1990


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NIGER APPLIED AGRICULTURAL RESEARCH PROJECT

(Contract AID 683-0256-C-00-8024-00)

CONSULTANCY REPORT

E. Stewart Saunders
Purdue University
SHORT-TERM CONSULTANCY REPORT

E. Stewart Saunders

Libraries
Purdue University

May 16 - June 11, 1990

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SUMMARY

INRAN invited me to the Niger Republic to evaluate the progress of its documentation centers since 1984 and to make recommendations for future improvements. The period of the consultancy was May 13 to June 11, 1990. In that period, I visited UNESCO in Paris to obtain a more recent version of CDS/ISIS. While in the Niger Republic, I visited the documentation centers in Niamey and Tarna and at the substation in Kollo. I met with the documentalists, the department heads of INRAN, and the INRAN and NAARP administrators. I also visited other documentation centers in Niamey, and I presented a brief seminar to researchers on the value of literature searching. The following constitutes an evaluation of the present state of affairs with proposals for improvement.
THE INRAN DOCUMENTATION CENTERS

During the past five years, INRAN has established the institutional and material infrastructure for sound documentation centers. Although the centers operate under some material and geographical handicaps, the system in place functions with a fair degree of responsiveness to the information needs of the INRAN researchers. The salient problems now confronting the centers are essentially those which confront libraries and documentation centers in the developed world.

In the following report I shall:
1. briefly describe the present state of the INRAN documentation centers,
2. outline the broad problems facing the documentation centers,
3. propose some general solutions which will function within the present constraints of INRAN and AID funding,
4. propose a number of specific steps to implement the broader solutions, and
5. prepare an estimate of costs.

INRAN Documentation Centers 1985 to 1990

The Documentation Centers have successfully implemented many of the recommendations contained in my short-term report of October/November 1984. The essence of these recommendations was to create the necessary infrastructure for the future evolution of an INRAN information system. I shall outline briefly the state of the centers as I found them in May of 1990. (A more detailed inventory is found in Appendices A and B.)

I. The BASE for the documentation system is the housing, equipment and personnel necessary to store and manage the collections of the documentation centers.
A. Housing and equipment
1. The Documentation Center in Niamey has a brand new facility which should be adequate for all operations. The Niamey Center is also fully equipped with shelving, furniture, photocopiers, etc. The Center at Tarna, while not new, is adequate in size, but it lacks the necessary equipment.
2. The Documentation Center in Niamey has a Compaq Deskpro microcomputer with 40 megabytes of hard drive.

B. Management and personnel

1. The Head of the Documentation Center in Niamey has:
   a. established budgeting procedures. Invoicing procedures are INRAN-determined.
   b. organized the work flow so that there is a division of responsibilities among the staff,
   c. established procedures to coordinate the documentation activities at Tarna with those in Niamey.

2. Three of the staff in Niamey are trained documentalists. One of the three is to go to Tarna in the near future. The assistant documentalist at Tarna, while not having formal training, is functioning very well in the technical areas of documentation.

II. The DOCUMENTATION SYSTEM is the combination of books, journals, and the services of the staff which provide the information to the INRAN researchers.

A. Technical procedures

1. Correct procedures for the cataloging of books and journals are being used in Niamey and Tarna. This was not the case in 1984. Present procedures conform to UNESCO (UNISIST) and FAO standards.

2. The CDS/ISIS bibliographic control program furnished by UNESCO has been installed on the Compaq Deskpro at the Center in Niamey, and it is presently being used by the documentalists to create an automated bibliographic data base for the Documentation Center. The adoption of CDS/ISIS will allow for a future integrated bibliographic data base for Niger and francophone Africa. This is a current project of the French Ministry of Cooperation and Development.

B. The collections

1. In 1984, the centers at both Niamey and Tarna had inherited collections of very old documents. The documents from the various agricultural research centers are still valuable, but old textbooks are no longer of value. The more important volumes in the center
at Niamey have been cataloged for the collection. All of the
documents in Tarna have been cataloged. Almost 900 of the
cataloged documents in Niamey have been entered on the CDS/ISIS
data base.

2. New books are being added to the collection in Niamey, although not
in great number. Some are being purchased, but most are coming
either on exchange agreements or as gifts from other institutions.
The center in Niamey receives documents automatically from around
18 international research centers. Duplicate copies are sent on to
the center in Tarna.

C. Networks and document delivery

The head of the documentation center in Niamey has initiated a system
of networks and document delivery. When requests for documents are
received and the documents are not in the collections at either Niamey
or Tarna, the requests are routed to the documentation centers at
ICRISAT, CIDR, or CEDES. Either the document or a photocopy is then
provided for the INRAN researchers. ICRISAT is currently receiving 76
agricultural journals, and CIDR receives around 25.

III. USING the Documentation System

A. The Documentation Center in Niamey alerts researchers in Niamey, Kollo,
and Tarna to new journal articles and books.
1. Bibliographies of new acquisitions are sent to the researchers.
2. Photocopies of the tables of contents of journals are circulated to
researchers.

The INRAN documentation centers have successfully implemented most of the
recommendations presented in the short-term report of 1985. Some areas still
need improvement. More importantly, however, new technology developed since 1985
now makes possible changes and improvements which could not be considered five
years ago.

General Problems

Documentation centers around the world are all facing the same general
problem: the exponential increase in scientific publication and the increasing
cost per document. Using the total world as a universe of publication, there are
presently 12,000 journals devoted to agriculture and related disciplines. Each year 200,000 journal articles, books, and reports are published in the field. Many are of questionable quality and many more do not pertain to semi-arid agriculture, but a large universe must still be reckoned with.

In addition to these problems, Niger as well as other West African countries faces the problems of slow and difficult communications and the problem of uncertain finances. Given the geographical and institutional isolation of the INRAN staff, determining what has been published requires substantial time and effort. Obtaining relevant publications is slow and many times impossible. Imperfect mail delivery and lack of funds all contribute to the problem.

To ignore currently published research is to debase the quality of newly planned research and to increase its cost. Reading the literature of agriculture is more than continuing education. Browsing in a few journals each week may be informative and stimulating and even lead to fresh ideas, but the results of published research have a direct bearing on an individual's research design. Survey research conducted by King Associates among scientists and engineers in American R&D institutions demonstrate this aptly. King found that 25% of journal articles read by these scientists resulted in altering the research design or reducing the costs of the project. The return to information has been found to be as high as 2.2 times the cost of the research. Take for example a research project in an area of high technology which is to be carried out without a survey of the literature and which is to cost a hypothetical 3.2 million dollars. If the literature on that subject had been consulted prior to the research design, it is possible that the project would have cost only one million dollars. The value of the literature would then represent 2.2 million dollars. The return to information may not be as high in agriculture as it is in the high technology sciences, but cost savings are still potentially great.

I have identified three general areas of concern within the INRAN framework which the documentation centers need to address.

1. The USE of published research.

INRAN researchers are not making use of the published research. As noted already, the effort required to learn about publications in one's field is great; the probability of obtaining the publication is small. All of this discourages the INRAN researcher from even making the attempt.
2. The IDENTIFICATION of published research.

The documentation centers cannot identify all of the information needs of the researchers. Given the large size of the publication universe in semi-arid agriculture, and the small size of the collections in the INRAN documentation centers, the probability that an information need will not be met by the collection is relatively high. Document clustering can be represented by various empirical hyperbolic distribution curves. This merely tells us that some of the future needs for information within INRAN can be predicted and met by a small and easily identified collection of journals and books. The obverse of this situation is that there will also be a large number of articles and reports whose need and availability cannot be predicted and met because they will be randomly scattered throughout many journals and reports. The latter group cannot be furnished by the documentation center prior to the need, only after the need has been identified.

3. The ACQUISITION of published research.

The documentation centers of INRAN have not fully established the mechanisms to acquire the needed documents.

A. To supply the journals and books whose use can be predicted prior to need requires a better acquisition procedure. Procedures which are operable within the framework of PAWN need to be established for the short term. Procedures which are operable without the support of PAWN are needed for the long term. The problem involves both the ability to select the titles and the contacts with reliable vendors who can supply the documents.

B. A different set of procedures is needed to supply those documents whose use cannot be predicted. This means the document must be acquired after its need has been determined. The problem is to obtain it quickly once it has been identified.

**General Solution**

The general solution to these problems is to gain access to the entire universe of literature on semi-arid agriculture by the following strategy:

1. Maintain a small, low-cost, and high-use collection in the INRAN documentation centers, and
2. back-stop this small collection with a method which will identify the balance of the literature on semi-arid agriculture and acquire the needed documents quickly.

This solution has been made economically and technically feasible by the introduction of CD-ROM technology in the last five years. CD-ROM is inexpensive to acquire and it does not depend on advanced communications networks. With CD-ROM one can search indexes, abstracts, or entire documents on a microcomputer.

With this sort of solution one could envisage a scenario in which:

1. the researcher queries an agricultural index or abstracting service on a microcomputer using a CD-ROM device.
2. Having identified six or seven journal articles or reports on his topic, he consults the documentation center in order to obtain them.
3. The documentation center has two or three in its collection, and it finds one more in the collection of ICRISAT.
4. For those articles or reports not available in Niger the documentalist sends a request to a PAWN institution.
5. If the need is urgent the document is expedited in one week by Express Mail, if not urgent it is sent by regular mail.

This general solution addresses most of the obstacles posed above in describing current problems.

1. The USE of published research.
   Once the index or abstracting service is on the microcomputer, there is no additional cost in its use. The researcher, not the documentalist, is the one who searches the data base for relevant material. He may "experiment" with different terms until he finds exactly what he is searching for. There are no cost or time constraints on the use of the microcomputer, consequently the researcher will make much more use of indexing and abstracting services. The introduction of indexing and abstracting services on CD-ROM in other research settings has resulted in a dramatic increase in the use of journals and reports.

2. The IDENTIFICATION of published research.
   Almost the entire universe of agriculture literature can be accessed by indexes or abstracts available on CD-ROM. These include indexes or abstracts from Commonwealth Agricultural Bureau (CAB), U. S. Department of Agriculture, and FAO. By this means just about any document
concerning semi-arid agriculture can be identified. In the future the quantity of agricultural literature on CD-ROM will increase greatly because this technology is being subsidized by donor agencies (see Appendix D).

3. The ACQUISITION of published research.

This strategy is a partial answer to the problem of acquisitions. It reduces the need for a large scale acquisitions program. Only the most obvious books and journals need to be purchased. All other acquisitions are identified by the researchers. The complete solution to the problem of acquisitions, however, demands additional training and experience for the INRAN documentalist.

Finally it needs to be pointed out that the maintenance of a small collection of documents and access to the balance of the literature through CD-ROM is cost effective. The capital costs can be borne up front in the next two years, but the annual maintenance can be both low and flexible. In most research institutions the cost of document services is around 3% to 3.5% of the budget of the institution. This level of financial support includes the acquisition of documents, microcomputer services, materials, and salaries for the documentalists. The general solution outlined above should be supportable within these general cost guidelines.

Recommendations

The specific recommendations listed below are designed to aid the INRAN documentation centers in performing their mission. The centerpiece is the introduction of CD-ROM technology, but a number of additional components will all improve the functioning of the system.

I. Improving the BASE of the system.

A. Housing and equipment

The equipment at the documentation center in Tarna needs to be raised to the level of the center in Niamey. Specifically the center needs:

1. new shelving
2. a storage cabinet
3. princeton files
4. a Compaq Deskpro microcomputer
The documentation centers in both locations need a CD-ROM player.

B. Management and personnel

Only a few small adjustments are needed in the way the centers are managed, but these small changes will facilitate operations. On the other hand the introduction of new technology and the need for improved acquisition procedures require further training for the documentalist.

1. To improve the daily operations of the two centers the following changes would be useful:
   a. The Head Documentalist should be given an equivalent rank to that of a department director.
   b. The documentalist at Tarna should be a professional documentalist and should report to the Head Documentalist.
   c. The budgets for the documentation centers should:
      (i) include separate lines for Niamey and Tarna (the budgets for Tarna should be on the Niamey Documentation Center budget)
      (ii) include separate lines for books and journals
      (iii) include a petty cash category for postage and other minor expenses.
   d. The two positions already approved for the documentation center, i.e., chauffeur and typist, should be filled.

2. In order to maintain a high level of service from the staff of the documentation centers, the following training is needed:
   a. Mme Adamou Hadiza will need further training in:
      (i) management and budget procedures
      (ii) acquisition and collection development skills for semi-arid literature
      (iii) use of CD-ROM technology
      (iv) use of DOS and CDS/ISIS
      A detailed proposal for her training will be forthcoming. The training is targeted for the summer of 1991.
   b. M. Alphazzzi Abdou and Mme Maliki Aissata need training to:
      (i) have an in-depth knowledge of DOS and CDS/ISIS
      (ii) have an understanding of the use of indexing services on CD-ROM
3. All of the documentalists should be given support and encouragement to attend professional conferences and to present papers at professional meetings.

II. Improving the DOCUMENTATION SYSTEM

The real test of a documentation system is to be able to deliver the specific document needed by a researcher at a time when he can use it. As stated previously in this report, the basic strategy is to have a small collection of high use documents and to rely on a combination of abstracts, CD-ROM, and rapid document delivery to supply all other requests.

A. Technical procedures

The technical procedures for organizing the collections in the documentation centers are well understood by the documentalists. They are already making plans to computerize the bibliographic files of the documentation center at Tarna using the CDS/ISIS program.

B. Collections

1. The documentation centers at Tarna and Niamey should each:
   a. have reference collections of 20 to 30 basic handbooks and guides,
   b. have subscriptions to a basic collection of 25 or 30 journals.

2. The station at Kollo needs a reference collection of 20 or 30 handbooks and guides.

3. The documentation center at Tarna needs to acquire the IRAT reports on microfiche.

4. The Head Documentalist needs to request free subscriptions to agricultural journals from the AAAS.

5. Subscription to journals, acquisition of books, and their delivery to the documentation center in Niamey will be the responsibility of Winrock.

6. The Documentation Center in Niamey needs an index to the IRAT reports contained in its collection.
C. Networks and Document Delivery

In order to complete the DOCUMENTATION SYSTEM the documentation centers must rely on the rapid provision of documents not held by any library in Niger. This requires the ability to identify needed materials, the communication of those needs to a document provider, and the delivery of the document to the center and the researcher.

1. The center in Niamey needs to acquire the following abstracts on CD-ROM:
   a. CAB Abstracts 1984-1990

2. The Head Documentalist needs to establish a procedure for supplying documents unavailable in either the INRAN documentation centers or in other centers in Niamey. For the short-term it is best that requests go from her to PRAAN which will then relay them to the Purdue Technical Information Center. Documents can be sent to Niamey every two weeks by Express Mail.

3. The Center in Niamey should install CG Net in the documentation center on a trial basis as a means to improve contact with specialist in other agricultural research centers and to supplement the document delivery procedure established by the INRAN documentation centers. (see Appendix C for details)

III. USING the documentation system

Improvements in the BASE and the DOCUMENTATION SYSTEM should lead to a large increase in the USE of agricultural literature in research design and implementation. In order to realize the potential of an improved system, the following is recommended:

A. The INRAN documentalist should provide seminars to the researchers in the use of CAB on CD-ROM.

B. After proper training the researchers should proceed to search the data bases themselves, using their own key terms and search strategies.

C. Each researcher should have a personal diskett on which to copy the results of his search, i.e., relevant abstracts.

D. The "groupes de travail scientifique" should consider the progress of each researcher in the use of published literature.
Estimation of Costs

I. Estimate of Capital Costs for Upgrading the INRAN Documentation Centers

A. Equipment

1. Compaq Deskpro microcomputer with 40 megabytes and monitor (Tarna) $2,700
2. New bookshelves, storage cabinet, princeton files, etc (Tarna) 4,500
3. two (2) CD-ROM players (Tarna & Niamey) 1,400

B. Reference books for Niamey, Tarna, and Kollo 6,500

C. Abstracting services on CD-ROM:
   CAB Abstracts:
   1. 1984-1986 2,500
   2. 1987-1989 5,000
   3. 1990 2,500

   TOTAL $25,100

II. Estimated Annual Costs for Collections and Document Delivery

A. 50 journal subscriptions at average price of $70 each (25 for Tarna & 25 for Niamey) $3,500
B. Book acquisitions for Niamey & Tarna 6,000
C. CAB Abstracts beginning in 1991 2,500
D. Photocopies of 250 articles or reports at $12.00 per document 3,000
E. Express Mail: $26 for 2 pounds. 26 deliveries per year 676

   TOTAL $15,676

III. Estimated Prorated Cost over 5 Years for a Document Delivery Service

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<th>For 1,250 docs per year</th>
<th>For 2,500 docs per year</th>
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<tr>
<td>A. CAB Abstracts 1984 to 1995</td>
<td>$22,500</td>
<td>$22,500</td>
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<tr>
<td>B. Photocopies of documents for 5 years</td>
<td>15,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Description</td>
<td>Cost 1 Year</td>
<td>Cost 2 Year</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>C. Express Mail for 5 years</td>
<td>3,380</td>
<td>3,380</td>
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<tr>
<td>D. CD-ROM Players (2)</td>
<td>1,400</td>
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<tr>
<td><strong>Total Cost for 5 Years</strong></td>
<td>$42,280</td>
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<td><strong>Cost Per Year</strong></td>
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<td><strong>Cost Per Document</strong></td>
<td>$33.82</td>
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APPENDIX A

The Documentation Center at Niamey, 1 June 1990
Equipment, Operations, Collections, Personnel

Equipment

I. Reading Room

6 tables with chairs
6 display stands
1 storage cabinet
1 microfiche reader
1 Compaq Deskpro microcomputer (40 megabytes)

II. Stacks

10 units of double faced shelving (20% full)
4 units of single faced shelving
5 drawer map case
1 photocopier

III. Archives Room

16 units of single faced shelving
9 units of double faced shelving
1 spiral binding machine

IV. Offices (three)

3 desks and chairs
2 electric typewriters

Operations

I. Bibliographic Access

A. Catalogs:

1. Shelf list (full cataloging)
2. Author catalog (partial cataloging)
3. Subject catalog (full cataloging)
4. Title catalog (partial cataloging)
5. Key word catalog (accession numbers only)
6. Periodical check-in file
B. CDS/ISIS Documentation Retrieval System

1. Search by any word in record using Boolean operators

2. Displays: personal authors
   corporate authors
   title
   geographic and subject terms

3. Authority control of terms
   a. Agrovoc Thesaurus Multilingue de Terminologie Agricole (FAO)
   b. Liste d'Autorité des Descripteurs RESADOC

Collections

I. Books and Reports

1,481 cataloged books and reports

II. Reference Collection

Contains around 50 titles

III. Journals

Has a large collection of older journals but currently receives only around a dozen free journals

IV. Microfiche

1. 2,742 IRAT reports (no index to them)
2. 1,050 reports from the International Livestock Center (has an index)

V. Current sources for document exchange or free documents

<table>
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<td>IITA</td>
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Reception is somewhat irregular. Many times it depends on ability to exchange materials.

VI. Archives

1. Fiche technique
2. Synthèse de réunion
3. Annual reports of INRAN
Personnel

I. Staff

3 professional documentalists
1 assistant documentalist
1 clerk (fichist)
APPENDIX B

The Documentation Center at Tarna, 25 May 1990
Equipment, Operations, Collections, Personnel

Equipment

I. Reading Room

Tables and chairs (many of the chairs are broken)
1 desk
1 storage cabinet (broken)
1 electric typewriter
1 microfiche reader
1 spiral binding machine

II. Stacks

17 utility shelves
4 single faced bookshelves
2 display stands
3 glass front bookshelves

Operations

I. Bibliographic Access

A. Catalogs:

1. Shelf list (full cataloging)
2. Author catalog (accession numbers only)
3. Title catalog (partial cataloging)
4. Key word catalog (accession numbers only)
5. Periodical check-in file

Collections

I. Books and Reports

2,050 cataloged books and reports

II. Reference collection

None

III. Journals

Has collection of older journals, but no currently-received journals
IV. Microfiche

None

V. Archives

Collection of INRAN materials in boxes and crates

Personnel

I. Staff

1 assistant documentalist
APPENDIX C
A Role for CGnet Within INRAN

It is presently possible for INRAN to establish rapid communications with other research centers and universities via a network hookup such as the one offered by CGNet International. Through the network it is possible to transmit between 10 and 20 pages of ASCII text per minute. The connections are very dependable. At a cost of $5.00 per minute telephone connect time and .50 per page transmission costs, this offers a cost effective way to expedite documents in ASCII text format.

Much of the research conducted by INRAN researchers is related to research being carried out at other agricultural research stations. CGNet would offer an effective means to stay informed on research in progress at IITA and other institutes and would also place researchers in contact with specialists around the world. CGNet is currently used by slightly over 200 agricultural research centers in 46 countries. As such, it offers a useful supplement to the document delivery service provided by the INRAN documentation centers. For that reason, it would be worthwhile to install a CGNet node in the Niamey Documentation Center on a trial basis.

The question arises as to whether CGNet could replace Express Mail as the means for sending published articles and reports to the documentation centers. At present, this is not a cost-effective method of transmitting published research. A printed document must be converted to ASCII text format by means of either an optical scanner or a level III fax machine. At present, it requires about 10 or more pages of ASCII text to represent one page of printed text. Because of this conversion ratio, it is prohibitively expensive as a means for document delivery. The U.S. Dept. of Agriculture and North Carolina State University are presently carrying out research to make this a reliable and cost-effective method. In the next five years, it could become an alternative avenue for such a service. In the meantime, Express Mail can better serve this function.
APPENDIX D

CD-ROM Projects in Agriculture

1. The Consultative Group for International Agricultural Research (CGIAR) is preparing to issue 25 discs containing around 450,000 pages of text on agricultural research from CGIAR institutions. Discs should be available in October 1991.

2. The Rockefeller Foundation is working on a project to issue 240 discs which will hold an agricultural library of around 10,000,000 pages of text. This is equal to about 30,000 volumes of printed text. The first discs will not be available until 1993.

3. The Technical Center for Agricultural and Rural Cooperation (CTA) has issued discs containing data from germplasm banks.

4. SESAME is a CD-ROM disc available from CIDARC. It contains abstracts of research originating in CIRAD, ORSTOM, INRA, ISRA, and the Faculté des Sciences Agronomiques de Gembloux.
APPENDIX E

Terms of Reference for the Consultancy
OBJECTIFS

1. Renforcer les relations inter-institutionnelles
2. Encourager une meilleure connaissance de l'INRAN par les institutions PAUN
3. Développer des liens de jumelage inter-centre entre le Centre de documentation et les bibliothèques du PAUN
4. Institutionnaliser des échanges pour la période post-PRAAN

TERMES DE REFERENCES

1. Revoir et évaluer les collections du Centre de Documentation, des Sous-Centres de Kollo et Tarna et effectuer une programmation d'achat.
2. Évaluer l'organisation et la gestion du Centre et des S/C et présenter un séminaire sur la gestion d'un Centre d'Information.
3. Identifier les besoins en personnel et formation du Centre et S/C et recommander des programmes de formation.
4. Présenter des recommandations pour de nouvelles acquisitions afin de renforcer les collections existantes.
5. Présenter des recommandations pour l'acquisition de matériel adéquat au Centre et S/C.
6. Programmer l'informatisation des divers services du Centre et des S/C (Service de prêt, de recherche documentaire etc...)
7. Présenter les ressources documentaires disponibles au niveau des institutions PAUN.
8. Identifier les possibilités et modalités des rapports inter-institutionnels et inter-réseaux.

ACTIVITES

1. Visiter le Centre et les Sous-Centres.
2. Rencontrez le personnel du Centre et des S/C.
4. Rencontrer les départementaux et les Chefs de Stations.
5. Rencontrer les membres de l'Equipe de l'Assistance Technique du PRAAN.

15 Février 1990