Research Networks: Evolution and Evaluation from a Donor's Perspective

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Introduction

There is general agreement today on the importance of agricultural research in economic and social development. Nevertheless, agricultural research continues to receive low priority in the allocation of financial resources by governments. In this climate, agricultural research organizations must not only be efficient but be seen to be so. They must demonstrate the value of their work. They must be able to prove in facts and figures that they are adequately repaying the societies that invest in them. According to Gastal (1987), any possible means of increasing observable benefits at lower cost should be pursued. Research networks are such a means. Such networks are playing an increasingly key role in the coordination of international efforts to develop improved technologies for food production, especially for small-scale farmers.

An agricultural research network can be defined as a voluntary association of research organizations with sufficient common objectives to be willing to adjust their research programmes to, and invest resources in, associated activities in the belief that they will thereby meet their objectives more efficiently than if conducting their research alone (Banta, 1982). In setting up a network, three basic functions are typically required. A planning function brings agreement on the objectives of the network and the relative priority to be attached to them; a cooperation function allocates resources to the activities required to meet the objectives; and a coordination function organizes the activities of the participants to achieve the objectives efficiently.

This paper reviews the involvement of the International Development Research Centre (IDRC) of Canada in network support. Using data from informal and formal evaluations, it also assesses the performance of these networks and presents the lessons learned.

Evolution of IDRC Support

The majority of IDRC-funded networks have evolved from individual projects in different countries. Often a prerequisite to network formation, these early project experiences helped determine the degree of common interests and problems among participating countries. Awareness of shared problems enables the new network to reach

agreement on objectives and priorities, allocate resources, assign responsiblities and organize activities cost-effectively.

Thus, IDRC has emphasized networks as a means of linking scientists working on similar problems in different countries rather than as mechanisms to foster or fund research in countries. It is an approach which has given IDRC a great deal of flexibility in responding to the expressed needs of developing country scientists as well as to fiscal pressures at home to deliver better technical and material support while reducing overheads.

Network members share information, technologies and methods, pooling their efforts to solve problems of mutual concern. Over the years, both participants and evaluators have found the networks supported by IDRC to be effective in generating and sharing knowledge about development, and IDRC has come to see networking as indispensable in the pursuit of efficient scientific research and technology adaptation. Involvement with networks has grown from an average of 13 network projects per year in the 1970s (9% of annual appropriations) to 79 networks and/or network projects per year in the 1980s (24% of annual appropriations).

Types of Network Supported

In general, the way networks are classified depends on the purpose of the classification. Those interested in dynamics have classified networks according to the level of integration of the different actors (Banta, 1982); others have classified them on the basis of commodity, production system or discipline (Faris, 1991). A widely reported classification (World Bank, 1987; Faris and Ker, 1988; Faris, 1991; Valverde, 1988) is the one proposed to the Special Program for African Agricultural Research (SPAAR) by Ralph Cummings Jr. and Calvin Martin (SPAAR, 1987). Based on the level of research in the network and the degree of collaboration used to plan and conduct research, this typology is further described in the paper by Plucknett et al in this book (p.187).

IDRC is currently using a classification based on what is exchanged relative to particular development problems or needs. According to this classification it is supporting four basic types of network:

- Horizontal networks linking institutions with similar interests working in the same or a related field.
- Vertical networks of institutions working on different aspects of the same problem or on different but interrelated problems.
- Information networks providing centralized information services to members and other users, enabling them to exchange information as needed; and
- Training networks, which provide training and supervisory services to participants working independently in their own research areas.

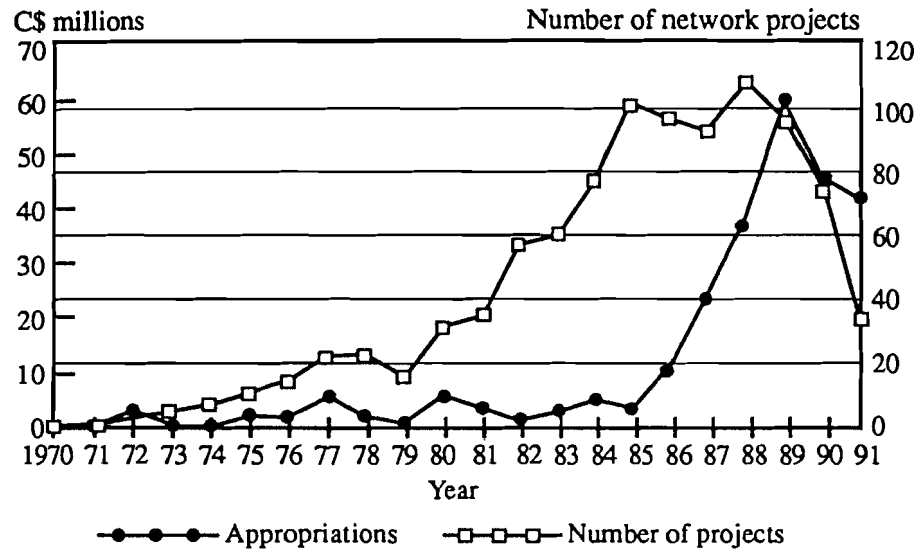
Across these four general categories there is wide variation. Networks evolve according to members' needs, the resources available and the kinds of contact established. Most of the early agricultural networking fostered by IDRC was a response to the isolation faced by developing-country scientists in the 1970s and to the need for critical masses of scientific effort if progress was to be made. Many of these networks started as informal groupings following workshops or conferences, moving to more formal associations with resources for coordination or a secretariat, as common interests and agreements to share resources were established. A few formed a nucleus around which a new commodity research institute crystallized.

Patterns of Support

Between 1970 and 1991 IDRC invested close to C$ 242 million in network-related projects. Some of this went directly to the creation and coordination of networks; some funded research by network members. Figure 1 shows these expenditures by year for the period. Looking at distribution by sector, agriculture clearly led the way in the use of research networks. Sixty-two percent of network-related funding was for agricultural sciences, 12% for social sciences, 12% for information sciences, 11% for health sciences and 3% for earth and engineering sciences (Figure 2). The geographical distribution of IDRC-supported network projects is shown in Figure 3. Latin America has been by far the most active region, with 39% of the projects, followed by Africa, with 28%. Network activity in Asia and the Pacific has been the lowest over the 20-year period, but has increased significantly over the past 2 years. Global networks are those which include more than one of these regions.

IDRC's substantial experience with networks, some of which has been formally documented in evaluations and staff papers, has led it to recognize networks as an important way of organizing resources for development-related research. In particular, the viability and usefulness of networks have increasingly benefited from enhanced access to new information technology. Yet there remain a number of concerns about networks which need to be addressed as we adapt this mechanism to present and future needs. We are approaching 'network overload' in some subjects and geographical areas. Donor coordination, itself a form of networking, is often weak. It is not easy to recognize and foster the appropriate conditions for network formulation, sustainability of dissolution, or to ensure that network resources are used efficiently and effectively. The tools needed to measure network performance are not well developed. There are relatively few multidisciplinary networks which operate effectively. Network links with national research and development systems are often weak. One way of bringing about improvements in efficiency is to study different experiences across countries, regions and subject areas. Through these studies principles for the design and management of networks can be deducted, and then applied to individual networks.

Figure 1 Number and funding level of network projects supported by IDRC, 1970-91



Examples of IDRC-supported Networks

The following examples show how some IDRC-supported networks were formed and have evolved.

Oilseeds network

Oils and fats are essential components of the human diet. Nutritionists recommend that about 20% of energy requirements come from oils and fats, which are concentrated forms of energy allowing efficient utilization of fat-soluble vitamins. Requirements for energy vary with age, weight and the level of physical exertion, but an average adult requires a minimum of about 55 g of oil or fat per day, or 20 kg per annum.

In many developing countries average consumption is much lower than this, often varying from 1 to 10 kg per annum. Low oilseed production is thus a major cause of the protein–energy malnutrition which affects enormous numbers of people in these countries.

Since the late 1970s, IDRC has supported oil crop improvement projects in China, India, Sri Lanka, Nepal, Pakistan, Mozambique, Tanzania, Ethiopia, Sudan and Egypt. These projects have included work on groundnut, brassica, sesame, sunflower, safflower, linseed, niger seed and castor. Among these commodities, only groundnut has been the responsibility of an international agricultural research centre, namely the International Crops Research Institute for the Semi-arid Tropics (ICRISAT).

As a group the oilseed crops are important, but individually most are neglected minor crops. Pulling them together through a network provided a substantial intellectual impetus to research and the necessary basis for the more cost-effective use of research resources.

IDRC support has been critical in focusing research attention on these crops, particularly in South Asia and Eastern and Southern Africa, where the crops are grown both for home consumption and as a source of cash income, often by very poor people. The networking approach has been particularly important in strengthening links among oil crop researchers in Canada, Asia and Eastern and Southern Africa, and between stronger and weaker programmes working on the same crop. The absence of an international agricultural research centre with responsibilities for most of the crops involved has made network activities more difficult to plan and backstop, but has also heightened their importance.

West African Farming Systems Research Network

This network emerged from the perception that farming systems research (FSR) had considerable potential for improving small-scale farming in West Africa, where severe problems were seen to be associated with the breakdown of existing farming systems caused by increasing population pressure on the land (Koala and Banta, 1989).

The West African Farming Systems Research Network (WAFSRN) evolved from a professional society formed by scientists. Its primary objective was to assist national practitioners seeking to improve their farming systems approach to agricultural research

Figure 2 Percentage network project appropriations to different scientific sectors, 1971-91

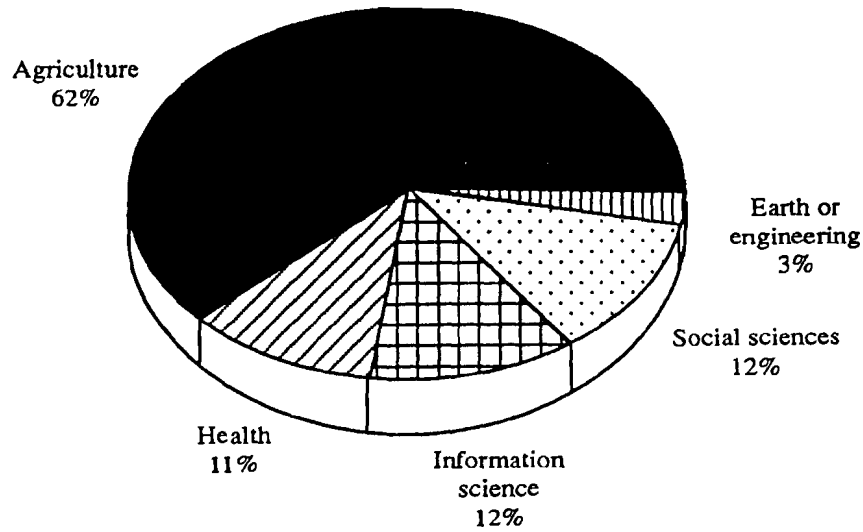
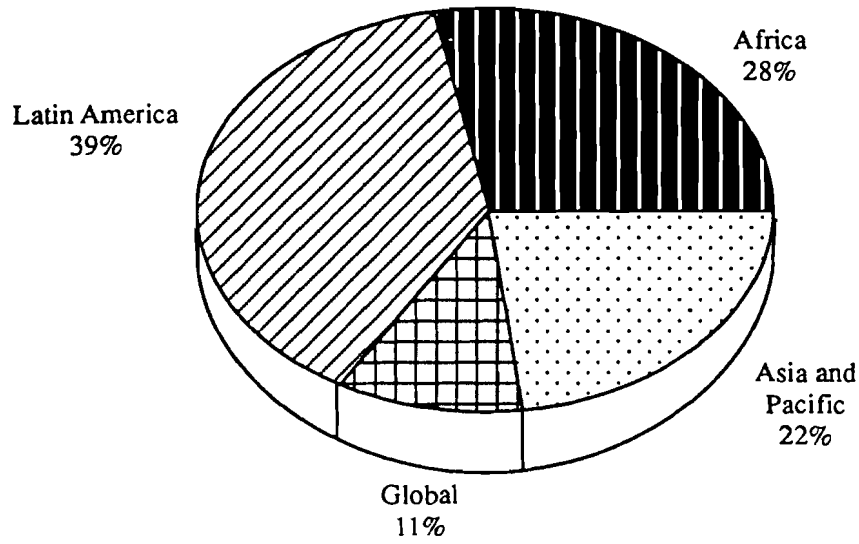


Figure 3 Percentage network project appropriations by region, 1970-91



and development. The network fostered the exchange of relevant experience among researchers, collected information and made it available to members, and promoted training programmes in FSR methodology.

The provision of a full-time coordinator and support services proved critical in stimulating the interest and facilitating the interaction among participants necessary for effective networking. These were strengthened further by technical and administrative inputs from the Semi-arid Food Grain Research and Development (SAFGRAD) project.

East and Southern Africa Rootcrop Research Network

Cassava and sweet potatoes are important staple foods and cash crops for many of the 200 million or more people who live in Eastern and Southern Africa. They provide food security against famine and political disturbance for many of the poorest of the poor in these countries (Ker, 1989).

Originally, IDRC supported the root crop research programmes of national agricultural research systems in individual countries. The first studies introduced, tested, evaluated and disseminated improved disease- and pest-resistant varieties of different root crops. The East and Southern Africa Rootcrop Research Network (ESARRN), which now numbers 12 countries, was then initiated to link and strengthen these national programmes. Additional support was provided for biological pest control through the Commonwealth Institute of Biological Control (CIBC). The United States Agency for International Development (USAID) began supporting the network a few months after IDRC. The

network was administered through the International Institute of Tropical Agriculture (IITA), which provided additional support and an IITA scientist as network coordinator.

ESSARN is an example of a horizontal network supported by more than one donor agency that is linking institutions with similar interests working on the same crops.

Latin American Aquaculture Network

Aquaculture development in Latin America has been promoted since the early 1980s through a number of IDRC projects in Brazil, Colombia, Panama, Peru, Chile and Ecuador (Buzeta, 1989).

Aquaculture has been recognized by all Latin American countries as an important production alternative, contributing to local protein supplies as well as to cash income for poor people.

The need to establish coordinating mechanisms to promote regional cooperation and strengthen national scientific and technological capacities has been stressed at several international meetings held to analyze aquaculture development in the past 15 years (Buzeta, 1989). In consequence a network has now been initiated with the general objective of contributing to the research, planning and training capacities of the participating aquaculture centres.

An important feature of this network is its focus on strengthening the technology transfer capability of aquaculture centres, through training and information exchange. To facilitate the exchange of information between researchers and producers, integrated planning/action groups were formed at the community level (Davy, personal communication) involving producers, researchers and representatives of government and non-government organizations, who together carried out the project's research and development activities.

The Latin American Aquaculture Network (LAAN) provides an example of a network seeking to involve end users in the research and development process. By involving the producers from the outset the project hoped to make them feel a greater sense of ownership of the technology developed, thereby facilitating technology transfer.

Need for Monitoring and Evaluation

Networks have proliferated over the years, as participants and donors have come to see them as a means of achieving more cost-effective use of resources, a more innovative approach to research, greater chances of impact and enhanced capacity building and institutional development. Various publications have discussed these benefits and the principles for successful networking (Faris, 1991; Plucknett et al, 1990). However, networks do not always live up to the expectations of their members. Monitoring and evaluation are essential, both to improve individual networking and to compare experiences and disseminate management lessons more widely.

Unfortunately, current literature on networks reveals little information on the methods available for evaluating them. The most significant contributions are from Valverde (1988) and Faris (1991), both dealing with internal (monitoring) and external evaluations.

Internal evaluation (monitoring)

It should be the responsibility of every network to evaluate its own activities, to identify and build on strengths and deal with problems as they evolve, before they become serious. Among the many possible internal evaluation methods, Faris (1991) has suggested four that are effective, involving coordinators, steering committees, network-wide workshops and monitoring tours.

Centralized coordination is a key to good network management. The coordinator's job is to supply technical and moral support to the national programmes, to help establish effective operational procedures (technically, financially and administratively), to act as a communications link among the members and as a buffer between conflicting national programme interests, to organize network activities, and to provide leadership. In his or her daily dealings involving these activities, the coordinator also monitors and evaluates operations, building on successes and checking for potential problems.

A steering committee has a monitoring and evaluating role more formal than that of the coordinator, often dealing with the same issues, but as they affect policy or strategy for the network as a whole.

IDRC's experience suggests that workshops and the publication of workshop proceedings can be effective as evaluation mechanisms, provided they are organized with good representation of the membership and periodically review the network's goals, mandate and objectives as well as its research priorities.

Monitoring visits by the coordinator, selected members or donor's representatives may be considered as a form of internal evaluation and can be a good way of identifying problems. The assessment criteria to be used during such visits will depend on the goals or the interests of the visitors. Donors, for example, may want to know how the network has increased the cost-effectiveness of research, and may ask coordinators or evaluators to report on this. Thus the borderline between coordinating networks and monitoring them sometimes becomes blurred. The monitoring role of IDRC programme officers has been adapted to fit the particular coordination mechanism used. Staff with a keen personal interest in a network's area of research may become heavily involved in coordination as well as monitoring. More formal external donor evaluations usually include questions assessing the monitoring and coordination functions.

External evaluations

External evaluation is useful for providing network members and organizers with data on programme operations and impact compared with initial objectives. The expectation is that, by injecting new insights into network management and participation, performance will be enhanced. However, acceptance of evaluation findings is a key to their being used

to make improvements. A major strength of internal evaluations is that network participants are involved in assessing their own activities. Allowing them to participate in external evaluations as well makes it more likely that the findings of the evaluation will be accepted.

The most comprehensive method for evaluating networks published to date is the one proposed by Valverde (1988) and reviewed by Faris (1991). It aims to identify and analyze the key constraints and elements that influence the execution of agricultural research network programmes. Through a systematic analysis of network elements, the method enables a list of weaknesses, strengths, threats and opportunities to be generated, leading to recommendations for appropriate adjustments. The Valverde method relies on both informal and formal data collection, varies according to the nature and type of network, and encompasses the assessment of biological research activities, regional exchange activities, and network management.

Evaluation Findings

Evaluations have been completed for 15 IDRC-supported networks since 1982. Each was undertaken to respond to particular information needs and addresses issues of significance to the network in question at the time. Although they were not designed to contribute to an overview of the lessons learned about networks, by comparing and synthesizing information from these evaluations it is possible to draw conclusions regarding their planning, organization and management. In addition, it is possible to examine how different types of network function—whether they have distinctive benefits, and their effects on the participants.

The 15 networks encompass three basic types of activity: research (9 networks), information exchange (3 networks) and technology transfer (3 networks). Research networks were designed to conduct basic or applied research on various topics, and involved universities, government and/or non-government organizations. Information networks focus on establishing systems to manage and/or analyze and exchange data, including the provision of bibliographic information which may or may not have been computerized. Technology transfer networks engage in the assessment and dissemination of improved technologies and technical skills. The networks ranged in age from less than 1 year to 12 years old at the time of evaluation. Some were specific to a region; others were global. Different disciplines were included in each. Table 1 provides the salient information on each network.

All of these evaluations were ex-post, in that they were started after the networks had begun operating. They were designed to provide information of importance to the specific network and therefore covered widely different issues. As a result it is difficult to aggregate or synthesize their findings. However, one can extract a number of useful lessons for improving network operations.

Table 1 Data on networks evaluated by IDRC

Name (year of evaluation)	Age (years)	Region	Discipline(s)
Research networks:			
Adolescent Fertility Network in West Africa (1992)	6	Africa	Social sciences
East and Southern Africa Rootcrop Research Network (ESARRN) (1992)	6	Africa	Agriculture
Latin America Aquaculture Network (LAAN) (1991)	5	Latin America	Aquaculture
Latin American Urban Hydrogeology Network (LAUHN) (1990)	0.5	Global	Hydrogeology
Macro-economic Analysis Program (MAP) (1985)	1	Africa	Economics
Network for Aquaculture Genetics in Asia (NAGA) (1989)	4	Asia	Aquaculture
Oilseeds Network for East Africa and Southern Asia (1992)	11	Latin America	Agriculture
Post-production and Food Industries Advisory Unit (PFIAU) (1988)	4	Africa	Agriculture
Red de Investigación en Sistemas de Producción Animal Latinoamerica (RISPAL) (1988)	7	Latin America	Animal science
Information systems networks:			
Agricultural Information Bank of Asia (AIBA) (1986)	12	Asia	Agriculture
Regional Information System on Planning (INFOPLAN) (1985)	10	Latin America	Economics and social science
IDRC Information Sciences Division, Caribbean Program (1989)	12	Latin America	Information science
Technology transfer networks:			
Caribbean Technology Consultation Services (CTCS) (1989)	3	Latin America	Industry
Rural Energy Technology Assessment and Innovation Network (RETAIN) (1989)	4	Global	Energy
Asian Network for Industrial Technology and Information Extension (TECHNONET Asia) (1982)	10	Asia	Industry

Viability

External resources are usually required to set up and coordinate network activities. In providing such support, donor agencies should recognize that a long-term funding commitment is required. Whatever the intentions of donor agencies with regard to the amount and duration of funding, the time period for which funding will be made available should be stated at the outset. This point was emphasized in half the evaluations. A fairly long time is needed to plan for the cessation of external support.

Many networks will be unable to maintain themselves financially without being offered at least some external support. While most networks have been able to attract external funding, only the technology transfer and information networks had generated what may prove to be more sustainable sources of financial assistance from participating organizations, clients and/or governments. As one might expect, these networks did not feel an urgent need to anticipate the cessation of donor funding, whereas the research networks were very sensitive to the issue of planning for the withdrawal of IDRC support in the future.

Adaptability

An important issue highlighted by the evaluations is the relationship between network coordination, control and ownership, and the degree of adaptability and responsiveness required by the network. Ineffective leadership and/or coordination, when combined with little or no local sense of ownership, tends to result in a network that does not adapt well to changing circumstances and is unresponsive to the needs of its members. The reverse is also true. Two evaluations serve to illustrate this point.

The first concerns the Agricultural Information Bank of Asia (AIBA). Initially there was poor leadership within the network, evidenced by 'insufficient assistance from the regional centre to the national centres'. There was also a feeling on the part of the national centres that they were not 'full and formal partners in policy making'. In other words they lacked a sense of control or ownership over the network at the local level. These two factors have led to the 'inability of the regional centre to adapt to the ever-changing situation of the national centres, which have developed fast'.

In contrast, in the case of the Latin American Aquaculture Network (LAAN), 'the role of the regional network coordinator in providing advice to research institutions and government policy-makers was seen as a major strength of the regional network'. At the national level, the Colombian work group took ownership of the agenda and began setting their own goals. The combination of strong network coordination and strong local ownership made the members feel that it provided appropriate information and a basis for action which suited their needs.

Information exchange

The advent of a network is often a response to the need to improve the exchange and dissemination of information (Akhtar, 1990). An important implication of this is the need to gear information dissemination to the needs of users, and to make them aware of the

services available. From the evaluation data it appears that, ironically, the information and technology transfer networks were weak in disseminating internally derived information. They also appear to have had difficulty recognizing the information and service needs of their end users. This discrepancy requires further study, given that these networks tend to be more user-oriented than research networks, which direct their outputs mainly to other researchers and research institutions. The target groups of information dissemination in the different types of network are presented in Table 2.

Networks also serve to establish additional links between network members and other national, regional or international organizations. These include connections between researchers who have previously had little or no contact with each other, and between institutions and government or non-government agencies. Technonet Asia (TA) has been particularly successful in establishing links, as noted by the evaluation:

> Over the years, TA has developed active cooperation with many international organizations; apart from IDRC its parent, and CIDA its other principal donor, TA has now cooperation with more than 60 international bodies; this cooperation ranges from simple information and personnel exchanges to elaborate joint venture projects (Jarmai, 1982).

The technology transfer networks have been the most successful in establishing contacts between individual researchers, while the research and information networks seem to have concentrated more on institutional links. Only the research networks seem to have established links with government agencies and/or universities. Technology transfer and information networks tended to focus their linkage activities on non-government organizations. In terms of intra- or inter-regional links, research networks appear to be more likely than the others to seek to establish relationships with international, or at least extra-regional, institutions. This reflects their characteristic role in transferring strategic research techniques and approaches to developing countries.

Attention should be paid to the issue of who is to be the ultimate beneficiary of the network, so that research and extension activities can be geared to the needs of this group. This lesson is particularly relevant for information networks which, while providing a valuable service, do not appear, from evaluation data, to be adequately considering who will be using their services, and what information needs to be provided. For example, the evaluation of the IDRC Information Sciences Division (ISD) notes that:

> ...of the potential user community of researchers, agricultural planners, extension workers, librarians, and small- and large-scale farmers, the actual user group has rarely included any of the 40,000 small farmers who comprised the main target audience (Durrant, 1989).

Capacity building

Training, both formal and informal, has been a significant network activity, leading to increased confidence and abilities in areas such as undertaking research, report writing and designing projects. Five of the network evaluations considered training to have had

Table 2 Targets of information dissemination by IDRC-supported networks

Network	Researchers/ consultants	Governments	Other institutions	Ultimate beneficiaries
Research networks				
Adolescent fertility	Yes		Yes	Yes
ESARRN	Yes		Yes	
LAAN	Yes	Yes	Yes	
LAUHN	Yes		Yes	
MAP	Yes			
NAGA				
ONEASA			Yes	Yes
PFIAU	Yes	Yes	Yes	Yes
RISPAL			Yes	
Information systems networks				
AIBA	Yes			
INFOPLAN				Yes
IDRC-ISD	Yes	Yes		Yes
Technology transfer networks				
CTCS	Yes			Yes
RETAIN	Yes			
TECHNONET Asia				Yes

a major impact on the success of the network. However, more attention needs to be paid to making training appropriate to participants' needs.

Networks which provide inputs not locally available have strengthened institutional research capacity, and have led to the establishment of national or regional institutions or fora which did not exist prior to the formation of the network. Among the examples of this are the Agricultural Information Society of Asia, which was created as a result of AIBA, and the Asian Industrial Extension Officers' Forum, formed under TA. In another case the Macro-economic Analysis Program (MAP) led to the revival of the *Eastern Africa Economic Review*, which 'provides a badly needed forum for debating on

economic policy issues relevant to the region, disseminating original research results, and linking economists in the region' (Young and Wangwe, 1985). AIBA also made a significant contribution to the formation of the International Information System for the Agricultural Sciences and Technology (AGRIS). Through the IDRC-ISD Caribbean Program, the Jamaican information system has served as a model for the establishment of similar systems in Barbados and the Dominican Republic. Information systems have also been established in Chile and Argentina following initiatives taken by the Latin American Regional Information System on Planning (INFOPLAN). However, the experience of six of the networks suggests that institutional capacity is sometimes not strengthened uniformly across the network, and that care must be taken that one participating institution does not benefit at the expense of others.

Cost-effectiveness

Networking has, in most cases, proved to be a more cost-effective method of delivering support to national programmes than the alternatives. The evaluation of the Caribbean Technology Consultation Services (CTCS) compared the cost of delivering network services with those of the United Nations Industrial Development Organization (UNIDO), and found that CTCS costs were 50% lower (Stanley and Elwela, 1988). Likewise, the evaluators of LAAN costed various research alternatives and found that it was cheaper to fund a network than to fund individual research projects (Moreau, 1991).

Summary of Lessons

Networks must evolve in relation to the needs of their members. If they ignore this cardinal rule they run the risk of becoming outmoded or dysfunctional. Networks need to monitor their operations and strategies to ensure continuing relevance and success. This includes ongoing or periodic assessment of all networking activities, leadership and coordination roles, network services, communication among members, dissemination of information, and adequacy of reporting, monitoring and evaluation procedures. Assessments in which the network actively participates tend to have more influence over subsequent network activities.

Planning for post-donor viability is an essential part of network planning. The literature suggests that donor support to a network should be defined from the outset, in terms of both nature and duration. If the duration of support is not discussed, and the question of the network's sustainability following termination of support is not explicitly addressed, the planning of the network's activities will be unlikely to take this issue adequately into account and the search for alternative sources of funding will be ignored.

By encouraging cooperation among research institutions and demonstrating positive results, networks can facilitate and encourage political commitment to a strong national

programme (Moreau, 1991). National capacity is also strengthened through the development of a critical mass of national researchers and through access to regional expertise.

Networks must take greater care in determining who are their beneficiaries and in gearing their services to that group. Too often, network services remain unknown to those who could benefit most from them.

Conclusions

Monitoring and evaluation are critical to addressing issues related to the everyday management of networks, the quality of the training and services they offer, and hence to the general satisfaction of members. However, based on the literature reviewed and on IDRC's experiences, both approaches have been less than precise in assessing such factors as network impact at the national level, long-term viability and operational performance. Another area where we need to sharpen our evaluation tools and skills is in assessing the relative efficiency of collaborative research through networks compared with researchers working independently. With the recent proliferation of research networks, hard information on this issue will be increasingly important both to donors and to the institutions concerned. We therefore offer some suggestions for strengthening the application of both internal and external evaluations.

Data from internal evaluations are usually timely but tend to be impressionistic or anecdotal. They are not usually based on rigorous methods of data collection, tending instead to draw on the perceptions of those closely involved in the ongoing operation of the network. By their very nature, internal evaluations lack a broader strategic perspective and cannot deal well with sensitive issues. External evaluation, on the other hand, can be much more rigorous in its data collection methods and can yield quantitative data. The analysis of these data from an external perspective can take strategic considerations and contextual and external factors into account. Contentious issues can be more easily dealt with by taking a broader perspective. The usual problem with external evaluation is that some data must be collected retrospectively and may therefore be of poor quality.

We submit that both internal and external evaluations are useful. In fact, the two should buttress each other. Monitoring will continue to be part of the day-to-day management of a network, while external evaluations will continue to be required for accountability or to document performance. Each approach has strengths not found in the other. IDRC is currently relying more and more on an approach which combines both, with internal evaluation informing external evaluation and vice versa. To make internal evaluation more effective, more attention should be paid to data collection methods; and more elements of external evaluations should be subsequently built into network activities.

Both internal and external evaluations can contribute greatly to levels of awareness and cooperation among network members. To be effective, both approaches should be highly

interactive and should build toward systematic and ongoing review of the daily life of the network. Results should permit scientists, policy-makers, donors and others to be aware of emerging problems and to make changes early on rather than wait until problems become ingrained. Evaluation results should be regularly disseminated among members through newsletters or other communications, to expose them to the value of this kind of exercise and the insights available through it.

The results of evaluations which are participatory in nature are more readily accepted and implemented. All those directly involved in the network should have a say in the design and implementation of evaluations. There should be no monitoring or evaluation mystique: participants should feel free to design the data collection methods and to specify the issues appropriate to their concerns and to the nature of their network. Wherever appropriate, evaluation activities should be integrated in existing data collection, review and reporting mechanisms, and should not impose a significant new burden on network participants. Ideally, participants will identify with the process and be prepared both to contribute to it and to benefit from it.

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