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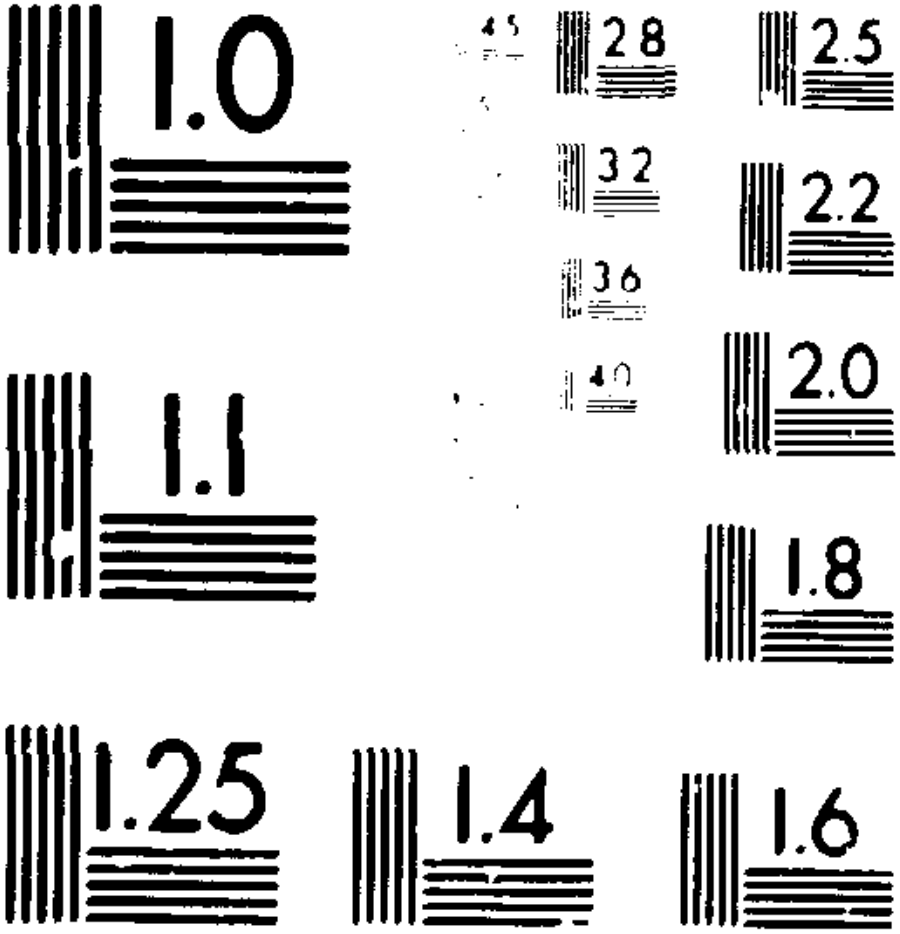

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COMPUTERIZED INFORMATION SYSTEMS AT ARAB FEDERATION FOR CHEMICAL FERTILIZERS PRODUCERS (AFCFP)

DP/RAB/78/021

KUWAIT

Technical report: Computerization of information and statistics *

Prepared for the Government of Kuwait
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

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Vienna

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The two months mission has been completed under the UNIDO project DP/RAB/78/11-54- Expert in computerized information system, associated with Arab Federation of Chemical Fertilizer Producer (AFCFP) in Kuwait, during 16.04.1984 - 15.06.1984.

The main objective of mission was to strenghten AFCFP activity and to improve the quality of Arab Federation work through computer oriented services in library (information) division and statistics department.

The main recommendations refered to the implementation of a decimal classification system (UDC) for library as well as of a cardholding document system, aquisition of suplementary hardware and software to enlarge the existing Word Processor System Microcomputer, implementation of dedicated software for library information system, development of a certain elaborated computer system for statistical data processing, provision of some video and audio equipment for AFCFP information centre, training program on microcomputer utilization, a study tour program for AFCFP managers, scientists and library staff, appointment of a new computer skilled person to take continuously care on such AFCFP specialized jobs, provision of budget for current expenses for microcomputer, video and audio equipment utilization, exchange of data and mutual connections with local and overseas similar organization and data banks (KISR-Kuwait, Loocheed-Dialog-USA) for microcomputer utilization, follow-up actions for project status evaluation in 1985.

INTRODUCTION

The mission has been considered in the frame of a regional project for development and promotion of fertilizer production and utilization in arab countries (DP/RAB/78/11-54).

The two months duration mission started on 16.04.84 and ended on 16.06.1984 with three days brieffing at UNIDO Vienna, at duty station Arab Federation of Chemical Fertilizers Producers (AFCFP) - Kuwait.

The objective of project was to strenghten AFCFP activity and to improve the quality of work at Arab Federation by computer oriented services in library division and statistics department.

Since a previous project provided AFCFP with a microcomputer for Words Processing System Services (ISC-WPS) which dedicated secretarial facilities only, there was a real need to enlarge its configuration with memory graphics, colour bilingual CRT, plotter, printer peripherals, according to user's applications.

For similar reasons, a training programme on microcomputer utilization has been considered necessary, as a good starting point for implementing and thenafter running AFCFP applications.

The basic solution for statistical data processing system has been developed, ready made software package for library oriented services have been recommended, technical facilities and procedures to access overseas date banks in some other countries (Lockheed Dialog USA) have been proposed.

To improve the work quality and experience of AFCFP personnel , a reasonable study tour programme has been suggested during september 1984 - august 1985, in similar, prestigeous organizations in Europe and USA.

I consider that the main objectives and duties of my mission have been attained. The results have been already partially utilized and others are supposed to be in the next future.

RECOMMENDATIONS

1.- Implementation of a amplified decimal classification system (UDC) for library papers and documents, by APCFP library staff.

2.- Implementation of a card holding document system for the evidence and organization of library books, papers, periodicals, as well as for convenient manual retrieval of data, by APCFP library staff.

3.- Aquisition of ready made software for library oriented information system and implementation on the existing machine (ISC with 8" diskette) for getting experience on package utilization.

4.- Aquisition of supplementary hardware and software facilities, as per technical details provided in report, for library and statistical applications :

- CPU/8-16 bits per word
- 64-256 KB RAM memory
- 4o MB hard disk memory
- bilingual, colour CRT with high resolution graphics
- bilingual 5o-12o cps, 8o-12o column printer
- 4-8 pen plotter
- 3oobps modem or accoustic coupler
- 1-2 MB back-up facilities
- standard interface protocol communication facilities
- Cobol, Pascal, DBase II programming facilities
- utility, debuging ,text editor, statistics programming aids

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5.- Creation of library data files on hard disk and implementation of library software on microcomputer, for continuous processing by AFCFP library staff.

6.- Elaboration of computer programms for statistical application, using the second part of project assistance and the technical support for programming from the computer delivering company.

7.- Implementation of programms with the direct involvment of AFCFP statistical department staff.

8.- Aquisition of video, audio, microfilm equipment and training of a person from AFCFP, to strengthen the data exchange activity with similar organizations.

9.- Continuation of training programme in the second part of project, by lectures and practical exercises for computer utilization.

10.- Implementation of study tours programme for five AFCFP persons (management level, statistics department and library) at suitable organizations, according to their availability, to provide a good exchange of experience, to improve AFCFP personnel expertize and quality of work.

11.- AFCFP should appoint a person with a certain background in micro computer utilization, to keep a permanent contact with the system and user's requirements and operate the micro computer. If necessary, to execute modifications of programms and the dialog with a professional computer company for various new services.

12.- AFCFP should provide an anual budget for current expenses, e.g. micro computer maintenance, overseas data bank access (network utilization), etc. of about 3.500 KD.

13.- AFCFP should concentrate the efforts on the implementation and utilization of its own library information system and statistical data processing system, by collecting and processing the most valuable information in the fertilizer industry, rather than general type of data.

For general purpose information there are facilities to access KISR/NSTIC information system and/or AIDO Baghdad library unit. Exchange of data with these organizations could be provided on magnetic media (8" or 5 1/4" diskettes) as well as through normal output printing, reports, journals etc. The last one is the most recommended alternative for the time being.

14.- To improve the quality and quantity of statistical data, AFCFP should strenghten the communication with other similar organizations in GCC area and other regions by mutual agreements and responsibilities.

15.- After implementation of computer oriented library and statistical services, AFCFP should elaborate advertising materials for publicity to its members and other organizations and obviously will demonstrate by practical projects its improved expertized.

16.- UNIDO/UNDP should consider follow-up actions at the beginning of 1985 to evaluate the progress and status of project implementation and the efficiency of microcomputer utilization.

II ACTIVITIES AND DUTIES

A. Objectives, duties, background, existing facilities

The main objective of the activity being reported on, within the framework of a Regional Cooperation Programme, is to strenghten the Arab Federation of Chemical Fertilizer Producer (A.F.C.F.P.) at Kuwait , through establishment of a computerized fertilizer information and documentation unit, which should represent also a source of data for AFCFP's members , as well as for the industrial information system of Arab Industrial Development Organization (A.I.D.O.) at Baghdad.

The main duties of my two months mission at AFCFP-KUWAIT, as per Job Description and project background, have been :

- to advise a computer oriented classification/coding system for documents and data handled by AFCFP library unit ;
- to advise a computer oriented information system for storage and retrieval of data from AFCFP library data base, as well as from other similar data base existing in Kuwait and elsewhere in the world ;
- to advise a computer oriented information system for statistical data on fertilizer production capacities, row materials, intermediates, capacities utilization, consumption, prices, general data on companies and Arab region countries, etc.;
- to advise on required data processing and file management techniques;
- to provide a basic introductory training on micro-computer architecture, operation and programming ;
- to select, specify and advise on suplementary hardware and software (besides the already existing micro computer)

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for accomodation of library and statistical computer oriented tasks and data communications with other similar local and overseas data banks.

The substance of my technical activity has been conected with the following areas of preocupation :

- the actual problems and status of AFCFP and its objectives ;
- AFCFP requirements with respect to library unit and statistical department, in terms of software and hardware facilities;
- the existing microcomputer hardware/software facilities and evaluation of the best compeny ;
- technical solutions regarding the information system (basic solution) as a good starting point for implementation ;
- basic training on microcomputer utilization.

The background of project has been provided :

- during briefing at UNIDO Vienna;
- by UNDP-Kuwait personnel;
- through technical discussions with AFCFP personnel (I.S.C., IBM,NCR,Olivetti,Data Point,Burroughs,DEC)
- during meetings with Kuwait Institute for Scientific Research (KISR) and A.I.D.O. Baghdad staff
- through some previous technical reports of former UNIDO consultants (DP/RAB/78/021/11-01/B)-Mr. H.G. Koerner and DP/RAB/80/010-DP/ID/SER.B/304-Mr. T.M. Alexander);
- through a number of statistical report and works prepared by AFCFP and other similar organizations.

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The existing technical facilities at AFCFP are :

- I.S.C. 8963 Word Processing Microcomputer, 8o8A CPU , 64 K-RAM memory, 19" colour low resolution CRT, 8" dual density diskette drive, dual head bilingual 5o character/sec printer, CP/MSo operating system, Assembler language, utility programs, standard WPS (Word Processor System) user's manual.
- 11 electrical typewritters, e.g. OLIMPIA-arabic 5, OLIMPIA-english 2, IBM-english 2, CONTINENTAL-arabic 1, CONTINENTAL-english 1;
- 4 Xerox photocopying machines, e.g. NASHUA 122o-S, NASHUA 125o (normal+reduction), NASHUA 122o, NASHUA 123o-DF (plus sorter) ;
- 1 Siemens telex machine ;
- 2 direct telephon lines and 4 local posts;
- microcompuer voltage stabilizer (12o-24o V, 15 Amps, 5o Hz).

The working conditions at AFCFP premises are excelent, e.g. central air conditioned large rooms, all required office type furniture, stationaries and accesories. The daily working time is 7.3o-14.oo, except Fridays, official national and religious holydays.

.3. Library information system

One of the main projects comprising of a number of activities and duties as previously mentioned is the library information system. The AFCFP library unit input data and documents are provided on daily, weekly, monthly and yearly basis, e.g. newspapers, journals, books, special studies and reports, proceedings, reprints of scientific works, technical seminar papers, etc.

A number of about 5o english and arabic articles x) are selected on monthly basis from various newspapers. There are almost 9o journals (english, french, arabic) received by AFCFP on monthly , quarterly and yearly basis, which make a total of 2o,ooo articles.

An increasing rate of about 4,ooo papers/year is quite feasible.

The actual number of 1,3oo english and arabic books is expected to rise with about 5o books per year, e.g. a total of 6,5oo papers (articles) which are going to increase on a rate of 25o new records per year.

Almost 3,ooo existing special studies and reports on fertilizer industry, fertilizers market and economy will be renewed yearly by about 5oo papers.

The existing number of 1,5oo english proceedings will be increased by 3oo new papers on yearly basis.

Therefore, the total existing papers (about 3o,ooo) will rise by 3,ooo-5,ooo new papers every year, generating a large library data base with original papers in the library unit, shelves, as well as on magnetic media (codes, author, names, titles, key words, abstracts), as a part of a computerized information system.

AFCFP is also expecting a large exchange of data on microfilms and microfiches with KISR Kuwait and AIDO Baghdad, UNIDO Vienna, FAO Headquarter and other similar organizations through - out the world , therefore specialized equipment should be considered as well (Appendix 4).

A very important role will be given to fertilizer plants operational data, maintenance reports, technical information on incidental shutdown and emergency operations, etc.

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x) Article/paper means a selected publication or part of a publication like journal, newspaper, book, etc; there might be more than one article selected from the same journal or book.

Besides papers and reports, technical meetings and on spot discussions are envisaged with plant engineers and operators and accordingly, video/audio equipment are considered to be the most suitable and efficient way of recording, disseminating and exchanging of data with AFCFP member companies, AIDO and other specialized agencies (Appendix 4).

AFCFP is requested to provide library services on current and on demand basis for a large number of customers in Kuwait and abroad, like ministries organizations, companies, plants, research institutes, consulting groups, individuals, A number of periodical outputs, e.g. monthly Documentary Bulletin , Abstracts are issued by AFCFP personnel and some other publications are expected in the nearest future e.g. printed journal indexes, titles indexes, abstract lists, cumulative indexes, library catalogs, etc.

Therefore, AFCFP concept for library information system should consider the following data sources :

- AFCFP own library , under manual operation, comprising of the most valuable data on fertilizer industry , fertilizer market in the world and Gulf region, plant operation data, other statistical data. A part of AFCFP library is suposed to be entered in the computerized information system, as magnetic records written on specialized devices and retrieved , according to author names, titles, key works ;

- KISR library, accessed through off-line inquiry services for other general data on chemical/fertilizer industry and technologies, patents, engineering data, etc;

- overseas data banks, accessed through telecommunication networks and computerized message switching systems, in Europe and USA, e.g. LOCHEAD-DIALOG services.

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Although AFCFP library unit is updating the inventory list of documentary inputs and outputs, a classification system and a document holding card system are sugested to be implemented, since they are playing a vital role.

During my visit at AIDO Library unit and KISR information unit, various classification systems and document holding card methods have been investigated. To provide compatibility from classification point of view, AFCFP is suggested to consider a simplified Universal Decimal Classification, e.g. the first 6÷8 decimal digits (see U.D.C. manual).

Besides the UDC classification code, it is recommended to provide an in-house serial number per document, the same as per inventory list of publications, for example :

1325/3/83 e.g. Oil and Gas Journal (inventory no.1325)
Volume no. 3/1983

For a more accurate in-house classification system, which provide data retrieval on 5 levels, the following coding system is recommended for documents :

1.- Confidentiality - 1 character : 0 - AFCFP only
1 - AFCFP members and AIDO
2 - other users

2.- Printing language - 1 character : 0 - English
1 - Arabic
2 - French
3 - Other languages

3.- Source of data : - 1 character : 0 - Newspapers
1 - Journals/Periodicals
2 - Proceedings
3 - Special reports
4 - Books
5 - Other sources (microfilms)

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4.- Subject - 1 character :
- 0 - Fertilizer industry
- 1 - Agriculture and fertilizers use
- 2 - Oil and gas industry
- 3 - Mining industry
- 4 - Chemical industry
- 5 - Science and technology
- 6 - Industrial companies
- 7 - Industrial developments
- 8 - Economy
- 9 - Other subjects

5.- Topic (subdivision of subject) - 1 character

The document holding card system, as per any library unit practice, has to be organized on paper cards, comprising of :

- the classification number (UDC simplified decimal code);
- the in-house coding number;
- the author first name and family name;
- the title, original and translated in arabic;
- other standard references (page no, pictures no, tables no).

The holding card file should be generated separetely on journals, proceedings, reports, books, other publications, and should be sorted on :

- classification numbers
- author names
- subjectwise
- printed language wise

All input and output papers should generate manual updating operations in the holding card files.

The microfilm and microfiches should be included in the classification system for evidence and prompt manual retrieval actions.

No special technical facilities are required for classification system implementation (except UDC manual, paper holding cards, holding card shelves).

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The estimated effort for classification system implementation for the actual volume of APCFP documents is about 24 men-months.

The exchange of library oriented services with KISR, AIDO and other local data banks could be performed off line, using papers, abstracts, microfilms and microfiches in the frame of the above mentioned classification system. Although these organizations are provided also with computer facilities, KISR system is an IBM / 37o Computer, using a specialized library oriented software package-STAIR-for its own books collection (decimal classification system, author name, title selection on key words).Using a Texas Instrument accoustic coupler, KISR is accessing through telecommunication network the DIALOG-LOCKHEED services from USA and other data banks.

AIDO is provided with H.P. 3ooo/4o system using MINISIS specialized library software and is exchanging information with UNIDO - Vienna.

Both of these organizations are exchanging data on magnetic tapes (16oo bpi) and/or 5" diskettes, but only at the level of titles and author names, without abstracts data recorded in their data bases. Therefore one of the most convenient communication way with KISR and AIDO is the off line exchange of data e.g. reports, technical papers, microfilms, etc.

For accesing overseas data banks there should be undertaken the following actions:

- provision of a 3oo bps modem, connected to the existing CRT terminal for an accoustic coupler;
- selection of some actual data banks (Appendix 1) to be approached;
- establishment of a mutual agreement with the nominated data bank/company in terms of account number, passwords, manuals and other relevant information (already initiated with DIALOG/USA)

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- establishment of official agreements and authorization for passwords from Ministry of Communications at Kuwait (already initiated);
- training at KISR Centre in use of online DIALOG service about of two-three days duration, with updates needed on an ongoing basis (already initiated);
- provision of budget (about 1000-1500 KD/year) for initial password charges and than after for operation.

A part of the total AFCFP library papers as per engineers selection, will be processed by the computerized information system.

The preparation of data before entering the microcomputer is comprising of following steps:

- selection of papers /documents;
- preparation of abstracts for selected papers (bilingual)
- classification of selected papers (simplified decimal and in-house codes).

Out of the total estimated number of AFCFP papers (about 40,000) almost 20,000 are subject to computerized processing, e.g. 20,000 records with classification codes, author names, titles, abstracts, key words. Therefore, the technical requirements to support the library information services on computer basis are :

- external memory of about 40 MB;
- minimum two CRT terminals as working stations;
- library dedicated software, with file management facilities and data retrieval system on key words and logical operators (and,or) basis.

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The provision of suitable software package could be considered in two alternatives :

- self programming the package, from A to Z, in Assembler, Basic, Pascal and/or Cobol language. The estimated effort for software elaboration is 6-12 man-months.(See Appendix 2 for general solution.) Since APCFP is willing to be operational in few months, this alternative is not recomended (programming is also rather complicated);

- ready made dedicated software package,available or microcomputers, under various operating systems (CP/M80, CP/M86, MS/DOS,Radio Shark,etc) at very reasonable costs (about 200 US $). Since this alternative is considered one of the best,the DATAPRO 1983 Directory of Microcomputer Software has been investigated under the following topics :

- Computer Management Aids	MSC5-160-101
- Data Management and Data Beses	MS05-200-101
- Education	MS05-220-101
- Engineering and Scientific	MS05-260-101
- Graphics[x)]	MS05-330-101
- Management Science	MS05-380-101
- Mathematics and Statistics[x)]	MS05-420-101
- Word Processing and Text Editor	MS05-620-101
- Utility Programms(Indexing)	MS60-950-114
- Document Tracking Systems	MS64-100-102

x) - Also for statistical application purposes

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A number of 23 software products have been selected (see Appendix 3) based on some preliminary information on their facilities , required hardware confirguration (mainly CPU type and memory), supported operating system, distribution media, cost of installation. Out of these software programms only two have been finally selected.

- SUPERFILE from Texas, Austin FYI Comp, CP/M, 5.1/4" diskette, 195$
- BIBLIO INFO from IBM, UCSD Pascal, 8" diskette, 295$

Prompt actions have been already initiated to contact Texas, Austin software house, for programming package delivery and initial implementation during July 84 on the existing ISC system (CP/M) than after for utilization on new hardware facilities (hard disk of 4o MB, CP/M8o or CP/M86 or MS/DOS depending on final microcomputer selection).

Therefore, the actual way of entering data and operating the application is supposed to be explicitely given to AFCFP by the time of receiving the ready made software , according to the user's manual , during July-August 1984, under the next phase of project.

Since there is a large amount of data to be entered in the library computerized information system, strenghtening the actual AFCFP man power (1 librarian) by another librarian, to perform manual routine activities as well as for computer data base is a strong requirement.

C. Statistical information system

One of the most important activity of AFCFP engineers is to provide on periodical basis (quarterly and yearly) statistical reports for fertilizers industry and row materials in the Gulf region, on plant, company and country basis.

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Nevertheless , some other data on fertilizers industry for other developed and under developing countries are also required to perform this task.

The actual AFCFP studies for the last 3 years and a number of discussions with the statistics group, have provided the basis for establishing the concept of a computerized statistical data processing system.

The main outputs for statistical reports (Appendix 5) are :

a) Country/company/plant/year basis statistics :

- Existing and new fertilizers capacities (Table 1)
- Fertilizers capacities development (Table 2)
- Row materials reserves (Table 3)
- Production of end products, intermediates and row materials (Table 4)
- Consumption of end products, intermediates and row materials (Table 5)
- Export of end products, intermediates and row materials (Table 6)
- Import of end products, intermediates and row materials (Table 7)
- Estimated production of end products, intermediates and row materials (Table 8)
- Estimated consumption of end products, intermediates and row materials (Table 9)
- Estimated import/export of end products, intermediates and row materials (Tables 10,11)
- Estimated use of N, P_2O_5, K_2O (Table 12)

b) Row materials statistics on country/year basis (Table 13):

- Row material reserves
- Row material production
- Row material consumption
- Row material export/import

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- Estimated production of row material
- Estimated export/import of row material

Phosfate rock, sulphur, potash rock and natural gas are considered as row materials.

c) Final products statistics on country/year basis (Table 14) :
   - Existing and estimated capacities
   - Actual production
   - Export/import of final product
   - Consumption of final product
   - Estimated production
   - Estimated consumption
   - Actual and estimated surpus/deficit
   - Average actual and estimated consumption of N, P_2O_5, K_2O in Gulf region
   - Average actual and estimated consumption N, P_2O_5, K_2O in other world regions

d) Statistics of investments on country/year basis (Table 15):
   - Exiting investments
   - Replacement of investments
   - New investments

e) Manpower statistics on country/year basis(Table 16):
   - Actual and estimated manpower
   - Structure of manpower (administrative, technical, skilled labour force, nonskilled labour force)

According to the type, source and availability of data, Appendix 6 is giving the structure of data base and its entities, on three levels:

- Country data files (agriculture, import, export, other general data)
- Company data file(location, name, status, capital, etc)

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- Plant data files (general data, technical data, row materials, intermediates, end products, other engineering and operational data)

The main files are interconnected throughout the country, company, plant codes, as well as of end products, intermediates and row materials codes.

The content of files and the structure of their records is given in Appendix 7.

The initial input data are provided from 1983 statistical report and other technical papers, according to the files requirements without any preliminary transcription on any other input forms, using the CRT Keyboard, under the guidance of a conversational data entry programme.

The tasks of data entry programme are:

- to display on CRT the programme requirements and to accept data from keyboard :
  (e.g. TYPE COUNTRY CODE: 23
  TYPE COUNTRY NAME: Jordan)
- to check the quality of data entered by operator (e.g. for numerical data, range of values, etc)
- to create an intermediate (working) file on diskette

Intermediate (working) files should be sorted by SORT-utility or SORT-COBOL programmes to prepare the final file creation.

Programme for files creation should read working files on sequential basis and write data on index sequential output files.

Programs for files updation should accept data from keyboard, check the validity of data, insert new records, delete new records, update existing records in the data base.

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Programs for printing reports should access the corresponding files, perform certain data calculation, prepare the reports and print out various reports.

Programs for graphical drawings on CRT should access data files, perform certain data calculation and generate various graphics (mainly 3 patterns e.g. bars, charts and curves).

The programmes should be written either in COBOL or in PASCAL computer language, except graphics soft ware, which should use a dedicated language (B.G.S.-bussines graphics software)

The general logical flow diagrams of main programs are given in Appendix 5.

The actual actions to develope and implemant the software package for statistical applications should be :

- to generate detailed flow diagrams for each programme
- to write the source programmes
- to enter the programmes in computer library
- to test programmes with a limited but relevant set of data
- to modify and improve the quality of programms
- to generate the final programms library for current utilization
- to enter the actual statistical data and to create the data base
- to activate and run the programms with the actual set of statistical data (1979-1983)
- to update the data base and generate reports on user requirements basis.

The estimated programming efforts is about 6-8 man months; the technical facilities required to support the statistics applications are:

- 2 CRT working stations (colour, bilingual)
- 64-256 KB-RAM memory
- medium/high resolution graphical facilities

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- hard printer, 80-120 characters/line, 50-120 cps
- light pen option for menu selection.
- 4-8 pen plotter
- COBOL, PASCAL compilers
- data base management basic software (e.g. DBASE 2)
- utility programms (e.g. SORT/MERGE, file transfer)
- text editor software
- debugging software

The programer should references for some other details (e.g. maximum values of quantities, totals and subtotals, bilingual text, explanatory notes, etc) the 1983 Statistical Data Book, issued by AFCFP.

The screen and printer outputs patterns of final reports could be revised by AFCFP scientists, if necessary, before programming, than after generating reprogramming supplementary efforts.

D. Utilization of existing microcomputer and perspectives

AFCFP has been provided with a Word Processing System (WPS) which is an Intelligent System Corporation (ISC) microcomputer. The hardware/software facilities are :

- single user configuration
- CPU on 8080A microprocessor (8 bit/word)
- 64 KB-RAM memory
- colour bilingual 8063 CRT, low resolution hardware
- keyboard with dedicated WPS keys
- upper case and arabic character sets
- 8" dual diskette drive (2x350 KB)
- 50 cps bilihgual (dual head) printer
- SDC (Serial Data Communication) 9600 bps port
- CP/M operating system
- utility programms (DUP, DDT, SYSGEN, DUMP, LOAD, etc)
- Word Processing System Software

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- Basic 8o languages
- Assembler language
- Contert editor

The only existing documentation which has been provided along with the microcomputer was the WPS user's guide. After discussions with Towell Corp., a new set of manuals have been given to AFCFP:

- Basic 8o - Reference Manual
- Dynamic Debugging Tool - User's Guide
- Text Editor - User's Manual
- CP/M User's Guide; CP/M Interface Guide;
- CP/M Alteration Guide
- Introduction to CP/M-Features and Facilities
- CP/M Assembler User's Manual
- Intercolour 8o63 CRT User's Manual

The actual configuration allows the user to perform a large number of secretarial dedicated jobs only. The WPS software and hardware include specific programmable and programmed task for typing letters organising and accessing standard WPS files, transfering and updating in WPS files according to the typical secretarial activities.

Therefore the actual WPS system could be utilized only for such jobs by AFCFP staff. Besides such stand alone utilization, the envisaged new hardware/software facilities (Appendix 9) will allow the system to be:

- connected to the other CPU, for transfering data
- from/to diskettes and hard disk (library and statistical applications);
- connected to overseas data banks, throughout a 3oo bps modern or accoustic coupler (library application)
- utilized as a working station to enter data access files, updatd files, displaying output data (reports, graphics) for library and statistical applications

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- operated as a multiuser system
- utilized for graphics (statistical application) with high resolution firmware facilities.

Due to the expected micro computer powerful confirguration and complex user's applications, although the user software will be developed and implemented in a certain period of time, AFCFP is strougly recommended to appoint a person with computer background and some experience, with permanent computer oriented duties (already initiated by AFCFP Secretary General Dr.Abu Khader).

E. Additional hardware/software evaluation

The system analysis of AFCFP library and statistical activities revealed the basic requirements for additional hardware and software and accordingly, the Technical Specification for new microcomputer facilities has been prepared (Appendix 8).

A large variety of micro computers commercialized by local agents and agencies are available on Kuwait market.

The most representative companies have been investigated, namely ISC Data Vue, IBM P./C, Ollivetti /M2o, Borroughs /B26, NCR/DMV, Data Point, DEC/PDP.

Technical discussions and meetings have been organized to provide data on AFCFP requirements and to collect proposals and quotations on hardware and software facilities, as well as technical and commercial documentation on various microcomputers (existing at AFCFP library).

Out of companies proposals, some time exceeding the minimum requirements of AFCFP, a selection of equipment and software packages has been conducted, thenafter the evaluation of various alternatives. The summary of these findings have been presented in Appendix 9.

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Note that Data Point Company did not send quotations for the time being, and DEC/PDP mini computer exceeds the available budget.

A step by step enlargement of the existing ISC/WPS machine have been deeply discussed with the same company and its 8 proposals and quotations were summarized in Appendix 1o.

Major factors for evaluation of various alternatives have been considered :

- to meet all or the majority of AFCFP requirements (Appendix 8)
- to be compatible with the existing microcomputer, therefore to allow connections and multiuser operation
- to provide software compatibility at the level of operating systems, data file management, input/output interface with the other microcomputers
- to provide compatibility at the level of magnetic media (diskettes format, density)
- to accept standard communication protocols at the level of input/output hardware ports (minimum RSC 232)
- to allow further hardware/software extension
- to offer high level programming language facilities
- to be cost effective
- to provide efficient programming support to AFCFP for development and implementation of its applications (statistics).

The technical advertising material(at AFCFP Library) and the quotations, with limited validity(of 3o-6o days from the date of issue) are giving details on hardware and software facilities offered by the above mentioned companies.

From technical and economical point of view AFCFP is suggested to take into consideration the companies /microcomputers:

ISC/Data Vue, IBM/PC-XT, NCR Decision Mate V

although the last one is not providing any practical technical support for software interface with the existing ISC micro computer,

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since these systems are cost competitive and effective at almost same level,(bilingual, external memory, graphics on high resolution, good software background and applicability.)

Due to the time interval between the preliminary investigations (april-may 1984) and the actual contracting procedures, after UNIDO/UNDP budget authorization (most probably July-August 1984) as well as due to limited validity of quotations,

AFCFP should finally decide the only one Contractor out of three, based on delivery time, programming support, revised prices, maximum discount offered by the company and warranty period (e.g. company programmers might not be any more available, company price policy is changing, company might enter the boycot list, delivery time might be changed according to some components shortage ,etc).

F. Training activities

According to the existing ISC system and the envisaged hardware and software additions, a number of 6 lectures have been prepared and delivered to AFCFP personnel.

The main topics covered by training program were:

- main developments and trends in micro computers arhitecture ;
- basic micro computer system structure ;
- basic concepts on programs and programming languages ;
- peripherals and "three-state drivers" concept ;
- microprocessor and memory chips connections (signals) ;
- memories (ROM, RAM) ;
- number systems (decimal ,digital, octal,hexadecimal) ;
- software fundamentals, flowcharts ;
- programming languages, evaluation(examples on BASIC, ASSEMBLER, machine coding facilities) ;

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- COBOL 80 microsoftware main programming instructions
- case study on logical flow diagram preparation and COBOL programming (reading magnetic tape input data file, data calculation, index sequential disk file creation, printing output report).

The technical support of lectures is presented in Appendix 11 and copies have been distributed in advance to AFCFP personnel. Hardware and software details are available at AFCFP (the set of ISC manuals).

There should be a good opportunity for AFCFP staff to attend training lettures delivered by hardware contractor company after installation of new facilities, with respect to system operation. Therefore companies have been requested to incorporate a special treining program in the frame of hardware/ software contract.

Since experience in understanding and operating the microcomputer could be accumulated only by practicing, there should be a continuation of lectures and a direct involvment of AFCFP personnel in the preparation of various logical flowdiagrams and coding software programms for statistical applications.

As a matter of fact, valuable experience and knowledge might be aquired through a convenient fellowship program in similar organizations in Gulf region countries and developed countries.

The schedule of fellowships could be arranged according to AFCFP tasks and personnel availability, during september-84-august 85, for Secretary General (1), Deputy Director(1), Statistical department engineers (2), Library officer(1),

A proposal of a fellowship program is presented in Appendix 12. A list of contacted companies and persons is presented in Appendix 13.

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II.- R E S U L T S

A.- Finding and results

Among the main findings and results of mission, one might mention the followings:

- Clarification of actual and potential facilities of the existing ISC/Word Processing Systems.
- Provision of a complementary set of technical documentation for the existing ISC/WPS System.
- Evaluation and proposal for a classification system for library documents (simplified UDC and in-house coding); as well as for a card holding system ;
- Evaluation of hardware and software requirements for library information system.
- Investigation, selection and proposal for some ready-made software packages for library application.
- Evaluation of technical requirements and procedures for accessing overseas data banks (Lockhead Dialog USA and others), as well as exchange of data with KISR Kuwait and AIDO Baghdad.
- Evaluation of hardware and software requirements for statistical information system.
- Preparation of basic concept for statistical data base, data files structure, input/output data and reports.
- Elaboration of general logical flow diagrams for statistical programms and recommendation of data processing and data file management techniques.
- Evaluation and price analysis of new hardware and software requirement and recommendations for selection.
- Preparation and distribution of technical supports for 6 lecturers, and delivery of lectures to AFCFP personnel.
- Evaluation of other AFCFP technical requirement and recommendation for selection (e.g. vido/audio equipment, head projector, photo camera, microfilm and microfiches readers, accessories).

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- A good exchange of technical opinions and experience with AFCFP personnel and computer companies during joint meetings
- Preparation of a Preliminary Report to evaluate the necessary budget for new equipment, software, technical documentation and expedite the implementation activities.
- Evaluation of new training programms for AFCFP staff under UNDP/UNIDO fellowship in Gulf countries, Europe and USA.

B.- Utilization of results

- The evaluation of hardware and software requirements for AFCFP computer application have been preliminary processed for budget authorization at Vienna UNIDO centre and further will be utilized for final selection and contracting the equipment.
- The suggested classification system for library will be implemented during the next period of time.
- Evaluation of library software has been allready utilized for preliminary contracts with the software house and will be implemented actually in AFCFP computer library system next 2 months.
- The basic concept of statistical data base and computer data processing will be utilized starting June 84 for coding programms and implementation on microcomputer, then after for running the application of AFCFP staff.
- Evaluation of video, audio , photo equipment will allow authorization of budget and the procurement of such facilities, giving to AFCFP the opportunity to improve substantially the exchange of technical data with similar companies and other organizations in the field of fertilizers utilization.

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- Training programme has been considered very useful as a background required by AFCFP staff for an efficient utilization of microcomputer and will be utilized for implementation and running the computer application.

- A considerable positive influence and better practical results are definitely expected in the next future after implementation of study tours programme for AFCFP staff.

III. C O N C L U S I O N S

AFCFP is playing an important role in the field of fertilizers industry, market and promotion, therefore strenghtening its activity by computer oriented activities . have been considered as a primal objective.

AFCFP library is expected to be the focal point in collecting, recording, distributing the most valuable data in the fertilizers production and utilization. The number of papers, documents, reports, handled on yearly basis is large and is increasing continuously.

A considerable part of these data are requested to be handled by microcomputer facilities, therefore suitable hardware and software components should be considered to give AFCFP the opportunity to complete its tasks at the best level.

Under UNDP/UNIDO guidance and technical projects there are certainly good premises to rich this objective taking also into consideration the real willingness of AFCFP to perform and implements courageous programms.

Statistical data processing and reports should be considered to be one of the most important AFCFP activity, with respect to GCC couhtries and also some other developed and underdeveloped regions.

The large volume of data as well as the processing time requested to elaborate statistical output reports, are good reasons to vote for microcomputer utilization, all the more AFCFP has been requested to enlarge its activity and rise the quality of work.

Nevertheless, the provission of ISC microcomputer at AFCFP premises should be considered as a vefy good starting point, as well as the training attended for Word Processing System by some of Arab Federation Staff.

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Library information and statistical information systems requires larger storage capacity, specialized software and elaboration of a good number of user's programms, therefore the actual two months mission and the continuation part could be considered the right actions for designing and implementing computerized systems.

A good co-operation and exchange of views with AFCFP staff provided a solid basis for projects development and mutual understanding.

The local microcomputer market, with a large number of companies and a good variety of systems has given the possibility of joint discussions, technical data evaluation, provision of hardware and software documents and quotations.

Since there was no experience in the microcomputer utilization except WPS operation, a suitable training programme has been considered the right way to make AFCFP staff to be more familiar with computer architecture, languages, hardware/software facilities and utilization. This starting point will be continued during the second part of project by direct involvment of Arab Federation personnel in implementation of library and statistical applications.