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**EVALUATION OF**

**IDRC'S TELEMATICS PROGRAM**

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## EXECUTIVE SUMMARY

The Telematics Program of the International Development Research Centre was initiated almost a decade ago. This evaluation was carried out for the Centre because "the Program has matured to the point where it is appropriate to step back and evaluate what impact the Program has had and to look forward to better ensure relevance of future support."

The evaluation is based on a large number of personal interviews and correspondence with individuals who had direct involvement in the Program as well as with knowledgeable observers. These discussions were guided by an issues paper.

The report sets out the context for computer communications systems and services for the research and development community in developing countries. It demonstrates that such services are slowly evolving and that the telecommunication carriers will have an important role in their evolution, but that an appreciation of the special needs of the research and development sectors is negligible and will need continued support from programs such as the Telematics Program.

It further highlights that other technologies are emerging which perform some of the same or similar functions as computer communications services and that the end-user is confronted with difficult choices. The report suggests that the needs of the end-user must be the focal point of a program such as the Telematics Program and that the research must be broad enough to help users make appropriate choices for sustainable operations.

The evaluation also reviews programs which are carried out by other organizations in support of computer communications for research and development and concludes that the Telematics Program remains unique in its focus on telematics as a research thrust, as opposed to providing operating support. At the same time, the evaluation found that this focus on telematics research proper will need to be moved more strongly into the foreground in future initiatives of the Program.

The experiments and pilot projects, carried out in the first decade of the Program, were judged by the clients as having been very appropriate vehicles to promote understanding and experiences with computer communications. It is felt that in a subsequent phase, programming methods should build on these experiences. In particular, human resource development and institution building should feature more prominently in future projects. The report suggests that a more pro-active approach to project definition and identification will assist in achieving this goal.

- o Ensure timely, targeted, including informal, exchange and dissemination of information, particularly in support of start-up projects.
- o Continue projects and experiments in Africa.
- o Undertake joint projects with organizations such as the ITU and INMARSAT to promote an understanding by carriers and service providers of special needs of the research and development community.
- o Explore the requirements and structures for national support centres which can offer sustained support and training to the research and developmental users of computer communications services.
- o Support the development of human resources and institutional capacities as integral part of each project and choose partner organizations according to their capacity to contribute to this process.
- o Mobilize information from existing and new projects to address policy and economic issues which are critical to long-term decision-making and to sustainability.
- o Support research on an "Information Centre of the Future" by field testing the use and utility of a range of existing and emerging technologies and by using the field sites to train future users and operators.
- o Maintain flexibility to continue some support to small projects and to non-traditional recipient organizations.
- o Explore realistic field projects at the level of the ultimate beneficiaries of IDRC's development support.

Findings from the evaluation support the continuation of the Telematics Program. The report introduces a number of observations on approaches to programming which should be taken into account when formulating the next phase of the Program. It concludes by translating the above findings and recommendations into outlines for a number of potential programming initiatives at different indicative budget levels.

## SECTION ONE: INTRODUCTION

In the early 1980s, the Telematics Program was established within the Information Tools and Methods Group of IDRC's Information Sciences Division. The Program has been

"promoting and supporting the development, testing, evaluation and use of data communication techniques by developing-country institutions in support of development and research objectives so that these institutions and others can make more informed decisions on the appropriateness and use of such techniques for their needs.

The Program began when use and indeed knowledge of such techniques was practically non-existent in the vast majority of developing countries. Now, implementation and use of data communications techniques is increasingly commonplace in many developing countries and, where it not, institutions are articulating the need for such services. It appears that the Telematics Program, one of the first of its kind, if not the very first among donor institutions, has played a positive role in this process. Currently the Program is focusing most of its efforts on Africa, where related developments have been slow.

The Program has matured to the point where it is appropriate to step back and evaluate what impact the Program has had and to look forward to better ensure relevance of future support<sup>1</sup>".

The origin of the Program can be traced to an international workshop on computer communications for development, which was held in 1981 by IDRC on the urging of a member of the IDRC Board.

The Terms of Reference for the evaluation report specify that the report

"will analyze and evaluate the effectiveness and impact of the Telematics Program to date and will present potential and recommended orientations and focusing for the Program in the coming decade<sup>2</sup>".

The analysis and evaluation of the effectiveness and impact of the Telematics Program was carried out through review of files, interviews in person and by telephone, and through correspondence.

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<sup>1</sup> Source: Draft "Evaluation of IDRC's Telematics Program", Division Activity Project, Information Sciences Division, September 1989.

<sup>2</sup> Source: Terms of Reference, Consulting Contract, IDRC File: 3-A-89-4115, November 10, 1989.

## SECTION TWO: THE TELEMATICS PROGRAM - ITS PRESENT AND FUTURE CONTEXT

### 2.1 Definition of Telematics

Telematics has been defined by the Program as technologies and processes which facilitate the exchange of information by combining computer technologies and telecommunications systems. Users typically use such systems and services for computer conferencing, electronic mail and bulletin boards as well as to access databases<sup>3</sup>.

It is important to keep in mind that at the time when the Telematics Program was established, such systems and services were just being introduced in developed as well as in more advanced developing countries. The tremendous developments which have occurred in the last ten years have been driven by the interests of the economies of the developed world.

University, academic and research or special interest networks developed as well by making use of the evolving technologies and services. Many faculty members and researchers in industrialised countries now have access to computer communications facilities.

### 2.2 The Parameters and Context of Telematics Systems and Services

Underlying these systems and services are a number of parameters which have to be in place to facilitate telematics services.

Telematics is a combination of telecommunications and computing technologies. We therefore need to distinguish between the channel (telecommunications) and the use of the channels (which could be voice or data). Further, we need to distinguish between technologies which are related to the channel (satellite earth stations, for example) and technologies for the use of the channel (computer communications protocols, for example).

To connect computers via telecommunication services requires knowledgeable individuals as well as communications modems, software protocols and host computers. Where telecommunication systems do not have high technical quality, error correction software is required to make up for this deficiency. Other options to circumvent troublesome telecommunications links or to establish links where none exist, include technologies such as satellite earth stations or packet radio.

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<sup>3</sup> Based on a discussion with David Balson, Telematics Program Officer.

International packet data services for African countries are only in their infancy, although many countries have announced plans to introduce such services.

Other solutions to cost containment include data compression and the use of high speed communications modems. The latter send data on regular telephone lines, but reduce the time used, and therefore, the communications costs. National packet data services are not yet widely available within developing countries.

Telematics systems require human resources to operate and manage the services. This applies to the underlying technical systems as well as to the services they provide. More complex services, such as computer conferencing, need more advanced management skills than electronic mail services. The lack of these management skills will negatively effect the success of the service.

### 2.3 The Technical Context: Other Evolving Technologies

Over the last ten years, technologies have been developed which can be seen as complementing or competing with telematics services or which may be offering some of the same features. A strict separation in the Telematics Program between telematics services and the services which these technologies can provide would be detrimental to the end-user, who needs to make investment decisions on the full range of services and technologies available.

The economics of information are at the heart of the discussion of the different technologies. For example, where large amounts of retrospective data need to be frequently accessed, computer communication links to a database may prove to be more costly than the local installation of CD-ROM facilities. When emerging or changing data are required, real-time computer access is necessary. For most developing countries, this means international long distance communication.

When such data is essential to the work of a number of people in the same organization, the data could be loaded from its database to a computer in the organization, in order to reduce the long-distance service charges. Access by individual users of the data then could be facilitated through a local area network (LAN), which links individual work stations to the computer, or, in the case of some retrospective data, to the centralized CD-ROM facilities. In order to make such a scenario economically feasible, a fair number of users of significant amounts of information needs to be present.

In the case of libraries or journal distribution, which in many developing countries are woefully inadequate, electronic storage of information contained therein may be more economical than the gradual acquisition of hardcopy.



of communications traffic (e.g. in comparison with the business community) and can rarely benefit from economies of scale.

The particular requirements of these two sectors will likely not be fully satisfied as a result of general progress made in telematics technologies and services. Specialized research and development with focus on institutions in developing countries is required. This research needs to encompass telematics technologies and services themselves, as well as their applications to research and development. IDRC's Telematics Program has contributed to this process.

## SECTION THREE: SUMMARY OF TELEMATICS INITIATIVES - IDRC AND OTHER ACTORS

### 3.1 Summary Description of the Projects and Activities Carried Out Under the Program<sup>5</sup>

Brief descriptions of projects and activities can be found in Appendix C.

### 3.2 The Commonwealth Secretariat<sup>6</sup>

The computer technology programs of the Commonwealth Secretariat do not pay specific attention to telematics, but concentrate on computer technology, policies and manpower training in general.

As part of a programme to help developing countries to maximize the benefits from new technologies, the Commonwealth Secretariat commissioned the writing of case studies on information systems and process automation in a wide range of national contexts. In 1988 a workshop was held to discuss results from the case studies in 13 different countries and to develop recommendations for further initiatives.

Further initiatives which were recommended included the commissioning of comparative studies of national technology policies and the monitoring of transnational co-operation. Further case studies at the organizational level would be valuable. All of the above should be adapted into material suitable for use in training workshops. Guidelines for the selection and implementation of technology was seen as a worthwhile initiative. The establishment of training centres within geographic regions was proposed.

A number of regional seminars have been carried out since the workshop, with focus on the management of change and on policy development. Further, management programs, supported by the Secretariat, such as at the East and Southern African Management Institute (ESAMI) in Tanzania, offer short courses on computer technologies and services.

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<sup>5</sup> IDRC distinguishes its initiatives between projects and activities. Projects are typically of longer duration and receive more substantial financing than activities. Activities can be planning studies, conferences or travel and subsistence support.

<sup>6</sup> Source: Management of Technological Change: Themes and Issues, by Mohan Kaul, Director, Management Division, Fellowship and Training Programs, Commonwealth Secretariat, in Information Technology for Development, Volume 4, Number 2, Oxford University Press, 1989, and interview with Division staff in February 1990.

### 3.4 The United Nations Agencies

Many agencies of the United Nations touch on computer technologies or policies. Again, computer communications is not specifically targeted, but is included in the broader concept. Some agencies, like WHO, are users of computer technologies and computer communications systems. UNDP supports a number of telematics activities in the Latin American region. Others, such as the ITU, UNESCO or UNIDO directly or indirectly influence developments.

Not surprisingly, the UN agencies have significant interest in computer communications systems for their own internal use. They operate offices and branches in different parts of the world and the need for access to and exchange of information is continuous. Recently, a working group, encompassing representatives of a number of agencies, was established to develop an overall computer communication framework for the UN system.

The plans of the WHO and of the ITU may offer interesting opportunities for joint initiatives for the Program. The WHO represents an example of a user agency which is expanding its significant know-how and technical resources to get closer to the field level. The ITU is assessing its support to computer-based training for the member administrations and is promoting the use of computer communications to support the introduction of such training modules. In this example, the ITU also can be considered a user agency. Although computer communications systems are not an expressed concern of the Union, it is likely that projects like the one mentioned, will spill over into the Union's coordination and promotional work to support the development of telecommunications systems in developing countries.

Both organizations would be interested in working with IDRC on future projects. It would appear that the ITU project might significantly increase the understanding of computer communications services by staffs of telephone administrations. The lack of awareness of details of this service by the staff of many telephone companies was observed by several respondents. This, in turn, was thought to negatively influence the type of services offered, the technical and maintenance support available, as well as tariffs.

The United Nations University has in the past co-funded a telematics project with IDRC. It is in the process of setting up a centre for research and development related to new technologies in the Netherlands. It would not be surprising for activities in telematics research and development to accelerate once the centre is fully established.

UNESCO and UNIDO support policy development, some research, information dissemination and training and in the latter case, industrial development. Both treat computer communication within the broader context of information technologies.

The absence of computer communications and information technology as areas for ODA programming makes the development of indigenous capacities, resources and structures a difficult task. Unless the host countries take firm stands, they find themselves confronted with a vast array of non-compatible systems, which are also difficult to maintain and repair. Further, programs which will ensure that trained manpower will be available for the future are rarely developed. Many host countries do not have the capacities to develop such broad national positions.

IDRC can be an effective supporter of such activities through demonstrations and case studies. These can be used to train and enlighten ODA staff, as well as to encourage host countries to develop appropriate technical standards and guidelines for the long-term development of manpower.

### 3.7 Private Sector

Over time, a number of manufacturers, such as IBM have promoted computer communications through the donation of equipment. Often this is viewed with a fair bit of trepidation by the research and development community, because of perceived associated commercial pressures.

An organization such as IDRC could represent an effective link by helping recipients to use such technologies as "unbiased" research and demonstration grounds. To illustrate the point, a research and demonstration project might be implemented under the INMARSAT program which would help users to assess their uses of computer communications while testing the earth station technologies of a number of manufacturers.

### 3.8 International Computer Communications Networks

In addition to the large commercial international networks which operate world-wide and serve any type of user, a number of special interest networks have evolved in the development and in the research community. These networks often interconnect with the commercial networks. Their service component comes from special value-added services, such as network management, ownership of communication software and protocols, or access to databases. Some networks will help the end-user in selecting computer terminals, and provide initial training and trouble-shooting.

Network operators which connect a number of services can be differentiated from service operators which connect a number of terminals into a specific service.

The Canadian NGO community has been an active participant in the development of computer communications. One network is WEB, which is a nonprofit communications network with hundreds of subscribing organizations in Canada. It provides access to global services by

## SECTION FOUR: PROGRAM BUDGET AND DISCUSSION<sup>7</sup>

### 4.1 Budget by Source

Since its inception, the Information Tools and Methods group of IDRC has spent \$2,250,497 in the Telematics Program for 19 projects and 21 activities<sup>8</sup>. Additional expenses for staff, staff travel and related costs are not included in this figure.

PROJECTS	\$1,886,931
ACTIVITIES	\$ 363,566
<u>TOTAL</u>	<u>\$2,250,497</u>

The distribution of funds over time shows that roughly 40% of the overall budget spent on activities was spent in the first two years from 1981 to 1983, reflecting Program start-up.

Contributions from recipients amounted to \$1,577,336. Funding from other sources are recorded roughly as \$880,000. Both these figures represent estimates only. For some projects in-kind contributions were not quantified, which leads to the assumption that recipient contributions are likely higher than reported here. Further, a number of projects drew on additional funding sources which are not reflected here or where not recorded, as these projects continued into follow-up phases or operational services, or as they spun-off related projects.

The amount of funds represented by the Program are in the order of \$4,710,000 (rounded).

The fact that over half of the total costs were carried by sources outside of the Telematics Program can be seen as an indication that the Program addressed areas of interest and need to recipients.

Several of the respondents stated that the prestige of IDRC's support of telematics has given them the lever to obtain additional funds nationally or internationally. In other cases, IDRC funding meant access to hard currency for equipment which would not have been easily attained otherwise.

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<sup>7</sup> For budget summaries see Appendix D.

<sup>8</sup> As of June 1990. See Appendix D for details.

CNI, as a national, quasi-governmental organization, has the mandate to promote computer applications, technology and policy in Tunisia and thus has the mandate and funding base to undertake exploration and dissemination of computer communications techniques, with or without IDRC funding.

ILET in Latin America also has become recognised as a centre of know-how and knowledge in this field and has actively shared its experience with organisations throughout the region. However, without external funding, from IDRC or other sources, ILET's continued role in this area is not firmly established or well-defined.

By supporting a number of projects and activities with the same organizations, the contribution of the Program to the development of capabilities in these institutions is recognised by a number of the respondents. It would appear that, in regions of the world, such as Africa, where computer communications capabilities are limited, the Program could accelerate its assistance in developing such capabilities for the long-term by working with a small number of organizations. In order to prevent dependence on IDRC support, and to encourage continued innovation, a number of programming mechanisms are suggested in the last section of the report which aim to support institutional development as well as flexibility.

#### 4.4 Types of Recipient Organization

The development of human capacities can take place in diverse environments. Experimental and pilot projects, in order to contribute to such capacity building, will need to be based in organizations which not only allow projects to happen, but which see the development of long-term capacity as part of their mission. Further, universities, information centres or non-governmental organizations will carry out this task from very different starting points and with different end results.

Work with universities or other training/research institutions will likely have wide-reaching effects, since their mandate is to build broad-based capacities. NGO's and information centres have more specialised target audiences, more direct and immediate service applications, plus more specialized training needs.

## **SECTION FIVE: ASSESSMENT OF THE PROGRAM WITHIN THE CONTEXT OF THE INSTITUTIONAL MISSION AND MANDATE<sup>10</sup>**

IDRC's philosophy, very much reflected in the operations of the Telematics Program, is that research decisions need to be made by the developing countries themselves. Further, activities should contribute to development through research and research support.

### **5.1 Mission and Mandate**

The Information Sciences Division in IDRC improves information systems, services and tools necessary for managing and using information relevant to problems of development. It further aims to build indigenous capacities and to foster co-operation and co-ordination. The primary direct beneficiaries of the research have been the research community, policy-makers and information centre staff. Increased attention is being paid to reach the ultimate beneficiaries of development.

The strategy the Division has employed centres on:

- o improved information flow between source and application
- o emphasis on areas identified by the Centre's other research divisions as reflecting developing country priorities
- o shifting emphasis to national and regional levels, as much has been accomplished globally
- o improving means to reach ultimate beneficiaries
- o diversifying the channels
- o increased attention paid to other (than bibliographic) forms of information
- o improved capacities to take advantage of new technologies.

Within the Division, the Telematics Program plan, as part of the Information Tools and Methods Program, calls for the facilitation of computer-based and satellite-based communications for providing access to and exchange of scientific data in support of developing-country researchers.

### **5.2 Has the Telematics Program Contributed to the Mission?**

The Program has contributed to the strategic directions of the Division in a number of areas. The following discussion draws on the analysis of discussions which are reported in later chapters of the report. It addresses what has been achieved by the Program in each of these areas, as well as suggestions for future initiatives.

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<sup>10</sup> Source: IDRC Board of Governors 34/16, pages 31-32 and 56-59, New Delhi, March 1986.

For the majority of the potential end-beneficiaries in Africa, however, such direct links will be elusive for a long time. Obstacles include not only the costs involved, but also the inexperience of these users with modern technologies and illiteracy. At another level, it is not likely that information exists in a form or language which is accessible to this group of users. Further, the researchers themselves are inexperienced in working with these end-users. Successful projects will likely require intermediaries, which could come from the NGO community or the rural extension agencies.

In terms of diversifying the channels of information distribution, the program was the first one which assisted the developing world to add the dimension of computer communications to scientific work<sup>11</sup>. In addition, alternate technologies, and therefore channels, are explored, namely CD-ROM technology and other optical discs.

A number of respondents pointed at the need for a concerted future effort in exploring, testing and appraising the range of different channels which in the future will bring information to researchers, policy-makers, information users and the general population. Some felt that the new communication channels, if planned right, might give a tremendous boost to providing access to information in particular in Africa.

They felt that future information centres and libraries will provide their users, through technologies such as CD-ROM, videodisc or computers, with access to historical and up-to-date collections of information which cannot be built up in hardcopy. Such information is difficult to access now because journals and books are not widely available, are rarely up-to-date and are location-specific, ie can only be read where they are physically located.

Most projects explore additional (to bibliographic) forms of information provision through computer conferencing and electronic messaging among researchers or development workers. The actual type of information and the associated research or development value of the information exchanged this way are unfortunately not very accessible, since in all but two scientific computer conferencing projects, little concrete usage data was collected.

The issue of improved capacities to take advantage of new technologies is also touched upon in later sections of the evaluation. Overall, respondents report that the Program has

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<sup>11</sup> For details see the report on an international computer conference on the bioconversion of lignocellulosics for fuel, fodder, and food which took place from May to December 1983. "International Computer-Based Conference on Biotechnology; A Case Study". Balson, D., editor, Ottawa, Ont., IDRC-241e, 1985.



contributed to increasing this capacity within participant organizations and through some workshops and a few newsletters. The Program will benefit from stressing initiatives which aim at the development of these capacities for the longer-term. Particularly in Africa, this should include the development of institutional capacities as well as focused efforts to increase the base of skilled people.

## SECTION SIX: ASSESSMENT OF PROGRAM OBJECTIVES AND PROGRAMMING INITIATIVES

This analysis is guided by two questions:

- o Are the Program objectives appropriate in today's context and in the next ten years?
- o Are the Program objectives being reached through the initiatives chosen?

### 6.1 Question One: Are the Program Objectives Appropriate in Today's Context and for the Future?

The Telematics Program of IDRC aims to

"promote appropriate adoption and adaptation of computer-based communication tools, techniques and methods in developing countries in support of development and research activities".

These global Program objectives are supported by the following six sub-objectives<sup>12</sup>:

- o increasing general awareness;
- o expanding the number of technical facilitators and the level of expertise;
- o improving the availability of and access to information on what can or cannot work;
- o influencing related policy development;
- o influencing related infrastructure development research;
- o promoting local capabilities in decision making on implementation and utilization of data communications techniques.

The global objective of the program is still very much supported by respondents from the research as well as the development communities. The reason is that the driving force behind today's rapid expansion of computer communication technologies and services in most parts of the world is the business and industrial sector. The needs and requirements of the research and the development communities continue to need further identification, development

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<sup>12</sup> Correspondence with David Balson, Telematics Program Officer, Nairobi, December and January 1989/90.

and promotion within this overall context. Many respondents felt that the Telematics Program has and can continue to play an important role in this process.

A few respondents suggested that the objectives should be appraised within the socio-political context of development in a given country. The absence of such analysis is feared to lead to further concentration of access to information and opportunities for those already information-rich. The Program might support a project which addresses the information needs of those who typically do not have access to many channels of information.

Section Seven discusses findings and recommendations resulting from the exploration of the Program's sub-objectives. It appears to be a general consensus of the Program participants that the sub-objectives do not require revisions and that they appropriately capture future needs.

## 6.2 Question two: Are the Program Objectives Being Reached by the Initiatives Chosen?

In order to explore stated objectives in research and field activities, the Program sponsored a number of projects as well as smaller initiatives of shorter duration, typically referred to as activities.

The review of the methods and approaches chosen to reach the global as well as sub-objectives yielded the following comments from participants and observers.

Most respondents, in particular those who had participated in or managed pilot (or experimental) projects, gave high marks to the flexibility of the Program and commented positively on the catalytic effects achieved by it. Several of the respondents commented that the external support received from IDRC gave internal as well as national recognition and status to their own project initiatives. In a new field, such as computer communications, this was very important to mount projects and experiments. Thus, the value of IDRC contributions went often well beyond the actual financial contributions.

The fact that the IDRC Program was able to finance small, short-term projects which can either be terminated or built upon was seen as important in the exploration of computer communications technologies.

Further, the Program's focus on actual field projects instead of a series of feasibility and paper studies was valued highly by many participants.

A weakness of the Program related to the actual adoption of computer communications by organizations was seen in the

insufficient exploration of cross-sectoral economic, policy, social or organizational issues as part of the experimental exploration of the technologies. Further, in some projects the actual applications of computer communications were not sufficiently addressed in the project formulation, which gives dominance to the exploration of the technologies over their applications.

The need for broader and better defined and more closely monitored evaluation and research emerges from projects with a certain degree of accumulated experience. Some of these projects are becoming concerned with operational sustainability and begin to realize that they have not explored sufficiently economic, cost-sharing, administrative or policy mechanisms which will facilitate this process. At least one project, however, has made a successful transition to full operations.

It is difficult to identify the results of some of the smaller activities, such as workshops, travel support, etc. In some instances they have led to full project proposals, which is a positive outcome. In other instances no follow-up developments are evident as a result. In a research and development environment this can be considered a successful outcome as well. However, some recipients had the expectations that follow-up projects would result from these activities where they did not materialise. Clearer definitions of expectations may help circumvent such misunderstandings.

Many respondents agreed that African organizations are in the greatest need for support in the exploration of computer communication technologies and services. Practical, hands-on experiments and projects, as pursued at present, were judged as important. Observers with particular interest in Africa noted the special importance of the fact that the program officer is based in the region, giving him a better view of conditions and making for generally better programming decisions.

## **SECTION SEVEN: ASSESSMENT OF THE EFFECTIVENESS AND IMPACT OF THE PROGRAM**

The following Section summarises findings and recommendations related to achieving the Program's six sub-objectives. Issues voiced in this Section, are again adressed in Section 8.3 and form the basis of the "Programming Initiatives".

### **7.1 Increasing Awareness of Computer Communications in the Research and Development Communities**

#### **Findings:**

- o Awareness of computer communications services has increased in developing countries since the existence of the Program.
- o The IDRC program can take credit for having contributed to this awareness, in particular in the agricultural research community, amongst international NGO's and within some university systems.
- o In the research community, administrators or administrative uses of telematics services have taken hold more quickly then scientific uses. Increased familiarity with the service, more user-friendly services, increased interconnection with scientific networks and an emerging generation of scientists who are used to working with computer communications is accelerating scientific use.
- o The international NGO community appears to be relatively aware of computer communications. NGOs have evolved as users of networks and as providers of alternate networks and services. This is evident from the list of subscribers to specialized computer communications networks. Some of these networks developed pricing policies, giving preferential rates to the NGO sector.
- o Some observers express concern that donors will find it easier to deal with NGO's which are members of a network and will give them inadvertently preferred treatment.
- o While the awareness of computer communications services and their potential benefits has grown, a significant number of donors, development workers and others continue to have the perception that the service is costly and a luxury.

- o The telecommunications companies in many countries still do not offer computer communications services. In some cases this is the result of a lack of technical knowledge; in others, the lack of access to funds to undertake the requisite upgrading of the infrastructure; and in still others restrictive national policies.
- o In addition, the particular needs of the research and development sectors for computer communication services, characterised by low volume and services outside the urban corridors, have not been well formulated.

#### **Recommendations:**

- o Increase the information dissemination activities to achieve a broader outreach. Provide realistic and honest case studies of benefits achieved and problems encountered.
- o Diversify the use of computer communications services in other research sectors, in co-operation with other organizations which are entering this field. By encouraging and assisting IDRC's own programs in the other research sectors to use computer communications, other organizations will likely follow suit.
- o Increase awareness at the broader national level by paying more attention to the totality of support that needs to be available nationally to facilitate the introduction of computer communications, including economic and policy analysis and models, such as service and pricing policies.

#### **7.2 Increasing the Number and Level of Technical Facilitators**

##### **Findings:**

- o All projects increased the number and level of technical facilitators.
- o Staff of some of the more mature projects act as important resources to others in their field, eg NGO's or agricultural research. This should continuously be encouraged.
- o The transition from IDRC-supported projects and activities to other modes of operation has been achieved successfully in some projects and less successfully in others.
- o The funding scope of projects did not in general appear to create a problem, although some projects suggested

that longer project time-lines would be desirable, as start-up typically proved to be longer than anticipated.

- o It appears that projects focused more on mastering the technologies of computer communications, than on the formulation and exploration of their applications.
- o Learning about/training in computer communication services and their applications is not possible in many developing countries, outside opportunities offered by the Program.
- o While awareness of computer communications appears to exist at a general level in many countries, it is accompanied by a general lack of access to appropriate and timely information about technologies, comparative pricing as well as about applications.
- o National maintenance and support centres for computer communications systems and services are necessary to overcome delays and costs of the present methods of fixing technical faults.

**Recommendations:**

- o Continue the development of technical facilitators through field projects.
- o Ensure that projects become training grounds for other interested parties in a given country or region. Make sure that this exposure is open to people with an applications background.
- o Encourage projects which combine field trials with a cross-disciplinary mix of research from areas such as economics, public administration, telecommunications and applications expertise.
- o Support the development of focal points at the national levels for expertise in computer communications. These might be national professional associations or high-level commissions, or permanent full-time bodies. Flexibility and responsiveness as well as access to the policy-making process appear to be necessary to fill an existing gap.

### 7.3 Availability of and Access to Information About What Can and What Cannot Work

#### Findings:

- o The projects supported by the Program represent a great wealth of experience in terms of what works and does not work.
- o Most projects do not appear to gather or disseminate this information for use by the broader interested community.
- o The exchange of information between established projects and newly developing ones is limited. This is particularly apparent in the formulation of applications. Further, there does not appear to be much direct exchange between projects when it comes to choosing technologies or to solving technical problems.

#### Recommendations:

- o Emphasize the development and dissemination of information about experiences in a format which is practical and useful to at least one of three groups, i.e. computer communications professionals, present and potential users of computer communications, and providers of telecommunications services.
- o Review the experience with the newsletters created in the INTERDOC project to see if and how such activities could or should be continued.
- o Build on experiences gained by supporting people from earlier projects to spend time advising newly evolving projects.
- o Ensure that local or national users of computer communications (those with/without IDRC support) exchange experiences among themselves, hoping that such local user groups will assist each other in problem solving.
- o Mandate and support project leaders and staff to actively gather and disseminate project findings.

### 7.4 Influencing Related Policy Developments

#### Findings:

- o Most projects do not expect, nor have the mandate, to directly affect policy developments at the national levels. They do, however, see effects related to the operating policies of their own organizations, or in



procedures established by donors, eg in budgeting and staffing for computer communications functions, as well as in the formulation of new projects.

- o Some project organizations have the mandate or are active in influencing the development of national policies and structures related to computer communications.
- o Some of the projects suggest that by creating an informed user community, policy development will be affected in the long-term.
- o Policies in the computer communications area will be influenced for many countries by the work of international organizations such as the ITU.

#### Recommendations:

- o Assist the national and international research and development community to influence important policy deliberations, in particular those which influence tariffs and access standards and protocols, as well as services outside the urban areas. Specifically, the ITU and INMARSAT are bodies which offer opportunities for such targeted initiatives.
- o On a regional basis, continue vigorously dialogues with carriers which are developing new services, as was done in the Caribbean and could be achieved in Africa through some cooperative projects alluded to in the above.
- o Actively support countries which have in place policies particularly relevant to the research and development community to assist others in developing theirs.

#### 7.5 Improving Research and Development Activities

##### Findings:

- o International NGOs report that they are better briefed and prepared for different initiatives through electronic access to others with related interests. The use of electronic mail systems as well as access to databases has fulfilled a useful function.
- o The network used by the international agricultural research centres is saving the centres significant amounts of funds.
- o Research users of computer communication services report most significant uses of the service for administrative support, in the form of messaging.

- o The complexities and costs involved in planning and executing computer conferences, accessing databases or co-authoring papers appears to discourage such uses, as does the general lack of trained individuals who have the leadership skills or mandate to facilitate these uses.
- o In organizations where senior management actively supports computer communications and where staff is allocated to facilitating easier access for users, more intensive and diverse use is made of the services.
- o Very useful technical developments are facilitated by the Program, such as the Arabic-language communication software. The formulation of project outcomes related to the impact and effectiveness of user activities is less well developed or traced.
- o In the early exploration of technologies, projects are typically concerned with the actual performance of the technology. In projects where users have pressing needs for access to information or in projects where user services have been important in the past, eg in the PADIS project, more information related to the actual impact of the service is likely to emerge.

#### **Recommendations:**

- o General case studies describing and documenting the actual use of the service and its relation to criteria such as research outcomes should be undertaken, as is the case at present with the CGIAR case study. Smaller case studies would be useful as well, since they can demonstrate to others some practical individual applications. Overall, information should be exchanged with much less delay.
- o More attention should be paid in the future to the formulation as well as implementation of research related to the usefulness and impact of the projects.

#### **7.6 Influencing Related Infrastructure Developments**

##### **Findings:**

- o Infrastructure developments in this field are very costly, for telecommunications development, as well as for computer communications protocols and methods.
- o The Program has played a useful role in providing resources for the adaptation of computer communications procedures to be more relevant to developing countries.

- o Computer communications services are novel services for telephone administrations in most African countries, which means that staff members from the administrations will also not have much knowledge of the way they operate, of technical and interface issues, nor of administrative or tariff issues.
- o The technical performance, the reach of the network, and the costs of services in some African countries are often not suitable for computer communications services aimed at the Program's target audience. Services to areas outside the main urban corridors or for small volumes are even more handicapped in terms of service availability or tariffs.
- o Packet radio of the type the Program has been encouraging, has not found acceptance by many telephone administrations, nor by the ITU. Some knowledgeable respondents see this technology useful only as an interim technology until full telecommunications services can be established. The costs associated with any interim infrastructure are such that solid justification needs to be present. Such justification may be present in specialised applications such as relief work or support for remote research centres. The development of infrastructures for general public services is not likely to offer such justification.

It would be preferable if the work related to digital radio would be approached from the perspective of the service it can provide to the research and development community, rather than as a technology which can temporarily close a gap.

#### Recommendations:

- o Bring telephone companies into the implementation and operation of projects, so that their staffs learn first hand about the services.
- o Develop joint activities with national or international telecommunications projects, including the computer-based training network of the ITU and the low-density satellite service trials program of INMARSAT. These projects are targeted to the telephone administrations and to infrastructure development. Early participation by the research and development community can help shape suitable future services.
- o The costs of infrastructure development precludes the Program from playing a leading role in the development of technologies. However, the Program can play a critical role in promoting the special requirements of the

research and development community within any such developments.

- o A range of technologies targeted to provide remote and rural data services are slowly becoming reality in developing countries. These include cellular radio and thin-route satellite services. It would appear useful for the Program not to single out one specific technology, but to put the focus on satisfying a particular communications need, with whatever technology makes most sense in a given situation.

## SECTION EIGHT: FUTURE PROGRAMMING POSSIBILITIES

### 8.1 Summary of Findings

- o Many participants in past or ongoing projects cautioned against significant changes to the Program's mode of operation and orientation. The flexibility of the Program in terms of supporting small and new projects in non-traditional organizations made it particularly dynamic. Recommendations for change were largely suggestions for refinements, not for drastic changes.
- o Almost all respondents strongly support the continuation of the Program.
- o Some suggested that the Program is too small to have significant impact, but that the use of computer communications services by a majority of IDRC projects would constitute a major breakthrough.
- o Sub-Saharan Africa continues to need concentrated assistance at the level of field trials and experiments.
- o In Latin America and parts of Asia and in some specialised sectors, such as international research organizations, emphasis should be given to policy, organizational, economic and related issues in order to explore factors related to sustainability and operationalisation of computer communications services.
- o The formulation of applications areas and of anticipated outcomes needs to receive more attention in most projects.
- o Sharing of experiences and findings across projects needs to be improved through concentrated efforts.
- o The development of national support systems for computer communications and other new communications technologies needs to receive particular attention to ensure that they can help the research and development community to use them to best advantage. This finding needs to be carefully integrated with the earlier finding that flexibility in programming should be maintained.
- o Co-operation with the telecommunications companies should be intensified. As commercial computer communications systems rapidly expand in most parts of the world, IDRC can help the research and development community to define and express their needs to telephone and other communications carriers.

- o The suggestion was made that the Program should cooperate with other complementary IDRC programs to help users experience and explore the full range of technologies. The environment for an "Information Centre of the Future" could be created which would explore the full range of potential technologies, and how they can be effectively used to meet user needs.
- o IDRC's continued role in the exploration of technologies and their applications will continue to be important in the face of the entry of other organizations into this area. IDRC supplements their largely operational focus with research, which is important in the present phase of the state of telematics. This phase can be characterised as transitional between the exploration of the technology and its ultimate operational application. The focus of the research needs to move in parallel from technical exploration to include a focus on sustainability.

## 8.2 Summary of Recommendations<sup>13</sup>

The following priorities should be considered in future programming:

- o Ensure that increased attention is focused on the research and development aspects proper of computer communications services and applications. Ensure that findings from this research is channelled to appropriate providers and users of operational services.
- o Disseminate findings from projects undertaken, using a variety of methods, including mandating project leaders to attend meetings/take on an advocacy role.
- o Insure timely, targeted, including informal, exchange and dissemination of information among users of computer communications services, particularly in support of start-up projects.
- o Continue projects and experiments in Africa.

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<sup>13</sup> This Summary of Recommendations captures the recommendations which emerged from Section Seven of the report as well as recommendations of broader contextual and programming nature which emerged from earlier sections of the report. The discussion of Programming Initiatives in later pages of this report attempt to translate these recommendations into suggestions for initiatives in which the Telematics Program might invest in the future.

- o Undertake joint projects with organizations such as the ITU and INMARSAT to promote an understanding by carriers and service providers of special needs of the research and development community.
- o Explore the requirements and structures for national support centres which can offer sustained support and training to the research and developmental users of computer communications services.
- o Support the development of human resources and institutional capacities as integral part of each project and choose partner organizations according to their capacity to contribute to this process.
- o Mobilize information from existing and new projects to address policy and economic issues which are critical to long-term decision-making and to sustainability.
- o Support the development of "Information Centres of the Future" by field testing the use and utility of emerging technologies and by using the field sites to train future users and operators.
- o Maintain flexibility to continue some support to small projects and to non-traditional recipient organizations.
- o Explore realistic field projects at the level of the ultimate beneficiaries of IDRC's development support.

### 8.3 Programming Initiatives

The consultant was asked to develop a number of programming initiatives at different indicative budget levels. The following program scenarios grow out of the main groups of recommendations discussed in the earlier sections. Prior to outlining actual scenarios for Program initiatives, a number of general comments and observations are offered to highlight the conceptual link between the scenarios presented in this chapter and the preceding analyses. The following observations are the consultant's interpretation of comments received in regard to the approach to programming by the Telematics Program.

#### 8.3.1 Towards a pro-active programming approach

To long-time observers of IDRC's Telematics Program, some of the approaches to developing initiatives suggested in the following, will appear out of step with the current approach of the Program, such as "an invitational" selection process. It is the opinion of

the consultant that a relatively reactive approach to project development was effective in the early phases of the Program, when the goals were largely exploratory. In future phases the approach should be more pro-active because a number of common issues have emerged from the exploratory phase in regard to policy, organizational development, economic analysis, access to services and human resource development. Future phases of the program must build on these issues.

The Program needs to translate the issues which emerged into programming approaches which will ensure that institutional as well as human capacities are developed. Individual researchers and institutions will benefit significantly from such guidance, as they themselves can rarely have the breadth of experience to define projects which will help move forward towards a common understanding of the issues. The Telematics Program and its partners have this collective knowledge. The consultation process of this report has contributed to the definition of the issues.

The scenarios identified in the following, incorporate programming steps and processes which aim to build human and institutional capabilities for the long-term. Computer communications services are quickly becoming operational for many users in many parts of the world, but appear to be far from reality for others. The Program can assist both groups by exploring common issues, sharing experiences and developing suitable capabilities.

### **8.3.2 Building on lessons learned**

A principal concern in the development of the scenarios is to expand on the gains of the Program so far. Thus, the collection, presentation and dissemination of information, lessons learned and valuable experiences is in the forefront of the recommendations. Dynamic and informal exchanges are often as valuable as formal publications. The scenarios focus on creating such informal opportunities for exchange and learning.

### **8.3.3 Focusing on applications and implementation**

While recommending the continued funding of some small and exploratory projects, the consultant sees the need to more tightly focus the Program's initiatives towards ensuring that long-term strategic goals are achieved. The rationale for this focus is based on the fact that computer communications technologies and services have matured over the years and the focus on experimentation needs to give way to a focus on researching applications and implementation issues. It is useful to refer back to Section Five which reviews the mandate of the Information Sciences Division and the contribution of the Telematics Program to it.



#### **8.3.4 Continuing a focus on Africa**

It is not possible to do justice to the differences in development, manpower and related issues in a global program, with the relatively small amount of funding under discussion. Therefore, the following recommendations maintain a continued focus on Africa, because the continent appears to need the most support for research and development in the uses of telematics services. At the same time, some initiatives in other regions are recommended to build on existing expertise and infrastructures.

#### **8.3.5 Ensuring institutional development**

The development of institutional and human capabilities is at the forefront of African needs. As discussed in section 4.4, the mandate and character of the recipient organization defines the type of long-term development that will take place. Projects carried out in the next phase of the Program should clearly articulate the long-term expectations for institutional and skills development, and choose recipient organizations accordingly.

#### **8.3.6 Concentrating program funds**

Building capabilities is a long-term process and it appears advisable to anchor future projects in recipient organizations which have successfully participated in the Program or which have the mandate to develop long-term capabilities. Concentrating the Program's funds within a few organizations, while leaving room for some smaller experimental activities, is likely to be most effective in creating long-term capabilities.

#### **8.3.7 Linking with organizations with operational responsibilities**

Project sustainability is closely related to the development of institutional and human capabilities. In Africa, where resources are extremely tight, sustainability will be critically important for future projects. Thus, not only is it necessary to focus on the development of long-term capabilities, it is also essential to make entities with a major say in the operationalisation of these projects into supporting partners early on. Specifically, the telephone companies and donor agencies, but also hardware and software vendors, are in this group. The recommended project scenarios suggest a number of initiatives which would establish closer links with them.

#### **8.3.8 Mainting a research and development focus**

While forging effective links with operators and vendors, the Program must ensure that its applied research and development nature is not converted into that of an operations-oriented service provider. Other players operate in this area or are emerging to fulfil this function. However, the dividing line between the two

functions can be narrow, in particular in areas where today limited operational activity is evident. The future success of a research program in telematics will emerge from its achievements in supporting research and development in the application of computer communications and in effectively feeding its findings to users, operators and vendors.

#### **8.3.9 Promoting use of computer communications within IDRC**

A number of observers commented that the Program's goals would be boosted significantly if IDRC were to fully integrate advanced computer communications services in its own internal communication process and within the projects in the other research programs. In the face of the use of these services by researchers in developed countries and the success of the CGIAR network, it is indeed somewhat surprising that the organization has not done so. The wholesale introduction of computer communications services into IDRC programs is not detailed in the following scenarios, since the costs would be beyond the scope of the program. However, it can be expected that cost trade-offs internal to individual projects could fund the service. In implementing such a service, the Program should assist the other research divisions with its expertise.

#### **8.3.10 Supporting the adaptation of existing technologies**

The scenarios concentrate on the development of uses of telematics services and on the development of capacities to effectively exploit them. They do not include technology-related R&D work, but rather the support to adapting technologies and software to specialised requirements of the development and research community. Technology-related R&D work is expensive and progressing at great speed in the industrialised countries. Funds required to make any impact in this area are far beyond the scope of the Program.

#### **8.3.11 Continuing cost-sharing**

The assumptions underlying the budget estimates are in keeping with the Program's practices in that the Program typically only contributes one-half or less of actual project costs, with the remainder coming from other donor organizations, the recipients and national governments.

## 8.4 Four Investment Scenarios

### 8.4.1 An investment of \$250,000

Exchange of experiences and expertise forms the core of initiatives at this level of funding. The initiatives proposed at this level of funding are designed to increase benefits from the program to date. Thus, they form part and parcel of all initiatives.

- o Increase the effectiveness and accelerate the learning curve of the projects presently under way or in planning by African recipients. This can be achieved through work assignments of participants from more established projects, from the specialized computer communications networks, such as CGNET, or by sending African project staff to the more established projects. Care should be taken to ensure that these exchanges not only cover technical needs, but also the development of uses of the technologies and an increased understanding of broader institutional and economic issues. These assignments need to be tied to the analysis of the information and training needs of a given project to achieve useful results.

BUDGET 50,000

- o Increase the effective reach of ongoing projects by establishing "visiting training programs" of individuals from other countries or other organizations who have a need for computer communications, but need to better understand its uses and technical systems. The thoughtful selection of these individuals is obviously important. Selection criteria should attempt to ensure that the individuals have a role in planning and using such services for their own organization or that they have a role in training and educating others.

BUDGET 25,000

- o Support the establishment of informal local or national user groups in African cities, where projects are under way. The projects could be funded to organize such groups. The purpose of user groups in Africa would be to increase access to information about technology and about locally-developed solutions to technical problems, as well as to facilitate knowing others involved in this field. It might be useful for the projects to arrange an occasional field visit to their own sites or to other projects, or to invite a guest speaker.

BUDGET 10,000

- o Build on the projects and activities of the Telematics Program to date with an active program of targeted information preparation and dissemination. Each major project (which has not already done so) should formulate and be funded for

dissemination activities to enhance the visibility of the project, with a clear definition of the target audiences and method of dissemination which might lead to adaptation by others. The Program officer should assist in this process by identifying broader regional and global information needs as well as appropriate fora.

**BUDGET 50,000**

- o Support the activities of the ITU by becoming an active partner in its computer-based training and telematics project. Specifically, under the aegis of the ITU training project, support the participation of the telephone companies in African countries with ongoing projects. While doing so, ensure that project staff has access to the ITU project and its training benefits.

**BUDGET 50,000**

- o Promote the development of position and policy papers to put forth the needs of the research and development sectors in major international debates and to help shape future telematics policies and services in such fora. Specifically, plan to influence the deliberations regarding international arrangements, tariffs, etc, of the INMARSAT data service. This would be best undertaken by project recipients who have experience in policy development and have a broad overview of present and evolving technologies and services.

**BUDGET 25,000**

- o Support the development of a guide which will help interested institutions to plan, implement and assess their potential uses of telematics services. This should be done with support from project leaders and specialized computer communications network operators. It also should be kept simple and could take the form of a checklist of points to consider, steps to take and should list useful names and addresses.

**BUDGET 10,000**

- o Support small experimental initiatives and activities which may lead to full projects, or which develop new knowledge on economic, policy and organisational issues (the latter particularly in Asia or Latin America). Coordinate initiatives in Africa with the AAAS projects. Take care that potential funding bodies are appraised of these initiatives.

**BUDGET 30,000**

#### 8.4.2 An investment of \$500,000

At this level of funding, the Program should add field applications of new technologies designed to reach researchers or development workers outside the main urban areas.

- o Implement projects and activities as identified in 8.4.1.

BUDGET 250,000

- o Implement one R&D project in Africa which explores new transmission technologies and which makes researchers and development workers who work in remote areas the beneficiaries of the service. Specifically, the INMARSAT digital earth station program comes to mind as a partner in this venture and which could provide the telecommunication link between the work sites. At the user end, an organization should be chosen which has actual and precise needs to regularly communicate between field and regional offices. National agricultural research stations or remote centres of the CGIAR group may be suitable.

At each stage of the planning and implementation process, the project should pay careful attention to supporting a research plan which will contribute to the dynamics and use of computer communications and information in the organization. This will require support from a cross-disciplinary team as well as a program management which combines research interests with the practical realities of supporting remote field workers.

It will be critically important for the effectiveness of the project to build into it a well conceived information dissemination and training component for observers from other organizations, so that the lessons learned can be applied or refined elsewhere without major delays.

The Program and the partner organization will need to plan the project in close coordination and with assistance from external, knowledgeable observers. It would be desirable if other research divisions in IDRC contributed their subject matter expertise to this process. An invitation to a number of organizations requesting a statement of interest, commitment and priorities in becoming the partner organization for the project might help bring to the fore the most appropriate organization and ensure that the partner has analyzed existing resources and needs.

BUDGET 250,000

### 8.4.3 An investment of \$750,000

At this level of funding, the program might add an additional project designed to explore the use of computer communications for the ultimate beneficiaries.

- o Implement projects identified under 8.4.1.

BUDGET 250,000

- o Implement the project identified under 8.4.2.

BUDGET 250,000

- o AMRC reports discussions in India of the feasibility of a computer communications project designed to provide urban squatters with the tools and means to access development agents. A well-defined project in this area could substantially contribute to our knowledge about information needs and information uses of disadvantaged groups.

It will be important that such a project offers the beneficiaries the flexibility and opportunity of access to relevant information. At the same time, it should contribute to the analysis of urban needs and services. The planning group for such a project will need to be carefully chosen to represent the major stakeholders in the results, including IDRC's other research divisions. Further, the principles of project design, cross-disciplinary analysis, training and information dissemination which are discussed in 7.4.2 apply here as well.

A substantial body of knowledge and experience has accumulated in the uses of communication media such as audiocassettes, posters, radio, television, small-scale video, etc, to assist the development process. Computer communications projects at the grassroots level will need to review such experiences and benefit from lessons learned.

In terms of sustainability and relevance, it makes sense to carry out such a project in more technologically developed countries, principally in Asia or Latin America/Caribbean. It is also important that the project partner is close to the grassroots to formulate a realistic and practical project, which suggests that an NGO might be the proper partner.

As in the previous scenario, a number of organizations should be invited to submit proposals for projects which they wish to implement, following criteria established by the Program.

BUDGET 250,000

#### 8.4.4 An investment of \$1,000,000

The last scenario responds to a number of the Information Sciences Division's strategic directions, namely diversifying channels, national emphasis, alternatives to bibliographic information and improved capacities to take advantage of new technologies. It is proposed to establish a laboratory for the "Library of the Future".

- o Implement scenarios 8.4.1, 8.4.2 and 8.4.3.

BUDGET 750,000

- o Libraries and information centres are chronically undersupplied and out-of-date in most African universities and in information centres, as discussed in earlier sections. A large range of technologies, including computer communications services, are in place or evolving which may drastically reduce bottlenecks and contribute to greater efficiency in areas such as research, academic work or project planning. An R&D project exploring the applications, costs, technical and organizational factors of these technologies could make a significant contribution to integrating these with future developments of libraries and information centres.

It will be most efficient to undertake such a project with a recipient institution which already has in-house expertise in the use, operation and maintenance of information technologies and computer communication services. Further, the partner needs to be committed to exploring and researching the technologies and their uses with the goal of developing information which will be useful for other organizations. The partner also needs to be committed to a formal or informal training and education function for the project. PADIS, one of the members of the CGIAR network, or one of the universities participating in the East African University Computer Communication Project, may be suitable. For the latter it would be important to recruit project leadership from the user end, the library.

This project is best formulated in consultation with representatives from all programs of the Information Sciences Division, because it affects all three.

BUDGET 250,000

## APPENDIX A

### METHODOLOGY

The terms of reference identify two parallel, but interrelated conceptual strands. One is the assessment of the effectiveness and impact of the program over almost ten years of operation. The other is the development of recommendations for a re-orientation or additional program focus over the next decade. Each of these strands required different approaches to obtaining information. While in the first strand individuals who participated in the different projects and activities of the Program represented the target group, for the second strand additional agencies and individuals were targeted because they had a particularly broad or future-oriented perspective. The review methodology was sensitive to these differences.

#### 1.0 SOURCES OF INFORMATION FOR THE REVIEW

Program documentation and project reports as well as the general literature were reviewed.

In respect to the analysis of effectiveness and impact of the Program, two groups of individuals were approached. One group was people closely involved with activities of the Telematics Program, the other group consisted of individuals from the development, telematics or research community who knew of the program and who have had occasional contacts with it. This group also included a number of individuals who had participated in the initial meeting in 1981 which was the first step in the development of a Telematics program at IDRC.

In respect to the second part of the mandate, representatives from donor agencies, from international agencies and from the telecommunication cum telematics sector represented the prime sources of information.

The information was gathered in personal interviews, through telephone interviews, and through follow-up exchanges of messages.

An interview cum discussion guideline was developed to solicit responses. It guided the discussions in Washington, Palo Alto, Europe and Africa. A number of individuals who could not be interviewed through visits and by phone received the guidelines with instructions to respond to the sections most familiar to them. Those who had participated in the Program activities or projects were asked to concentrate on sections dealing with Program effectiveness and impact.



## 2.0 METHODOLOGICAL DIFFICULTIES

The Terms of Reference called for the analysis of the program both in terms of effectiveness and in terms of impact. Impact assessment is difficult for this type of program and without substantial original research work. The impact assessment for the Program was largely built on reports from project staff and participants and thus is rather subjective.

If it proves possible, one or two projects or activities will receive more in-depth attention to follow through the impact assessment to the next level of beneficiary, eg a field researcher/worker.

Effectiveness criteria can be established to suit the framework of the program. A first draft of these criteria for the program can be found in a later section.

Much of the review is qualitative in nature, but every effort was made to attempt quantification of some of the information received. It is well possible, for example, to compare costs and savings for alternate means of communication. Quantification of other factors, such as gains resulting from quicker turn-around for information queries may not be possible, while it may be possible to quantify the reduction in time delay for such queries. It is proposed to attempt quantification of a number of select activities or events only.

## 3.0 ASSESSMENT CRITERIA AND OBJECTIVES

The following text consists of most of the document which was used as interview guide as well as to solicit written feedback from participants in the Program projects or activities, and to organize inputs from the literature review. It also guides the overall structure of the evaluation report.

The first section elicits responses to the Program objectives and their appropriateness for present and future initiatives. The second section represents the criteria and questions developed to elicit responses regarding the effectiveness and impact of the Program. The third section elicits responses regarding the future direction of telematics in developing countries and the last section aims to solicit responses as to future initiatives and focus of the IDRC Telematics Program.

### 3.1 Program objectives and their operationalization

The Telematics Program of IDRC aims to

PROMOTE APPROPRIATE ADOPTION AND ADAPTATION OF COMPUTER-BASED COMMUNICATION TOOLS, TECHNIQUES AND METHODS IN DEVELOPING

**COUNTRIES IN SUPPORT OF DEVELOPMENT AND RESEARCH ACTIVITIES THROUGH:**

- o increasing general awareness;
- o expanding the number of technical facilitators and the level of expertise;
- o improving the availability of and access to information on what can or cannot work;
- o influencing related policy development;
- o influencing related infrastructure development research;
- o promoting local capabilities in decision making on implementation and utilization of data communications techniques.

The Telematics Program was established roughly ten years ago. During this time, the objectives and goals have been operationalized through feasibility studies, pilot projects, demonstration projects, meetings and workshops (typically called "activities") and the dissemination of project reports and evaluations. In addition, over time the Program further refined its goals and took a regional focus with Africa as primary geographical area of intervention.

**QUESTIONS:**

From your experience with the Program, do you see a need to change these objectives or activities and projects to reflect the changing situation from ten years ago? If so, please recommend alternatives.

Please comment on the overall effectiveness of the mix of Program initiatives, such as feasibility studies, pilot projects and other activities.

**3.2 Effectiveness and impact of the Telematics Program - are the goals and objectives being reached through the initiatives chosen?**

**3.2.1 Increasing general awareness**

The Program has carried out a number of demonstration and pilot projects, feasibility studies and other activities. The Program was among the first ones to explore computer-based messaging systems in developing countries and can be expected to have influenced later developments.

## **QUESTIONS:**

o Has the awareness and use of computer communication systems by researchers and development workers in developing countries increased significantly over the past ten years? Please cite examples.

o Do researchers from developing countries who are looking at the use of communication technologies go for advice and support to IDRC or to people and groups who have worked on projects sponsored by the Telematics Program, i.e. do you receive occasional requests? What might you have done differently to increase awareness of your project by other interested groups?

o If you participated in a project of the Program: did it include a range of potential interests, e.g. researchers, administrators, telephone company? Were these the right participants, and, in retrospect, who else should have been involved?

### **3.2.2 Expanding the number of technical facilitators and the level of expertise**

The numbers of technical facilitators and their levels of expertise will likely differ in different parts of the world. What can we establish about a link between the Telematics Program and the expansion of this expertise in different countries.

## **QUESTIONS:**

o Have you and other Program participants from the developing world been instrumental in the further development of telematics initiatives in your country or region? Could you please elaborate with examples?

o Have Program participants or their organization been capable of and able to build telematics activities into subsequent operations or funding proposals? Please elaborate on why this was or was not possible in your case.

o Have the projects or activities been of sufficient scope and length to allow for an adequate level of expertise to develop? What recommendations do you have for future activities based on your project participation?

### **3.2.3 Improving the availability of and access to information on what can or cannot work**

The underlying issues here cover the hardware and software aspects of telematics as well as utilisation, infrastructure, policies, costs, resource people and contacts. Further, the fact that this Program was one of the first of its kind underlines the importance

of both improving the information available and providing access to it.

**QUESTIONS (improving the information available):**

o What new information did your activities generate related to the reliability, appropriateness and performance of computer communications technology for less developed countries?

o Could you please describe what new information came out of your project related to software system aspects and which are particularly relevant for less developed countries?

o Could you please discuss lessons from your project on the use of computer communication systems among researchers and development practitioners in less developed countries? What worked and what would you do differently?

o Please describe administrative, organizational and human factors which influenced the success of your project.

o Could you please elaborate on cost and economic information from your project which can be used by other interested parties for project planning? Have you been asked for such information by other interested parties? Would it be useful for your own planning and operation to have access to economic model or case studies?

**QUESTIONS (improving access to information):**

o Please estimate the number of requests for information, technical papers and advice which you personally or your organization have received related to your involvement in the project.

o Please comment from you own experience on how to improve access to information about computer communication systems for the research community in developing countries.

o Has the Program been successful in supporting national and regional resource people and experts to act as contact persons for others who are beginning to use computer communication services? Could you further comment on what else could be done to improve the availability of such expertise?

**3.2.4 Influencing policy developments**

When the Program was initiated, few national or international policies had been established to guide the evolution of such service. In some countries restrictive policies were applied to this type of service, while in others no guidelines were apparent. Further, donor agencies had no program or lending strategy for telematics initiatives at that time.

## **QUESTIONS:**

o What evidence exists that national authorities have come to understand the research and developmental value of computer communication services? Can you give examples of rate structures or other mechanisms to promote or permit them?

o Have you noticed that international agencies or other donors have begun to incorporate computer communications into their project dossiers? Please cite examples.

o What evidence exists that user agencies have adjusted operating procedures to integrate computer communication services into their operational procedures?

o What evidence exists that the Program has played a role in the above?

### **3.2.5 Improving development and research activities through the use of computer communication systems**

It is not realistic to rely on quantitative measures or to apply these to more than a select number of projects or activities within projects carried out under the program. Never-the-less, demonstrations and pilot projects can serve as a basis for qualitative and anecdotal information which will be very useful to assess the improvement of research activities.

## **QUESTIONS:**

I hope that you can provide me with examples/materials related to:

o time reduction for a typical research cycle due to shorter turn-around on critical information;

o changes in research direction resulting from access to outside information;

o improved co-ordination of development activities/thrusts;

o anticipated reductions in absences from work due to travel.

o other

### **3.2.6 Influencing related infrastructure development**

Telecommunication as well as computer infrastructures need to be in place for effective computer communication services. The development of infrastructure is very costly and has been the subject of many international debates. (Infrastructure needs go well beyond the issue of hardware and technology, and include availability of maintenance and advisory services to assist in the

decision process about appropriate systems and services and in their implementation. These issues have, in part, been dealt with in other points of this section.)

**QUESTIONS:**

o In what way has your project and activity influenced infrastructure development?

o Can you identify follow-up activities by carriers or suppliers?

o Please discuss any thoughts you may have on future initiatives which the Program might undertake in this area?

**3.2.7 Providing different kinds of support in different regions of the world**

**QUESTIONS:**

o Where do you see the major need for support to the development of computer communication in your country, region or professional field? Please discuss needs such as training, pilot projects, policy studies.

o If you are aware of related initiatives by other organizations, please provide information on these.

**3.2.8 Other feedback**

As a participant or close observer of the IDRC Telematics Program you may have additional concerns and experiences related to the Program. Please feel free to comment on these and suggest ways of dealing with them and integrating them into future program initiatives.

**4.0 ENSURING THE RELEVANCE OF THE PROGRAM IN THE COMING DECADE**

The analysis in section 3.0 will assist in the development of this task. For example, the analysis might show that, although computer-based messaging systems are very relevant to the work of the research community in developing countries, participating organizations may not have the skills to implement them on an ongoing basis, or the policy environment negatively influences their establishment. Such findings would obviously result in recommendations for future steps by the Program.

To ensure relevance of the Program for the coming decade an assessment of anticipated developments in technology as well as services will be required. Your assessment and projections of advances in telecommunication and information technologies and

services, changing development priorities and pressures on development research will form the basis for this task.

I would appreciate your responses in the following areas ( please feel free to also discuss other issues not raised here):

- o What will be the important technologies and services in ten year's time (e.g. CD-ROM, expert systems, others) and how can they support development efforts?

- o Where will be the bottlenecks to implementation and use of these services in developing countries - or, specifically, your country/your organization (infrastructure, policies, manpower and know-how) - and what initiatives will be required to overcome them?

- o Please describe what other donors, research organizations, professional associations and development agencies are planning to do in this field (can you imagine co-operative projects taking place which are sponsored by different agencies / could you outline suggestions)?

- o Where will the private sector be in these developments (what role could it take to help institutions make informed choices about computer communications)?

- o What could be IDRC's particular niche in future developments (given the fact that it has a research mandate, limited funds, and operates as a catalyst for new initiatives)?

- o What process could IDRC use to develop projects and activities which will be of greatest benefits to the science, research and development community in less developed countries?

## 5.0 OUTCOMES

No pre-conceived notion exists as to what the future program may look like. The investigation therefore is open to a wide range of suggestions and recommendations. The following "thrusts" represent a few examples of potentially suitable activities by IDRC in this field.

I would like to encourage you to use your imagination, coupled with your knowledge of the field and of evolving needs to help expand, amplify, reject and elaborate on potential roles of the Telematics Program over the next ten years. I would be grateful if you would think about the thrusts in terms of what might and what will not work - and what would be required to make them work.

- o A thrust to explore new technologies and systems (identify specific examples) because ... computer-based messaging systems may be considered wide-spread and available on a commercial basis, or

because international donors are financing such projects on an operational basis.

- o A thrust towards policy studies and investigations of operational cost-sharing methods because ... these areas may be considered major bottlenecks.

- o A thrust toward user training in more formal situations in parts of the world ... where qualified manpower is seriously lacking.

- o A thrust toward developing national support centres in a select number of countries to provide advice on appropriate technologies and services and which can give a basic level of support when problems arise.

- o A thrust towards packaging advice and towards dissemination because ... experiences exist, but are not widely known.

- o A thrust towards developing pre-operational services, jointly with major donors, to facilitate the transition to operational services.

- o A thrust toward working at the "lower level" of the information chain, ie the farmer or rural extension worker, with the concomitant issues of technical needs, resource requirements and information presentation and utilisation.

- o others.



## APPENDIX B

### PEOPLE WHO CONTRIBUTED TO THE REVIEW

#### CANADA

##### INTERNATIONAL DEVELOPMENT RESEARCH CENTRE, Ottawa

John Woolston former Director, IDRC Information Sciences  
Division  
Robert Valantin Associate Director, Information Tools and  
Methods (ITM)  
David Balson Program Officer for Telematics  
Elizabeth Murray Administrative Assistant, ITM

##### DEPARTMENT OF COMMUNICATIONS, Ottawa

Gabriel Warren Director General, International Branch  
James Savage International Branch  
Bob Tritt International Branch  
John Gilbert Government Telecommunication Agency

##### CANADIAN INTERNATIONAL DEVELOPMENT AGENCY, Ottawa

Charles Morrow Social Dimensions Section  
Colin Billowes Telecommunications Division  
Gerry Kenney Telecommunications Division

##### UNIVERSITIES, RESEARCHERS, OTHERS

John Black University of Guelph  
Peter Robinson Consultant  
Warren Thorngate Carleton University  
Roger Roy Asia Pacific Foundation of Canada  
Staff Alternet  
Rory O'Brian WEB

#### UNITED STATES

Wendy White Board of Science and Technology for  
International Development, National Science  
Foundation  
Barry Gold National Academy of Sciences  
Amy Wilson American Association for the Advancement of  
Science  
Lisbeth Levey American Association for the Advancement of  
Science  
Bjorn Wellenius World Bank  
Jim Cowie World Bank  
Robert Schware World Bank  
Selcuk Ozgediz Consultative Group on International  
Agricultural Research, World Bank  
Michael Lafflin International Institute for Research,  
Clearinghouse on Development Communication  
Pat MacDougal Intelsat

Andrea Maleter	Intelsat
George Lindsey	CGNET
Gregory Staple	International Institute of Communication
Gary Garriott	Volunteers in Technical Assistance
Noreen Janus	CARINET
John Scott	Public Service Satellite Consortium

**UNITED KINGDOM**

John Davidson	Inmarsat
Graham Cooper	Cable and Wireless
John Farnell	Cable and Wireless
Denise Hall	British Telecom
Victoria Rubinson	International Institute of Communications
William Montgomery	Commonwealth Fund for Technical Cooperation
Olu Fadahunsi	Commonwealth Secretariat
Raul Vicenco	Commonwealth Science Council
Mohan Kaul	Commonwealth Secretariat
Rogers Okut-Ume	Commonwealth Secretariat

**SWEDEN**

Carl-Goran Heden	Karolinska Institutet
Eng-Leaong Foo	Karolinska Institutet

**CARIBBEAN**

Gerald Lalor	University of the West Indies
Allan Williams	Association for Caribbean Transformation

**CHILE/MEXICO**

Gabriel Rodriguez	Instituto Latino-Americano de Estudios Transnacionales (ILET)
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**HONG KONG**

John Sayer	Asia Monitor Resource Centre (AMRC)
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**NETHERLANDS**

Michael Polman	Antenna
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**INDIA**

S. Ramani	National Centre for Software Technology
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**ITALY**

Staff	IDOC
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**GERMANY**

Reinhard Keune	Friedrich Ebert Stiftung
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**FRANCE**

Alan Hancock	UNESCO
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**KENYA**

Richard Labelle	ICRAF
Bob Huggins	ICRAF

Mark Riley	GEC Plessey
Charles Aloo	Electronic Services Ltd
Philip Okundi	Kenya Port Authority
John Doyle	ILRAD
Toni Rodriguez	University of Nairobi
Michael Hailu	IDRC Nairobi
Faye Makane	African Regional Standards Organization

**ETHIOPIA**

Berhane Michael	Ethiopian Telecommunication Authority
Nancy Hafkin	UN Economic Commission for Africa
Lishan Adam	UN Economic Commission for Africa
Michael Klass	ILCA
Erich Bruns	ILCA
Getachew Birru	University of Addis Abbeba
Mr. Girmaw	ITU

**TUNISIA**

Farouk Kamoun	National Centre for Informatics
Ismail Atmane	ALDOC
Noureddine Ellouze	Institut Regional des Sciences Informatiques et des Telecommunications (IRSIT)
Raouf Chkir	Ministry of Communications

**GENEVA**

INTERNATIONAL TELECOMMUNICATION UNION	
Andreas Embedoklis	Technical Cooperation Department
Lucio Goelzer	Computer Department
Shola Taylor	RASCOM
Diedrich Westendorp	Center for Telecommunications Development
Jaime Herrera	Training Division
Tom Dahl-Hansen	World Telecommunications Forum
T.V. Srirangan	Policy advisor

**OTHER U.N. AGENCIES**

Sam Molander	High Commission for Refugees
Salah Mandil	World Health Organization
Chris Szpak	ACCIS Secretariat

## APPENDIX C

### SUMMARY DESCRIPTION OF PROJECTS AND ACTIVITIES

#### SECTION ONE: PROJECTS<sup>1</sup>

##### PROJECT 3-P-83-0166

##### CGIAR Data Transfer Network - Pilot Project

Division: IS

Sector: INFRASTRUCTURE DEVELOPMENT - COMPUTER SCIENCES

The Consultative Group on International Agricultural Research (CGIAR) is an international consortium of institutions dedicated to food production research in developing countries. Due to the rising costs of conventional communication, CGIAR has decided to explore the possibility of implementing a data transfer network. In 1982-83, Telematics International carried out a feasibility study; this project will increase the scope of the study and test a small computer-based message service (CBMS) for CGIAR.

Macrothesaurus Descriptors: /telecommunications/ /information services/ /electronic data processing/

Area Under Study: /Global/

Total IDRC Contribution: 78000 \$CAD

Date Funds Committed: 19831100

Estimated Completion Date: 19870816

Status: Closed

Recipient: Consultative Group on International Agricultural Research  
(CGIAR) Secretariat  
Washington, D.C. US  
Address: CGIAR SECRETARIAT, 1818 H STREET N.W.,  
WASHINGTON, D.C. 20433, U.S.A.

Researcher: OZGEDIZ, SELCUK Mr

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<sup>1</sup> Projects marked by an asterisk\* were not included in the discussions related to Telematics Program budget. The projects marked \* do, however, relate to the Program in some ways as well as to some of the recommendations for future initiatives and are therefore included in the project summaries to demonstrate IDRC's broader exploration of other technologies.

PROJECT 3-P-85-0082

Latin American Communications Network for Non-governmental  
Organizations

Division: IS  
Sector: Information Tools and Methods

The use of new information technology is expanding rapidly in Latin America and the need for data communications techniques is growing apace. This project will enable the Instituto Latinoamericano de Estudios Transnacionales (ILET) to study and experiment with a microcomputer-based communications network among nongovernmental organizations in Mexico, Brazil, Peru, Argentina and Chile. The project will produce a manual and a detailed report to assist other organizations in implementing these techniques by providing answers, based on concrete experience, to the questions and problems related to effective utilization of new communications technologies.

Macrothesaurus Descriptors: /telecommunications/ /microcomputers/  
/computer conferencing/ /non-governmental  
organizations/

Area Under Study: /Latin America/ /Mexico/ /Brazil/ /Peru/  
/Argentina/ /Chile/

Total IDRC Contribution: 95425 \$CAD

Date Funds Committed: 19850726

Estimated Completion Date: 19870126

Status: Closed

Recipient: Instituto Latinoamericano de Estudios Transnacionales  
(ILET)  
Santiago CL  
Address: Casilla 16637, Correo 9, Santiago, Chile

Researcher: Rodriguez, Gabriel Mr

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PROJECT 3-P-85-0147

Computerized Communication Links for Latin American  
Brucellosis Research Network

Division: IS  
Sector: Information Tools and Methods

Good communications are necessary to any cooperative research effort, especially when developing-country institutions are involved. This project allows the United Nations University to establish a computer-linked Latin American research network for scientists involved in the production of brucellosis vaccines and diagnostic reagents. The project focuses on evaluation of the practical usefulness of such computer networks. As a side benefit, it also demonstrates data-communication techniques for other interested research networks.

Macrothesaurus Descriptors: /telecommunications/ /computers/ /medical research/ /organization of research/

Area Under Study: /Latin America/

Total IDRC Contribution: 137500 \$CAD

Date Funds Committed: 19851220

Estimated Completion Date: 19881220

Status: Closed

Recipient: United Nations University  
Tokyo JP

Address: Development Studies Division, United Nations  
University, Toho Seimei Building, 15-1, Shibuya  
2-chome, Shibuya-ku, Tokyo 150, Japan

Researcher: Kokke, Robert Dr

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PROJECT 3-P-85-0241

INTERDOC Network

Division: IS

Sector: Information Tools and Methods

In 1984, a group of non-governmental research and documentation centres established a global network known as INTERDOC devoted to sharing skills and knowledge on information-handling techniques. This project will allow the International Documentation and Communication Centre to coordinate the development of this network. Information will be shared via computer-based communication techniques and also through the production and dissemination of a newsletter in both English and Spanish.

Macrothesaurus Descriptors: /documentation/ /information technology/  
/information exchange/ /non-governmental organizations/

Area Under Study: /Global/  
Total IDRC Contribution: 125000 \$CAD  
Date Funds Committed: 19860414  
Estimated Completion Date: 19880414  
Status: Closed

Recipient: International Documentation and Communication Centre  
(IDOC)  
Rome IT  
Address: International Documentation and Communication  
Centre (IDCO), Via S. Maria dell'Anima, 30,  
00186 Rome, Italy

Researcher: Foubert, Charles Mr

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PROJECT 3-P-85-0246

Transborder Data Flows (Thailand)

Division: IS  
Sector: Information Tools and Methods

Modern developments in the computer and telecommunication fields increasingly make possible the transfer of large amounts of data at a very low cost. The result, internationally called transborder data flows, can profoundly affect individuals, corporations, and governments. These data flows are poorly understood, and often policies to control them are enacted based on insufficient information. This project aims to improve this situation by producing sound and useful knowledge on transborder data flows as they relate to Thailand. The project will contribute to the creation of an appropriate legal and institutional framework for transborder data flows within the country.

Macrothesaurus Descriptors: /transnational data flow/ /evaluation/

Area Under Study: /Thailand/  
Total IDRC Contribution: 70000 \$CAD  
Date Funds Committed: 19860226  
Estimated Completion Date: 19880226  
Status: Closed

Recipient: King Mongkut's Institute of Technology  
Bangkok TH

Address: Faculty of Engineering, King Mongkut's  
Institute of Technology, Ladkrabang Campus,  
Ladkrabang, Bangkok 10520, Thailand

Researcher: Srisakdi Charmonman Dr

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**PROJECT\* 3-P-86-0059**

**CD-ROM Evaluation**

Division: IS

Sector: Information Tools and Methods

Information sciences supports access to and exchange and delivery of information. New developments in storage media can radically alter how these processes are carried out. Current developments involve the use of optical-disk technologies to store bibliographic references, pictures, and full text in a computer-accessible format. One such technology, CD-ROM (Compact Disk - Read Only Memory), is being developed and tested around the world, especially in conjunction with microcomputers. This project supports the testing and evaluation of CD-ROM technology for the delivery of bibliographic references within five IDRC-supported projects and the Centre Library. In addition, it will analyse CD-ROM's potential impact on the information sciences field, particularly as applied within developing countries.

Macrothesaurus Descriptors: /information technology/ /new technology/  
/data storage/ /evaluation/

Area Under Study: /Global/.

Total IDRC Contribution: 47000 \$CAD

Date Funds Committed: 19860709

Estimated Completion Date: 19870709

Status: Closed

Recipient: International Development Research Centre (IDRC)  
Ottawa, Ontario CA

Address: Information Sciences Division, IDRC, P.O. Box  
8500, Ottawa, Ontario, Canada K1G 3H9



PROJECT\* 3-P-86-0060

CGIAR Publications Preservation and Dissemination

Division: IS

Sector: Information Tools and Methods / Science and Technology  
Information

In the last few years, it has become increasingly difficult to obtain copies of some CGIAR (Consultative Group on International Agricultural Research) and international agricultural research centre publications. This project assists CGIAR to permanently preserve its publications, as well as to increase international awareness and availability of these publications, particularly in developing countries. Project participants will collect CGIAR scientific and technical literature; catalogue and index this literature; physically prepare the materials for conversion to either microfiche or optical-disk storage; and analyses the technological feasibility and market acceptability of using optical-disk technology versus micrographic technology for preserving and disseminating the publications.

Macrothesaurus Descriptors: /information recording/ /information  
technology/ /new technology/  
/agricultural information/

Area Under Study: /Global/

Total IDRC Contribution: 95000 \$CAD

Date Funds Committed: 19860731

Estimated Completion Date: 19871131

Status: Closed

Recipient: International Bank for Reconstruction and Development  
(IBRD)  
Washington, D.C. US  
Address: IBRD, 1818 H. St. N.W., Washington, D.C.,  
20433, U.S.A.

Researcher: Frierson, Eleanor Ms

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PROJECT 3-P-86-0154

AFRIMAIL

Division: IS

Sector: Information Tools and Methods

Information and information systems are playing a greater role in the development of nations. One challenge in North African countries has been the introduction in computer systems of Arab characters alongside Latin ones. This project enables the Centre national de l'Informatique (CNI) in Tunisia to develop and test a bilingual messaging system (French/Arabic) based on international standards for the interconnection of messaging systems. The system will be accessible through various telecommunications techniques by the Tunisian research community.

Macrothesaurus Descriptors: /telecommunications/ /computers/

Area Under Study: /Tunisia/

Total IDRC Contribution: 71500 \$CAD

Date Funds Committed: 19870106

Estimated Completion Date: 19880706

Status: Closed

Recipient: Centre national de l'informatique (CNI)

Tunis TN

Address: DEpartement des projets logiciels arabisEs, 17,  
rue Belhassen Ben Chaabane, 1005 El Omrane,  
Tunis, Tunisie

Researcher: Sassi, Mohammed Ben

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PROJECT 3-P-86-0242

Latin American Computer-based Networking: Communication for  
Action -- Phase II

Division: IS

Sector: Information Tools and Methods

The Instituto Latinoamericano de Estudios Transnacionales (ILET) has helped to increase the level of activity in networking in its region through the coordination of the Latin American Communications Network for Non-governmental Organizations project (3-P-85-0082). As a logical follow-on, this second phase will test and evaluate more sophisticated communication software packages, within a Latin American trade information network and a South-North telecommunications technology transfer network. As part of these experiments, various training methodologies will be developed and evaluated. The project will result in expanded awareness, understanding and use of these systems, the availability of training models; and a technical report on the telephone and data

communication systems in Latin America and strengthening of network facilitators. The general results of the project will be disseminated widely.

Macrothesaurus Descriptors: /telecommunications/ /microcomputers/  
/computer conferencing/ /computer  
programmes/ /training/

Area Under Study: /Latin America/

Total IDRC Contribution: 267456 \$CAD

Date Funds Committed: 19870604

Estimated Completion Date: 19900531

Status: Active

Recipient: Instituto Latinoamericano de Estudios Transnacionales  
(ILET)  
Santiago CL  
Address: ILET, Casilla 16637, Correo 9, Santiago, Chile

Researcher: Rodriguez, Gabriel Mr

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PROJECT 3-P-87-0055

Asia Computer Communications Experimentation and Training  
Project

Division: IS  
Sector: Information Tools and Methods

Non-governmental organizations in Asia are showing increasing interest in the computerization of their operations and the use of computer communications techniques for facilitating information exchange. This project will enable the Asia Monitor Resource Centre to assist, promote, and facilitate the development of appropriate computer communications techniques by action-oriented organizations concerned with grass-roots development. The activity will involve the identification and strengthening of facilitators, the carrying out of concrete data communication-based networking experiments in Southeast and South Asia, and the dissemination of these experiences throughout the region.

Macrothesaurus Descriptors: /telecommunications/ /computers/  
/information technology/ /information  
exchange/ /training assistance/  
/non-governmental organizations/

Area Under Study: /Asia/  
Total IDRC Contribution: 78686 \$CAD  
Date Funds Committed: 19871009  
Estimated Completion Date: 19891009  
Status: Active  
Recipient: Asia Monitor Resource Centre (AMRC)  
Kowloon HK  
Address: Asia Monitor Resource Centre, 444-446 Nathan  
Road 8/F, Flat B, Kowloon, Hong Kong  
Researcher: Sayer, John Mr

---

PROJECT 3-P-87-0084

Water Pumping Technology (Malaysia) - Phase III

Division: HS IS OPE  
Sector: Water Supply and Sanitation / Information Tools and Methods

IDRC's handpump program has focussed on developing a low-cost water pumping device that can be fabricated and assembled in-country, and installed and maintained by villagers themselves. Phase I consisted of a network of projects which examined the technical viability of a unique handpump design incorporating plastic (PVC) below-ground components. A second network (Phase II) showed that these pumps are easily adapted to varying social and environmental conditions, are affordable, and can be mass-produced in-country. To derive maximum benefits from the results of the research and development activities supported in the first and second phases, this phase III project in Malaysia will establish a regional centre of excellence for handpump technology. The centre will provide training in the manufacture, assembly, installation and maintenance of the UNIMADE handpump to a network of manufacturing units (large- and small-scale) within the region and elsewhere. Also the project will develop a computerized communications network (Telematics Network) to facilitate technical and marketing support to all participating organizations.

Macrothesaurus Descriptors: /pumps/ /manufacturing/ /technology  
transfer/ /technical information/  
/information dissemination/  
/telecommunications/

Area Under Study: /Malaysia/  
Total IDRC Contribution: 1129040 \$CAD

Date Funds Committed: 19880317

Estimated Completion Date: 19910501

Status: Active

Recipient: University of Malaya. Department of Mechanical  
Engineering  
Kuala Lumpur MY  
Address: University of Malaya, Lembah Pantai, 59100  
Kuala Lumpur, Malaysia

Researcher: Goh Sing Yau Prof

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PROJECT 3-P-87-0157

National Database / Data Network Utilization (Mexico)

Division: IS

Sector: Information Tools and Methods

The Instituto Latinoamericano de Estudios Transnacionales (ILET) in Mexico City was an active participant in the Latin American Communications Network for Non-governmental Organizations project (3-P-85-0082). Research within this project identified the need for further study on networking issues on the national level. In response to that need, this project will permit ILET to study and demonstrate how national database development and utilization can be improved through cooperative effort and computer-based networking. The ultimate objective of this project is to promote greater utilization of Mexico's indigenous information and communications resources. A directory of national databases will be produced, as well as a report on the use of national telematics resources to support more coherent development of and better access to these information resources. The results of the project will be disseminated with the help of the National Council for Science and Technology (CONACYT).

Macrothesaurus Descriptors: /data bases/ /telecommunications/  
/information sources/ /directories/

Area Under Study: /Mexico/

Total IDRC Contribution: 41789 \$CAD

Date Funds Committed: 19871116

Estimated Completion Date: 19890516

Status: Active

Recipient: Instituto Latinoamericano de Estudios Transnacionales  
(ILET)  
Mexico City MX  
Address: Instituto Latinoamericano de Estudios  
Transnacionales (ILET), Avenida Maria 23,  
Coyoacan, Apartado Postal 21-440, 04000 Mexico,  
D.F., Mexico

Researcher: Robina, Soledad

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**PROJECT 3-P-87-0228**

**Packet Radio Experimentation (Lesotho)**

Division: IS  
Sector: Information Tools and Methods

The lack of adequate communication services in the predominantly rural, mountainous country of Lesotho has a detrimental effect on development efforts. This project will test a new technology, packet-radio, which could solve communication problems. Packet-radio connects one computer to another using a radio transceiver for error-free transmission of text or data. Researchers will experiment with packet-radio and related techniques to meet rural information dissemination and communication needs and to evaluate their ability to meet these needs. The experiments will likely involve development applications in the agricultural and health fields. The project will include an assessment of the possibility of an operational packet-radio communications system for Lesotho and the potential use of such a system in other countries.

Macrothesaurus Descriptors: /radio/ /broadcasting/ /rural areas/ /new  
technology/ /technical cooperation/

Area Under Study: /Lesotho/

Total IDRC Contribution: 149000 \$CAD

Date Funds Committed: 19881207

Estimated Completion Date: 19901231

Status: Active

Recipient: Lesotho Telecommunications Corporation, Maseru LS  
Address: Lesotho Telecommunications Corporation,  
Kingsway, Palace Road, P.O. Box 1037, Maseru  
100, Lesotho

Researcher: Khabele, T. Mr

PROJECT\* 3-P-87-0253

National Information System (Jordan)

Division: IS FAD

Sector: Information Tools and Methods / Socioeconomic Information /  
Science and Technology Information / Training for Institutional  
Support

The Government of Jordan recently prepared an ambitious plan for the establishment of a National Information System (NIS) to support planning, decision-making, and research, and provide services to public and private sector organizations. The key to the NIS is a Socio-Economic Information Centre at the Ministry of Planning and a Scientific and Technical Information Centre at the Royal Scientific Society, which will serve as focal points for their respective areas of specialization and will coordinate technical aspects of the NIS as a whole. Additional information centres, programs, and services are being incorporated as the NIS grows to full operation. This project will provide program support, concentrating on aspects crucial to its overall success: systems coordination, pilot applications and operations, communications and technical training.

Macrothesaurus Descriptors: /information systems/ /technical  
information/ /scientific information/  
/information services/ /institution  
building/

Area Under Study: /Jordan/

Total IDRC Contribution: 420000 \$CAD

Date Funds Committed: 19880430

Estimated Completion Date: 19900430

Status: Active

Recipient: Royal Scientific Society (RSS)

Amman JO

Address: Royal Scientific Society, P.O. Box 925819,  
Amman, Jordan

Researcher: Nusseir, Y., Dr. and Muasher, M. Dr

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PROJECT\* 3-P-88-0014

Establishment of a Regional School of Information Studies for  
Africa (SISA)

Division: IS FAD  
Sector: Socioeconomic Information - Information Infrastructure  
Development

There is a strong need in Africa to provide high level training programs in information science to meet the growing demand for information specialists. This project will establish a School of Information Studies for Africa at Addis Ababa University, offering a regional postgraduate program leading to a Master of Science degree in Information Science (M.Sc.I.S.). The program is intended to serve Eastern and Southern Africa, composing the following countries: Botswana, Comoros, Djibouti, Ethiopia, Kenya, Lesotho, Malagasy, Malawi, Tanzania, Uganda, Zambia, Zimbabwe.

Macrothesaurus Descriptors: informations sciences/higher  
education/institution building/

Area Under Study: Africa South of Sahara

Total IDRC Commitment: 1365000 \$CAD

Date Funds Committed: 19890612

Estimate Completion Date: 19940612

Status: Active

Recipient: Addis Ababa University  
Addis Ababa, Eth.  
Address: Addis Ababa University, P.O.B. 1176 Addis  
Ababa, Ethiopia

Researcher: Getachew Birru, Mr.

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PROJECT 3-P-88-0187

Syrian Networking Experimentation and Information System  
Development / Access

Division: IS  
Sector: Information Tools and Methods -- Telematics / Socioeconomic  
Information -- Information Infrastructure Development / Science and  
Technology Information -- Sciences and Technology

This project will allow the Scientific Studies and Research Centre (SSRC) of Syria to develop computerized bibliographic data bases at the national level in the fields of scientific and technical information, and socioeconomic information, in cooperation with existing research libraries and documentation centres. It will allow the acquisition of expertise and know-how in the design and practical



implementation of telematics-based information services through a phased-in experimental approach to the provision of national packet-switching services offering access to the newly-developed data bases and to other computer services. This will be carried out initially through use of an expanded existing experimental network (SSRCNET/SUN) and then through the planned operational packet-switched service, SYRIAPAC. An additional experimental link will be implemented via ARABSAT to allow exchange of information between Tunisian and Syrian institutions, and the acquisition of expertise in the design of international telematics-based services.

Macrothesaurus Descriptors: /information systems/ /data bases/  
/systems design/ /information technology/  
/information networks/ /information  
services/ /information exchange/  
/telecommunications/

Area Under Study: /Syrian Arab Republic/

Total IDRC Contribution: 222000 \$CAD

Date Funds Committed: 19890425

Estimated Completion Date: 19910425

Status: Active

Recipient: Scientific Studies and Research Centre of El Berzeh  
(SSRC)  
Damascus SY  
Address: Scientific Studies and Research Centre, P.O.  
Box 4470, Damascus, Syria

Researcher: Harfouche, Nabil Dr

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PROJECT 3-P-88-0200

Women and Natural Resource Management Network (Africa)

Division: SS IS COMM SPA

Sector: Women in Development/Socioeconomic Information/Information  
Infrastructure Development

This project will provide support to a group of anglophone and francophone researchers in various African countries as well as two to three associated Canadian researchers to undertake a series of studies on the participation of women in natural resource management. The studies will be centred around three specific concerns and will be carried out using a common methodology and frame of reference. An

explicit information component will support the research and communication activities of the network from its inception. This activity is aimed at servicing the immediate information needs of the researchers by ensuring that all information generated by the network participants is effectively and promptly shared with research colleagues and disseminated to appropriate groups of possible users, especially to decision makers in local and national governments of the countries of the network as well as to other researchers interested in environmental issues.

Macrothesaurus Descriptors: Women's participation/natural resources/  
resources management/ organization of research/  
information exchange/ research capacity/

Area under Study: Africa

Total IDRC Contribution: 753100 \$CAD

Date Funds Committed: 19890519

Estimated Completion Date: 19920519

Status: Active

Recipient: Environmental Liaison Centre (ELC), Nairobi, Kenya  
Address:ELC. P.O.B. 72461, Nairobi, Kenya

Researchers: Mutemba Shimwaayi Dr.

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PROJECT 3-P-88-0241

Regional Information System on Food Technology (CRAT) - Phase II

Division: IS

Sector: Science and Technology Information -- Industry and  
Technology Development / Information Tools and Methods -- Telematics

In the first phase of this project, the Centre regional africain de technologie (CRAT) established a centralized information system specialized in energy and food. In the second phase, CRAT will develop an information network on food and technology, based on the experience acquired during the first phase. Specifically the second phase will establish the mechanisms for the network; develop common methodological tools; train personnel of the network's "focal points"; test and assess the feasibility of telematic links to improve the deficient African communication system; and distribute documentation to network members.

Macrothesaurus Descriptors: /information networks/ /food technology/  
/information dissemination/

Area Under Study: /Africa/

Total IDRC Contribution: 285700 \$CAD

Date Funds Committed: 19890505

Estimated Completion Date: 19920531

Status: Active

Recipient: Centre regional africain de technologie (CRAT)  
Dakar SN

Address: Centre regional africain de technologie, B.P.  
2435, Dakar (Senegal)

Researcher: Timoulali, Mohamed Dr

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PROJECT 3-P-88-0249

CODESRIA: Institutional Support - Phase V

Division: SS IS COMM

Sector: Divisional Initiatives/Socioeconomic Information/Research  
Results Dissemination and Utilization

The Council for the Development of Economic and social Research in Africa is an organization of African research institutions designed to stimulate new research and to improve quality via enhanced cooperation and collaboration among its members. IDRC was the first organization to provide institutional support to CODESRIA. Under the earlier phases of this support, CODESRIA established a permanent secretariat and supported research, training, publications, and documentation services. This phase is sponsored by IDRC's Social Sciences, Information Sciences, and Communications Divisions as an institutional grant conforming with the Centre's provision for Integrated Support for Research Institutions (ISRI). The grant provides support for the following elements of CODESRIA's program: national working groups; multinational working groups (researcher and staff training); publications; information and documentation service (CODICE); and administrative support to the secretariat.

Macrothesaurus Descriptors: social research/research capacity

Area Under Study: Africa

Total IDRC Contribution: 1016330 \$CAD

Date Funds Committed: 19890331

Estimated Completion Date: 19920331  
Status: Active  
Recipient: Council for the Development of Economic and Social  
Research in Africa  
Dakar, SN  
Address: CODESRI. P.O.B. 3304, Dakar, Senegal  
Researcher: Makandawire, Thandika Dr

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PROJECT 3-P-89-0011

SITIA: Telematics and Informatics Information System for  
Africa

Division: IS  
Sector: Information Tools and Methods

Through this project the Institut africain d'informatique (IAI) will build up an information system on telecommunication and computer science technologies known as the "systeme d'information sur les technologies de l'informatique et de la telematique" (SITIA) in 11 west and central French-speaking African countries. This will be the first regional information system on these technologies present in Africa and perhaps in the Third World. Specific objectives of the project are to create a coordinating centre for the system at IAI and identify focal points in member countries; acquire equipment; recruit and train specialized personnel for the coordinating centre; collect information on new technologies and bibliographic research; make data accessible on-line; diffuse information from telecommunications consultations; contribute information on teaching and research activities at l'IAI; and generate resources through the system with the view to assuring the continuation of these activities through partial self-financing.

Macrothesaurus Descriptors: /information systems/ /information  
services/ /computer science/  
/telecommunications/

Area Under Study: /French-speaking Africa/

Total IDRC Contribution: 224600 \$CAD

Date Funds Committed: 19900215

Estimated Completion Date: 19920815

Status: Active

Recipient: Institut Africain d'Informatique (IAI)  
Libreville GA  
Address: Institut Africain d'Informatique, B.P. 2263,  
Libreville, Gabon

Researcher: Faye, Ambroise Mr

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PROJECT 3-P-89-0025 (Phase II)  
PROJECT 3-P-86-0168 (Phase I)

African Standards Documentation Network

Division: IS  
Sector: Science and Technology Information -- Industry and  
Technology Development / Information Tools and Methods

The African Regional Organization for Standardization (ARSO) is an African intergovernmental organization established in January 1977, responsible for the promotion of standardization, quality control, certification, and metrology activities in the region. Standardization is an essential economic activity. Its concept and application encompass all aspects of human endeavours and have profound effects on production, distribution, and consumption of goods and services. Phase I of this project strengthened ARSO as the regional clearing-house for information on standards. All objectives of phase I were achieved with selected technical publications being issued and distributed. The objective of phase II is to make ARSO's Documentation and Information Systems (ARSO-DISNET) fully operational by developing national documentation and information centres on standards at participating centres of the network and by strengthening the exchange of information among ARSO-DISNET members, partly through experimentation with the use of telematics techniques.

Macrothesaurus Descriptors: /standardization/ /standards/ /technical  
information/ /information networks/  
/information services/ /information  
exchange/ /data bases/telecommunications/

Area Under Study: /Africa/

Total IDRC Contribution: 244685 \$CAD

Date Funds Committed: 19890915

Estimated Completion Date: 19910915

Status: Active

Recipient: African Regional Organization for Standardization (ARSO)  
Nairobi, Kenya

Address: 12th floor City Hall Annexe,  
Muindi Mbingu St., P.O. Box 57363, Nairobi

Researcher: Faye, Makane Mr

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**PROJECT 3-P-89-0193**

**Computer-Based Networking in Africa (PADIS)**

Division: IS

Sector: Information Tools and Methods / Socioeconomic Information

The Pan African Development Information System (PADIS) was established in 1980 as a cooperative development information system to serve African member states of the United Nations Economic Commission for Africa (ECA). This project will allow PADIS to coordinate a pilot African regional, investigative, and experimental computer-based networking activity involving international, interregional, and intraregional linkages both to and from PADIS and through it to other networks. It will contribute towards the appropriate utilization of data communications information technology in Africa; an improvement in the flow of information for socioeconomic development in the region; and the timely utilization of existing information systems. Information technology employed in this project will be used both for communications (messaging, conferencing, and bulletin boards) and for on-line searching. The project will also be linked with other similar projects planned in Latin America and the Caribbean to maximize project investments, and for the sharing of experience and information.

Macrothesaurus Descriptors: /PADIS/ /access to information/  
/information networks/ /information  
technology/ /information exchange/  
/telecommunications/ /computers/

Area Under Study: /Africa/

Total IDRC Contribution: 217825 \$CAD

Date Funds Committed: 19900313

Estimated Completion Date: 19920313

Status: Active

Recipient: United Nations Economic Commission for Africa (UN-ECA)  
Address: UN Economic Commission for Africa, P.O. Box  
3001, Addis Ababa, Ethiopia

Researcher: Hafkin, Nancy Mrs

PROJECT\* 3-P-90-0028

Optical Digital Disk Experimentation: Registry Office  
(Senegal)

Division: IS

Sector: Information Tools and Methods / Socioeconomic Information --  
Information Infrastructure Development

Total IDRC Contribution: 165680 \$CAD

Status: Active

Recipient: Senegal. Delegation l'informatique Dakar SN  
Address: Delegation a l'informatique, 3, rue Beranger  
Feraud, B.P. 218, Dakar, Senegal

Researcher: Wane, Sada Mr

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PROJECT 3-P-90-0068

East and South African University Network (ESANET)

Division: IS

Sector: Information Tools and Methods

The project will provide a computer communication link between the  
computing centres/departments of Southern- and East African  
Universities.

Area under Study: South- and East Africa

Total IDRC contribution: 112000 \$CAD

Date Funds Committed: In negotiation

Completion Date: In negotiation

Status: Future project

Recipient: University of Nairobi, Computer Department

Researcher: Professor Tony Rodriguez

## SECTION TWO: ACTIVITIES

In addition to projects, the Program has carried out a number of activities which are typically smaller and of shorter duration than projects. The following description gives indications of the type of activities carried out:

- 1) 3-A-81-4062 Program planning conference
- 2) 3-A-82-4245 Bioconversion computer conference
- 3) 3-A-82-4266 Feasibility study - CGIAR
- 4) 3-A-83-4025 Planning visit - from Madras
- 5) 3-A-83-4105 Needs assessment - Caribbean
- 6) 3-A-83-4117 Feasibility study - CGIAR
- 7) 3-A-84-4080 Planning meeting - West Africa
- 8) 3-A-84-4271 Packet radio demonstration - Pacific region
- 9) 3-A-85-2065 Project design support - Tunisia
- 10) 3-A-85-4003 Feasibility study - Latin America/Car.
- 11) 3-A-85-4034 Feasibility study - Latin America/Car.
- 12) 3-A-85-4295 Feasibility study - Africa
- 13) 3-A-86-4130 Feasibility study - Asia
- 14) 3-A-86-4251 Travel support for Project discussion
- 15) 3-A-87-2000 Needs assessment/feasibility - West Africa
- 16) 3-A-87-4215 Needs assessment - Caribbean
- 17) 3-A-88-4299 Conference support - global
- 18) 3-A-88-5915 Needs assessment - Africa
- 19) 3-A-89-4907 Meeting support - Africa
- 20) 3-A-89-4917 Needs assessment - Caribbean



APPENDIX D<sup>1</sup>

CHART ONE:

BUDGET COMPOSITION BY CONTRIBUTORS

FOR PROJECTS

PROJECT #	CONTRIBUTIONS IN \$CAD			
	ITM <sup>2</sup>	IDRC <sup>3</sup>	RECIPIENT <sup>4</sup>	OTHER <sup>5</sup>
3-P-83-0166	78,000		65,522	
3-P-85-0082	95,425		in-kind	
3-P-85-0147	137,500		47,075	
3-P-85-0241	125,000		3,780	39,620
3-P-85-0246	70,000		4,483	
3-P-86-0154	71,500		92,000	
3-P-86-0242	252,268		in-kind	
3-P-87-0055	78,686		in-kind	
3-P-87-0084 <sup>6</sup>	95,480	1,033,560	372,720	286,520
3-P-87-0157	41,789		3,960	
3-P-87-0228	149,000		in-kind	
3-P-88-0187	142,000	80,000	465,496	840,000
3-P-88-0200 <sup>7</sup>	26,000	734,180	in-kind	
3-P-88-0241	55,000	230,700	10,800	
3-P-88-0249 <sup>8</sup>	50,000	966,330	in-kind	6 million
3-P-89-0011	112,300	112,300	511,500	
3-P-89-0025 <sup>9</sup>	50,000	192,610	in-kind	
3-P-89-0193	108,913	108,912	in-kind	
3-P-90-0068	148,070		in-kind	
SUB-TOTAL	1,886,931		1,577,336	
TOTAL:	3,464,267			

**CHART TWO:****BUDGET FOR ACTIVITIES  
ITM CONTRIBUTIONS ONLY**

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<b>ACTIVITY #</b>	<b>IDENTIFICATION OF ACTIVITY</b>	<b>\$ CAD</b>
3-A-81-4062	Program planning conference	27,400
3-A-82-4245	Bioconversion computer conference	17,000
3-A-82-4266	Feasibility study - CGIAR	41,900
3-A-83-4025	Planning visit - from Madras	1,085
3-A-83-4105	Needs assessment - Caribbean	13,100
3-A-83-4117	Feasibility study - CGIAR	54,100
3-A-84-4080	Planning meeting - West Africa	8,000
3-A-84-4271	Packet radio demonstration - Pacific	7,500
3-A-85-2065	Project design support - Tunisia	3,880
3-A-85-4003	Feasibility study - Latin America/Car.	22,500
3-A-85-4034	Feasibility study - Latin America/Car.	11,200
3-A-85-4295	Feasibility study - Africa	16,715
3-A-86-4130	Feasibility study - Asia	10,375
3-A-86-4251	Travel support for Project discussion	130
3-A-87-2000	Needs assessment/feasibility - Africa	32,600
3-A-87-4215	Needs assessment - Caribbean	22,176
3-A-88-4299	Conference support - global	50,000
3-A-88-5915	Needs assessment - Africa	11,400
3-A-89-4907	Meeting support - Africa	2,855
3-A-89-4917	Needs assessment - Caribbean	9,650
	<b>TOTAL</b>	<b>363,566</b>

1. The projects summarised in Appendix C include additional related projects.
2. Contributions of the Telematics Program only.
3. This column identifies funds from other research divisions in IDRC.
4. Contributions in this column relate only to the telematics component of a project.
5. Contributions in this column are to the overall research project, and may or may not include support for the telematics component.
6. Contributions identified in the columns "recipients", "IDRC" or "Other", did not contribute to the telematics component of the project. In these cases, Telematics Program funds were added to research projects to extend their reach through the use of telematics techniques.
7. See above Note.
8. See above Note.
9. See above note.

## APPENDIX E

### RECOMMENDATIONS

#### SUMMARY OF RECOMMENDATIONS<sup>1</sup>

- o Ensure that increased attention is focused on the research and development aspects proper of computer communications services and applications. Ensure that findings from this research is channeled to appropriate providers and users of operational services.
- o Disseminate findings from projects undertaken, using a variety of methods, including mandating project leaders to attend meetings/take on an advocacy role.
- o Insure timely, targeted, including informal, exchange and dissemination of information among users of computer communications services, particularly in support of start-up projects.
- o Continue projects and experiments in Africa.
- o Undertake joint projects with organizations such as the ITU and INMARSAT to promote an understanding by carriers and service providers of special needs of the research and development community.
- o Explore the requirements and structures for national support centres which can offer sustained support and training to the research and developmental users of computer communications services.
- o Support the development of human resources and institutional capacities as integral part of each project and choose partner organizations according to their capacity to contribute to this process.
- o Mobilize information from existing and new projects to address policy and economic issues which are

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<sup>1</sup> This "Summary of Recommendations" captures recommendations from Section Seven as well as those of broader contextual and programming nature which have emerged from other sections of the report. The individual recommendations from Section Seven are listed in the second part of this Appendix and relate specifically to "Assessment of the Effectiveness and Impact of the Program".

critical to long-term decision-making and to sustainability.

- o Support the development of "Information Centres of the Future" by field testing the use and utility of emerging technologies and by using the field sites to train future users and operators.
- o Maintain flexibility to continue some support to small projects and to non-traditional recipient organizations.
- o Explore realistic field projects at the level of the ultimate beneficiaries of IDRC's development support.

## RECOMMENDATIONS FROM SECTION SEVEN<sup>2</sup>

### 7.1 Increasing Awareness of Computer Communications in the Research and Development Community

#### Recommendations:

- o Increase the information dissemination activities to achieve a broader outreach. Provide realistic and honest case studies of benefits achieved and problems encountered.
- o Diversify the use of computer communications services in other research sectors, in co-operation with other organizations which are entering this field. By encouraging and assisting IDRC's own programs in the other research sectors to use computer communications, other organizations will likely follow suit.
- o Increase awareness at the broader national level by paying more attention to the totality of support that needs to be available nationally to facilitate the introduction of computer communications, including economic and policy analysis and models, such as service and pricing policies.

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<sup>2</sup> These recommendations are copied from Section Seven "Assessment of the Effectiveness and Impact of the Program".

## 7.2 Increasing the Level and Number of Technical Facilitators

### Recommendations:

- o Continue the development of technical facilitators through field projects.
- o Ensure that projects become training grounds for other interested parties in a given country or region. Make sure that this exposure is open to people with an applications background.
- o Encourage projects which combine field trials with a cross-disciplinary mix of research from areas such as economics, public administration, telecommunications and applications expertise.
- o Support the development of focal points at the national levels for expertise in computer communications. These might be national professional associations or high-level commissions, or permanent full-time bodies. Flexibility and responsiveness as well as access to the policy-making process appear to be necessary to fill an existing gap.

## 7.3 Availability of and Access to Information About What Works and What Does Not work

### Recommendations:

- o Emphasize the development and dissemination of information about experiences in a format which is practical and useful to at least one of three groups, ie computer communications professionals, present and potential users of computer communications, and providers of telecommunications services.
- o Review the experience with the newsletters created in the INTERDOC project to see if and how such activities could or should be continued.
- o Build on experiences gained by supporting people from earlier projects to spend time advising newly evolving projects.
- o Ensure that local or national users of computer communications (those with/without IDRC support) exchange experiences among themselves, hoping that such local user groups will assist each other in problem solving.
- o Mandate and support project leaders and staff to actively gather and disseminate project findings.

## 7.4 Influencing Related Policy Developments

### Recommendations:

- o Assist the national and international research and development community to influence important policy deliberations, in particular those which influence tariffs and access standards and protocols, as well as services outside the urban areas. Specifically, the ITU and INMARSAT are bodies which offer opportunities for such targeted initiatives.
- o On a regional basis, continue vigorously dialogues with carriers which are developing new services, as was done in the Caribbean and could be achieved in Africa through some cooperative projects alluded to in the above.
- o Actively support countries which have in place policies particularly relevant to the research and development community to assist others in developing theirs.

## 7.5 Improving Research and Development Activities

### Recommendations:

- o General case studies describing and documenting the actual use of the service and its relation to criteria such as research outcomes should be undertaken, as is the case at present with the CGIAR case study. Smaller case studies would be useful as well, since they can demonstrate to others some practical individual applications. Overall, information should be exchanged with much less delay.
- o More attention should be paid in the future to the formulation as well as implementation of research related to the usefulness and impact of the projects.

## 7.6 Influencing Related Infrastructure Developments

### Recommendations:

- o Bring telephone companies into the implementation and operation of projects, so that their staffs learn first hand about the services.
- o Develop joint activities with national or international telecommunications projects, including the computer-based training network of the ITU and the low-density satellite service trials program of INMARSAT. These projects are targeted to the telephone administrations and to infrastructure development. Early participation by the

research and development community can help shape suitable future services.

- o The costs of infrastructure development precludes the Program from playing a leading role in the development of technologies. However, the Program can play a critical role in promoting the special requirements of the research and development community within any such developments.
  
- o A range of technologies targeted to provide remote and rural data services are slowly becoming reality in developing countries. These include cellular radio and thin-route satellite services. It would appear useful for the Program not to single out one specific technology, but to put the focus on satisfying a particular communications need, with whatever technology makes most sense in a given situation.