ESTABLISHMENT OF

AN ETHIOPIAN WATER INFORMATION AND DOCUMENTATION CENTRE
in the

WATER RESOURCES COMMISSION

of the

GOVERNMENT OF ETHIOPIA

report by

J. Stephen Parker

IRC INTERNATIONAL WATER AND SANITATION CENTRE

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0. INTRODUCTION

0.1 This report on the development of information management in the Water Resources Commission of the Government of Ethiopia has been prepared by the IRC International Water and Sanitation Centre, at the invitation of the Commissioner for Water Resources, as a contribution to the development of the water sector in Ethiopia. The letter of invitation requested the IRC consultant:

> to formulate a project on establishment of a documentation centre at the Arba Minch Water Technology Institute.

0.2 In preliminary discussions with the Commissioner and senior members of the staff of the Commission, it was learned that the aim was, in fact, to establish a national documentation centre for water resources, for which the Arba Minch Water Technology Institute had been proposed as a possible site. This report accordingly addresses the question of the suitability of the Institute as a site for the proposed documentation centre, as well as practical questions relating to its establishment and development.

0.3 This report may be said to have its origins in the Regional Tutors' Seminar organized by the African Medical and Research Foundation (AMREF) in Nairobi in December 1989. During the course of the seminar, IRC indicated its willingness to assist the countries represented there in formulating project proposals relating to information management. It was as a result of this that the invitation to undertake the present assignment was issued.

0.4 The AMREF Environmental Health Unit, which hosted the Nairobi seminar, also has responsibilities with regard to information development in the water supply and sanitation sector in East Africa, particularly in the area of technical information. AMREF's _Plan of Operation, 1990 to 1991_ provides for it to assist member countries in establishing focal points for the dissemination of technical information on water supply and sanitation. In view of this, IRC indicated, at the Nairobi meeting, that any assistance which it might offer in this field would, wherever possible, be provided in close cooperation with AMREF. Although the present assignment was carried out exclusively by IRC, the consultant's findings and conclusions were discussed with the Senior Information Officer of the AMREF Environmental Health Unit at a meeting in Nairobi on 24 March 1990, and the draft report was later submitted to AMREF for comment. These comments have been taken into account in producing the final text.

Any errors and omissions in the report, however, must be considered the responsibility of IRC.

0.5   In submitting this report, IRC would like to express its thanks to the Commissioner for Water Resources, Mr. Aragaw Tiruneh, and his staff, for the opportunity to carry out this assignment and for the help and support they provided. It is hoped that this report, and, in particular, the project proposals for the development of technical information management capabilities in the Water Resources Commission contained in Appendix A, will help to provide a basis for such development and be a useful contribution to the development of the water supply sector in Ethiopia.

1. THE WATER RESOURCES COMMISSION

1.1 The general objective of the Water Resources Commission (originally established in 1981 as the National Water Resources Commission) is to give central guidance in, and ensure the optimal utilization of, the inland water resources of Ethiopia. It has overall responsibility for making proper provisions for adequate supplies of suitable water for irrigation and domestic use and adequate facilities for drainage, the safe disposal of human waste and industrial effluents, and the control and prevention of pollution and disease. The Commission's headquarters are in Addis Ababa. Its responsibilities in respect of specific aspects of water resources are discharged through three autonomous authorities, one specialized agency and one training institution, as indicated below.

1.2 The Water Resources Development Authority (WRDA) was established in 1981 as an autonomous government organization responsible for conducting studies regarding the utilization, administration, regulation, protection and allocation of the country's inland waters, and for supervising in detail the implementation of government policies and plans for water resources development. The Authority's headquarters are located in the same building as the headquarters of the Water Resources Commission in Addis Ababa.

1.3 The Water Supply and Sewerage Authority (WSSA) was established in 1981 as an autonomous government organization with responsibility for providing water supply and sewerage services in all parts of Ethiopia, except the city of Addis Ababa and such other urban centres as may be considered by the Commission to be capable of running their own water supply and sewerage services. At present, only the city of Asmara has been so designated. The headquarters of the Authority are located in the same building as those of the Water Resources Commission and the Water Resources Development Authority in Addis Ababa.

1.4 The Ethiopian Water Works Construction Authority (EWCCA) was established in 1980 with responsibility for the centralized design and planning of water works (especially dams, irrigation and water supply works) and for helping encouraging and organizing self-help programmes for the construction, modification and maintenance of small water-works. The Authority's headquarters are located in the same building as those of the Water Resources Commission, the Water Resources Development Authority and the Water Supply and Sewerage Authority in Addis Ababa.

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1.5   The <u>National Meteorological Services Agency</u> (NMSA) was
        established in 1980 as an autonomous public agency
        responsible for providing meteorological services,
        controlling air pollution and discharging Ethiopia's
        international obligations regarding meteorological
        activities. The Agency's headquarters are located in
        Addis Ababa in a building some distance away from that
        housing the headquarters of the Water Resources
        Commission and the three water authorities.

1.6   Ethiopia is divided for administrative purposes into
        fifteen regions. For water resources purposes, however,
        these have been reduced in number to eight. The Water
        Resources Commission itself has no regional offices at
        present, but plans to establish them in the near
        future. The Water Resources Development Authority also
        has no regional offices, but maintains a number of
        field offices at project sites. The Water Supply and
        Sewerage Authority has seven regional offices, located
        in the same towns as seven of the eight regional
        offices of the Ethiopian Water Works Construction
        Authority. In some towns, the regional offices of these
        two authorities are in close proximity, but in others
        they are some distance apart.

1.7   The <u>Arba Minch Water Technology Institute</u> is
        administered by the Water Resources Commission but its
        academic standards and curricula are governed by the
        Commission for Higher Education. It began its academic
        programme in September 1986 and now has about 500
        students, 82 academic staff and 126 administrative
        staff. The academic programme comprises courses at
        diploma, advanced diploma and degree level in hydraulic
        engineering, irrigation engineering and sanitary
        engineering as well as in meteorology, basic sciences
        and the humanities.

1.8   The Institute is located near the town of Arba Minch
        some 500 kilometres South West of Addis Ababa. The last
        200 kilometres of the road between the capital and Arba
        Minch are unpaved, and the journey by car takes eleven
        hours. There are two flights a week between Addis Ababa
        and Arba Minch, by an 18-seater DHC-6 Twin Otter
        aircraft. The Water Technology Institute has no telex
        or fax facilities at present.

1.9   In addition to the water authorities of Addis Ababa and
        Asmara, there are several international and foreign aid
        agencies and non-governmental organizations active in
        the sector. The activities of these bodies are not
        considered in this report.

2. A PREVIOUS STUDY OF THE PROBLEM

2.1 Introduction

2.1.1 A study on the establishment and development of an information and documentation system for the water resources sector in Ethiopia was carried out in November 1987 by a consultant provided by Unesco within the framework of its Water Sciences Information and Documentation Assistance Programme.

2.1.2 The terms of reference for this assignment required the consultant to undertake a two-week mission to advise the National Water Resources Commission (as the present Water Resources Commission was then known) on the most effective way to operate its documentation centre. The consultant's report was to include a review of the present status of the Commission's library and documentation centre and a plan and programme to improve the situation within the context of the ten-year perspective plan.

2.1.3 In introducing her report, the consultant noted that she had discovered during the assignment that the Commission's real expectations and requirements were for assistance in the establishment of a sectoral water-related information system aimed at meeting the information needs of users throughout the country. Her report was accordingly written within this broader context.

2.2 Background

2.2.1 The report contains useful background information on the water sector in Ethiopia, on the infrastructure of scientific and technical information in the country and on the nature and scope of scientific and technical information activities in general. However, it provides very little information on the existing situation of information provision in the water resources sector in Ethiopia, and very few concrete proposals for development.

2.2.2 Only one page of the report is allotted to a description of the existing information situation in the sector in Ethiopia. The main problems noted are a complete lack of a regular budget for library acquisitions, particularly of professional journals, and lack of skilled and trained information manpower.

2.3 Objectives, strategy and priorities

2.3.1 In discussing the planning of an information and documentation system for the sector, the report outlines briefly and in general terms the purpose of a specialized information system for the sector, the

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nature of water resources information and the main functions of an information and documentation centre. It goes on to identify, again in general terms, organizational, functional, training and linking objectives for improving the availability and accessibility of information.

2.3.2　Only when it comes to outlining a strategy for attaining these objectives does the report put forward proposals specifically related to the Ethiopian situation. It identifies the first step in this process as "locating the sources and users of water resources information". Under this heading, the report states that:

> The existence of the Water Technology Institute in Arba Minch, with the broad spectrum of its educational and research tasks and library facilities ... justifies the idea of making it a focal point for information and documentation activities in the water resources sector. (p.24)

2.3.3　The report goes on to note that engineers working in the regional offices of the various water authorities are also in need of information and documentation, and proposes that:

> the development of relationships between the Centre in the WTI in Arba Minch and the Regional Units merits considerable attention. (p.24)

At least some of the existing regional units, the report suggests, should be upgraded to be able to take an active part in the development of the system.

2.3.4　With regard to information provision in the headquarters of the Commission and the various authorities in Addis Ababa, the report says only that:

> the Headquarters of the NWRC ... have also some modest library facilities which ought to be strengthen [sic] and firmly linked (particularly due to its location and hence the importance) with the focal and regional points to constitute an interrelated system ... . (p.25)

2.3.5　Priorities for action are identified as the regular provision of the leading water resources journals and the training of staff in computer science and electronic information handling techniques.

2.3.6　An "immediate workplan" outlining practical steps to be undertaken immediately, proposes, first, the collection of project reports and their inclusion in a computerized bibliographic database. It is suggested that this be carried out by the library of the Arba

Minch Water Technology Institute, two small libraries
at the Commission's headquarters in Addis Ababa, and
the library at the "Southern Region Head Office" [in
fact, the Southern Regional Office of the Ethiopian
Water Works Construction Authority] in Awassa. The
library in Arba Minch should be the focal point for all
information and documentation activities of the
Commission.

2.4   Hardware and software

2.4.1   The report's recommendations with regard to equipment,
        techniques and software propose the use of IBM PC or
        compatible microcomputers, the adoption of the
        bibliographic data input sheet developed by the
        National Scientific and Technological Information and
        Documentation Centre, and the installation of the
        CDS/ISIS (Computerized Documentation System/Integrated
        Set of Information Systems) software developed by
        Unesco. The software is described in some detail in an
        annexe to the workplan.

2.4.2   It should be noted here that the CDS/ISIS software as
        such is designed for use on mainframe computers, and
        that it is the companion Mini-micro CDS/ISIS software
        (mentioned briefly in the annexe) which is designed to
        run on IBM PC and some other microcomputers. It should
        also be noted that, while Mini-micro CDS/ISIS is used
        at ILCA, PADIS and NSTIDC, as stated in the report,
        these institutions all use MINISIS, a related software
        package designed specifically for use on Hewlett
        Packard HP-3000 series computers, for their own
        bibliographic databases.

2.5   Staff

2.5.1   Dealing with staff requirements, the immediate workplan
        refers to the need to recruit scientific and technical
        professionals, as well as librarians, and suggests that
        the Commission should designate a graduate Project
        Manager with a water resources background, managerial
        experience and a good knowledge of information and
        documentation processing techniques. The person
        selected could receive training in these techniques at
        ILCA or PADIS. The remaining staff could be recruited
        from among the staff of the existing libraries and of
        the Public Relations Department (of the Commission).
        Engineers and other professionals could also be
        involved in the indexing and abstracting of documents.
        The report gives no indication of the numbers of staff
        required at different levels or in different units,
        noting only that:

            It is difficult to specify the number of staff
            required by any one centre as this depends on the
            volume of work and services envisaged.

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The workplan concludes by proposing the creation of a Steering Team to ensure coordinated implementation of the project.

2.6   Long-term planning

2.6.1   The final section of the report, dealing with long-term planning, outlines some recent trends and techniques in information and documentation processing which might affect the operation of the proposed information system in the future, and emphasizes the need for the Project Manager and the Steering Team to develop an action plan covering several years.

2.7   Conclusion

2.7.1   The provisions of this previous study have been described here in some detail because it is clearly desirable, if possible, to base the present proposals on the findings of such a recent study of the same question, rather than to start again from scratch. In general, the proposals put forward in the Unesco consultant's report, though somewhat unstructured and lacking in detail, provide a sound basis for the more specific proposals put forward in the present report, and are referred to at appropriate points in the text below.

2.7.2   The earlier report does not however, seem to give proper consideration to one important topic, namely that of the location of the focal point of the system in relation to the locations of the principal groups of users. This omission seems to be due to an over-emphasis on the information needs of education and research in the sector, and a consequent neglect of the needs of practitioners. This in turn may be due to a failure to analyze in sufficient detail the nature of information provision and needs in the water resources sector.

2.7.3   The next section of this report attempts to outline the structure of information provision in the sector in general, as the basis for an analysis in the succeeding section of the implications of this structure for technical information provision in the Water Resources Commission in Ethiopia. This analysis in turn provides the foundation for the concrete proposals for future development which are presented in Appendix A below.

3.   INFORMATION IN THE WATER AND SANITATION SECTOR

3.1   The importance of information as a key element in the
      success of activities in the water and sanitation
      sector has been recognized at the international level
      by the Steering Committee for Cooperative Action for
      the International Drinking Water Supply and Sanitation
      Decade, which has identified four major areas of
      information activities in the sector, namely:

            Project and Sector Information
            Management Information Systems
            Technical Information Exchange
            Public Information and Promotion.

3.2   Project and Sector Information (PSI) embraces general
      information and statistical data on the water supply
      and sanitation sector in the country as a whole, and
      information on completed, ongoing and proposed projects
      in the sector, at all levels. It is used primarily by
      planners and policy-makers, both in the country and in
      external support agencies, international organizations
      and research institutions.

3.3   Project and Sector Information is concerned mainly with
      data relating to the sector as a whole, and thus
      provides, for example, aggregations at the national
      level of data derived from specific management
      information systems at the sub-sectoral, institutional
      and project levels. A prerequisite for the development
      of an effective PSI system is therefore the existence
      of effective systems for collecting, processing,
      storing and retrieving data and information at these
      lower levels.

3.4   Management Information Systems (MIS) deal mainly with
      internally-generated information and data relating to
      the planning, administration, day-to-day operation,
      management, performance and evaluation of specific
      institutions, organizations, programmes and projects in
      the sector. They are concerned with

      (a) information needed to manage the resource (e.g.
          water, health)

      (b) information needed to manage the institution.

      Every institution, organization, programme or project
      in the sector requires its own MIS designed to meet its
      own specific needs, though in some cases one MIS - for
      example, that for a specific project - may in practice
      be a subsystem of one or more larger ones - for
      example, that of the institution managing the project,
      or that of the contractor responsible for implementing
      it.

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3.5   Information dealing with, or needed for, the <u>management of the resource</u> relates to:

(a) <u>water resources</u>

including: hydrogeological, meteorological and hydrological data, information on the protection and development of water resources, etc.

(b) <u>water demand and water use</u>

including: population data, coverage data, service applications, records of consumption, cost recovery data, health impact data, etc.

(c) <u>water supply</u>

including: borehole records, well records design and construction records, operation and maintenance data, water quality data.

3.6   Information dealing with the <u>management of the institution</u> relates to:

(a) <u>personnel</u>

personnel records

(b) <u>physical facilities</u>

equipment records, stores records, records of upkeep of buildings, etc.

(c) <u>finance</u>

accounting records, financial plans, budget estimates, etc.

3.7   Some categories of information, for example, records of meetings, development plans, etc. may deal both aspects.

3.8   The <u>formats</u> in which these various types of information are presented include:

(a) forms of various kinds
(b) graphs, charts and diagrams
(c) maps, plans, engineering drawings
(d) specifications and standards
(e) contracts
(f) letters, telexes, memoranda
(g) minutes of meetings
(h) technical reports, etc.

3.9   <u>Technical Information Exchange</u> (TIE) involves the transfer between individuals and institutions of

information capable of being applied - if necessary, after adaptation to local needs - in more than one situation. It thus deals with information relating to problems and solutions, methods and techniques, the results of research and field studies, sources of equipment, expertise and materials, and so on. Technical Information Exchange may be characterized by its _aims_, which are to _transfer_ information, data, knowledge and experience from one location to another in which they may be applied according to local needs. Virtually every institution in the sector _needs_ technical information to enable it to benefit from the experiences of others, and also _generates_ technical information which would be of benefit to others.

3.10   Technical information, reporting on experiences elsewhere which may be relevant to operational needs may deal with any of the topics above, but from a different standpoint. The most common formats in which such information is presented are:

(a) reports
(b) books and pamphlets
(c) periodical articles
(d) conference papers
(e) audio-visual materials.

3.11   Public Information and Promotion (PIP) is in a different category from the others outlined above, in that it is directed at the general public rather than other sector professionals, and aims to develop awareness, improve motivation and change behaviour in relation to water supply and sanitation, rather than provide information for use as a tool in carrying out technical or managerial activities in the sector.

3.12   These four categories of information activity in the water supply and sanitation sector are not mutually exclusive. Thus, for example, data included in a PSI system may be derived, at least in part, from the processed outputs of several MIS in the sector, and national indicators and growth forecasts generated by a PSI system may be used as inputs to a MIS for planning purposes. Similarly, data derived from MIS may, after suitable repackaging (for example, in the form of a report or periodical article), be made available to others through TIE facilities; and information distributed in this way may be further repackaged (for example, as a radio broadcast or brochure) for use in PIP.

3.13   In accordance with the terms of the invitation from the Commissioner for Water Resources to undertake this study (see para 0.1 above), the remainder of this report deals mainly with technical information in the

Water Resources Commission, the three authorities and the Arba Minch Water Technology Institute.

4.   TECHNICAL INFORMATION PROVISION IN THE WATER RESOURCES COMMISSION

4.1   Introduction

4.1.1   This review of the existing situation with regard to technical information provision in the Water Resources Commission is based on only brief discussions with senior staff in the various authorities, in the Commission itself and in the Arba Minch Water Technology Institute. It is hoped nevertheless, that it provides a reasonably accurate general picture of the situation.

4.2   The Water Resources Commission

4.2.1   The Water Resources Commission itself has one small library, housed in cramped conditions on the fifth floor of the headquarters building in Addis Ababa and containing a collection of about 10,000 books and technical reports. The library has a staff of one library assistant holding a para-professional diploma in library studies from the Department of Library and Information Studies at Addis Ababa University, and one clerk. The present library assistant will shortly be moving to another unit of the WDD and steps are being taken to recruit a replacement. The library has no recurrent budget for acquisition of books and periodicals (apart from local newspapers) and the only new books and current periodicals received are donations. The library is not properly catalogued; the only record of its contents (which is in any case incomplete) is a simple listing, without indexes, on sheets of paper.

4.2.2   The collection of reports, though not comprehensive and not up-to-date, is nevertheless quite extensive, and constitutes a valuable information resource.

4.2.3   The Commission's archive (registry) through small, appears to be well organized.

4.2.4   Throughout the offices of the Commission, and of the various authorities attached to it, large numbers of technical reports, research reports, project documents and books, and a few current periodicals, are to be found on the desks or bookshelves of officials. No records of the existence or locations of these documents are maintained anywhere in the organization.

4.2.5   A small collection of audio-visual materials is held by the Public Relations Department, which also has some audio-visual equipment.

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4.3   Ethiopian Water Works Construction Authority (EWCCA)

4.3.1   Lack of access to documentation is regarded as a big
        problem in EWCCA. The only library in the Authority is
        a small one at its Southern Regional Office in Awassa,
        which has been developed with support from the Canadian
        International Development Agency (CIDA). This library
        has a small collection of up-to-date books and
        technical reports and is creating a bibliographic
        database of these materials on a Zenith laptop
        computer, using the dBase IV software package. The
        library is run by a library diploma holder (see para
        4.2.1. above). Neither the headquarters nor any of the
        seven other regional offices of the Authority has a
        library. An attempt to establish a documentation centre
        for project documents, contracts, etc. at the
        headquarters is being hampered by lack of space.

4.3.2   Headquarters staff have access to the WRC library in
        the same building, but find that much of its collection
        is too theoretical to meet their needs, and that the
        lack of current foreign periodicals is a serious
        deficiency. Some members of staff have their own small
        document collections and individual subscriptions to
        foreign periodicals, but find the latter difficult to
        maintain due to lack of foreign exchange.

4.3.3   The Chief Engineer of the Authority, when interviewed
        by the consultant, emphasised the need for overall
        planning of library, documentation and information
        facilities in the WRC and its constituent authorities,
        and considered that, since the headquarters staff of
        all these bodies have easy access to the WRC library,
        priority should be given to establishing library and
        documentation units in the regional offices of the
        various authorities rather than in their headquarters.
        The risk of overlap and unnecessary duplication of
        effort between the separate regional offices of
        different authorities located in the same town could be
        minimized by designating one as the principal centre,
        and the others as subsidiary centres in each case. If
        the proposal to establish regional offices of the WRC
        itself is put into effect, the principal regional
        library and documentation units could be located there,
        with the regional offices of the different authorities
        maintaining only small reading rooms. The number of
        potential users in the various authorities in each
        region is comparatively small, but these units could
        also serve the needs of users from other organizations
        working in the water sector.

4.4   Water Supply and Sewerage Authority (WSSA)

4.4.1   The headquarters of the Water Supply and Sewerage
        Authority has two small libraries, one on the first and

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one on the third floor of the headquarters building, and a documentation centre for project reports, etc. in the basement. The two libraries are to be merged in the near future. One of them comprises little more than one bookcase full of books and a table displaying a number of periodicals, located in a conference room. The other is a very small room, little more than a large cupboard. Both these collections are managed by one untrained member of staff. The lack of foreign exchange for acquiring documents from abroad is a major problem.

4.4.2   The documentation centre in the basement is slightly more spacious, but still extremely overcrowded. It is run by two untrained staff members. There is no catalogue or index of the collection, which contains only final reports on completed projects, not preparatory or working documents. The Chief Engineer of the Authority considers it a pressing need to rationalize these various document collections and create proper records of their contents to help avoid unnecessary duplication of effort in repeating studies which have already been carried out in the past.

4.4.3   The Authority has seven regional offices, none of which has a library.

4.5   Water Resources Development Authority (WRDA)

4.5.1   The Water Resources Development Authority has a small library at headquarters, run by a diploma holder. The Authority has no regional offices, but does maintain a number of project offices at project sites. The Authority depends heavily on documentation of various kinds to support its design, construction, operation and maintenance activities as well as its responsibilities in relation to water quality control, water rights and water changes. It lacks knowledge of how to organize collections of different kinds of documents, including project documents, confidential reports and drawings.

4.5.2   The Chief Engineer of the Authority, when interviewed by the consultant, proposed the creation of a general central reference library for the whole headquarters organization (the WRC, ECWWA, WSSA and WRDA), supplemented by smaller specialized collections in each authority's headquarters and desk reference collections for use by specific working groups. He pointed also to the need for a centralized document numbering system to provide an accurate means of identifying individual documents and document series. Such a system could also provide the basis for a reliable record of the documentary production of the WRC and the authorities.

4.6   National Meteorological Services Agency (NMSA)

4.6.1   The National Meteorological Services Agency has a small documentation centre, staffed by two library diploma holders (see para 4.2.1 above) and housed in very cramped conditions in its headquarters building. Some of the Agency's six regional offices also have small document collections. The Agency also maintains a data archive of climatological records. These are compiled manually and stored in hard copy, and the archive is very overcrowded. It is planned to introduce a computerized system for data processing in the near future, and to microfilm the historical records in order to save space.

4.6.2   It is expected that the Agency will absorb other government bodies concerned with other kinds of geophysical data in the near future, and possibly then change both its name and its status, becoming an autonomous body independent of the Water Resources Commission. For this reason, the information needs of the Agency are not considered further in this report.

4.7   Arba Minch Water Technology Institute

4.7.1   The Library of the Arba Minch Water Technology Institute is at present housed in temporary accommodation pending completion of a new library building which is now under construction. It is expected that GTZ, the aid agency of the Federal Republic of Germany, will finance the provision of furniture and equipment for the Library to the value of DM 500,000 (US$ 292,400) and provide books to the value of DM 50,000 (US$ 29,240). The library already has substantial collections of books received from foreign donors, many of which cannot be made available to users at present due to lack of space. It is hoped that the American Association for the Advancement of Science will provide a number of subscriptions to foreign scientific and technical journals in the near future.

4.7.2   The librarian of the Institute is at present studying for a master's degree in library and information science at Loughborough University of Technology in the United Kingdom. The Acting Librarian is a Canadian volunteer, also with a master's degree in library science. He is supported by a staff of five, of whom four are diploma holders. It is expected that GTZ will provide a library expert for a period of 12 man-months to assist in the layout of the new library, the establishment of the library system and the training of counterpart staff.

4.7.3   The new library building has a superficial floor area of about 1,800 square metres on two floors with a rooftop lecture theatre. The space available should be

adequate to meet the Institute's needs for some time to come, but the layout of the building leaves much to be desired. Staff work areas on the ground floor are too small, are divided into too many small rooms and lack easy access to the public areas. An area of 210 square metres on the first floor (20 percent of the total) is occupied by rooms designated on the plans as being intended for "diploma designing". No-one now connected with the Institute has any idea what is meant by this. There are no toilets for either staff or public use either at the rooftop level (for the lecture theatre) or on the first floor, and only two staff toilets (as well as separate public toilets) on the ground floor.

4.7.4   Proposals for improvements in the internal layout of the building, which it should be possible to implement without major alterations before construction is completed, are put forward in Appendix A.2 below. Sketch plans of the existing and proposed layouts of the ground and first floors are also incorporated in that section.

5. GENERAL CONCLUSIONS

5.1 Introduction

5.1.1 While the main concern of this report is with technical information as defined in section 3 above, it is clear even from the most superficial examination of the existing facilities for information provision in the Water Resources Commission that there are serious deficiencies and problems in respect of the supply of information concerned with the management of water resources and of information required for the management of the organization (the WRC, the three Authorities and the NMSA) itself, as well as in respect of technical information generated both inside and outside the organization. There appear to be no facilities at present for providing Project and Sector Information, and the facilities for Public Information and Promotion are very limited.

5.2 Project and Sector Information

5.2.1 As noted above (para 3.3) a prerequisite for the development of an effective PSI system is the existence of effective management information systems. The existing management information systems within the WRC are not operating effectively at present, and the essential basis for an effective PSI system is therefore lacking. When these systems are operating effectively the creation of a PSI system can be considered. At that time, the possibility of adapting the CESI (Country External Support Information) methodology for PSI, developed by the World Health Organization (WHO), to the Ethiopian situation, should be investigated.

5.2.2 Adequate documentary backup to a PSI system is essential if users of the aggregated data produced by the system are to be able, if they wish, to investigate specific topics in more detail. Such backup could be provided, in the case of Ethiopia, by the documentation centre which this report proposes should be established in the Water Resources Commission.

5.3 Management Information Systems

5.3.1 The WRC itself, each of its three constituent authorities, and each programme and project in the sector, needs its own management information system, designed to meet its own needs but fully compatible with the systems operated by the other elements of the organization.

5.3.2 The nature and extent of the needs for management information within the organization, and the kinds of services and facilities which must be developed to meet

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those needs, clearly call for further and much more detailed study.

5.4 Public Information and Promotion

5.4.1 The provision of this type of information is the responsibility of the Public Relations Department of the WRC and of similar departments in each of the three authorities. The WRC has identified a need for substantial improvements in its capacity to produce audio-visual materials and publications, and has proposed that provision for appropriate production facilities be incorporated in the proposed documentation centre.

5.5 Conclusion

5.5.1 This section of the report has attempted to indicate only in general terms the main needs in respect of Project and Sector Information, management information and Public Information and Promotion. Specific actions to be taken to meet these needs are outlined in section 7 below.

5.5.2 Conclusions in respect of technical information, which is the main concern of this report, are presented separately in section 6 below.

6.   CONCLUSIONS ON TECHNICAL INFORMATION

6.1   Introduction

6.1.1 All units of the organization need to participate in
       technical information exchange activities, which must
       be fully coordinated if they are to be effective. As
       noted above, this report is mainly concerned with the
       technical information needs of the organization, and,
       in particular, with the establishment of an effective
       documentation centre as the first step in the creation
       of an information and documentation system designed to
       meet those needs.

6.1.2 The planning and development of such a system and, in
       particular, decisions as to the location of the
       proposed documentation centre, must be based on a
       realistic appraisal of the technical information needs
       of different groups of users within the organization.
       In this regard, it is clear that the needs of the user
       community at the Arba Minch Water Technology Institute
       on the one hand, and those of users working in the
       Commission, the three Authorities and the NMSA, on the
       other, are substantially different and thus call for
       different responses in terms of the provision of
       information materials, facilities and services.

6.2   Technical information needs at Arba Minch

6.2.1 The main user groups at Arba Minch are students,
       academic staff, research workers and administrative
       staff. The needs of students are primarily for basic
       information on hydraulics, irrigation, sanitation and
       meteorology and the basic social and natural sciences.
       This information is presented in the form of textbooks,
       reference works, audio-visual aids and so on, all of
       which are already available in reasonable quantities
       and will continue to be provided in future under the
       library development programme.

6.2.2 Academic staff and research workers have little need of
       textbooks, but also need reference materials and, for
       some purposes, audio-visual aids, as well as materials
       on teaching and research techniques. They have a much
       greater need for scientific and technical periodicals,
       conference proceedings and the like, mainly published
       abroad, and, particularly for research purposes, some
       need for technical documents - field studies, project
       reports, etc. - produced within the country, often as
       part of the operational activities of the Water
       Resources Commission and its constituent bodies.
       Administrative staff generally need technical
       information on their own fields of specialization, e.g.
       accounting, and not on water-related topics as such,
       and are best served by special provision within the
       general library collections.

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6.2.3   Most of these needs, like those of students, can also
        be met by resources provided under the regular library
        development programme or through normal inter-library
        lending and document supply facilities. Providing
        access to locally-produced "grey literature" such as
        project reports generally requires separate and special
        provision which should certainly be incorporated into
        the library's development plans, for example in the
        form of a separate documentation unit for this type of
        literature. Such a unit could also serve the occasional
        needs of users outside the Institute for this kind of
        documentation.

6.3   Technical information needs in the Water Resources
        Commission

6.3.1   The main user groups in the Water Resources Commission
        and its constituent bodies are policy makers and
        planners, administrators, engineers, technicians,
        trainers and support staff, many of whom need access
        mainly to project and sector information or management
        information. In terms of technical information, policy
        makers and planners need access to key international
        journals in the field, while administrators need access
        to foreign literature on management topics. Engineers
        need externally-generated technical information on new
        methods and techniques, experiences in other countries
        and so on, but have a much greater need for internally-
        generated information directly related to their
        operational activities, in the form of field study
        reports, project documentation, specifications,
        standards, manuals and so on. Technicians also need
        access to some of this documentation, particularly
        specifications, standards and manuals. Support staff
        require access to externally-generated technical
        information on their fields of work, such as office
        administration.

6.3.2   Some of these needs, for example, for international
        journals, literature on management topics, information
        on new engineering techniques and so on, can best be
        met by a well-stocked conventional library with
        adequate foreign exchange resources to maintain an up-
        to-date collection of the mainly foreign literature in
        these fields. Such a library could also maintain
        collections of reports, project documents,
        specifications, standards, and manuals, thus developing
        into a documentation centre rather than a library.

6.4   Comparison of technical information needs

6.4.1   In summary, the main needs for technical information at
        Arba Minch are for externally-generated information
        (foreign books, journals, etc.), with an occasional
        need, mainly from research workers, for locally

generated information (reports, studies, etc.). These needs could best be met by a well-developed academic library with a special collection or documentation unit dealing with locally-generated information. The main needs for technical information in the WRC, on the other hand, are for locally-generated information (reports, studies, etc.) with some degree of access to externally-generated information (foreign books, journals, etc.). These needs could best be met by one or more specialized documentation units with a technical library component.

6.4.2 The needs of the two institutions, though they overlap to some extent, are thus essentially different, and could not be met easily, if at all, by a single library or documentation unit. This is emphasized by the geographical isolation of Arba Minch, on the one hand, and the wide geographical distribution of WRC staff, in the headquarters and regional centres, on the other. It is emphasized also by differences in the information-seeking and information-using behaviour of the two groups of users. Whereas the academic, and even more so the researcher, can often afford to wait for a needed document to be supplied from another location, or is accustomed and often expected to travel to other locations to consult information sources, the practitioner generally needs information - particularly internally-generated information - immediately to solve pressing operational problems. He cannot wait for days or weeks to receive a document from some other location, and does not have the time, nor is he expected, to travel to other locations to consult such documents.

6.4.3 It is difficult, finally, to conceive of the technical information needs of WRC staff, as outlined above, being met satisfactorily, if at all, by a documentation centre located at Arba Minch. On the other hand, some of the needs of users at Arba Minch, particularly researchers, could be met by a documentation centre located at WRC headquarters. Most of the needs of most of the users at Arba Minch could, however, be met for most of the time by the library at Arba Minch, providing that it contained a specialized documentation unit of the kind referred to above.

6.5   Conclusion

6.5.1 The nature of any proposals for the establishment of a national documentation centre for the water sector therefore depends on exactly what kind of documentation centre, serving what target groups of users, the Commission desires to create.

6.5.2 If the main aim is to serve the research needs of the sector, with incidental provision for the needs of

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practitioners, then the Arba Minch Water Technology
Institute is the most appropriate location. This aim
could probably be achieved, to a large extent, within
the framework of the existing project for the
development of the library at Arba Minch.

6.5.3   If the main aim is to serve the operational needs of
practitioners in the sector, with incidental provision
for the needs of researchers, then a documentation
centre at WRC headquarters, reaching practitioners in
the regions through a network of sub-centres, is the
right solution. This would require the launching of a
new project.

6.5.4   There seems to be no reason, in principle, why both
projects should not be pursued simultaneously. In this
case, it is suggested that the WRC documentation centre
should be designated as the national documentation
centre, forming the focal point, first of a
documentation system embracing sub-centres within the
WRC organization (including the centre at Arba Minch),
and subsequently of a national network linking this
system with other documentation centres concerned with
water resources. Specific actions to be taken in this
regard are outlined in section 7 below.

7.   RECOMMENDATIONS

7.1   Introduction

7.1.1   It is recommended that the development of information
        and documentation services for the water resources
        sector in Ethiopia be carried out under the overall
        direction and control of the Water Resources Commission
        in a phased programme providing for the development of
        technical information and documentation facilities,
        public information and promotion facilities, management
        information systems and a project and sector
        information system.

7.1.2   The main elements of each of the three phases proposed
        are outlined below. The project proposals attached at
        Appendix A relate to improvements in technical
        information management in Phase I only.

7.2   Phase 1

6.2.1   Technical information and documentation

        1.A.   Establishment and development of an Ethiopian
                Water Information and Documentation Centre
                (EWIDOC)

                The aim of this project is to establish EWIDOC at
                WRC headquarters to be responsible for providing
                technical information to WRC staff and others and
                to form the basis for the subsequent development,
                in Phases 2 and 3, of an Ethiopian Water
                Information and Documentation System (EWIDOS) and
                and Ethiopian Water Information and Documentation
                Network (EWIDON) respectively. A detailed
                proposal for this project is provided at Appendix
                A.1.

        1.B.   Establishment and development of the library and
                documentation centre at the Arba Minch Water
                Technology Institute

                This project provides for improvements in the
                internal layout of the new library building, to
                be implemented within the framework of the
                existing plans for completing, furnishing and
                equipping the library with support from GTZ.
                Detailed proposals and sketch plans relating to
                these improvements are presented at Appendix A.2.

7.2.2   Public information and promotion

        1.C.   Establishment of an audio-visual production and
                materials unit

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1.D.   **Establishment of a document production and distribution unit**

The Water Resources Commission has already prepared detailed lists of the equipment required for an audio-visual production and materials unit, and has the technical expertise available inhouse to prepare proposals for a document production and distribution unit. It is therefore proposed that the Commission itself should prepare detailed project proposals for the establishment of these units and their incorporation in EWIDOC.

7.2.3   **Management information systems**

1.E.   **Undertake detailed studies of the requirements of all units of the Water Resources Commission and the three constituent authorities for:**

(a) information needed for the management of water resources (hydrological data, drilling and construction records, etc.)

(b) information needed for the management of the organization (personnel records, correspondence, etc.)

These studies should be undertaken by suitably-qualified consultants.

7.2.4   **Project and Sector Information**

1.F.   **Undertake preliminary feasibility study of the requirements for Project and Sector Information in Ethiopia, with particular reference to the applicability of the CESI methodology**

Advice on the conduct of such a study should be sought from the CESI Secretariat at WHO headquarters.

7.3   **Phase 2**

7.3.1   **Technical information and documentation**

2.A.   **Establishment and development of an Ethiopian Water Information and Documentation System (EWIDOS) centred on EWIDOC and comprising:**

(a) documentation units/subcentres in the headquarters of each of the three Authorities

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(b)   regional documentation centres in the
         regional headquarters of the Water Resources
         Commission

   (c)   regional documentation units/subcentres in
         the regional offices of the three
         Authorities

   (d)   the library of the Arba Minch Water
         Technology Institute.

7.3.2   Management information systems

   2..B.   Establishment and development, at WRC
           headquarters and those of the three authorities,
           of management information systems for:

   (a)   management of the resource

   (b)   management of the organization.

7.3.3   Project and Sector Information

   2.C.   Establishment and development of a Project and
          Sector Information System.

7.4   Phase 3

7.4.1   Technical Information and Documentation

   3.A.   Establishment and development of an Ethiopian
          Water Information and Documentation Network
          (EWIDON) centred on EWIDOC and comprising:

   (a)   units of EWIDOS

   (b)   information and documentation units in other
         institutions in the water sector

   (c)   networking facilities and arrnagements
         linking these units with:

         (i)   NSTIDC

         (ii)   international and foreign information
                systems in the water sector.

7.4.2   Management Information Systems

   3.B.   Extension of the management information systems
          developed under 7.3.2. above to the regional
          offices of the WRC and the three authorities.

PROJECT 1.A. ESTABLISHMENT OF AN ETHIOPIAN AND WATER
              INFORMATION AND DOCUMENTATION CENTRE (EWIDOC)

1.   Introduction

1.1   This project has been prepared on the basis of a report
      on information management in the Water Resources
      Commission compiled by the IRC International Water and
      Sanitation Centre in consultation with the African
      Medical and Research Foundation (AMREF) in March, 1990.

1.2   Superscript reference numbers, thus: [1] refer to
      explanatory notes in section 7 of this Appendix.

2.   Development objective

2.1   To strengthen the capacity of the Water Resources
      Commission to apply the experience and knowledge of
      other water supply and sanitation institutions in other
      countries in the planning, establishment, operation and
      maintenance of effective and efficient water supply and
      sanitation facilities in Ethiopia.

3.   Immediate objective

3.1   To establish within the Water Resources Commission an
      Ethiopian Water Information and Documentation Centre
      (EWIDOC) capable of performing the following functions
      efficiently and effectively:

      (a)   identifying, locating, selecting, procuring,
            recording and preparing for use both national and
            foreign documents of various kinds;

      (b)   providing access to these documents, both:

            (i)   indirectly, by means of list of new
                  acquisitions, catalogues, indexes, etc;
                  and

            (ii) directly, through various arrangements
                  for access to the centre (opening hours,
                  etc.) and its collections;

      (c)   providing the following types of services to
            users, among others:

            (i)   answering enquiries, referring enquirers
                  to other sources of information;

            (ii) literature searching services;

(iii)   current awareness services;

                    (iv)   document delivery services;

          (d)   creating and maintaining:

                    (i)   a computerized bibliographic database of
                            national documents, both retrospective
                            and current;

                    (ii)   a computerized record of its own document
                            collections;

                    (iii)   a computerized union list of periodical
                            holdings on water supply and sanitation
                            in libraries and documentation centres in
                            Ethiopia;

                    (iv)   a computerized union catalogue of
                            national documents on water supply and
                            sanitation held in various libraries and
                            documentation centres in Ethiopia;

          (e)   preparing input to other national, regional and
                  international information systems;

          (f)   developing and controlling an Ethiopian Water
                  Information and Documentation System (EWIDOS)
                  comprising EWIDOC and other libraries and
                  documentation centres within the Water Resources
                  Commission and its constituent authorities at
                  regional level;

          (g)   developing and coordinating an Ethiopian Water
                  Information and Documentation Network (EWIDON)
                  comprising EWIDOS and documentation centres in
                  other institutions in Ethiopia.

4.   Strategy

4.1   To seek foreign technical assistance for the
       establishment of EWIDOC in the form of:

          (a)   the supply of an information management
                  specialist[1] for a minimum period of twelve
                  months, to initiate and develop the Centre and
                  its activities and train a local counterpart and
                  other local staff;

          (b)   the supply of information materials, including
                  books, periodicals, reports, maps, audio-visual
                  materials, etc. published outside Ethiopia for a
                  minimum period of three years;

          (c)   the supply of furniture, information processing
                  and storage equipment and supplies sufficient to

enable EWIDOC to operate effectively for a
minimum period of three years;

(d)   support for the provision of a national
        consultant[2] to advise on and monitor the
        planning, establishment and operation of EWIDOC
        and the eventual development of EWIDOS and
        EWIDON;

(e)   the supply of a vehicle for use by the
        information management specialist and other staff
        of EWIDOC;

(f)   the provision of training opportunities for the
        local staff of the Centre, including, where
        appropriate, fellowships for training and study
        tours abroad.

4.2   To complement the foreign technical assistance required
        by:

(a)   formally establishing EWIDOC as a unit of the
        Commission;

(b)   providing suitable and adequate accommodation for
        the EWIDOC;

(c)   recruiting a professionally-qualified librarian
        as head of EWIDOC;

(d)   recruiting other local staff with appropriate
        qualifications as required;

(e)   providing an adequate recurrent budget to enable
        UWIDOC to perform its functions properly,
        including regular provision for the purchase of
        locally-published information materials and an
        adequate foreign exchange component for the
        purchase of materials published abroad;

(f)   providing general administrative and logistical
        support to EWIDOC;

(g)   transferring the existing collections of the WRC
        Library to EWIDOC;

(h)   providing support, at an appropriate time, for
        the development of EWIDOS and EWIDON.

5.   Outputs

5.1   The main outputs of the project will be the provision
        of technical information, original documents or copies
        of documents containing technical information, or
        bibliographical details of documents containing
        technical information, originating from anywhere in the

world, to users in the water and sanitation sector anywhere in Ethiopia or in other countries.

6.   Inputs

6.1   Manpower

1 x   information management specialist (technical assistance)

1 x   national consultant (9mm/mm in 3 years elapsed time) (technical assistance)

1 x   librarian/head of EWIDOC

1 x   library assistant (technical services)

1 x   library assistant (user services)

1 x   library assistant (national collection)

3 x   library attendants

1 x   secretary

1 x   typist

1 x   driver

6.2   Training

At this stage, it is possible only to indicate in general terms the kinds of training required. They will include:

(a)   general orientation to information work;

(b)   basic technical training in library and documentation methods;

(c)   specific orientation to water-related information;

(d)   general training in the use of computers in information work;

(e)   specific training in the use of the Mini-micro CDS/ISIS software and of databases on CD-ROM (Compact Disc--Read Only Memory);

(f)   formal training for professional qualifications in information science;

(g)   management training;

(h)   development training (in interpersonal
       relationships, etc.).

6.3   Accommodation

    (a)   Accommodation for staff

        1 x office for information management specialist
           ($10m^2$)

        1 x office for national consultant ($10m^2$)

        1 x office for librarian ($10m^2$)

        3 x workspaces for library assistants
           ($3 \times 10m^2 = 30m^2$)

        3 x workspaces for library attendants
           ($3 \times 10m^2 = 30m^2$)

        1 x office for secretary ($10m^2$)

        1 x office for typist ($10m^2$)

        1 x workspace for driver ($5m^2$)

        TOTAL for staff: 105m^2

    (b)   Accommodation for readers

        20 x reading spaces @ $2.3m^2$ = 46m^2

    (c)   Accommodation for collections

        Space for 20,000 documents @ 200 per m^2 = 100 m^2

    (d)   Traffic and utility space

        Allow 40% of total (a)-(c) ($251m^2$) = 100 m^2

    (e)   TOTAL ACCOMMODATION REQUIRED

        Total of (a)-(d)   =   351 m^2

        + 10% for expansion =   35 m^2

        TOTAL   =   390 m^2

6.4   Equipment

6.4.1   2 x microcomputer workstations, each comprising:

    (a)   1 x microcomputer, 100 percent IBM-compatible,
        with minimum 640K RAM, 40 mb hard disk, 12"

colour monitor and enhanced keyboard, MS-DOS
3.30 operating system

e.g. IBM PS/2 Model 502-61 with 12" colour
display model 8513 and enhanced keyboard,
MS-DOS 3.30.

(b) 1 x 5¼ disk drive and adapter

(c) 1 x Uninterrupted Power Supply (UPS) unit for
computer

e.g. Grizzly 500 VA

(d) 1 x voltage stabilizer/surge protector for UPS

(e) printer and power cables

6.4.2   1 x laser printer

e.g. Hewlett Packard LaserJet

6.4.3   1 x voltage stabilizer/surge protector for printer

6.4.4   1 x electronic typewriter

e.g. IBM model 6784

6.4.5   1 x photocopier

e.g. Xerox model 1040

6.4.6   1 x microfiche reader

6.5   Furniture

6.5.1   The following list is intended only to provide an
indication of the items of furniture likely to be
required. A final list, with specifications, should
be prepared as part of the process of planning the
accommodation for the documentation centre.

3 x executive desks with return
4 x secretarial desks with return
1 x printer table
7 x office tables
3 x occasional tables
3 x executive swivel chairs
30 x upright chairs
4 x secretarial swivel chairs
14 x casual seating units
10 x 4-drawer vertical filing cabinets
7 x rows of 2 units single-sided glass-fronted
bookshelves
7 x storage cupboards
4 x 4-seater reading tables

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4 x single-seater study carrels
                       20 x rows of 3 units double-fronted bookshelves, 6
                               shelves per unit
                        2 x rows of 3 units single-sided periodical display
                               shelving
                        1 x atlas table
                        1 x magazine rack

6.6   Supplies

6.6.1   General office supplies

-   desk trays, paper punch, file folder and
    guides, paper clips, rubber bands, drawing
    pins, liquid paper and thinner, pencils, pens
    sharpeners, typewriter ribbons and lift-off
    tapes, typing paper, etc.

6.6.2   Computer supplies

-   floppy disks (5¼" and 3½"), disk storage,
    cleaning kits, security cables, printer
    ribbons, acoustic printer cushion, listing
    paper, etc.

6.6.3   Photocopying supplies

-   toner, spares kits, paper

6.6.4   Library supplies

-   pamphlet boxes, periodical binders, book
    supports, label holders, book labels, book
    order forms, index cards, book cards, date
    stamps, date slips, book pockets, spine marker,
    book repair materials, etc.

6.7   Vehicle

        1 x   Suzuki Samurai 4 x 4 (or similar)

6.8   Finance

6.8.1   It is not possible, at this stage, to determine the
        costs of all the inputs listed above. This will
        require detailed study by the Water Resources
        Commission and potential donors, supported by
        quotations from local and foreign suppliers.

7.   Explanatory notes

1. It is understood that provision for a "library
    expert" has already been made under the proposals for
    GTZ assistance to the Arba Minch Water Technology
    Institute. In view of the fact that a Canadian
    volunteer librarian is already employed at the

Institute and that the Institute's own librarian is expected to return from higher degree studies in the United Kingdon in the summer of 1990, it is proposed that the GTZ expert should be assigned to the role of information management specialist under this project, and spend most of his or her time in developing EWIDOC and carrying out studies for the eventual development of EWIDOS and EWIDON.

The person selected as information management specialist should have postgraduate qualifications, or the equivalent, in information science or information management, educational or professional qualifications in a relevant scientific or technical discipline, and substantial practical experience in planning, developing and directing information systems in developing countries, preferably in the water sector.

2. The main task of the national consultant will be to assist the information management specialist in collecting data on existing document collections in the water sector. The person appointed should be a professionally-qualified librarian or information scientist with substantial practical experience in, and knowledge of, the information sector in Ethiopia. First-hand experience in the water sector would also be an advantage.

3. The person appointed as head of EWIDOC should have postgraduate qualifications, or the equivalent, in librarianship or information science and substantial practical experience in managing a specialized documentation and information unit.

PROJECT 1.B.   ESTABLISHMENT OF A LIBRARY AND DOCUMENTATION
               CENTRE, ARBA MINCH WATER TECHNOLOGY INSTITUTE

1.   INTRODUCTION

1.1 This project has been prepared on the basis of a report on
    information management in the Water Resources Commission
    compiled by the IRC International Water and Sanitation
    Centre in consultation with the African Medical and
    Research Foundation (AMREF) in March, 1990.

1.2 Superscript reference numbers, thus: [1] refer to
    explanatory notes in section 7 of this Appendix.

2.   DEVELOPMENT OBJECTIVE

2.1 To strengthen the capacity of the staff and students of
    the Arba Minch Water Technology Institute to learn from
    and apply the experience and knowledge of other water
    supply and sanitation institutions in Ethiopia and
    elsewhere in teaching, learning and undertaking research
    in the water supply and sanitation sector.

3.   IMMEDIATE OBJECTIVE

3.1 To improve the internal layout of the new library building
    now under construction at the Arba Minch Water Technology
    Institute.

4.   STRATEGY

4.1 To revise the floor layouts of the new library building in
    accordance with the proposals outlined in section 6.1
    below and require the contractors to complete the building
    in accordance with the revised layouts.

5.   OUTPUTS

5.1 The main output of the project will be a completed library
    building with improved floor layouts.
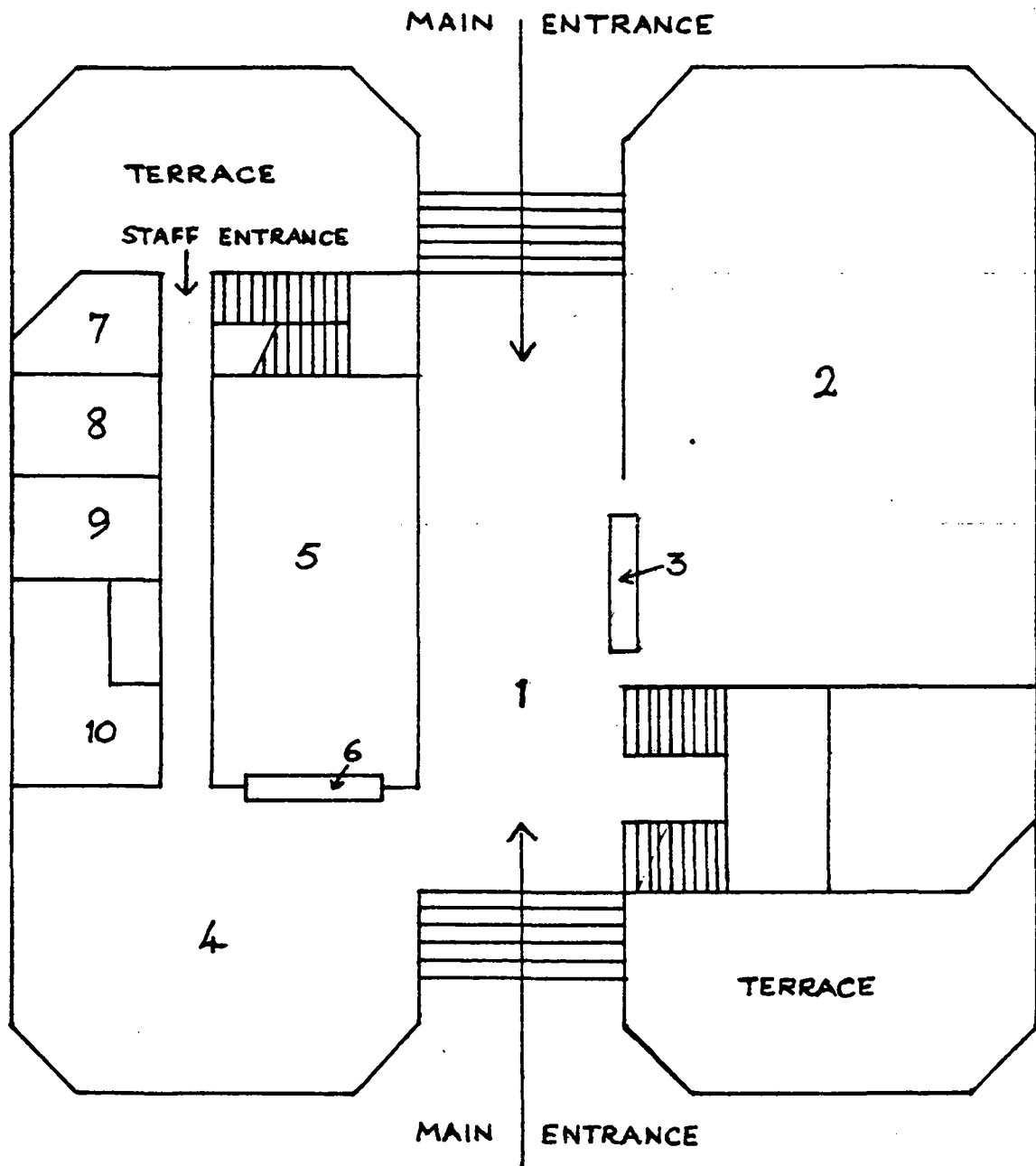
6.   INPUTS

6.1 Accommodation

6.2.1   The floor layouts of the new building should be
        modified before construction is completed. The existing
        and proposed layouts of the ground and first floors are
        shown in Figures 1.A to 2.B below, together with lists
        of the existing and proposed functions of the various
        areas.

6.2.2   The internal layouts of the main areas shown on the
        revised plans should be determined by the library

director in consultation, if necessary, with the
information specialist to be provided under technical
assistance. [1]

Arba Minch Water Technology Institute. Library.

MAIN | ENTRANCE

TERRACE

STAFF ENTRANCE

7

8

9

10

5

6

1

2

3

4

TERRACE

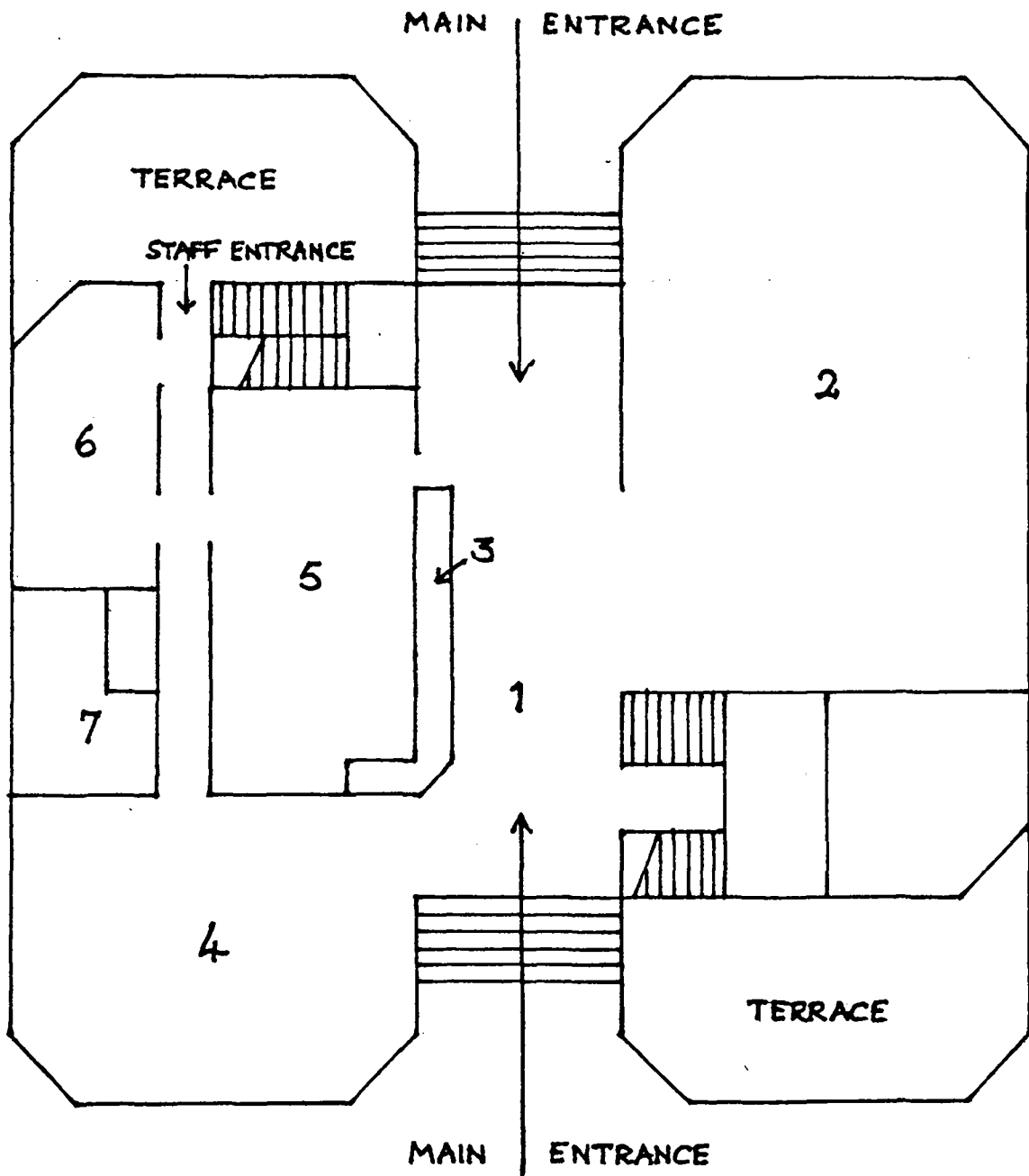MAIN | ENTRANCE

1.A. Ground floor. Original layout.

Arba Minch Water Technology Institute Library

1.A Ground floor Original layout

KEY

1. Lobby

2. Open access bookstack

3. Control desk

4. Reading room for faculty, researchers, postgraduate students

5. Closed access bookstack

6. Control desk

7. Unpacking and receipt

8. Mobile libraries

9. Technical staff

10. Book repair and copying

Arba Minch Water Technology Institute. Library

MAIN | ENTRANCE

TERRACE

STAFF ENTRANCE

6

5

3

2

1

7

4

TERRACE

MAIN | ENTRANCE

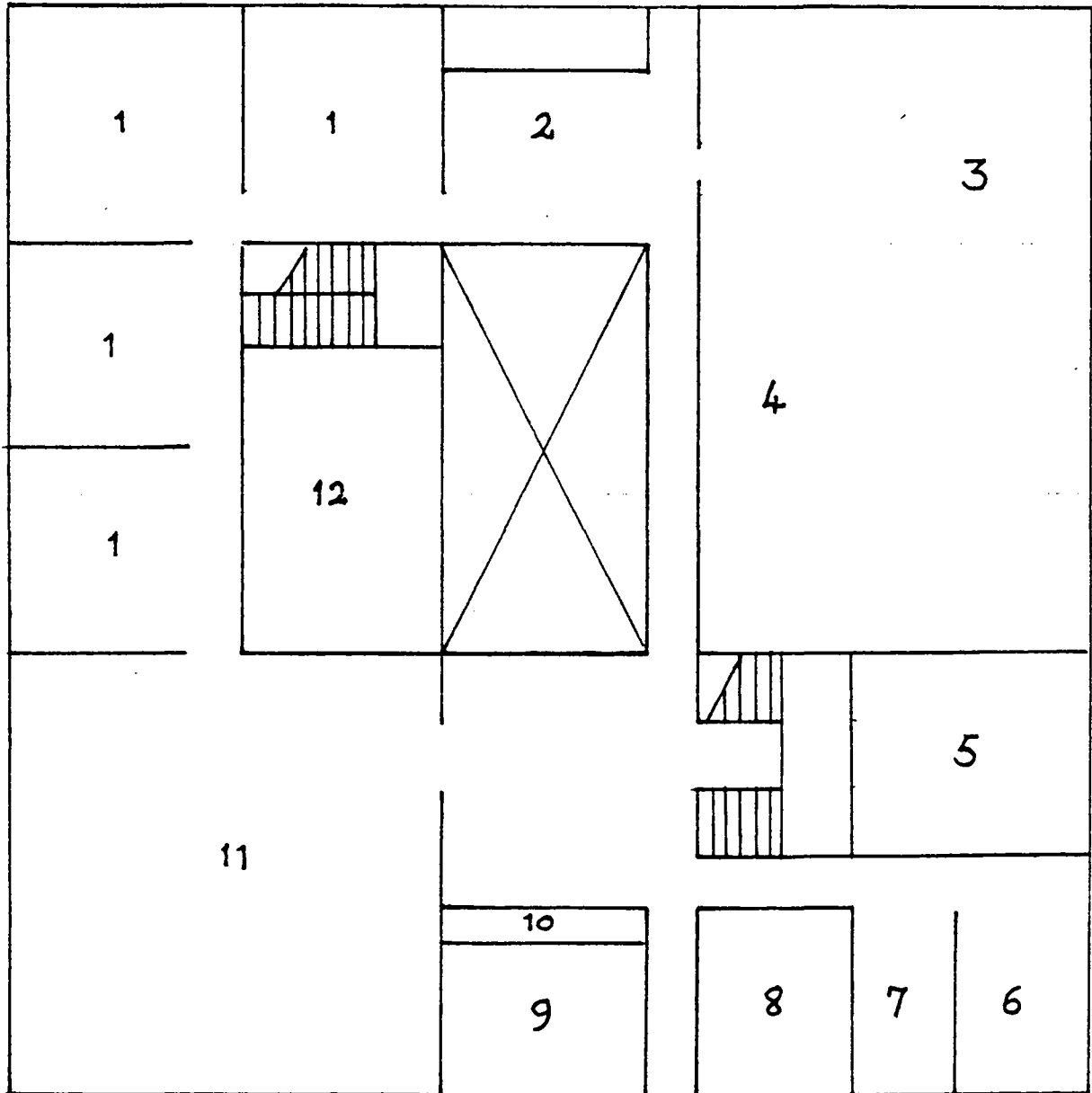1.B. Ground floor. Revised layout

Arba Minch Water Technology Institute Library

1.B   Ground floor Revised layout

KEY

1.   Lobby

2.   Undergraduate library: open access bookstack and reading
      room

3.   Control desk

4.   Periodicals reading room

5.   Staff workroom and short loan collection

6.   Staff workroom

7.   Book repair and copying

Arba Minch Water Technology Institute. Library


2.A. First Floor. Original layout.

Arba Minch Water Technology Institute

2.A. First floor. Original layout

KEY

1. "Hall for diploma designing"

2. "Diploma materials"

3. Reading hall

4. Open access bookstack

5. Newspaper lounge

6. Library director's office

7. Director's secretary

8. General office

9. Enquiries

10. Library catalogue

11. Reading room

12. Closed access bookstack

Arba Minch Water Technology Institute. Library.
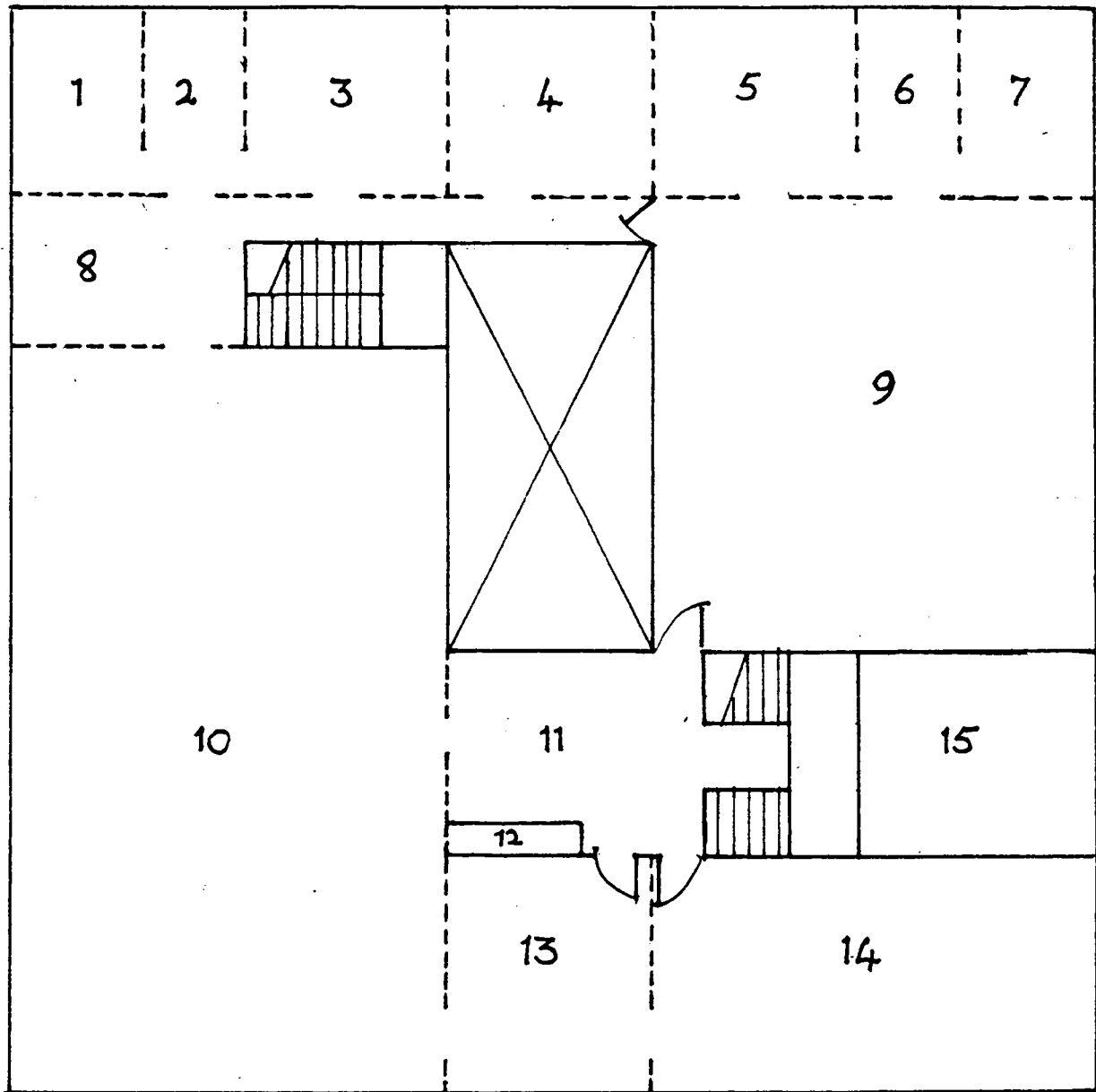
2.B. First floor. Revised layout

(---- = demountable partitions)

Arba Minch Water Technology Institute Library

2.B   First floor Revised layout

KEY

1.   Library director's office

2.   Director's secretary

3.   General office

4.   Staff meeting room

5.   Staff workroom (documentation centre)

6.   Secretary to head of documentation centre

7.   Head of documentation centre

8.   Reception area

9.   Documentation centre

10.   Postgraduate library

11.   Lobby

12.   Control desk

13.   Staff workroom

14.   Research room

15.   Meeting room

7.   <u>Explanatory notes</u>

1.   It is understood that provision for a "library
     expert" has already been made under the proposals
     for GTZ assistance to the Arba Minch Water
     Technology Institute. In view of the fact that a
     Canadian volunteer librarian is already employed at
     the Institute and that the Institute's own
     librarian is expected to return from higher degree
     studies in the United Kingdon in the summer of
     1990, it is proposed that the GTZ expert should be
     assigned to the role of information management
     specialist under this project, and spend most of
     his or her time in developing EWIDOC and carrying
     out studies for the eventual development of EWIDOS
     and EWIDON. However, the expert should also advise
     on the detailed internal layout, furniture and
     equipment for the Institute's library.