff would have to be trained for this area ▪ has no files of industries, in relation what is needed for the EEIS

INSTITUTION: National Inst. of Normalization and Quality Control (INNOQ)

CONTACT PERSON: Gabriela Rebello da Silva, tel. 423666

CUSTOMER BASE	industries, trade companies, state departments, ministries; training of quality control, in and out of the country
MARKETING CHANNELS	mail, newspapers, fax, TV, radio; seminars, workshops; international agencies of standardization: ISO, ARSO
INFORMATION SERVICES	standards, calibration, quality control, quality assurance, laboratory certification, metrology, training
TECHNICAL EXPERTISE	at the moment no technical expertise staff in operation
CONSULTANCY TRANSLATION	will work in this area
COMMERCIAL INTEREST	none

ADVANTAGES	DISADVANTAGES
■ will deal with much information of and from the industries ■ inspires confidence due to the character of its activity ■ understands the necessity of payment for the information	■ has not been structured yet ■ no equipment at the moment

INSTITUTION: Project and Management Consultants (Austral)

CONTACT PERSON: Antonio A. Matos (Chairman), 33445

CUSTOMER BASE	industries, commercial enterprises, all other economic sectors
MARKETING CHANNELS	publicity, personal contacts, mass-media, mail, fax
INFORMATION SERVICES	no supply of any kind of information due to the character of its activity; consultancy
TECHNICAL EXPERTISE	1 engineer, 4 biologists, 6 economists, lawyers; 26 full-time employees, about 50% of them with university degree; 12 PCs with operators
CONSULTANCY TRANSLATION	very well equipped in this area
COMMERCIAL INTEREST	income generation for the company

ADVANTAGES	DISADVANTAGES
▪ team of very specialised experts in several technical fields ▪ has a department directed only to environment issues ▪ intends to be a SCP with the objective of making money ▪ is encouraged by the EEIS project	▪ is afraid that its customer base could be not enough to cover the costs of operation

INSTITUTION: National Inst. for the Development of Local Industry (IDIL)

CONTACT PERSON: Fulgencio Magaia (Executive Director), tel. 431173

CUSTOMER BASE	promoting of Small Scale Industries in particular, and the Small and Medium Enterprises (11-200 employees) in general; about 300 projects in all provinces
MARKETING CHANNELS	booklets, newspapers; mail, fax
INFORMATION SERVICES	technical information - engineering, technologies, economic, financial; technical assistance for setting up and/or rehabilitation and expansion of SMIs; management training
TECHNICAL EXPERTISE	staff of about 20 people - 4 economists, 1 chemical engineer, 1 mechanical engineer, 2 foreign economists, part-time lawyer; 4 PCs with their operators
CONSULTANCY TRANSLATION	economic feasibility studies, project analysis, raising of financial resources, legal advisory, promotion of foreign investments; translation from/to English
COMMERCIAL INTEREST	in principle it is a non-profit organization; it charges about 3-5% of the value of its feasibility studies

ADVANTAGES	DISADVANTAGES
▪ services targeted at SMIs ▪ is well known in the family of Mozambican enterprises ▪ has branches in all provinces ▪ in less than 2 years the computer network of all provincional branches will be established	▪ at the moment no services on environment or energy

INSTITUTION: Mozambican Association of Young Entrepreneurs (AJEM)

CONTACT PERSON: Hipolito Amele, tel. 421129

CUSTOMER BASE	about 60 entrepreneurs from Maputo are members of the association; small enterprises - industry, trade, agriculture; branch in Beira, next year in Nampula and Cabo Delgado
MARKETING CHANNELS	brochures, newspapers, radio, TV; seminars, workshops, training courses
INFORMATION SERVICES	information about training (also abroad), business opportunities, joint ventures; small seminar on environment is being prepared; training courses
TECHNICAL EXPERTISE	1 lawyer, 1 economist, 1 accountant - all part-time; many members are engineers or economists; computers will be probably installed next year (up to NORAD)
CONSULTANCY TRANSLATION	consultancy on law, economics, accountancy, setting up of new enterprises; no translators at the moment
COMMERCIAL INTEREST	non-profit organization, symbolic charges for services provided

ADVANTAGES	DISADVANTAGES
▪ most of its members are industrialists ▪ is constituted by young people (up to 45 years old) with good perspectives in the near future	▪ small capabilities of its full-time technical expertise ▪ non-commercial interest of its activity

INSTITUTION: Provincional Directorate of MIE (Maputo-Province)

CONTACT PERSON: Arao Nhancale, tel. 722131/2

CUSTOMER BASE	all industries in Maputo-Province, especially SMIs; EDM - provincional system of energy
MARKETING CHANNELS	through IDIL; department dealing with information to support SMIs; printed material, mail, fax
INFORMATION SERVICES	business information; cadastral information in files
TECHNICAL EXPERTISE	no experts; 1 computer will be bought
CONSULTANCY TRANSLATION	advisory on investment opportunities; management training; no translation capabilities at the moment
COMMERCIAL INTEREST	non-profit services; symbolic payment will be applied to recruit part-time experts

ADVANTAGES	DISADVANTAGES
▪ is encouraged to be a SCP ▪ deals directly with all industries in Maputo Province, especially with SMIs ▪ SMIs and some large-scale industries are under its responsibility	▪ not very good experience with with the central government due to its interference with the Provincional Directorate's activities ▪ very little experience in the energy and environment field ▪ no profit interest of its activity

INSTITUTION: Industrial Association of Mozambique (AIMO)

CONTACT PERSON: Aura Soares (General Secretary), tel. 424659-20302

CUSTOMER BASE	150 members of the association; small-, medium- and large-scale industries from the whole country
MARKETING CHANNELS	monthly bulletin, meetings, mail; contacts with other associations of that type (also foreign)
INFORMATION SERVICES	trade and business information
TECHNICAL EXPERTISE	no full-time experts; people trained for working with computers (at the moment 1 PC)
CONSULTANCY TRANSLATION	consultancy on law, business; limited translation capabilities, mainly from English
COMMERCIAL INTEREST	non-profit services, symbolic payment

ADVANTAGES	DISADVANTAGES
■ very good contacts with industries ■ good relationship with other associations	■ no services on environment or energy ■ no technical expertise at the moment

INSTITUTION: Ministry of Health (Department of Hygiene and Environment)

CONTACT PERSON: Rufino M. Melo, tel. 492813

CUSTOMER BASE	food industries, water suppliers (Agua de Maputo); 3 branches: Maputo (south zone), Beira (central), and Nampula (north)
MARKETING CHANNELS	printed material provided by mail; 2-3 meetings/year
INFORMATION SERVICES	library with information on environment (water problems and pollution), documents mainly in English and French; 1 PC with data base containing information collected from enterprises
TECHNICAL EXPERTISE	2 engineers, 1 chemical engineer, 3 biologists, 2 physicians, 2 veterinarians
CONSULTANCY TRANSLATION	advisory services - how to reduce wastes; investigation on working conditions; capabilities of translation from English and French
COMMERCIAL INTEREST	state department with no commercial interest; there is a suggestion to charge for its services

ADVANTAGES	DISADVANTAGES
▪ has an authority to enforce industries to accomplish with regulations concerned to workers´ health and environment ▪ has confidence especially among SMIs ▪ has experience in environment aspects	▪ due to its original objectives it doesn´t deal with industrial information ▪ its activity is without any profit interest ▪ feels discouraged as a government department

INSTITUTION: Mozambican Association for Industrial Maintenance (AMMI)

CONTACT PERSON: Arlindo Moiane (President), tel. 426062

CUSTOMER BASE	50 members representing all types of industries, members only from Maputo; contacts with enterprises from Maputo and with maintenance technicians from Maputo and other provinces
MARKETING CHANNELS	statues, monthly bulletin; newspapers, magazine "Tempo", TV, radio; seminars, lectures, workshops, brain storms
INFORMATION SERVICES	information on mechanization, maintenance, environment, and energy
TECHNICAL EXPERTISE	many engineers; specialists from the university assist in its services (e.g. expert in water problems); about 30 members will be trained for management, informatics by CFI
CONSULTANCY TRANSLATION	consultancy on engineering, maintenance; will be also on environment; translation from English
COMMERCIAL INTEREST	services offered by AMMI will be charged; no commercial interest

ADVANTAGES	DISADVANTAGES
▪ services on energy and environment problems, e.g. Seminar on Maintenance and Environment ▪ very good contacts with other organizations (AIMO, AJEM, university) ▪ members are well specialised in the field of their activity ▪ very well inserted in the industry	▪ non-solid infrastructure built yet

INSTITUTION: Association of Private Enterprises of Mozambique (AEPRIMO)

CONTACT PERSON: Diogo Guilande (President), tel. 421526/8

CUSTOMER BASE	600 members from all provinces but Sofala small-, medium-, and large-scale enterprises (industry, trade, agriculture) of the private sector;
MARKETING CHANNELS	newsletters, mail, fax; seminars, workshops, round tables
INFORMATION SERVICES	business information, management, legislation
TECHNICAL EXPERTISE	no full-time staff; lots of people in contact, especially engineers, economists, and lawyers
CONSULTANCY TRANSLATION	feasibility study, legislation; contacts with bank agencies
COMMERCIAL INTEREST	none

ADVANTAGES	DISADVANTAGES
▪ big number of members from the whole country ▪ is encouraged to participate in the network ▪ very well inserted in the private sector which becomes the motor of the industry	▪ environment is not in the centre of its activity

INSTITUTION: World Academy for Sustainable Development (ProWorld)

CONTACT PERSON: Henrique Lopes (President), tel. 475938/9

CUSTOMER BASE	some large-scale industries, now going to small- and medium-scale; research institutions, training centres, universities
MARKETING CHANNELS	books concerned about environment; in the near future small magazine on environment; conferences
INFORMATION SERVICES	training; project: data collection on wood consumption as an energy source (from the whole country); dissemination of printed material about energy, environment, technologies, e.g. biogas, wind energy
TECHNICAL EXPERTISE	no full-time staff; part-time: 1 economist, 1 chemical engineer, 1 physicist; few computers but collected information not computerized
CONSULTANCY TRANSLATION	consultancy on energy and environment problems; very good translation capabilities (documents in English)
COMMERCIAL INTEREST	no commercial interest; is going to charge for published books

ADVANTAGES	DISADVANTAGES
▪ is especially interested in energy and environment problems ▪ wants to join the network very much	▪ not very well described the short-time objectives of its activity

INSTITUTION: Association of Entrepreneurial Women and Executives (ACTIVA)

CONTACT PERSON: Palmira Pedro Francisco (Vice President), tel. 465843

CUSTOMER BASE	380 active members (1000 "on paper"); entrepreneurial women of all provinces - mainly: small shops, hairdressing, restaurants; - also: some industries, transport, agriculture
MARKETING CHANNELS	bimonthly bulletin; newspapers; mail; seminars, round tables
INFORMATION SERVICES	training, courses: management, legislation, health of woman, business
TECHNICAL EXPERTISE	only part-time: 1 economist, 1 agronomy engineer, 1 lawyer; 1 PC with data base on members
CONSULTANCY TRANSLATION	consultancy on legislation, economy; small translation capabilities
COMMERCIAL INTEREST	non-profit activity; the main objective is promotion of business women

ADVANTAGES	DISADVANTAGES
■ big number of members	■ not much inserted in the industry; the customer base is not interested in environment problems ■ no services on energy or environment

INSTITUTION: Information Centre of University of Eduardo Mondlane (CIUEM)

CONTACT PERSON: Francisco Mabila, tel. 492601

CUSTOMER BASE	university, some industries, associations, banks, UN organizations
MARKETING CHANNELS	3-monthly bulletin; e-mail, mail, fax, telex; symposia, round tables; international contacts
INFORMATION SERVICES	training on the use of basic software (Word Perfect, Lotus, dBase); software applications; computer maintenance
TECHNICAL EXPERTISE	engineers, 1 economist, 1 part-time lawyer, people working with computers; many PCs; PDP-11, 2 micro-VAX, HP-1000
CONSULTANCY TRANSLATION	consultancy on software, hardware; very good translation capabilities
COMMERCIAL INTEREST	services are charged

ADVANTAGES	DISADVANTAGES
▪ team of very well specialised experts ▪ good infrastructure (computers, e-mail)	▪ contacts mainly with some large industries ▪ no services on industrial information

ANNEX 13

EEIS SURVEY - NETWORK MEMBERS: EVALUATION CRITERIA

Scale 5 - very good
4 - good
3 - sufficient
2 - poor
1 - bad

	C I I	Chamber of Commerce	N E C	C F I	INNOQ	Austral	I D I L	A J E M	Provinc. Directorate of MIE	A I M O	Ministry of Health (Hyg.Env.)	AMMI	AEPRIMO	ProWorld	ACTIVA	CIUEM
Political Acceptability / Information Policy	5	5	5	4	4	3	4	3	3	4	3	3	3	4	3	5
Existing / Expandable Network of Organizations	1	3	4	3	1	2	4	3	2	3	3	2	4	2	3	2
Commercial Interest / Financial Consultants	3	2	1	3	2	5	3	2	1	2	1	2	2	2	2	4
Information Handling Capabilities	4	3	4	3	2	4	3	2	1	2	2	2	2	3	1	3
Information Technology Infrastructure	4	2	4	4	2	4	4	2	2	2	2	1	2	3	2	4
Technical Information Experience	3	3	4	2	2	4	4	4	2	3	4	4	4	3	2	3
Environment Commitment	4	2	5	1	1	4	2	3	2	1	4	3	1	5	1	1
Marketing Resources	2	4	4	4	2	3	3	3	2	3	2	3	4	4	3	3
Network Coordination Capabilities	3	4	4	2	1	3	3	2	2	3	2	2	3	3	2	2
TOTAL	29	28	35	26	17	32	30	24	17	23	23	22	25	31	19	27
Average	3.22	3.11	3.89	2.89	1.89	3.56	3.33	2.67	1.89	2.56	2.56	2.44	2.78	3.44	2.11	3.00

ANNEX 14

WORKSHOP ON ENERGY AND ENVIRONMENT INFORMATION SYSTEM

LIST OF PARTICIPANTS

Octavio F. Mutemba - Minister
Ministry of Industry and Energy
Italo Fraquelli - UNIDO Country Director
UNIDO
Luis Vidreira - Director
Ministry of Industry and Energy
Peter N. Pembleton - UNIDO staff member
UNIDO
Mariusz Suchorowski - Expert in Information Systems
UNIDO - Proj. XP/MOZ/92/124
Arlindo Moiane - Environment Engineer
UNIDO - Proj. XP/MOZ/92/124
Francisco Mabjaia - Environment Engineer
UNIDO - Proj. XP/MOZ/92/124
National Environment Commission

Palmira P. Francisco - Vice-President
Association of Entrepreneurial Women (ACTIVA)
Fernando L. Garragory - Information Senior Expert
UNIDO, Industrial Information Centre (CII)
Neyde Mutaca - Vice-President
World Academy for Sustainable Development (ProWorld)
Alberto Mavume - Consultant
World Academy for Sustainable Development (ProWorld)
Inocencio Matavel - President
Industrial Association of Mozambique (AIMO)
Aura Claudia Soares - General Secretary
Industrial Association of Mozambique (AIMO)
Arao Nhancale - Director
Provicional Directorate of MIE for Maputo Province
Fulgencio Magaia - Executive Director
National Inst. for the Development of Local Industry (IDIL)
Aurelio Z. Chirrime - General Secretary
Mozambican Association for Industrial Maintenance (AMMI)
Mabor de Mocambique (MABOR)
Vitorino Joao Malate - Vice-President
Mozambican Association of Young Entrepreneurs (AJEM)
Gabriela da Silva - Director
National Inst. of Normalization and Quality Control (INNOQ)
Francisco Mabila - Engineer
Informatics Centre of the Eduardo Modlane University
Generosa Cossa - Vice-Director
Informatics Centre of the Eduardo Modlane University
Rufino M. Melo - Director
Ministry of Health - Department of Hygiene and Environment

Borges Chambal - Industrial Director
Sociedade Geral de Cervejas e Refrigerantes 2M (SOGERE)
Nelson C.B. Cardoso - Industrial Director
S.E. Ginwala Filhos Lda (GINWALA)
Mumbaraque Abdulrazal - Technical Director
Fabrica de Tintas do Ultramar Sarl (PINTEX)
Jacob J. Nyambire - Director
Fabrica de Paper e Cartao (FAPACAR)
Gilberto Manuel - Director
Empresa Nacional de Refrigeracao e Climatizacao (ENAFRIO)
Martins L. Bilal - Director
Companhia de Fundicao e Serralharia (COFUSEL)
Fernando Juliao - Director
Electricity of Mozambique
Virgilio Maungue
Ministry of Mineral Resources
Rafael Nambale
Ministry of Industry and Energy
Luisa Diogo - Program Officer
World Bank
Gabrielle Ott - Junior Professional Officer
UNIDO
Gitte Hundahl - Junior Professional Officer
United Nations Development Programme

ANNEX 15

ENVIRONMENT AND SUSTAINABLE INDUSTRIAL DEVELOPMENT

WORKSHOP

ENERGY AND ENVIRONMENT INFORMATION SYSTEM (EEIS)

A.

The Ministry of Industry and Energy (MIE), in coordination with the National Environment Commission (NEC) and with the support of the United Nations Industrial Development Organization (UNIDO), organized the Workshop on Energy and Environment Information System (EEIS) in the Hotel Polana, from 18-19 August 1993.

The Workshop, which was attended by several institutions (economic associations, industrial enterprises, Ministries and UNIDO), was opened by H.E. Mr. Octavio Mutemba, Minister of Industry and Energy, who presented the background and purpose of the workshop.

Mr. Fraquelli, Director of UNIDO in Mozambique, followed the opening speech by explaining the necessity of establishing effective channels of information transfer in Mozambique.

Presentations were then made, according to the agenda, by:

1. Mr. Peter Pembleton (Industrial and Technological Information Section of UNIDO);

2. Mr. Mariusz Suchorowski (UNIDO Expert);

3. Mr. Arlindo Moiane (Ministry of Industry and Energy).

Dr. Luis Videira chaired the Workshop and in his closing remarks noted, inter alia, that the creation of an Energy and Environment Information System (EEIS) is "...a challenge that will succeed only through the cooperation between government and private enterprise, among the enterprises themselves, between the enterprises and their industrial associations, trade unions and the industrial community in general."

B.

Conclusions and Recommendations

The participants discussed all the items on the agenda and reached the conclusions and recommendations outlined below.

Agenda item 1

The type of information on energy and environment required by small- and medium-scale industry (SMI):

a. Alternative sources of energy and the financial viability of those alternatives. This will facilitate the application of the information by SMIs and help in the choice of the most suitable option;

b. What are the most dangerous wastes produced by industry and their impact upon the environment as well as the options for reducing the impact;

c. Economic information--i.e. information that obviously leads to an improved financial and economic situation for the plant;

d. Case study information--examples of success stories for a particular alternative industrial strategy, preferably examples from developing countries, especially in Africa.

In relation to this agenda item, it is also recommended to:

» Sensitize the end-users (industrialists at SMI and larger scale levels) to the necessity to save energy. This should be achieved through the provision of awareness-raising information;

» Educate the entrepreneurs in respect to observing simple maintenance regulations;

» Educate the entrepreneurs as to the necessity to look for information and to get into the 'information habit', when they will want to obtain and be better able to use information;

» Make a critical selection of the information to be supplied to industry;

» Analyze the advantages and disadvantages of the various possibilities for introducing modifications in an industrial plant.

Agenda items 2 & 3

Contacts with the SMIs for the dissemination and distribution of information could use the means outlined below:

a. Telephone, mail, telefax and telex;

b. The mass-media: newspaper, radio, media-fax;

c. Bulletins, brochures, films and other types of promotional literature;

d. Seminars, workshops, conferences;

e. Vocational institutions, banks and associations linked to industry;

f. Periodicals directed to certain sectors of industry which carry articles on current subjects of interest;

g. Local government institutions located in the provinces;

h. Creation of extension services under the Ministry of Industry and Energy, as in the example of the Ministry of Agriculture.

Agenda item 4

For the Secondary Contact Points (SCPs) it is necessary to:

a. Train the staff;

b. Provide equipment and international expert assistance;

c. Coordinate their activities;

d. Consider that some investments will not bring immediate reward;

It was emphasized that existing infrastructure, in the way of organizations, institutions and associations in the provinces (e.g. provincial directorates of the Ministry of Industry) be utilized as SCPs for the EEIS.

Agenda item 5

Promotional efforts required include:

a. Institution of an annual award (if there are ways of evaluating) for the company that has achieved the best results in avoiding environmental damage;

b. Provision of information on the alternative technologies which will allow them to obtain positive results in terms of profit from their changed activity;

c. Education of entrepreneurs in terms of the profits and losses of their activity;

d. Education about the reuse of industrial wastes as fuel or raw material for other industrial processes and introduce the possibility of a waste exchange;

e. The need for an effective organization for collection and dissemination of information for industry.

Agenda item 6

To help the SMIs realize their need for information and to join the EEIS, it is proposed to:

a. Train and educate the entrepreneurs to the value and advantages of having information;

b. Educate the entrepreneurs to the issues related to environmental conservation and sustainability of industrial activity;

c. Consider a 'transition period' for this education to take effect and for an 'information mentality' to be created.

Agenda item 7

For payment mechanisms it was considered that:

a. During the start-up of the system, the information, services and products to be supplied to the end-users should not be charged to them. The information supply is therefore to be subsidized by sources such as government, UNIDO and other donors;

b. Information definitely has a value and must be paid for, but not during the initial phase.

Agenda item 8

To draw the attention of the industrial community to the issues related to energy and environment, all possible means currently available should be utilized.

Agenda item on PCP and SCP

a. SCPs should be placed in all provinces of the country;

b. The following criteria should be used in their selection

--existing capacity

--available means
--training
--other issues related to efficient operation.

c. The system should use existing institutions and avoid the duplication of effort and the dispersal of information;

d. The Ministry of Industry and Energy should establish and operate its proposed Industrial Information Centre (CII).

It is further recommended, to ensure the effective implementation of the recommendations and conclusions of this Workshop, that

1. They be submitted to the competent government organs for a decision on how to proceed;

2. Be followed and implemented by a UNIDO project.

Maputo, August 20th 1993

ANNEX 16

PEOPLE MET

Mia Couto - Biologist, IMACTO: environment consultancy group

Francisco Ilidio Diniz - Project's Director, SOCIMO: Comercial and Industrial Society of Mozambique

Jonathan C.A. Hobbs - Director, Industrial Environmental Forum of Southern Africa, South Africa

Venancio Massingue - Director, CIUEM: Informatics Centre of the University of Eduardo Mondlane

Ruzvidzo S. Maia - Director, Southern Centre for Energy and Environment, Zimbabwe

Kukame T. Ngwamotsoko - Environmental Affairs Manager, Soda Ash Botswana

Celso N.E. de Oliveira - UNIDO expert: responsible for drafting the ESID programme for Mozambique

Luiz M.R. Pereira - Geophysicist, Meteorologic Services of Mozambique

Evan Painting - Manager, Building Technology (CSIR), South Africa

Bjarne Sivertsen - Senior Scientist, SADCC: Southern African Development Coordination Conference

See also:

- plants which responded to questionnaire (Annex 5);
- participants of group B of the seminar (Annex 8);
- institutions visited during the EEIS survey (Annex 12);
- participants of the workshop (Annex 14).