DDDR: IAR/74/26 Restricted
July 1974

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

TECHNICAL ADVISORY COMMITTEE
Eighth Meeting, Washington, D.C., 24 July - 2 August 1974

EVALUATION OF CARIS PILOT PROJECT
(Preliminary Report)

TAC Secretariat
Food and Agriculture Organization of the United Nations
Rome 1974

EVALUATION OF CARIS PILOT PROJECT

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CONTENTS

SUMMARY FOREWORD

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A. Preamble

The evaluation of the CARIS Pilot Project, funded by the International Development Research Centre, is the fourth stage of the pilot program, as phased by Mr. A. Thèvenin in his Progress Report of January 1974 (DDDR: IAR 74/5). This evaluation has four main components:

1) Input. Evaluating the efficiency of the methods and approaches that were used for collecting the data.

2) Processing. Assessing the efficiency and effectiveness of the two systems involved in the comparative trials of the Pilot Project, and determining as far as possible their compatibility with other similar systems, such as those of FAO and other United Nations agencies, and with such developing systems as the International Information System for the Agricultural Sciences and Technology (AGRIS) and that of the European Community. In this connection, classifications, codes, computer utilization, etc. are considered in relation to their respective systems.

3) Output. Evaluating the usefulness of the records and the printed output, and the effectiveness of the retrieval methods in relation to the various needs of such groups of potential users as research workers, research administrators, and information centres.

4) Future. Recommending, by syntheses from the foregoing, possible approaches for the future development of CARIS from its intentionally restricted experimental phase to one covering research projects in all developing countries.

All aspects of the evaluation except those concerned with computer utilization were investigated by Dr. O. Ojeaga Ojehomon, Permanent Representative of Nigeria to FAO, and M. Robert Lagière, Institut de Recherches du Coton et des Textiles Exotiques, Paris, appointed as short-term consultants by the Information Sciences Division of IDRC. Dr. Ojehomon travelled to institutions in Ghana, Liberia, Nigeria, and Sierra Leone, all of which countries had participated in the CARIS Pilot Project, and to Guinea, which had not; M. Lagière obtained the views of a representative selection of agricultural research institutions in France before proceeding to visit institutions in Senegal and the Ivory Coast. Expressions of opinion on the usefulness and methodology of CARIS were received by the CARIS Coordinator (M. Armand Thèvenin) from many other institutions and pertinently interested organizations in developing and developed countries, and a useful response to a questionnaire put out by M. Thèvenin is still being received. Earlier data of value to the consultants were provided by M. Guy Vallaeys, Institut de Recherches

Agronomiques Tropicales et des Cultures Vivrières, Paris, who was unfortunately unable to proceed with a consultancy on this evaluation.

The computer aspects of the study are being investigated by the Studiengruppe fur Systemforschung, following a check list prepared from an analysis of the output material. Communication delays have protracted the commencement of this part of the evaluation. As soon as the report is available, we propose to issue it together with the full texts of the reports by the two other consultants.

B. Response to CARIS

In general terms, there is enthusiasm for the idea of CARIS, especially as a global system. All of the institutions and individuals visited by the consultants in West Africa agreed on the need for such a system to link separate efforts in agricultural research. The feeling in developed countries is more qualified, although even here criticism is levelled more at the presentation and the costs of the presentation rather than at the system as an informational concept.

C. Input

The data collected are shown to be extremely variable in at least two dimensions: specificity of content and institutional coverage. Bearing in mind the experimental nature of the Pilot Project, both are to some extent explainable; but equally, both will require to be remedied in an on-going system. The degree of detail that needs to be collected, for both printed directories and magnetic tape, is closely related to output requirements and will be considered under that heading.

The question of institutional coverage, however, raises a fundamental point on the methods of information collection. The omission of many centres of known activity is disquieting. Although participation in the Pilot Project was not enforced in any way, some mechanism will have to be introduced to ensure that all institutions and departments involved with agricultural research are included. It is not surprising that, arising from the attention focussed on this question by the consultants, institutions and individuals at once wished to rectify such omissions.

D. Processing

Comparison of the processing differences between FAO's French-language version of the directory and SSIE's English-language version is sometimes made difficult by a user's natural language preference. The consultants commendably overcame this problem, but comments from other sources often indicate that only one version has been examined and thus no comparisons are then made.

The consultants have indicated many areas where processing changes are desirable, but there is nevertheless a decided bias toward the FAO system as exemplified by the French version. The preference is particularly strong in the area of subject classification: the SSIE method is considered too theoretical whereas the FAO method is considered more in tune with users' retrieval

requirements. Refinement of the FAO CARIS classification is already being undertaken in the light of the consultants' reports, and steps have been taken by the AGRIS Coordinating Centre to allow considerable compatibility between the subject categories that will be used for AGRIS over the next three years and the subjects and activities classifications of CARIS.

Similarly, there is a preference for the FAO methodology in relation to the listing of institutions, with sub-stations following directly after their parent institutions.

E. Output

There is general consensus that printed directories are the preferred form of output, and will remain so for some considerable time. Most people interviewed were interested in ancillary outputs such as question-and-answer services and SDI, but only as additional rather than alternative services.

It is generally recognized that the production in a global system of directories similar to those of the Pilot Project would be uneconomic. Schemes for breaking down the total output into geographic, disciplinary, and commodity entities are considered in outline. But more importantly, there is a decided tendency to suggest simplifying the content of the directories, deriving from more simplified input. As mentioned under (C) above, there is diversity of specificity: some institutions take the word 'project' to mean an individual experiment, whereas others take it to mean a research program. Both extremes are generally rejected and the true project preferred, so action will need to be taken to define these differences to ensure input of an even level.

Users also show a preference for simplified project descriptions, giving title and objective but omitting approach and results. Further data than this could be stored but not printed.

Information on institutions is generally considered satisfactory, except perhaps for the inclusion of 'financial support', but see M. Lagière's report (pp. 6-7).

F. Future

The whole tone of both reports is constructive, users obviously wishing to build up a structure of permanence, dependability, and financial viability.

The demand is there for a global system, based primarily on directories with appropriate up-dating, but with a computer-based service as a strongly advocated ancillary service.

REPORT ON EVALUATION OF CURRENT AGRICULTURAL RESEARCH INFORMATION SYSTEM (CARIS)

By DR. O. OJEAGA OJEHOMON

Embassy of Nigeria

Rome, Italy

April, 1974

SUMMARY AND CONCLUSIONS

(i) I visited selected research institutions in five West African Countries (Ghana, Guinea, Liberia, Nigeria and Sierra Leone) to ascertain the comments of research investigators and research administrators on the pilot CARIS directory, and their suggestions for the future development of CARIS.

(ii) Group discussions were held in the institutions with the professional research personnel whose disciplines covered a broad spectrum of agricultural research activities. Thus, the discussions involved a representative group of investigators.

(iii) CARIS was enthusiastically welcomed by everybody as a project that would bridge a long-standing gap of correspondence between agricultural research workers. The hope was generally expressed that CARIS would develop into a truly world-wide project.

(iv) The printed directory would appear to be preferred to the "Question-and-Answer" retrieval service from computers, although when co-operating centres are sufficiently widespread, the latter could also become accepted.

(v) Project descriptions were preferred to Programme or Experimental descriptions by investigators. The final form of project descriptions for the printed directory which emerged from the various discussions was as follows:

Title:	succinct and running as in published papers
Objective:	brief and precise
Approach & Results:	to be omitted

(vi) With this type of concise format there appears to be very little difference between programme descriptions, such as 9.0179, 9.0180, and project descriptions, such as 9.0272, 14.0043 and 14.0065. In the former case, the enumerated objectives could be separated into individual projects, each with an appropriate title.

(vii) A careful distinction has been made between description for the printed directory and for the computer. All parties agreed that as much information as possible per project could be stored in the computer, within the limits of its storage capacity. Investigators could subsequently draw upon the stored material through "question-and-answer" Retrieval Service.

(viii) The correct name for each institution and out-station should be

fully/.....

fully written.

(ix) The institutions within each country were listed alphabetically; the out-stations of each institution should be similarly listed directly following the parent-institution, as in the French version of the Directory.

(x) Network projects should be given accession numbers only, under the parent-institution instead of new numbers under each trial station.

(xi) The organization of the projects for an institute should be in some order, such as by crop and discipline, ending finally alphabetically.

(xii) Except for specially-funded research work, there should be no need to repeat after each project that it is supported by the institution under which it was described.

(xiii) The names of all investigators associated with a project should be cited in the project descriptions, as in the French version.

(xiv) The phasing of a project should be included, also as in the French version.

(xv) None of the indexes on Subject and Activities was satisfactory to investigators, although those in the French version were more acceptable. However, there was unanimous suggestion for a simple, alphabetical index, with the main terms based on crops, disciplines and projects in descending order.

(xvi) The Investigator index should be retained; the Investigator by Speciality index could be retained if the problems of precise definition of specialities could be resolved, but the Executive Agency index should be deleted.

ACKNOWLEDGEMENTS

I was given very kind and valuable assistance by many people during my tour. Without their kindness and assistance, I could have achieved only a small fraction of my objectives. As it is impossible to identify everybody individually for thanks, I take this opportunity to express my gratitude to all those who helped me in whatever manner during this tour.

I should, however, like to express special thanks to the Ambassador, Embassy of Nigeria, Rome, Italy and through him the Nigerian Ambassadors in Ghana, Liberia and Sierra Leone and the Charge d'Affaires in Guinea. Similarly, I thank the Ambassadors to Italy (and their Permanent Representatives to FAO) of the Embassies of Ghana, Guinea, Liberia and Sierra Leone, and through them the various research investigators and administrators who all treated me so very kindly and courteously.

CONTENTS

A. INTRODUCTION

1. The International Development Research Centre (IDRC), Ottawa, Canada, appointed me one of its consultants, with effect from 1 to 30 March, 1974, to evaluate the CARIS pilot Directory. The Directory had been prepared in two versions, (English and French) from the same basic information collected from various agricultural research institutions of the member countries of WARDA (West African Rice Development Association).

2. The CARIS Directory is a compendium of some of the on-going research projects in the WARDA member countries. The English version is divided into Parts 1 and 2. Part 1 contains project descriptions (RESEARCH PROJECT SECTION) and four indexes. The projects are described in the first 212 pages. The subsequent 282 pages are the four indexes (Subject, Executive Agency, Investigator, and Investigator speciality) which are intended to assist the investigator to arrive at the information contained in the initial 212 pages of project descriptions. By far the largest index is the SUBJECT INDEX, which alone consists of 266 pages.

3. Part 2 of the English version (46 pages) contains descriptions of primary data on the research institutions where the projects described were being done.

4. The French version contains the same project and research institution descriptions as the English version, but the organization of the French Directory and the style of indexing and presentation differ markedly from that of the English version. There are three parts in the French version. Here the descriptions of the research institutions are presented first (Part 1). Part 2 contains 232 pages of the project descriptions, and Part 3 contains five indexes (Subject, Activities, Alphabetical list of contents, Investigator and Investigator by speciality).

5. Partly, my responsibility was to ascertain the reactions of agricultural research workers in selected institutions to the two versions of the CARIS Directory. In this regard, it was necessary to find out their comments on the organization, style and utility of the Directory. It was also necessary to seek their opinions on the future development of the CARIS project, i.e. for example, how they would like CARIS information presented to them: in the form of printed directories, comprehensive or selected on some basis to be determined? Or would they prefer a question-and-answer retrieval service from computing centres?

6. I was scheduled to visit five countries, namely, Ghana, Guinea, Liberia, Nigeria and Sierra Leone, from 1 to 30 March, 1974. In each country, research institutions to be visited were selected primarily on the basis of their contributions to this pilot CARIS Directory and how easily visits to them could be combined. The visit to Guinea was planned so as to introduce CARIS there, since no project descriptions were returned from Guinea.

7. In all I visited 24 institutions and talked with about 150 researchers and administrators of research.*

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* Details of Dr. Ojehomon's itinerary and of the institution's and personnel visited will appear in the final version of this report.

8. Copies of the CARIS Director had been dispatched by post during the first week of February 1974 to all the research institutions which had contributed information to the Directory. It was foreseen that probably these may not have reached the institutions before I arrived there. Consequently, I took along with me some copies of both the English and French versions. When I arrived in Nigeria on 1 March, 1974, the Directory had not reached research institutions, but by the 13th several of the institutions in Nigeria and the other countries had received their copies. In most cases these were kept on the library shelves as normal library accessions.

9. On my arrival at any institution, copies of the Directory were distributed to the staff who were thus given about 24 to 48 hours to look through them before we held our discussions. Many research officers complained that they did not have sufficient time to peruse the Directory properly and that whatever they had to say were only their first reactions.

10. Some institutions (Institute of Agricultural Research, Ahmadu Bello University, Samaru, Zaria and Cocoa Research Institute of Nigeria, Ibadan; Crop, Forest Products and Soil Research Institutes, Kumasi) decided that they needed more time to study the Directory. After our preliminary group discussions they undertook to send their written comments by post.

11. In all the other institutions, I held group discussions with the researchers who had had the opportunity to look through the Directory. These group discussions engendered vigorous exchange of ideas. During each debate on a topic it was easy to identify different individual attitudes to the Directory, but as researchers argued among themselves some conclusions about what they wanted eventually emerged.

12. At the beginning of each group discussion, I introduced the CARIS project by explaining the background, as a response to the continued request by researchers all over the world for information on current agricultural research - on who is doing what, where, how and how far? - so that researchers could contact their counterparts for exchange of information. It was emphasised that CARIS was to be distinguished from bibliographies of published papers with which researchers were already acquainted.

13. The various sections of the Directory were introduced separately, namely, the project descriptions, the institution descriptions and the various indexes. Members of each group were then asked to comment on each section. The comments expressed in each institution are reported in Annex I.*

14. In spite of the short time available, and consequently, the limited number of institutions visited and discussions held, a broad spectrum of researchers and research administrators was involved. This gave a good opportunity for a wide variety of views, expressed from

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*Annex I will appear with the final version of this report.

different backgrounds of discipline and experience. The comments may, therefore, be considered as representative.

B. IS CARIS USEFUL?

15. Everybody welcomed CARIS enthusiastically as a project that would fulfil a long-standing requirement for a source of information on on-going international agricultural research projects. It was repeated over and over again that there is a communication gap between research officers all over the world, because counterparts do not know about each other's work except, for example, through published articles in journals or international conferences. Consequently, there has been very limited immediate exchange of ideas on current research, and much duplication of work. Everybody believed that, when and if CARIS becomes fully operative, it would bridge this gap in communications. The hope and wish were expressed that CARIS would and should become fully operative, with a truly world-wide scope.

16. The pilot Directory was seen as only an example and part of the services which CARIS should give. Thus, although the Directory was studied, discussed and criticised per se, it was always within a more comprehensive conceptual framework. Several suggestions were made about the initial operative phase and future development of CARIS. But before going into these in any detail, it is appropriate to describe some general observations which undoubtedly influenced the suggestions made.

17. It was observed generally that the Directory, particularly the English version, was very big. It was noted that it contained only part of the research tasks of 13 countries, because several research institutions were missed out entirely, and in many cases the list of tasks described per institute was grossly incomplete. It was quickly appreciated that, with the present format and style, it would be impossible to operate CARIS on a world-wide scale as a single volume of printed directory. The necessity became obvious for clear and concise descriptions of research tasks, in order to keep the size of printed directories within manageable proportions.

18. Although actual consideration of this point was left till the very end of each group discussion, it was surely in the minds of people and kept popping up throughout the discussions. Consequently, their suggestions for concise descriptions and deletions of certain sections of the Directory must have been influenced by this consideration, for as several persons observed:

> "It depends on how far you want to go. The more information we can get about what someone else is doing the better, but we can't expect too much within the scope of a world-wide directory".

C. TYPE OF WORK DESCRIPTION

19. Three levels of work descriptions were distinguished. For convenience these are called Programme, Project and Experiment descriptions.

Programme description

20. Examples of programme descriptions were illustrated by some of the descriptions from the International Institute of Tropical Agriculture (IITA), such as 9.0178, 9.0179 and 9.0180 of the English directory. In these examples, the titles are "subject areas" or divisional names, within the Institute, such as, Soil Chemistry Division, Agronomy Division, although the word "Division" was, of course, not printed. The so-called title was followed by a catalogue of the objectives of the programme.

Project description

21. Examples of project descriptions were the commonest in the directory, such as 9.0080, 9.0010 and 9.0214. Here one concrete, central problem was identified in the title and the objectives described as one unit, even though it was clear that one or several experiments would be involved.

Experiment description

22. Experimental descriptions are identified primarily from the details of APPROACH and RESULT such as 4.0258, 4.0270 and 11.0088, where actual experimental details and results have been given.

Descriptions Mixed in Directory

23. It is noteworthy that the descriptions of work from many institutions were a mixture of all three levels, reflecting individual investigator's understanding of what CARIS wanted. It is, therefore, doubtful whether everybody had a clear conceptual delineation between programme and project, except, of course, that the former could be resolved into several projects. As an investigator put it: "An institution has a programme of research; the institution's programme could be sub-divided into Departmental or Divisional programmes, such as soil fertility, crop protection, crop improvement etc." and cited the IITA descriptions as example.

Consensus for Project descriptions

24. With the exception of two individual investigators who asked for work description at the experimental level, it was abundantly clear that investigators preferred the programme or project descriptions. Of these, the majority asked for project descriptions.

Details of Project descriptions

25. The depth and scope of descriptions of each project were matters of lengthy discussions. Some investigators argued that in a printed directory there was need for Title, Objective, Approach and Progress; others that it was sufficient to have Title and Objective only, and all other details could be stored in computer for retrieval on request.

Title

26. It was suggested that the TITLE is the most important part of the project description, both from the indexing and retrieval point of view, and in capturing the attention and interest of the investigator. Therefore, the title should be clear and comprehensively descriptive, like the running titles used for the publication of papers in scientific journals. In this connection, it was pointed out that the details given in most objectives could actually be re-phrased as the titles, so that there would be no need for a re-definition of objective.

Objective

27. The objective, it was argued, should be concise and specific as in 14.0062 and 14.0063, without excessive verbiage, nor introductory material intended to place it in proper perspective.

Approach

28. The attitude to APPROACH was varied. A few investigators would like to see as such information as possible about the methodology used for each project. Some of them argued that they would like to know how a counterpart was doing his work before they would decide to communicate with him, because, "the title and objective may be beautifully described in words, but he may be working in the "wrong" direction." It was further argued that, in many cases, investigators would want to contact their counterparts for details on their "Approach". Hence, some preliminary idea about this was necessary.

29. On the other hand, many investigators argued that "Approach" should be deleted, because the information given under it could not help another investigator to plan his experiment. It would always remain necessary to write to the appropriate investigator for details on methodology.

30. Another group of investigators suggested that the information provided under "Approach" in the Directory was of variable quality. In certain cases it was very useful, in others it was not. In the former examples it should be retained and in the others omitted. The problem was how to decide when to include or exclude "Approach". In truth, the argument concerned the quality and style of the description, not the type of project. It did not mean that certain projects were of a nature that necessitated "Approach" and others were not. Consequently, if for all projects the same quality were maintained, then the question of optionally leaving out "Approach" in some projects does not arise.

Progress (Results)

31. Although some investigators argued seriously in favour of including "PROGRESS" or "RESULTS" in the project description, most investigators suggested its deletion from the printed directory. Those who argued for its retention pointed out that it would help them to form a complete idea of a counterpart's work before they communicated with him. It was, therefore, proposed that some brief but precise information on results should be included. Others argued that it was difficult, it not impossible, to describe results precisely in a few lines; it would make the findings meaningless.

32. One person pointed out that in 14.0062, for example, the results are very informative and it is not necessary to consult the investigator of this project before comparing them to his own results - if he were working on similar trials. The majority of investigators pointed out that this was not the purpose of CARIS. CARIS was seen essentially as a source of information for communication purposes - like the yellow pages of a telephone directory. Therefore, it would always remain necessary to contact the original investigator or CARIS centre for details of results.

33. It was argued that since we were dealing with on-going research, the "progress" should be changing continually. Therefore, what appears in a directory, say, six months after the initial description should be already outdated. Consequently, descriptions of progress or results would serve no useful purpose and should be omitted. If the project was completed and definite results obtained then the project no longer qualified for inclusion in CARIS. So, it was argued, no matter how one looked at it, results have no place in a CARIS directory.

D. ORGANIZATION OF THE RESEARCH PROJECT SECTION.

Correct names of institutions

34. The names of several institutions were unrecognizable in both versions of the Directory. Some examples from Nigeria only are tabulated below. This may be the fault of research institutions who wrongly completed the appropriate section of CARIS Form A; it could also, in some cases have resulted from excessive abbreviation during computer processing of the source documents, and from the separation of out-stations from the parent-institution. The latter would appear more likely because the section on Institution Description had most of the names correct.

Table 1. Correct names of institutions and as described in the Directory

Correct name	As in the Directory
Cocoa Research Institute of Nigeria, (CRIN), Gambari	Gambari Experimental Station
Federal Department of Agricultural Research (FDAR), Moor Plantation, Ibadan	Moor Plantation, Ibadan
Federal Department of Agricultural Research, Rice Research Station, Badeggi.	Badeggi Rice Research Station
Ahmadu Bello University Institute of Agricultural Research	Institute of Agricultural Research, I.A.R.

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Sub-Stations and "network" projects

The section on Research Project descriptions was organized alphabetically by country and by research institution within each country. In the French version the parent institution was listed alphabetically and its out-stations listed immediately following it, as in the Institution Description section of both the English and French versions. In the Research Project section, however, this layout was not maintained in the English version. Here the parent institution and out-stations were treated as independent units and listed in appropriate alphabetical order, so that they were physically separated, often by pages, within the Directory.

36. The "projects" in the out-stations were also treated as if they were separate from those of the parent-institutions, although, in fact, many of the stations were only trial sites in "zonal" or "network" trials. Consequently, many of their "projects" were primarily experiments initiated at, and supervised from headquarters, and probably, replicated in several other sites (sub-stations). Although these "projects" were described as "networks", they were given accession numbers, in both versions of the Directory, as if they were of equal status with the substantive projects (although one was eventually referred to the latter).

37. These two organizational points distorted the relationship between the parent institution and its out-stations, obscured the true relevance of the "network" projects and inflated the number of projects actually contained in the Directory.

38. It was suggested, principally by the institutions affected, that:

(i) in the Research Project section of the English version, the out-stations should be grouped under the parent institution, as in the French version.

(ii) the "network" trials in out-stations should not be given separate accession numbers; instead, the locations of network trials should be listed under the appropriate substantive project at headquarters. An alternative could be to repeat under the out-stations only the substantive project number and title in smaller type or italics or in some other way to identify the sub-station status in the network trial.

Orderly arrangement of projects

39. Another point concerned the arrangement of the projects under each institution and station. This section of the Directory was organized alphabetically by country and by institution within each country. But the projects were separated by dissimilar ones, and projects by one investigator were sometimes dispersed among those of other investigators, such as 14.0044; and 140060 to 14.0065 by Poisson.

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40. It was observed that this was contrary to usual practice of research programme descriptions by institutions. For instance, a research institution would normally organize its projects on a divisional basis either by crop, or speciality (e.g. breeding, chemistry, pathology, physiology) or group of activities (e.g. crop production, crop protection), each with a specific code number. This, it was argued, made it easy to find or refer to a project.

41. It was suggested that CARIS should choose an orderly basis for project arrangement, and under each heading the projects should be finally arranged alphabetically.

Phasing of Project

42. As has been done in the French version of the Directory, several investigators asked for the inclusion of the date of commencement and probable date of completion of a project, to give an idea of how the project may have progressed relative to others. It would also help one to determine the "up-to-dateness" of a "progress" or "recommendation".

Identification of investigators

43. The citation of investigators, where more than one were involved in a project, raised much complaint against the English version of the Directory. In the French version all investigations cited in the source document were identified in the Project Description section; in the English version only a principal investigator was so identified. This caused much resentment among investigators, who felt slighted, and asked how CARIS could judge who was the principal investigator in a co-operative project of officers of equal status? They requested that, as in the French version, all investigators associated with a project and cited on the source document should be identified.

Identification of "Supporting Agency"

44. The projects of an institution were described under its name. It was observed that this implied that the institution supported the projects described under its name. Therefore, there was no need to separately insert after each project that it was "supported by" the institution. It was recognized, however, that some external agency may have provided the funds for some specific research. It was agreed that only in such special cases may the supporting agency be indicated in the printed directory.

E. THE INDEXES

Subject Index - English version

45. There was a popular rejection of this subject index. Comments ranged from "too difficult to use; totally unrelated to usual agriculture practice", to "no index at all is better than this one". The specific criticisms were numerous. Some of them will be enumerated briefly:

(i) It was suggested that the type of classification used in the subject index was based on complete scientific knowledge, probably already in use by the Smithsonian Science Information Exchange, and bears little relevance to actual subjects or areas of agricultural research.

(ii) There was excessive indexing, ad absurdum, thus including unnecessary classification terms (such as minor taxa of Insecta) and compelling excessive cross-references which sometimes led one to a dead-end after a frustrating, long search. A yam agronomist searched in vain for references on yam production.

(iii) The concepts used for the classification were not specific enough. Consequently, many unrelated projects were pooled together under a common term, and related ones scattered about the index. Several examples were cited under Soil, Rubber, etc.

Subject Index - French Version

46. Under this heading will be treated Index "A, par Sujets de Recherche" and "B, par Activities". These were generally more acceptable than the subject index of the English version. The reasons were:

(i) The classifications were more closely related to actual agricultural research practice.

(ii) They followed some easily recognizable patterns; references were simple and easy to follow, even though the limited cross-referencing made it possible for one to trace an item from only a few angles.

47. However, several criticisms were levied against these indexes, of which the two most frequent will be mentioned here. Firstly, it was observed that the main concepts chosen for classification were sometimes abstruse, absurd or far-fetched. For instance, what does one understand by "A1320, Internal Climate", or, "A2000, Plants Utilized by Man" or "B1400, Improvement of Climate"? Secondly, the Subject Areas or Activities were not arranged in any identifiable, logical order. For instance, in "A1000, Biosphere" why should "SOLS" come before "EAUX" and "Proprietes Physiques....." (A1110), before "Proprietes Chemiques....." (A1120)?

Suggestions made for Subject index

48. The consensus of opinion was that none of the subject indexes was adequate. The majority of investigators requested a simple subject index organized alphabetically by crops and under each crop by discipline. Finally, the projects should be arranged alphabetically under each discipline.

49. Some specialist groups, such as in Forestry, suggested the use of indexes already in use by bibliographic books with which they were already familiar. Among those suggested was the "Forestry Abstracts of World Literature" with the Oxford decimal method. They argued that if the same Oxford code numbers were used for CARIS, it would facilitate cross referencing between completed works (in bibliographic books) and on-going research projects (in CARIS).

Executive Agency Index

50. The unanimous decision was that this index was only of statistical interest and should be deleted. It did not help one to reach any particular project.

Investigator Index

51. A few people assessed the Investigator index as of doubtful value. They argued that unless an investigator was already known by name or reputation, this index could not help an enquirer. But, argued the majority of investigators, this index is very useful because it would enable one to keep track of the work and whereabouts of people already known either through publication or other reputation. The concesus, therefore, was for this index to be retained.

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Investigator by Speciality Index

52. This was the most controversial index. The first reaction of most investigators was to welcome it, but on closer study they criticised it severely. In principle, this could be a very useful index, but it was beset by the problem of precise definitions of different specialities.

53. It was observed several times that, for example, the term "Agronomy" is very comprehensive and could embrace a heterogeneous group of activities. Consequently, it was seriously pointed out, "Agronomy" has different connotations for the American - and European-trained investigator. Using "Agronomy" and "Plant Breeding" as examples, the index listed all agronomists and breeders in alphabetical order. "How does one distinguish the agronomists or breeders working on cowpea, or cocoa or maize or wheat?" This highlighted the need for further sub-division of each speciality by crop, as far as possible.

54. On the other hand, some investigators observed that some specialities were excessively fragmented, such as Food Science, Food research, Food technology, Nutrition, Nutrition and Home Economics, Animal Nutrition, Biochemistry, Biochemistry and Biophysics, Biochemistry and Nutrition, Biochemistry and soils, Plant biochemistry; Nematology, Plant Nematology. Very often the lines of demarcation between these various sub-disciplines were not clear and so there were many errors. For instance, Hemeng, O.B., is a plant nematologist in Ghana; his name appeared under "Nematology".

55. The citation of project numbers in the English version made the latter preferable to the French version in this respect. It was suggested by a couple of investigators that instead of citing project numbers, page numbers would be better.

F. INSTITUTION DESCRIPTIONS

56. These were generally welcome. The only objection expressed by some institutions concerned the inclusion of "Financial Support". They argued that this was unnecessary, especially as it could be confidential; besides it could change from year to year.

G. THE FUTURE OF CARIS

57. There was a general expression of the hope, sometimes fervent, that CARIS has come to stay; that it would not be one of those projects that dies after a first exposure to people; that it would develop into a truly world-wide project.

58. Regarding the types of services to users, there was general understanding that the first step in the processing CARIS is the computerization of the data. It was suggested that all available data be thus processed and brought up-to-date continuously. Once the data are in the computer several possiblities were envisaged.

59. The "Question and Answer" retrieval service was seen as very important and inevitable, because of the comprehensive retrieval possibilities and "up-to-dateness". But it was not a popular operative idea in view of the inherent time-lag in correspondence. And the postal services being as they are today, most investigators were sceptical about the usefulness of this service. However, if the computer data could be duplicated and distributed to regional and, finally, national documentation centres with computers, the time-lag might be considerably reduced. As one investigator observed, it might even be possible to have a telephone service. When this stage is reached in the dispersal of CARIS network, maybe the "Question-and-answer" service would become attractive to users.

60. The printed directory had the most appeal to investigators. It would be handy on the library shelf or research desk for quick and easy reference. It was appreciated that the printed information might tend to be out of date, but investigators felt that this was not too high a price to pay for the earliness with which one could initiate correspondence directly with a counterpart from the printed directory. It was further argued that, in any case, the original investigator should have the most current and complete information, and the earlier one contacted him the better.

61. Since there was the chance that investigators might transfer from one institution to another after a directory had been printed, it was suggested that enquiries should be directed to the head of an institution. But this is a matter of administration procedure.

62. The concept of a comprehensive directory in one volume was very attractive, but it was appreciated that this was not possible. Several alternatives were suggested. Directories could be printed, firstly, by crops or groups of similar crops, such as cereals, grain legumes, etc., covering all disciplines per crop on a worldwide basis; or, secondly, by discipline (speciality) like Agronomy, Plant Breeding etc., covering all crops on a worldwide basis; or, thirdly, both by crop and/or discipline but by geographical regions or climatic zones.

63. There was thus no consensus on the type of directory that users would like to see established.

15/.....

H. GENERAL OBSERVATIONS

Definition of "Agricultural Research"

64. There is a need for CARIS to define to various scientific research institutions and university faculties of agriculture, what types of projects qualify for inclusion in CARIS. Uncertainties about this point undoubtedly led to the omission of several projects that might otherwise have been sent to CARIS.

Editing of translations

65. There was general dissatisfaction with the quality of the translations in the directories. These would require editing.

Form B Questionnaire

66. With the pilot Directory as a guide, there was no difficulty envisaged about completing Form B in future and there was enthusiastic readiness to complete new ones when required to do so.

67. Many questionnaires were completed by investigators. Their dispatch to CARIS was delayed or forgotten when they were sent for the signature of the head of the institution. Being busy, he had to make a special effort to sign them, especially when they were about 50 to 100. This requirement for the signature of the head of the institution should be omitted. A covering letter from the institution should be adequate.

Number of Projects in the Directory

68. Each network project was given a separate accession number in each trial location or station. This necessarily inflated the actual number of substantive projects in the Directory.

69. Several institutions and university faculties of agriculture were omitted in the pilot Directory. Some institutions reported only a part of their projects for several reasons. Attempts were made to collect some of these outstanding projects (Table 2) to obtain an estimate of the likely numbers to be expected. A total of 465 were collected from eight institutions.

Table 2 Numbers of outstanding projects collected from various institutions during evaluation tour.

Country	Name of Institution	No. of projects
Nigeria	International Institute of Tropical Agriculture, Ibadan	6*
	Rubber Research Institute of Nigeria, Iyanomo, Benin City	38
	University of Ahmadu Bello, Institute for Agricultural Research, Samaru, Zaria	120
	University of Ibadan, Faculty of Agriculture, Forestry and Veterinary Science	192
	University of Ife, Institute for Agricultural Research and Training, Moor Plantation, Ibadan	54
Liberia	University of Liberia College of Agriculture and Forestry, Monrovia	21
	West African Rice Development Association	4*
Sierra Leone	University College, Faculty of Agriculture	30
		465

* Programme descriptions

PROJECT PILOTE C . A . R . I . S

MISSION D'EVALUATION EN: FRANCE, SENEGAL ET COTE D'IVOIRE

R. LAGIERE

May 1974

P R O J E T P I L O T E C . A . R . I . S

MISSION D'EVALUATION EN : FRANCE, SENEGAL ET COTE D'IVOIRE

20 mars - 17 mai 1974

Objet : Estimer le travail effectué, les méthodes employées, les besoins des utilisateurs et la meilleure manière de les satisfaire.

Plan

Préambule

CARIS a pour but de rassembler puis diffuser les informations de base du domaine agricole, y compris les pêches maritimes et continentales et la technologie alimentaire, sur: i) les Opérations de recherche en cours, ii) les institutions et stations de recherches et iii) les chercheurs.

Elliptiquement exprimé ces informations indiquent

Qui fait Quoi et Où

Pourquoi, Comment, Résultat.

Mais le service assuré par CARIS n'est ni une diffusion d'abstracts (documentation secondaire) ni une publication de mini-articles auxquels on pourra valablement faire référence. C'est, à nos yeux, simplement une information donnée par les chercheurs à d'autres chercheurs sur leurs travaux en cours dans un but de coopération et dans l'intention d'établir des relations entre collègues attelés à la même tâche.

CARIS est fondé, essentiellement, sur l'opération de recherche. Les informations générales sur les organismes, les stations et points d'appui tendent à tracer le cadre dans lequel se place cette opération. Pour intéressantes qu'elles sont, ces informations, tout comme celles relatives aux climats et aux sols, n'ont fait l'objet que de rares remarques spontanées. Ce sont les opérations de recherche qui ont retenu la plus grande attention et des chercheurs consultés et des organismes administratifs de tutelle.

Nous étudierons donc en premier les informations diffusées par le projet-pilote CARIS tant dans leur collecte que dans leur contenu puis nous exposerons les remarques et suggestions concernant le traitement et la diffusion des informations par CARIS-mondial; une conclusion rappellera les éléments principaux de cette enquête.

Les opinions présentées ici ont été émises, à titre personnel, par 203 personnes -- administrateurs de la recherche, documentalistes et principalement chercheurs -- appartenant à 32 institutions et stations oeuvrant dans ou pour la recherche agronomique des pays de l'Afrique de l'ouest.

I - INFORMATIONS DONNEES PAR CARIS-PROJET-PILOTE

Nous distinguerons les informations concernant les opérations de recherche de celles relatives aux stations de recherche.

A - Informations sur les opérations de recherche

La critique principale faite au projet-pilote s'adresse à l'hétérogénéite de l'information diffusée tant en ce qui concerne le niveau des études signalées que dans leur rédaction. Cela tient beaucoup moins à CARIS, dont la notice explicative était suffisamment claire, qu'aux chercheurs qui, selon leur tempérament, ont plus ou moins divisé leur tâche et développé leur rédaction.

On incrimine partiellement aussi l'expression "Projet de recherche." Les chercheurs francophones ne l'ont pas comprise. Ils la rejettent et proposent unanimement "opération de recherche" pour la remplacer.

Cette dénomination présente le double avantage en français d'indiquer une étude en cours (alors que "projet" s'adresse à l'avenir) et de situer son niveau dans la hiérarchie du concept de recherche: Programme-Opérations-Actions. Une opération de recherche est, généralement, la plus petite unité faisant l'objet d'un financement individualisé; elle est, le plus souvent, monodisciplinaire et un chercheur ne peut raisonnablement participer effectivement à plus de quatre ou cinq opérations simultanément. La Côte d'Ivoire emploie l'expression "opération de recherche" avec la même définition. Pour le Sénégal le niveau correspondant est appelé "unité de recherche". Ces deux Etats ont la même conception et estiment que leurs recherches devraient être rapportées dans CARIS au niveau de l'Opération ou de l'Unité.

Quant à la rédaction des informations, 162 utilisateurs (dont un bon nombre de "fournisseurs") sur 203, soit 81%, sentent la nécessité de la codifier et d'éliminer les développements inutiles. Les titres doivent être clairs et concis, indiquant à eux seuls l'objectif principal de l'opération. Les informations supplémentaires doivent rester brèves, sans phrases et, à la limite, 50 chercheurs sur 162 estiment qu'il serait préférable d'employer des mots descripteurs plutôt que des phrases pour indiquer objectifs et méthodes.

Observations

Toutes les appréciations ont été données touchant au contenu de la fiche de l'opération, allant du plus grand développement à la suppression des objectifs, méthodologie, résultats provisoires, résultats définitifs.

La possibilité offerte par CARIS d'établir des relations épistolaires directes entre chercheurs a été bien ressentie mais diversement appréciée: "tout l'intérêt de CARIS est là", "il faudra que j'écrive...et réponde", "répondra-t-il?", "et les transmissions?", "ne serait-il pas préférable de s'adresser à CARIS central pour obtenir des informations supplémentaires?"

Malgré cette diversité dans les appréciations nous nous sommes efforcés de dégager quelques grandes lignes d'orientation d'après les réponses faites à un questionnaire précis.

- Les résultats provisoires sont-ils nécessaires?:

  Non : 163 - 81%

  Oui : 30 - 15% : Comment les exprimer? :
  . résumé avec chiffres : 7,5 %
  . 2-3 lignes indicatives sans chiffres : 7,5 %

- Les résultats définitifs ou partiels (à la fin de chaque action) sont-ils nécessaires?

  Oui : 117-58% : Comment les exprimer? :
  . résumé avec chiffres, seul : 37)
  . -id- , + référence rapport : 40) 77 - 38 %
  . 2-4 lignes indicatives, seules : 3)
  . -id- , + référence rapport: 37) 40 - 20 %

  Non : 76-38% : Par quoi les remplacer? :
  . la référence du rapport ou de la publication : 76 - 38 %

15% des chercheurs, seulement, aimeraient avoir des résultats provisoires; ils se situent, presque uniquement, parmi le personnel affecté aux plantes pluriannuelles, arbustes ou arbres. La moitié d'entre eux seraient satisfaits avec des indications qualitatives brèves.

La majorité des personnes consultées (58%) désirent des résultats définitifs dans le répertoire; ils devraient être présentés dans un abstract concis, avec des chiffres mais avec ou sans la référence du rapport pour le plus grand nombre (38%).

Mais il ne faudrait pas sous estimer l'importance relative (38%) de ceux qui, considérant qu'il est très difficile d'estimer la valeur d'un résultat exprimé en quelques lignes et en ignorant les conditions dans lesquelles il a été obtenu, demandent uniquement la référence du rapport ou de la publication; ils préfèrent obtenir les informations directement des responsables et ils leur écriront.

Cette référence du rapport est demandée, il faut bien le remarquer, par 153 chercheurs (40 + 37 + 76) soit 76% des consultés. Il est impossible de ne pas en tenir compte.

Il ne semble pas que les utilisateurs attachent une grande importance aux "objectifs" tels qu'ils sont présentés; ils ne sont le plus souvent qu'un renforcement du titre et, celui-ci, amélioré, peut éviter cette répétition. Il leur paraît préférable d'inscrire, à leur place, les "Actions de recherche" composant l'opération.

Il ne se dégage pas non plus une majorité en faveur d'un exposé détaillé de la méthodologie (traduction libre de "Approche"). L'emploi de mots caractéristiques (descripteurs) est le plus souvent conseillé pour les techniques classiques. Une information très brève serait suffisante dans le cas d'une technique originale pour attirer l'attention et inciter à demander de plus amples renseignements au responsable.

Le problème majeur qui se poserait serait celui de l'accessibilité aux rapports annuels des chercheurs. Les autorités responsables de la recherche scientifique en Côte d'Ivoire et au Sénégal accepteraient que ces rapports soient diffusés; elles étudient la possibilité de remettre régulièrement à CARIS le document de synthèse annuel faisant le point de l'avancement des recherches dans chaque opération. Les Etats participant à CARIS devraient, soit prévoir des exemplaires de ces rapports pour diffusion, soit adresser régulièrement à CARIS central un exemplaire de chacun d'eux, laissant à celui-ci le soin de répondre aux demandes d'informations. Un tel regroupement, les parties principales étant stockées sur micro-fiches, constituerait un réservoir de "documentation souterraine" d'une valeur pratique inestimable.

Outre les observations et suggestions des alinéas précédents nous retiendrons également les propositions suivantes:

1 - Indiquer la discipline à laquelle se rattache l'opération.

2 - Faire référence au programme dont dépend l'opération.

3 - Dater la fiche.

4 - Indiquer les liaisons avec d'autres organismes dans l'étude de certaines Actions.

5 - Inclure dans le répertoire les travaux effectués en facultés ou ailleurs et en rapport étroit avec l'agriculture (thèses, etc...)

Ces observations pourront être ou simplement conservées en mémoire ou introduites dans le répertoire.

Compte tenu des observations précédentes et afin de donner satisfaction au plus grand nombre tout en évitant de conférer au répertoire le caractère d'une revue secondaire d'abstracts qu'il n'a pas et que beaucoup lui refusent, nous proposons de présenter l'opération dans le répertoire par:

- son titre
- l'énumération des actions
- un aperçu de la méthodologie
- des résultats partiels ou définitifs indicatifs
- la référence du rapport ou de la publication.

Voici deux exemples (avec des données imaginées) illustrant notre proposition:

IV-300-0043 RETENTION ET LIXIVIATION DES ELEMENTS NUTRITIFS DANS LE SOL EN RAPPORT AVEC LE NIVEAU DE FERTILISATION

(1411) A. Durand (01.72/12.76) Fiche rédigée le 5/2/74

Actions : 1 - Bilan des éléments nutritifs sous bananier à Azaguié.
2 - Bilan des éléments nutritifs sous plantes fourragères à Adiopodoumé.
3 - Bilan des éléments nutritifs sous maïs à Adiopodoumé et Korhogo.

Techniques classiques d'étude

Action 1 achevée; lixiviation azote, fixation phosphore. Rapport annuel ORSTOM, Département d'Agronomie 1973

IV-300-0052 ETUDE BIOCENOTIQUE DES INSECTES RAVAGEURS DU COTONNIER

(1411) B. Durand (06.71/12.76) Fiche rédigée le 10/7/73

Actions : 1 - Ecologie de Dysdercus voelkeri.
2 - Ecologie d'Heliothis armigera
3 - Prédateurs des Aphides et des Jassides.

Techniques classiques. Milieu nutritif original pour H. armigera

Action 1 achevée; connaissances nouvelles sur migrations D. voelkeri. Public. dans Coton & Fibres Tropicales 1973, 250-270.

NOTE. Il ne semble pas nécessaire de rappeler le nom de l'organisme d'exécution puisqu'il est déjà indiqué par son numéro dans le catalogage (IV-300)

B - Informations sur les institutions et stations de recherche

Le projet-pilote propose une description de la station à l'aide de 10 caractéristiques:

a - Adresse exacte, adresse télégraphique, téléphone éventuellement
b - Situation géographique: longitude, latitude, altitude
c - Milieu: climat, sol
d - Personnel de recherche: chercheurs, techniciens
e - Superficie des champs d'expérience et orientation
f - Equipements spéciaux
g - Enseignement, stages, vulgarisation
h - Bibliothèque, documentation, publications périodiques
i - Domaines d'activité
j - Financement.

Qu'en pensent les utilisateurs consultés?

. Elles donnent satisfaction sans réserve : 126 - 63 %
. Elles sont satisfaisantes mais on devrait les compléter : 74 - 37 %

Les suggestions principales sont les suivantes:

1 - Ajouter la date de création de l'institution ou de la station; sa superficie totale.

2 - " la date de rédaction de la fiche.

3 - " le type d'agriculture de la région (pluvial, irrigué), le calendrier cultural (semis, récolte), la production principale de la région.

4 - Indiquer l'existence et l'orientation d'un parc de matériel de culture (traction animale, traction motorisée)

5 - Supprimer la rubrique "d- Personnel de recherche" et l'inclure dans la rubrique "i- Disciplines et domaines d'activité" en affectant numériquement les chercheurs à leur discipline. On aurait ainsi une vue plus exacte de l'orientation de l'activité de la station.

6 - Modifier les "domaines d'activité" qui deviendraient donc "Disciplines et Domaines d'activité". Cette information serait donnée par la station par référence à une liste type diffusée par CARIS. Ne pas oublier la Technologie dans ces Activités. Indiquer les plantes étudiées.

7 - Compléter la rubrique "Superficie et orientation" en ajoutant:
Boisement et sylviculture
Défense et restauration des sols.

La plupart de ces suggestions nous paraissent excellentes et la fiche de recueil des informations en serait légèrement modifiée.

A noter la nécessité de mieux situer les stations sur la carte.

COLLECTE DES INFORMATIONS

Des fiches de deux types ont servi à collecter les informations. Les unes étaient destinées aux opérations de recherche en cours, les autres aux stations de recherches. Leur libellé puis comment les remplir et, enfin, qui devrait s'en charger ont été l'objet d'appréciations diverses.

Les informations demandées par les fiches ont donné satisfaction aux chercheurs, en général. Les notices explicatives accompagnant ces fiches ont été jugées différemment selon les utilisateurs mais le sentiment général penche nettement vers la satisfaction.

Compte tenu des observations et suggestions du chapître I nous sommes conduits à proposer deux modèles de fiches dits "améliorés". Ils figurent en annexe à ce chapître.

Fiche "opération de recherche"

Nous avons rapporté précédemment ce que la majorité des chercheurs désiraient connaître. Il est apparu rapidement, par ailleurs, qu'un bon nombre de fiches n'avaient pas été remplies par le responsable de l'opération, pour de multiples raisons. La question s'est alors posée de savoir qui, selon les chercheurs, devrait fournir les informations.

Ils ont choisi entre quatre possibilités et les résultats sont les suivants:

La fiche "opération de recherche" doit être remplie par:

- le responsable de l'opération, seul : 25 - 12 %
- la direction du chercheur, seule : 4 - 2 %
- le responsable assisté de sa direction : 92 - 45 %
- le responsable assisté d'un itinérant CARIS : 68 - 34 %

Après examen du répertoire du projet-pilote les chercheurs ont estimé à une large majorité qu'il fallait nécessairement exiger une bonne homogénéité dans la présentation des informations. Pour l'obtenir ils envisagent deux possibilités avec une légère préférence pour la première: recourir au concours régularisateur de leur direction ou bien bénéficier, la première année au moins, des conseils d'un expert itinérant CARIS. Cet itinérant pourrait être, éventuellement, l'un d'eux qui, après un court stage de formation à CARIS central, ferait office de conseiller dans le pays de ses activités ou pour l'ensemble des pays d'une région.

Le titre de l'opération oriente vers un classement dans telle ou telle rubrique. Mais un certain nombre de mots descripteurs sont dégagés de l'information et permettent de la retrouver sous d'autres entrées. C'est CARIS central qui s'est chargé de déterminer les mots-clés du projet-pilote. Qu'en pensent les chercheurs et cela peut-il être continué? Ils ont répondu aux quatre propositions suivantes:

A votre avis qui doit dégager les descripteurs de l'information?:

- le responsable de l'opération, seul : 9 - 4 %
- le responsable assisté de sa direction : 18 - 9 %
- le responsable assisté d'un itinérant CARIS : 61 - 30 %
- CARIS central : 98 - 49 %

Le responsable, seul ou assisté de sa direction, préfèrerait s'il ne possède pas le dictionnaire des descripteurs (celui d'AGRIS vraisemblablement) que CARIS central se chargea de ce travail. L'hypothèse de l'itinérant CARIS est considérée par beaucoup comme la meilleure solution si celui-ci est possesseur du dictionnaire mais un certain nombre d'utilisateurs la supposant, à priori, irréalisable ont opté pour CARIS central. Il est bien évident qu'il est difficile de demander aux chercheurs de choisir des descripteurs sans le dictionnaire des mots avec leur sens exact. Ils peuvent, aux mieux, en proposer mais en les définissant; c'est un travail que la majorité d'entre eux n'accepterait pas volontiers. Mais en possession de ce dictionnaire nous pensons qu'ils sont les mieux à même de choisir les descripteurs adaptés à leur travail.

Annexes au chapître II: pages suivantes

FICHE OPERATION DE RECHERCHE

1 - N° CARIS

2 - Station de recherche responsable

3 - Fiche rédigée le:

---

4 - TITRE DE L'OPERATION

Début: Fin:

6 - Discipline à laquelle se rattache l'opération

7 - Programme dans lequel entre l'opération

8 - Chercheurs

Disciplines - Spécialités

---

9 - Liste des Actions de recherche de l'opération

10 - Méthodologie courante indiquée par des descripteurs

11 - Méthodologie originale. Quelques indications

12 - Pour les opérations de recherche sur arbustes et arbres: résultats provisoires indicatifs (2-3 lignes)

13 - Résultats partiels (actions) ou définitifs qualitatifs (2-4 lignes)

Référence du rapport ou de la publication

14 - Publications parues sur l'opération en cours

15 - Liaisons avec d'autres organismes pour l'étude de cette opération

FICHE STATION DE RECHERCHE

1 - N° CARIS

2 - Organisme administratif de tutelle

3 - Fiche rédigée le:

---

4 - STATION DE RECHERCHE

Créée le:
Superficie cadastrale: ha
Longitude: Latit.: Altit.:

5 - Organisme de recherche responsable
nom et adresse

Créé le:

---

6 - Agriculture locale: pluviale ☐ irriguée ☐ Production principale
Epoque normale de semis ..... de récolte .....

7 - Disciplines et domaines d'activité, avec le nombre de chercheurs par discipline

8 - Productions étudiées

9 - Champ d'expérience: superficie totale / ha / dont:

Cultures
/ non irriguées ha / / irriguées ha /

/ Paturages ha /

/ Boisement & sylviculture ha /

/ Etangs & pisciculture ha /

/ Défense et restauration des sols ha /

10 - Equipements spéciaux

11 - Parc de matériel de culture:

développé: oui ☐ non ☐
traction animale ☐
traction motorisée ☐

12 - Enseignement, stages, vulgarisation

13 - Bibliothèque, Documentation. Publications périodiques

14 - Financement - Montant total

III - TRAITEMENT DES INFORMATIONS

Les utilisateurs avaient à comparer, quant au catalogage, au classement et aux index, deux traitements différents de la même information:

- celui imaginé par la F.A.O. et imprimé en français;
- et le programme du SSIE, présenté en anglais.

Le catalogage proposé par la F.A.O. (Pays - Station - Opération) est jugé plus satisfaisant à la quasi unanimité que celui réalisé par le SSIE en raison de l'affectation à la station des projets de recherche. Les chercheurs veulent, en effet, pouvoir classer les références tirées des index en s'aidant de la station qui indique, par sa situation géographique, la zone climatique.

Un cas particulier a été soulevé: comment faire référence à une station dans le cas d'opérations consistant en actions dispersées dans le pays et dont les responsables ne dépendent d'aucune station?

La solution à retenir pour le classement des informations n'a pas prêtée à de grandes discussions. En effet, l'une des propositions (celle de la F.A.O.) correspond aux classifications techniques habituelles aux chercheurs en agronomie (sujet de recherche et activité de recherche); ils se sont rapidement familiarisés avec elle et cela d'autant plus facilement qu'elle est spécifique à l'agronomie.

L'autre, d'essence documentaire et nettement plus générale, a été imparfaitement comprise, jugée incomplète ou inadaptée. Elle a été, en outre, desservie par son véhicule linguistique et l'absence d'une présentation synoptique des différentes entrées.

Les chiffres ci-dessous reflètent ces opinions:

	Classement	Index de recherche
- Chercheurs partisans de:		
. la solution de la F.A.O.	191-95%	178-89%
. du programme du SSIE	9- 4%	8- 4%

L'index alphabétique des matières de la F.A.O. a souvent été jugé assez pauvre en descripteurs fins et plusieurs suggestions ont été faites pour l'enrichir:

i - s'inspirer du système du SSIE et introduire de nombreux mots-clés fins qui, "interdits", renverraient à des descripteurs plus généraux;

ii - fondre l'index-sujet dans l'index alphabétique des matières et ne conserver séparé que l'index-activité.

La proposition ii - semble riche de possibilités et mériterait d'être étudiée; elle présenterait, en outre, l'avantage d'éviter une classification-sujet fermée, limitée dans son extension.

Un certain nombre de préférences ont été avancées:

1 - Placer les index au début du répertoire, l'index alphabétique des matières en premier puis les deux autres précédés chacun de leur classification.

2 - Les noms des matières actives devraient figurer dans l'index aussi bien que celui des produits commerciaux.

3 - Les noms vernaculaires devraient renvoyer aux noms latins correspondants.

IV - DIFFUSION DES INFORMATIONS

Les informations collectées ont été diffusées grâce à l'édition sur papier d'un répertoire global des opérations de recherche. On peut envisager, évidemment, d'autres procédés d'information du chercheur intéressé: une diffusion sélective de l'information, un service de question-réponse, une interrogation directe des bandes magnétiques dans certaines capitales équipées en matériel de restitution, une banque de données, etc...

Les 203 chercheurs interrogés sur ce sujet ont été nets:

-	Diffusion par un répertoire, seul	: 58 - 29 %
-	Diffusion par répertoire plus service Q-R complémentaire	: 132 - 61 %
-	Diffusion par service Q-R seul	: 9 - 4 %
-	Diffusion sélective de l'information	: 0*

* Les 60 premières personnes consultées ayant répondu "non" nous n'avons plus posé la question.

La réponse est claire et indiscutable: 90% exigent un répertoire imprimé pour être informés valablement. Leur champ d'activité et l'étendue de leur besoin d'information sont trop vastes pour justifier une diffusion trop sélective. Une édition sur papier est une matière concrète que l'on peut consulter régulièrement et de laquelle on peut tirer des informations assez souvent imprévisibles. Elle seule permet une utilisation du service Q-R. Sans ce "support papier" l'information stockée sur bande perdra une bonne partie de sa valeur parce qu'elle ne sera ni suffisamment ni intelligemment exploitée. En outre, l'édition d'un répertoire incite le chercheur à le consulter et à s'informer, ce à quoi ne peut prétendre une bande magnétique fut-elle "décentralisée" à 1000 km au lieu de 10 000.

Le répertoire sur papier est donc nécessaire au bon fonctionnement de CARIS. Si l'on adopte une rédaction stricte et courte le volume total ne devrait pas être trop élevé pendant les dix premières années du moins. Partant du répertoire du projet-pilote réalisé pour 13 pays et compte tenu de ce que un tiers des opérations, environ, n'ont pas été répertoriées, on peut estimer très grossièrement le volume du répertoire pour 65 pays dont principalement ceux en voie de développement, à l'exclusion des quelques Etats les plus développés qui possèdent leurs répertoires propres:

	13 pays	65 pays
Stations et institutions	50 pages	250 pages
Opérations de recherche	300 pages	1500 à 2000 pages
Index	180 pages	900 pages

Cela n'a rien d'effrayant. Bien peu de chercheurs auront à consulter les 1500 pages du répertoire des opérations de recherche. Cela ressort des réponses aux questions di-dessous:

		Oui
- Désireriez-vous un répertoire présenté:		
. globalement (tel que celui du projet-pilote)	:	19 - 9 %
. par secteurs	:	179 - 89 %

- Dans l'hypothèse d'une présentation sectorielle quelle division choisiriez-vous?

- par disciplines	:	99 - 49 %
- par types de productions	:	47 - 23 %
- géographique (continent ou sous-continent)	:	33 - 16 %

La division par disciplines scientifiques a le plus de partisans puis vient celle par types de productions.

A côté des grandes divisions classiques on nous a demandé de réaliser, dans la mesure du possible, les secteurs suivants; selon le partage retenu:

Disciplines scientifiques

Milieu
Machinisme agricole
Economie agricole, sociologie (démographie)
Zootechnie
Physiologie, nutrition, alimentation animales
Pathologie animale
Protection des plantes (Entomologie, Pathologie, Phytopharmacie, Techniques de protection)
Océanographie physique et biologique (biologie halieutique)

Types de productions

Production animale (Elevage, Pathologie)
Production forestière et Pêches

Secteurs géographiques

Europe (moins le Bassin Méditerranéen)
Bassin Méditerranéen
Afrique au sud du Sahara et Madagascar
Moyen-Orient et Asie
Océanie
Amérique du Nord (Canada, U.S.A.)
Amérique centrale et Amérique du sud.

La division par secteurs permet au chercheur de trouver regroupées le plus grand nombre des opérations qui l'intéressent directement. Il fera appel au service de Q-R pour compléter ses informations hors de son secteur ou pour connaître les dernières opérations ou les résultats les plus récents qui n'ont pas encore fait l'objet d'une mise à jour.

Les stations de recherche pluridisciplinaires ainsi que les centres de direction de la recherche possèderont très certainement l'ensemble des secteurs. Les chercheurs qui seront dans leur environ immédiat en bénéficieront et n'auront probablement recours au service Q-R qu'à de rares occasions. Celui-ci ne sera de quelque utilité que pour les chercheurs isolés.

L'intérêt attaché par le chercheur au répertoire sur papier se manifeste encore dans les réponses faites à la question, très hypothétique, suivante:

. si les moyens (financiers et humains) de la F.A.O. étaient insuffisants pour mettre en place immédiatement le service CARIS au complet, devrait-on:

- se limiter aux répertoires impromés (documentation manuelle): 35)
- se limiter aux répertoires mais traiter les données et les stocker en ordinateur pour les utiliser ultérieurement :138) 173 - 86 %
- mettre en place immédiatement un service de Q-R : 20 - 10

Le service Q-R est compris comme un complément aux répertoires sur papier et 30% des chercheurs interrogés n'en voient pas l'utilité s'ils ont accès à tous les secteurs.

CARIS C'EST LE REPERTOIRE IMPRIME QUE L'ON CONSULTE A VOLONTE ET NON LA BANDE MAGNETIQUE QUE L'ON PEUT INTERROGER.

Ce répertoire sur papier est donc un document de base dont il faut prévoir le renouvellement et la mise à jour. Les réponses des chercheurs à ces préoccupations sont relativement dispersées:

Ré-édition du répertoire		Mise à jour	
- tous les ans	: 4)		
2 ans	: 17)	sans mise à jour	27
3 ans	: 6)		
- tous les 3 ans	: 9)		
4 ans	: 14)	(régulière, annuelle:	152
5 ans	: 149)	et mises à jour (régulière, bisann. :	20
6 ans	: 1)	(par service Q-R :	3
10 ans	: 2)		
- pas de ré-édition mais mise à jour tous les 6 ou 12 mois par le renouvellement de feuilles entières	: 1		

La solution la plus souvent recommandée est une périodicité de 5 ans pour le répertoire avec des mises à jour annuelles lesquelles sont constituées par les opérations nouvelles et les résultats définitifs des opérations achevées présentés sur feuilles volantes à classer dans le répertoire.

Une périodicite de 3 ans sans mise à jour mais avec un recours au service Q-R pour connaître les informations nouvelles sur tel ou tel sujet serait également parfaitement concevable quand tout fonctionnera bien et sera correctement exploité.

Banque de données en agriculture

Des banques de données existent déjà en mécanique, physique, chimie, océanographie, physique, etc...; d'autres sont en préparation (Océanographie biologique); certaines, enfin, sont très concevables: machinisme agricole, économie, technologie, statistiques. Hors ces branches bien particulières de l'agronomie les chercheurs ont quelques difficultés à imaginer ce que serait, et l'intérêt que présenterait une banque de données en agriculture.

Ils en seraient très partisans s'ils jugeaient possible une telle réalisation. Mais elle leur semble difficilement concevable en raison du caractère très particulier des résultats en agriculture qui sont très influencés par les facteurs locaux, les méthodes d'obtention et qui évoluent avec l'avancement de la recherche; l'agriculture, en général, n'est pas une science exacte.

A la question "Que pensez-vous d'une banque de données en agriculture et quel usage en feriez-vous?" les chercheurs ont répondu:

- Irréalisable, utopique et inutile sauf pour des secteurs particuliers	:	148 - 74 %
- Possible et utile (Technologie, machinisme, systématique, chimie phytosanitaire)	:	27 - 13 %
- sans opinion	:	28

Bien peu croient à la possibilité de créer une banque de données valable en agriculture, sauf dans certains secteurs. Mais même si cela était possible ils ne placent pas cette réalisation en tête de leurs préoccupations. Ils estiment que les services de documentation existants déjà, puis celui d'AGRIS de niveau II, complétés par la faculté d'écrire aux chercheurs étrangers leur permettent de répondre à leurs besoins principaux en matière de données.

V - CONCLUSION

Au terme de cette enquête conduite auprès des chercheurs et qui reflète l'opinion personnelle de chacun d'eux on peut affirmer que CARIS est bien accueilli et qu'il est même, maintenant, attendu.

Après chaque entretien d'une durée moyenne de deux à trois heures, nos collègues avaient à répondre sans complaisance à la question portant sur l'utilité de CARIS si celui-ci répondait à leurs désirs. Ils l'ont fait ainsi:

-	Très utile (indispensable, même)	: 38	) 172 - 85 %
-	Utile	: 134	
-	De quelque utilité	: 25	)
-	Inutile	: 1	) 31 - 15 %
-	Sans opinion	: 5	)

85% des utilisateurs potentiels consultés estiment que CARIS sera utile à très utile si les périodicités retenues sont respectées, si le service est rapide et à la condition que les informations diffusées répondent à ce qu'ils attendent. C'est un véritable plébiscite!

CARIS sera une information excellente qui ne concurrencera pas les services de documentation et apportera aux chercheurs de grandes possibilités d'ouverture sur le monde de la recherche agronomique.

Comment leur donner satisfaction?

1/ Par des informations concises et claires sur les opérations de recherche (Ch. I, A)

2/ Par des informations complètes sur les stations (Chap. I, B)

3/ Par la collecte régulière des informations et leur diffusion dans les meilleurs délais. Ils admettent parfaitement d'avoir à remplir ou à compléter des fiches tous les ans, à condition que cela soit utilisé intelligemment (Chap. II)

4/ Par un traitement des informations selon le système de la F.A.O. légèrement amélioré (Chap. III)

5/ Par la diffusion de répertoires sur papier. La masse globale peut être partagée en quatre parties principales:

a) - le répertoire des institutions et stations de recherche
250 pages environ — 1 volume

b) - les classifications A et B, l'index alphabétique des matières et l'index-activités
600 pages environ — 1 volume

c) - les index auteurs (alphabétique, discipline) et les index par stations
250 pages environ — 1 volume

d) - les répertoires des opérations de recherche
1500 à 2000 pages environ n volumes

dont, par exemple, seuls ou groupés:

. Amélioration des plantes
(génétique, sélection, amélioration asexuée)

. Protection des plantes
(pathologie, entomologie, phytopharmacie, technique de protection)

. Climats, Eaux, Sols (pédologie; biologie, physique et chimie des sols)

. Physiologie végétale

. Techniques de culture et de récolte. Machinisme agricole.

. Economie rurale. Sociologie

. Technologie

. Zootechnie. Physiologie, nutrition, alimentation et pathologie animales

. Océanographie physique et biologique. Pêches continentales.

Les volumes a), b) et c) pourraient être édités tous les 5 ans sans mise à jour. Ceux de la classe d) feraient l'objet de mises à jour annuelles et de ré-éditions quinquennales.

REMERCIEMENTS

Nous remercions l'International Development Research Center (I.D.R.C.) et plus particulièrement Monsieur Donald LEATHERDALE pour la grande liberté, l'autonomie et la confiance dont nous avons bénéficié.

Que la Direction Générale de la Recherche Scientifique et Technique sénégalaise (M. SENE), le Ministère de la Recherche Scientifique ivoirien (M. de DINECHIN), Madame la Directrice de l'Institut de Technologie Agricole sénégalais, Monsieur le Directeur Technique de l'OCLALAV (M. AFOYON), Messieurs les Directeurs Généraux des Instituts de recherches, Monsieur le Directeur de l'ITIPAT ivoirien veuillent bien accepter nos remerciements et excuser le trouble passager apporté dans leur service. Nous sommes très reconnaissants envers nos collègues chercheurs qui ont accepté de participer à cette enquête; nous souhaitons que les réalisations répondent à leurs voeux.

Enfin "the last but not the least" nous n'aurions garde d'omettre tout ce que CARIS et nous-mêmes devons à l'équipe coordinatrice mise à la disposition de la F.A.O. et animée par Monsieur Armand THEVENIN, Ingénieur agronome, forestier. La qualité des répertoires, la rapidité d'exécution des trois premières phases ont agréablement surpris les chercheurs qui ne pouvaient faire moins, à leur tour, que d'apporter des réponses d'égale qualité aux questions faisant l'objet de cette quatrième et dernière phase.

R. Lagière
Rome, le 16 mai 1974

LISTE DES ORGANISMES CONSULTES

FRANCE

- Centre Technique Forestier Tropical (CTFT). Chercheurs et documentaliste
- Institut d'Elevage et de Médecine Vétérinaire des Pays Tropicaux (IEMVT). Chefs de service de laboratoire, documentaliste
- Institut Français de Recherches Fruitières Outre-Mer (IFAC). Cadres de direction, documentaliste
- Institut Français du Café, du Cacao et autres Plantes Stimulantes (IFCC). Chefs de service de recherches, documentaliste
- Institut de Recherches Agronomiques Tropicales et des Cultures Vivrières (IRAT). Chefs de service de recherches, chercheurs, documentaliste
- Institut de Recherches du Coton et des Textiles Exotiques (IRCT). Chefs de service de recherches, chercheurs.
- Institut de Recherches pour les Huiles et Oléagineux (IRHO). Cadre de direction, Chefs de service de recherches, documentaliste
- Centre d'Etude et d'Expérimentation du Machinisme Agricole Tropical (CEEMAT). Cadre de direction, chercheurs

SENEGAL

- Délégation Générale à la Recherche Scientifique et Technique (DGRST). Directeur et informaticien. Dakar
- Institut de Technologie Alimentaire (ITA), Dakar. Direction, Chefs de services de recherches
- Organisation Commune de Lutte Antiacridienne et de Lutte Antiaviaire (OCLALAV). Dakar. Directeur technique, experts
- CTFT, IFAC, IRHO. Dakar. Administration et vulgarisation
- Laboratoire National de l'Elevage et de Recherches Vétérinaires. Dakar. (IEMVT). Cadres de direction, chercheurs
- Centre National de Recherches Agronomiques. Bambey. (IRAT). chercheurs.
- Station de Recherches des Fibres Textiles (IRCT). Kaolack. Chercheurs
- Office de la Recherche Scientifique et Technique Outre-Mer (ORSTOM). Dakar. Direction, Chefs de service de recherches, chercheurs.

COTE D'IVOIRE

- Institut pour la Technologie et l'Industrialisation des Produits Agricoles Tropicaux (ITIPAT). Abidjan. Directeur, Chef de service de recherche, chercheurs, documentaliste
- Station Sylvicole de Bouaké (CTFT). Chercheurs
- Station Piscicole de Bouaké (CTFT). Chercheurs
- Centre du CTFT en Côte d'Ivoire. Abidjan. Chercheurs
- Centre de Recherches Zootechniques de Minankro. Bouaké. (IEMVT). Chercheurs
- Station de Recherches Fruitières d'Anguédédou (IFAC). Chercheurs
- Station Expérimentale de Bingerville (IFCC). Directeur, chercheurs
- Station de Recherches d'Agronomie Tropicale et des Cultures Vivrières (IRAT). Chercheurs Bouaké.
- Station de Recherches du Caoutchouc en Afrique (IRCA). Bimbresso. Chercheurs
- Station de Recherches des Plantes Textiles (IRCT). Bouaké. Direction, chercheurs.
- Station de Recherches des Plantes Oléagineuses et Huiles (IRHO). La Mé. Chercheurs
- Centre ORSTOM d'Adiopodoumé. Directeur. Chercheurs
- Centre ORSTOM de Petit Bassam (Sciences Humaines). Abidjan. Chercheurs
- Centre de Recherches Océanographiques. (ORSTOM). Abidjan. Chercheurs.

Total: 32 Organismes et stations - 203 personnes.

CARIS PILOT PROJECT

EVALUATION MISSION TO FRANCE, SENEGAL AND THE IVORY COAST

R. LAGIERE

May 1974

CARIS PILOT PROJECT

EVALUATION MISSION TO FRANCE, SENEGAL AND THE IVORY COAST

March 20 - May 17, 1974

Purpose: To assess the work done, the methods employed, the needs of users and the best means of satisfying same.

Contents

Introduction

The objectives of CARIS are to collect and disseminate basic information in the areas of agriculture, maritime and continental fisheries, and food technology, respecting: (i) research operations in progress, (ii) research institutions and stations, and (iii) researchers.

In a nutshell, this information relates:

Who is doing What,

Where, Why, How and with What Results

However, the services provided by CARIS are neither the distribution of abstracts (secondary documentation), nor the publication of brief articles for handy reference. We see it solely as information given by researchers to other researchers about their current activities, in a spirit of co-operation and with a view to establishing relations between fellow-workers in the same field.

CARIS is based essentially on actual research operations. General information on institutions, stations and support facilities serves to outline the context in which such activities take place; interesting though it is, this information - like data on climate and soils - was limited to occasional spontaneous comments. It was the research activities themselves that attracted most attention, both from the researchers consulted and the sponsoring administrative bodies.

We shall accordingly begin by examining the information distributed by the CARIS pilot project, with regard to both their gathering and content, and we shall then outline remarks and suggestions concerning the processing and distribution of information by CARIS world-wide; we shall conclude with a summary of the main points of our survey.

The opinions presented here were expressed personally by 203 people - research administrators, records officers and mostly researchers - belonging to 32 institutions and stations working in or supporting agricultural research in West African Countries.

I - INFORMATION PROVIDED BY THE CARIS PILOT PROJECT

We shall be making a distinction between information concerning research activities and that concerning research stations.

A - Information on research activities

The main criticism directed against the pilot project concerned the heterogeneity of the information distributed with respect both to the level of the studies reported and to the style of the reporting. This has less to do with CARIS, whose explanatory notice was sufficiently clear, than with the researchers, who divided their work and developed their reports more or less according to their personal inclinations.

Partial blame is also ascribed to the expression "Projet de Recherche" (research project). French-speaking researchers did not understand it. They rejected it and unanimously suggested "opération de recherche" (research activity) to replace it.

This term has the twofold advantage in French of indicating a study in progress (whereas "projet" suggests something in the future) and of identifying its proper level in the program/activities/practices hierarchical concept of research. Generally, a research activity is the smallest unit enjoying distinct funding; it is usually unidisciplinary, and a researcher cannot reasonably take an effective part in more than four or five activities at any one time. The Ivory Coast uses the term "opération de recherche" with the same definition. For Senegal, the corresponding level is called "unité de recherche" (research unit). Both governments have the same notion in mind, and feel that their research should be reported in CARIS at the "activity" or "unit" level.

With regard to reporting style, 162 users (including a good many "suppliers") out of 203 - 81% - feel a need for codification and the elimination of unnecessary detail. Titles should be clear and concise, and should at once indicate the main objective of the activity. Supplementary information should be kept brief, in note rather than sentence form, and 50 researchers out of 162 go so far as to say it would be preferable to use descriptor words rather than sentences to indicate objectives and methods.

Remarks

Every kind of assessment was made of the content of the activity form, ranging from the most highly detailed to the elimination of objectives, methodology, provisional results and final results.

The possibility offered by CARIS of establishing direct relations by letter between researchers was clearly realized but variously assessed: "that is the chief value of CARIS", "it means I'll have to

write . . . and reply", "will the other fellow answer?", "what about forwarding?" and "wouldn't it be better to apply to CARIS central for additional information?".

Despite this divergence of opinion, we did attempt to identify some general trends on the basis of the answers given to a detailed questionnaire.

- Is the statement of provisional results necessary?

No : 163 - 81%

Yes : 30 - 15% : How should they be formulated?
- summary with figures: 7.5%
- 2-3 lines of explanation, without figures: 7.5%

- Is the statement of final results or partial results (at conclusion of each activity) necessary?

Yes : 117 - 58% : How should they be formulated?
- summary with figures only:) 77 - 38%
- same, plus report reference:)

- 2-4 lines of explanation only:) 40 - 20%
- same, plus report reference:)

No: 76 - 38% : What should replace them?
- the reference to the report or publication: 76 - 38%

Only 15% of the researchers would like to have provisional results; they were found almost exclusively among those working on perennial plants, shrubs and trees; half of them would be satisfied with brief qualitative indications.

A majority (58%) of those consulted would like to see final results in the directory; such results should be presented in a brief abstract, with figures but with or without the report reference, according to the greatest number (38%).

However, we should not underestimate the importance in relative terms of the 38% who feel that it is extremely difficult to assess the validity of a finding expressed in a few lines, when one does not know under what conditions it was obtained, and they request only the reference to the report or publication, preferring to consult the authors directly by writing to them.

It should be noted that the report reference is requested by 153 researchers (40 plus 37 plus 76), or 76% of those consulted; it is impossible not to take this into account.

Users do not appear to place very much emphasis on "objectives" as they are presented; most often such objectives are merely an

amplification of the title, and improvement of the latter could avoid this repetition. Users would prefer an account of the research practices included in the activity.

Nor is there a clear majority in favour of a detailed statement of the methodology or approach used. The use of descriptors is most often recommended in the case of standard techniques. In the case of a novel technique, a very brief note would be sufficient to call attention to the fact and encourage others to apply to the researcher involved for further details.

The major problem is said to be that of access to the researchers' annual reports. The authorities responsible for scientific research in the Ivory Coast and Senegal would be agreeable to the distribution of these reports; they are studying the possibility of submitting to CARIS the annual synopses describing the stage that has been reached in each research activity. Governments participating in CARIS should either provide copies of their reports for distribution or send a copy of each one to CARIS central on a regular basis; CARIS would handle requests for information. Such a collection, with the main portions stored on microfiches, would constitute an extremely useful pool of "inside" information.

In addition to the observations and suggestions noted in the preceding paragraphs, we would also consider the following proposals:

1 - indicate the discipline to which the activity is related;

2 - provide a reference to the program under which the activity is carried out;

3 - date the profile;

4 - indicate any liaison with other institutions in connection with a particular activity;

5 - include in the directory any work done in universities and elsewhere that has a direct bearing on agriculture (theses, and so on).

These points could be merely stored in the memory bank, or included in the directory.

In view of the foregoing, and in order to satisfy the largest possible number without giving the directory a character that it does not have and that many would deny it - that of a secondary periodical made up of abstracts - we propose that each operation should be reported in the directory as follows:

- title;
- list of activities;
- review of methodology;
- Significant partial or final results (in summary);
- the reference to the report or publication.

May we give two examples to illustrate our proposal (using imaginary data):

IV-300-0043 RETENTION AND PERCOLATION OF NUTRITIVE ELEMENTS IN THE SOIL IN RELATION TO THE LEVEL OF FERTILIZATION

(1400) A. Durand (01.72/12.76) Profile Prepared 5/2/74

Activities: 1 - Inventory of nutritive elements in banana groves at Azaguié
2 - Inventory of nutritive elements in pasture lands at Adiopodoumé
3 - Inventory of nutritive elements in corn lands at Adiopodoumé and Korhogo

Standard research techniques

Activity 1 completed; nitrogen percolation, phosphorus fixation. Annual report, ORSTOM, agronomy department, 1973

IV-300-0052 BIOCENOTIC STUDY OF INSECT PESTS OF THE COTTON PLANT

(1411) B. Durand (06.71/12.76) Profile Prepared 10/7/73

Activities: 1 - Ecology of Dysdercus voelkeri
2 - Ecology of Heliothis armigera
3 - Predators of Aphids and Jassids

Standard techniques. Novel nutritive medium for H. armigera

Activity 1 completed; new knowledge on migrations of D. voelkeri. Published in Coton & Fibres Tropicales 1973, 256-270.

NOTE: It does not seem necessary to report the name of the organization conducting the activity, since this is already indicated in the catalogue number (IV-300).

B - Information on Research institutions and stations

The pilot project proposed describing each station on the basis of the following ten characteristics:

a - full address, cable address, telephone number (if any)
b - geographical location: longitude, latitude and altitude
c - environment (climate, soil)
d - research staff (researchers, technicians)
e - area and layout of experimental fields
f - special facilities
g - teaching, training and extension activities
h - library, documentation, periodicals
i - areas of activity
j - financing

What were the opinions of the users consulted?
- fully satisfactory: 126 - 63%
- satisfactory, but should be more complete: 74 - 37%

The main suggestions were as follows:

1 - add date on which the institution or station was established, and give total area;

2 - add date profile was prepared;

3 - add type of agriculture carried on in the region (rain-fed, irrigated), crop schedule (seeding, harvesting), main product of the region;

4 - indicate existence and layout of farm equipment fleet (animal traction and power traction);

5 - eliminate the heading "d-research staff", and include this information under heading "i-disciplines and areas of activity", giving the number of researchers assigned to each discipline; this would provide a clearer picture of the station's activities;

6 - change "areas of activity" to "disciplines and areas of activity", with information being provided by the station in accordance with a specimen list distributed by CARIS, and covering technology used and plants studied;

7 - complete the item "area and layout" by adding details of afforestation cover and forestry, and land conservation and reclamation.

We find most of these suggestions excellent, and the information gathering form will be slightly modified.

Note the necessity for more accurate geographical data on research stations.

II - GATHERING OF INFORMATION

Two types of forms were used to gather information, one for research activities in progress, and the other for details of the research stations themselves. A variety of opinions were expressed as to their wording, the manner of completing them, and who should do so.

Researchers were generally satisfied with the information requested on the forms. Opinions of users were divided on the explanatory notes accompanying the forms, but the general feeling was definitely positive.

Bearing in mind the observations and suggestions discussed in section I of this report, we wish to present two improved specimen forms; they are appended to this section.

The "research activity" form

We have already reported what most researchers wished to know. It rapidly became obvious that a good many of the forms had not been completed by the head of the activity; there were many reasons for this. The question thus arose as to who - in the researchers' opinion - should provide the information. Four possibilities were presented, and the results were as follows:

The research activity form should be completed by:

- the head of the activity alone:	25 - 12%
- the researchers's supervisor, alone:	4 - 2%
- the head assisted by his supervisor:	92 - 45%
- the head assisted by a travelling CARIS expert:	68 - 34%

After examining the pilot project directory, a large majority of the researchers concluded that it was essential to require a high level of consistency in the presentation of information. They perceived two possible ways of achieving this, expressing a slight preference for the first: relying on the regulatory assistance of their supervisors, or seeking the advice of a travelling CARIS expert, at least during the first year. Perhaps the position of expert could be filled by one of them; the person concerned would take a brief course of training at CARIS central, and would then act as an adviser in the country where he was working, or in all the countries in a particular region.

The title of the operation suggests classification under such and such a heading. However, a number of descriptors, or key words, are selected from the information provided, and are used to permit consultation under other headings. CARIS central undertook to identify the key words for the pilot project. What do researchers think of this, and can it be continued? They answered as follows when presented with these four proposals:

In your opinion, who should identify the information descriptors?

- the chief of the activity, alone:	9 - 4%
- the head assisted by his supervisor:	18 - 9%
- the head assisted by a travelling CARIS expert:	61 - 30%
- CARIS central:	98 - 49%

The head, whether or not assisted by his supervisor, would prefer that CARIS central undertake this task, in cases where he is not in possession of the dictionary of descriptions (the AGRIS one, probably). The idea of the travelling CARIS expert is regarded by many as the best solution, if he has the dictionary, but a number of users, having decided at the outset that this was unworkable, opted in favour of CARIS central. It is obviously difficult to ask researchers to choose descriptors without the dictionary that gives their exact meanings. The best they can do is to suggest words, giving definitions, but this is a job that most of them would be reluctant to take on. However, if they do have the dictionary, we believe they are best qualified to choose the descriptors appropriate to their work.

Appendices to section II: following pages

RESEARCH ACTIVITY PROFILE

1 - CARIS number

2 - Research station

3 - Prepared (date):

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4 TITLE OF ACTIVITY

Begins:

Ends:

6 - Discipline to which activity is related

7 - Program under which activity is carried out

8 - Researchers

Disciplines - specializations

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9 - List of research practices involved in subject activity

10 - Standard methodology indicated by descriptors

11 - Novel methodology (brief notes)

12 - For research activity on shrubs and trees: summary of provisional results (2-3 lines)

13 - Partial results (activities) or final results qualitative (2-4 lines)

Reference to report or publication

14 - Material already published on activity in progress

15 - Liaison with other institutions in connection with this activity

RESEARCH STATION PROFILE

1 - CARIS number

2 - Sponsoring administrative body

3 - Prepared (date):

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4 - RESEARCH STATION

Established (date):
Area acc. to land register (hectares):
Long: Lat: Alt:

5 - Research organizations involved

Established (date):

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6 - Local agriculture: rain-fed /___/ Irrigated /___/ Main product:

Normal seeding time: harvest time:

7 - Disciplines and areas of activity, with number of researchers in each discipline

8 - Products being studied

9 - Experimental fields: total area /_____/ (hectares), including:

Under cultivation non-irrigated	Under cultivation irrigated	Pasture	Forest and sylvi-culture	Ponds & fish breeding	Land con-servation & reclama-tion
/_____ha/	/_____ha/	/_____ha/	/_____ha/	/_____ha/	/_____ha/

10 - Special facilities

11 - Farm equipment fleet:

improved: /___/ yes /___/ no

animal traction /___/

power traction /___/

12 - Teaching, training and extension activities

13 - Library, documentation, periodicals

14 - Funding (total amount)

III - PROCESSING OF INFORMATION

With respect to cataloguing, classification and indexing, users were requested to compare two systems for processing the information:

- the FAO Directory, printed in French;
- the Directory prepared by the Smithsonian Science Information Exchange (SSIE) presented in English.

Almost all users consider the FAO system of cataloguing (country - station - activity) more satisfactory than the SSIE system, because of the assignment of research projects to stations. Researchers wish to be able to classify references found in the index by looking up the station, since the geographical location of the latter gives an indication of the climatic zone.

One special case was raised: how is reference to be made to a station if an activity consists of practices spread throughout a country and being conducted by researchers who are not attached to a station?

The question of a system for classifying information did not give rise to a great deal of discussion. One of those proposed (the FAO one) corresponds to the technical classifications with which agricultural researchers are familiar (research subject and research activity); they quickly became accustomed to it, a process made easier by the fact that it is specific to agriculture.

The other, which is essentially documentary and much more general in character, was deemed to be incomplete and unsuitable. It was also at a disadvantage because of the language used and the absence of a brief summary of the various headings.

The following figures show how opinions were divided:

	Classification	Research Index
- Advocates of		
- the FAO system	191 - 95%	178 - 89%
- the SSIE system	9 - 4%	8 - 4%

Many felt that the FAO alphabetical subject index was deficient in exact descriptors, and a number of suggestions were made for improvements:

i - using the SSIE system as a basis, adding numerous exact key words that would not be used, but would refer to more general descriptors;

ii - combining the subject index with the alphabetical subject index, keeping only the activity index separate.

The second of these suggestions appears to be promising, and deserves further study; it would also have the advantage of avoiding a closed subject classification that could not be expanded.

A number of preferences were formulated:

1 - The indexes should be placed at the beginning of the directory, the alphabetical subject index coming first, followed by the other two, each with its classification.

2 - The names of active subjects should appear in the index, as well as those of commercial products.

3 - Vernacular terms should refer to the corresponding Latin terms.

IV - DISSEMINATION OF INFORMATION

The information collected was disseminated by means of a general directory of research activities, in book form. Naturally there are other possible methods of communicating information to the researcher: selective distribution of information, an enquiry service, direct consultation using information stored on tape in a number of cities equipped with retrieval equipment, a data bank, and so on.

The 203 researchers questioned were quite clear on this point:

-	dissemination by directory only:	58 - 29%
-	directory plus enquiry service:	132 - 61%
-	enquiry service only:	9 - 4%
-	selective dissemination of information:	0*

* after the first 60 people replied "no", we stopped asking this question.

The answer is clear: 90% require a printed directory in order to keep properly informed. Both their areas of activity and their information needs are too broad to warrant selective dissemination. A directory in book form is a practical tool that can be consulted regularly, and that can in many cases supply information for which the need cannot be foreseen. It is essential if the enquiry service is to be usable. Without this printed medium the information stored on tape will lose much of its usefulness, since it will not be adequately or intelligently employed. Furthermore, the publication of a directory encourages a researcher to consult it and improve his knowledge, something that a tape cannot do whether it is 10,000 or only 1,000 km away.

The directory in book form is thus essential to the successful operation of CARIS. If the written style is kept lean and concise, the size of it should not become excessive, at least over the first ten years. On the basis of the directory for the pilot project, which covered 13 countries, and bearing in mind that about one third of the research activities were not included in it, it is possible to arrive at a very rough estimate of the size of a directory covering 65 countries, most of them developing countries, and excluding the few more advanced countries that have their own directories:

	13 countries	65 countries
Stations and institutions	50 pages	250 pages
Research activities	300 pages	1500-2000 pages
Indexes	180 pages	900 pages

There is nothing alarming about this. Very few researchers will have to consult the 1500 pages of the directory of research activities, as shown by the following replies:

	Yes
- Would you like a directory presented:	
. as an all-inclusive work (such as the pilot-project directory):	19 - 9%
. divided into sectors:	179 - 89%
- If it were divided into sectors, on what basis?	
. by disciplines:	99 - 49%
. by types of product:	47 - 23%
. geographically (by continent or subcontinent):	33 - 16%

Division by scientific disciplines had the greater number of advocates, followed by "types of product".

Apart from the usual broad divisions, we were asked to group subjects under the following headings, as far as possible:

Scientific disciplines

Environment
Farm machinery
Agricultural economics, sociology (demography)
Animal sciences
Animal physiology, nutrition and feeding
Animal pathology
Plant protection (entomology, pathology, plant protection products, protection techniques)
Physical and biological oceanography (fish biology)

Types of product

Animal production (husbandry, pathology)
Forest production and fisheries

Geographical sectors

Europe (not including the Mediterranean Basin)
Mediterranean Basin
Sub-Saharan Africa and Madagascar
Middle East and Asia
Oceania
North America (Canada, U.S.)
Central and South America

Classification under such headings would enable a researcher to find in one place the largest possible number of activities of direct

interest to him. He will be able to use the enquiry service to obtain additional information on sectors other than his own, or to learn the most recent results that have not yet been included in an updated study.

Multidisciplinary research stations and research management centres will undoubtedly have information on all sectors. Researchers in their immediate vicinity will be able to make use of this, and will probably make only occasional use of the enquiry service. The latter will nevertheless be of use to isolated researchers.

The researchers' interest in a directory in book form was further demonstrated in their replies to the following highly hypothetical question:

. If the human and financial resources of the FAO were insufficient for a full CARIS service to be set up immediately, should we:

-	confine ourselves to the printed directories (manual documentation):	35	
-	confine ourselves to the directories but process the data and computerize them for later use:	138	173 - 86%
-	immediately establish an enquiry service:	20	- 10%

The enquiry service is seen as a complement to the printed directories, and 30% of the researchers questioned saw no need for it if they had access to all sectors.

CARIS IS A PRINTED DIRECTORY TO BE CONSULTED AT WILL, RATHER THAN A TAPE STORAGE TO BE SEARCHED.

Thus, the printed directory is a basic document, and provision will have to be made to revise and update it. The replies on these points were fairly varied:

Republication		Updating		
- every year:	4)	without updating		27
every 2 years:	17)			
every 3 years:	6)			
- every 3 years:	9)		(every year:	152
every 4 years:	14)		(biennially:	20
every 5 years:	149)	plus updates	(by means of	
every 6 years:	1)		(the enquiry	
every 10 years:	2)		(service:	3
- no republication, but updates every 6 or 12 months by means of the replacement of entire pages				1

The favoured arrangement is republication of the directory every 5 years, with annual updates covering new activities as well as the final results of completed ones; these would be presented on loose leaves for inclusion in the directory.

A 3-year interval without updates but with recourse to the enquiry service for new information on a given subject would also be perfectly acceptable, when everything is operating well and being used properly.

An agricultural data bank

Data banks are already in existence in mechanical engineering, physics, chemistry, physical oceanography and so on; others are being prepared (biological oceanography); still others can readily be imagined: farm machinery, economics, technology and statistics. Outside these rather specialized branches of agriculture, researchers find it somewhat difficult to see what the nature and purpose of an agricultural data bank would be.

They would be strongly in favour of it if they thought it feasible, but they found it difficult to believe that it was, due to the extremely restricted validity of results obtained in the field of agricultural research, which are deeply affected by local factors and by the methods used, and which change as research activities proceed; generally speaking, agriculture is not an exact science.

Replies to the question: "What do you think of an agricultural data bank, and what use would you make of it?" were as follows:

-	Unfeasible, unrealistic and pointless except in specialized sectors:	148 - 74%
-	Feasible and useful (technology, machinery, systems, plant protection chemistry):	27 - 13%
-	No opinion	28

Very few believe in the feasibility of an agricultural data bank, except in certain sectors. But even if it were feasible, it is not one of their primary concerns. They feel that existing documentation services, plus those of AGRIS level II, and the possiblity of writing to researchers in other countries, enable them to satisfy most of their requirements insofar as data are concerned.

V - CONCLUSION

At the end of this survey of researchers, designed to elicit the personal opinions of each one of them, we can state that CARIS is being well received, even that it is now eagerly awaited.

At the end of each two- or three-hour session, our interviewees were asked for a candid answer as to the usefulness of CARIS: did it conform to their wishes? They replied as follows:

-	very useful (in fact, essential);	38	
-	useful:	134	172 - 85%
-	of some use:	25	
-	of no use:	1	31 - 15%
-	no opinion:	5	

Of the potential users consulted, 85% feel that CARIS will be useful or very useful if the requested frequency of publication is maintained, if service is speedy, and if the information provided is up to their expectations. This is almost comparable to a referendum!

CARIS will be an excellent information medium that will not compete with documentation services, and will offer researchers major opportunities for access to the world of agricultural research.

How are their needs to be satisfied?

1. By providing clear and concise information on research activities (I A).
2. By providing complete information on research stations (I B).
3. By regular gathering of information, and dissemination of same with a minimum of delay. They are perfectly willing to complete the forms every year, provided that intelligent use is made of their input (II).
4. By processing the information in accordance with a slightly improved FAO system (III).
5. By the dissemination of directories in printed form. The total subject-matter could be divided into four main parts:

   a) a directory of research institutions and stations (about 250 pages) — 1 volume

   b) classification A and B, the alphabetical index of subjects and the activity index (about 600 pages) — 1 volume

   c) the author indexes (alphabetical and by discipline) and the indexes by stations (about 250 pages) — 1 volume

d) the directories of research activities (about 1500-2000 pages) n volumes

including, for example, individually or in groups

. plant improvement (genetics, breeding, vegetative improvement

. plant protection (pathology, entomology, plant disease control products, protection processes)

. climate, water, soil (soil science, soil biology, soil physics and soil chemistry)

. plant physiology

. cropping and harvesting techniques; farm machinery

. rural economics; sociology

. technology

. animal sciences; animal physiology, nutrition, feeding and pathology

physical and biological oceanography; inland fisheries.

Volumes a), b) and c) could be published every five years, with no updating. Those in category d) would be updated annually and reissued every five years.

ACKNOWLEDGMENTS

We wish to thank the International Development Research Centre (IDRC), particularly Mr. Donald Leatherdale, for the very wide freedom, autonomy and trust which were conferred upon us.

We would also express our thanks, and our apologies for any disruption of their activities, to: the Senegal Scientific and Technological Research Branch (Mr. Sene), the Ivory Coast Ministry of Scientific Research (Mr. de Dinechin), the Director of the Senegal Institute of Agricultural Technology, the Technical Director of OCLALAV (Mr. Afoyon), the directors of the various research institutes, and the director of ITIPAT in the Ivory Coast. We are most grateful to our colleagues, the researchers who agreed to take part in this survey; we hope that future results will reflect their wishes.

Finally - last but not least - we shall definitely not fail to mention all that CARIS and ourselves owe to the co-ordinating team placed at the FAO's disposal, under the leadership of Mr. Armand Thevenin, an agricultural and forestry engineer. The quality of the directories and the speed with which the first three phases were completed were a pleasant surprise for the researchers, who in turn could not do less than respond as well as they did to the questions asked during this fourth and final phase.

R. Lagière
Rome, May 16, 1974

LIST OF INSTITUTIONS CONSULTED

FRANCE

- Centre Technique Forestier Tropical (Technical Centre for Tropical Forestry) (CTFT); researchers and records officer

- Institut d'Elevage et de Médecine Vétérinaire des Pays Tropicaux (IEMVT) (Tropical Animal Husbandry and Veterinary Medicine Institute); laboratory supervisors, records officer

- Institut Français de Recherches Fruitières Outre-Mer (IFAC) (French Institute for Fruit Research Overseas); managerial staff, records officer

- Institut Français du Café, du Cacao et autre Plantes stimulantes (French Institute for Research on Coffee, Cocoa and other Stimulant Plants (IFCC); research supervisors, records officer

- Institut de Recherches Agronomiques Tropicales et des Cultures Vivrières (IRAT) (Research Institute for Tropical Agriculture and Food Crops); research supervisors, researchers, records officer

- Institut de Recherches du Coton et des Textiles Exotiques (IRCT) (Cotton and Exotic Textiles Research Institute); research supervisors, researchers

- Institut de Recherches pour les Huiles et Oléagineux (IRHO) (Oils and Oil Seeds Research Institute); managerial staff, research supervisors, records officer

- Centre d'Etudes et d'Expérimentation du Machinisme Agricole Tropical (CEEMAT) (Experimental Study Centre for Tropical Farm Machinery); managerial staff, researchers

SENEGAL

- Délégation Générale à la Recherche Scientifique et Technique (DGRST) (Scientific and Technical Research Authority); director and data-processing specialist; Dakar

- Institut de Technologie Alimentaire (ITA) (Food Technology Institute); Dakar; managerial staff, research supervisors

- Organisation Commune de Lutte Antiacridienne et de Lutte Antiaviaire (OCLALAV) (Joint anti-locust and anti-avian Organization), Dakar; technical director, experts

- CTFT, IFAC, IRHO, Dakar; administration and extension representatives

- Laboratoire National d'Elevage et de Recherches Vétérinaires (IEMVT) (National Laboratory for Animal Husbandry and Veterinary Research), Dakar; managerial staff, researchers

- Centre National de Recherches Agronomiques (National Centre for Agricultural Research) Bambey (IRAT); researchers

- Station de Recherches des Fibres Textiles (IRCT) (Textile Fibre Research Station), Kaolak; researchers

- Office de la Recherche Scientifique et Technique Outre-Mer (ORSTOM) (Overseas Scientific and Technical Research Board), Dakar; managerial staff, research supervisors, researchers

IVORY COAST

- Institut pour la Technologie et l'Industrialisation des Produits Agricoles Tropicaux (Institute for the Technology and Industrialization of Tropical Agricultural Production) (ITIPAT), Abidjan; director, research supervisor, researchers, records officer

- Station Sylvicole (Forestry Station) Bouaké (CTFT); researchers

- Station Piscicole, Bouaké (CTFT) (Aquaculture Station); researchers

- CTFT centre for the Ivory Coast, Abidjan; researchers

- Centre de Recherches Zootechniques de Minankro, (Animal Research Centre) Bouaké (IEMVT); researchers

- Station de Recherches Fruitières (Fruit Research Station) Anguédédou (IFAC); researchers

- Station Expérimentale (Experimental Station) Bingerville (IFCC); director, researchers

- Station de Recherches d'Agronomie Tropicale et des Cultures Vivrières (IRAT), (Tropical Agriculture and Food Crops Research Station) Bouaké; researchers

- Station de Recherches du Caoutchouc en Afrique (African Rubber Research station), Bimbresso; researchers

- Station de Recherches des Plantes Textiles (Textile Plants Research Station) (IRCT), Bouaké; managerial staff, researchers

- Station de Recherches des Plantes Oléagineuses et Huiles (Oils and Oil Seeds Research Station) (IRHO), La Mé; researchers

- ORSTOM centre, Adiopodoumé; director, researchers

- ORSTOM centre, Petit Bassam (Human Sciences), Abidjan; researchers

- Centre de Recherches Océanographiques (Ocenographic Research Centre) (ORSTOM), Abidjan; researchers

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Total: 32 organizations and stations - 203 people