A UTILIZATION FRAMEWORK FOR IDRC PROJECTS

A practical guide for developing utilization strategies

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INTRODUCTION:

"We publish so many reports and put on so many workshops, yet somehow people in the field still don't seem to appreciate the good research we have done, or be aware of our technologies. We can't seem to get our results out there"

This quotation could easily be the complaint of a research manager in a development organization. It should not come as a surprise. The average research manager is so preoccupied with his immediate day-to-day problems that he or she has often little time to think through the challenge of utilization.

The case for research and technological development as key to economic development and social well-being does not need to be made here.

This paper focuses on what a research organization in a development context can do, to improve the chances that the results of its research projects will be applied and implemented.

The utilization of research results is a process that is studied and understood less with the tools of natural and biological sciences, but more with those of the social and management sciences. It is also a communications challenge.

The specific objective of this paper is to arrive at some practical guidelines that should help research managers, program officers, project leaders and research scientists in devising strategies and resource allocation decisions to increase the chance of results utilization. Most of these concerns should be addressed at the start of a project. What is proposed is an eight point utilization framework.

Technology transfer as a rule is case-specific. It is very difficult to discuss the utilization of research results, without first defining what research we are talking about, and who is to utilize it. For the purpose of this discussion, accordingly, I

would like to limit the scope of this framework to the type of research projects sponsored by a donor agency like IDRC, that lead to results which can be applied.

The context of IDRC: a research-oriented organization

IDRC does not carry out research itself, but funds scientists and research organizations in developing countries. The Centre has a well-established track record of close to twenty years of operations, with several thousand projects completed or in progress in over one hundred countries.

IDRC has concentrated most of its initial efforts on building research capacity in developing countries and funding research projects. Recently, it has paid significantly more attention to the question of how to apply and adapt knowledge resulting from research, particularly over the last couple of years. The most recent move was the adoption by IDRC's Board of Governors of a policy to "increase the probability that outputs from the research which [IDRC] supports will make some positive contribution to the process of economic and social development."

IDRC's project selection system

Over its twenty years of operations, IDRC has developed a unique philosophy of responding to the real development needs of its client countries. This philosophy is best illustrated in the way the centre chooses and shapes its research projects, of which a major component is the intensive consultative process with recipient organizations in the course of developing project proposals.

This philosophy is also embodied in a system for selecting priorities, and identifying, developing, and approving research projects. While some may not see it as a system, nonetheless it consists of a number of related components that function relatively well, including:

-- A strategic planning system that produces yearly reviews of policy and programs.

-- Regional directors that provide the Centre with periodic reviews of the development priorities for their region.

-- Program officers, specialists with post-graduate training, that identify potential recipients of funds, research the technological needs and opportunities, and develop the right kind of projects.

-- Numerous consultations which occur between the Centre and the recipient organization, between the Centre and other organizations, and within the Centre and its experts, to refine the project and make sure that it is cost effective, technically up-to-date, and appropriate to a specific development problem in a country.

-- A well-known, transparent hierarchy and decision structure for approving projects.

In this paper we take this system as given. We will focus primarily on the management question of how we can tackle utilization in the context of a successful research funding organization.

Is utilization justified?

A number of authors have criticized the top-down approach of donor agencies in imposing certain technological choices on a developing country, not always in the latter's best interest. This is often referred to as the "pro-innovation bias", an assumption that the result of a research project or an innovation should be diffused and adopted by all members of a population. (Rogers, Everett M., Diffusion of Innovations, third edition, Free Press, New York, 1983. page 92)

From an organizational viewpoint, this raises the question of how should one take the decision to disseminate a technology. Major multinationals have as a rule very rigorous "gating" systems, or hoops, through which an innovation has to pass before it goes to market.

It is difficult to establish such a rigorous screening process in an IDRC-type project, because of the great number of actors involved, all of whom are more or less equal, none of whom has the ultimate authority over the project. But it is possible to outline three broad areas in which some consensus can be arrived at.

The first area is internal to the donor, IDRC, whereby all involved divisions agree that a project is ready to be used. Because of the variety of projects and disciplines involved in development, there is no magic formula for arriving at such a

consensus. At best, there is a general sense among program officers close to a project that a technology or research product is sufficiently evolved to be used in its specific environment, eg. a new agricultural method, having passed on-farm tests, can be considered ready for broader dissemination; a particular form of community participation in health prevention at the village level can be sufficiently proven at the village level to be extended to a district level; or a component of macro-economic research may be sufficiently advanced to hold a seminar for government decision-makers. In each of these areas, it is relatively easy to move to the next step in the utilization process.

A more challenging question is the consensus between the donor, IDRC, and the recipient organization, which carried out the research, the second area of concern. Clearly, there are additional factors that enter into the equation. A classic situation would be one in which the recipient is a traditional research organization, with neither the mandate nor the interest in advancing the innovation process beyond the discovery and scientific publication. To a donor agency program officer, the question maybe one of "converting" the recipient to a more aggressive marketing-oriented attitude, oftentimes a long process. On the other hand, it might be simpler and faster to involve a second organization which is more closely involved in marketing or disseminating activities.

Finally, the third area of concern is the viability of the technology itself. The literature is full of examples where a technology appeared to satisfy all the technical requirements, but failed in the market: pharmaceutical products, which on broader dissemination, proved to have devastating side effects on a small portion of the population; industrial turnkey-plants which proved out to be totally unfit for their environment; or policy research in economics, which appeared attractive on a computer model, but when applied to a real national economy, ended up in destroying the economy itself. In theory at least, most developing nations have a number of safeguards against the diffusion of imperfect technologies, eg. a bureau of standards, building codes, a Food and Drugs Administration, a department of consumer affairs, or any number of powerful consumer and environmental lobby groups. Any one of these could stop an innovation dead in its tracks, given enough time. In some developing countries, however, there may not be any of these "safeguarding" organizations, or more likely, they may not have the necessary influence to have any effect. Unless such a consumer protection infrastructure can be created fairly rapidly -- not a likely scenario -- then one is left with placing a greater responsibility on the innovators to monitor any undesirable side

effects that may emerge from an innovation, as it is undergoing utilization. There is no easy answer.

Looking at the issue positively, there are factors that can reduce this technological risk. IDRC, for example, has a well-functioning research project selection system that responds and adapts to a developing country's priorities and needs, reducing significantly the chances that the wrong research will be funded. Moreover, in the cases where a project may indeed result in an inappropriate technology, the large inertia of a developing country's infrastructure will serve as a natural system of checks and balance. The real challenge is not to prevent the wrong technology from being disseminated, but to focus enough energy behind a technology to ensure that dissemination will occur at all. The utilization framework proposed in this paper attempts to facilitate this task.

The utilization framework as a management tool

In developing a utilization framework, what is intended is not a general theory on utilization, but the exposition of a simple management tool. Like any management tool, eg. performance appraisals and rewards systems, objective setting and planning, or financial control, the utilization framework should be seen as a flexible instrument to help a manager develop a strategy for the utilization of research results. It could be used by researchers, when they are formulating a research proposal for submission to funding agencies like IDRC, or by program officers from IDRC or other donor agencies when discussing projects with potential recipients. The framework can be seen as an eight-point checklist to be used when developing a utilization strategy. Not all elements must necessarily have equal weight, and some aspects may take on greater or lesser importance, depending on the project, the technology and the particular society.

The genesis of the framework: methodology

The methodology used in this paper is relatively simple. A trial framework was developed based on concepts found in the fields of economics, technology transfer, classical marketing and social marketing. This was then tested against a sample of thirty five completed IDRC projects. These projects were previously screened by IDRC's Office of Planning and Evaluation, on the basis that they had produced identifiable results. The framework was adapted to account for the type of research undertaken by the Centre. It was also modified to include some elements of social

marketing (see Neill H. McKee, "Social marketing in International Development: a critical review", M.Sc. Thesis, College of Communications, Florida State University, 1988).

This model was presented to a small group of senior researchers and managers in IDRC, and to all the staff of one of its divisions (Communications). Further important modifications were made at that time, most importantly the addition of an eighth element, that of costing. Finally, the model was field tested at one of the regional offices (West Africa). The conclusion by the West Africa Regional Office program officers working in the field was that with some fine tuning, the model could be quite helpful in project formulation and discussion.

It should be noted that with any such model, one can expect continual refinements. However, it is most important that all modifications or additions to the model satisfy one very important criterion: the modification has to make sense practically, and contribute directly to the improved management of the utilization process.

Examples from thirty-five IDRC project cases are used to illustrate the framework. The projects were selected by IDRC's Office of Planning and Evaluation as part of their preparation of the Centre's fifteenth anniversary report, "With our own hands". These case analyses do not in any way represent an evaluation or assessment of a project, nor a judgement on its performance, but rather are used to illustrate the management principles behind utilization. It should also be pointed out that the files used in this sample were closed in 1985, and later material has not been included. It would be valuable to update these data, however, this should be considered as a separate exercise.

The eight point utilization framework

There are eight elements in the framework:

1. Product / service
2. User / adopter
3. Market potential
4. Economic and political environment
5. Distribution channels
6. Promotion

7. User / adopter behaviour

8. Price / cost

These elements are used in developing utilization strategies for research projects. In effect, their application imposes a management discipline on research for development, and should increase the probability that the research results will be used. The framework can be a powerful management tool, but as will be seen when each of the elements are discussed below, it also has some limitations. The framework is also of limited help if there are no obvious deliverable products at the end of a project, such as in the case of basic research or training projects.

1. Product / service

The first element in the framework is the product of the research. It can be best understood as the package of benefits that is to be disseminated. Because the products considered in this study are almost exclusively the results of research, they are sometimes called innovations. IDRC has examined the outputs of its funded research projects, and identified several types of products. (IDRC, Program and Policy Review X: The Utilization of IDRC-Supported Result, p.8) The product can be a piece of hardware such as a handpump, or grain dehuller; a biological product, such as a new seed variety; a health product such as a contraceptive vaccine; applied knowledge, such as the link between sanitation and health, or curriculum models; policy advice, such as advice on macroeconomic policy, or the introduction of a new element to a public debate.

In describing a product, it is important to understand the novelty or improvements of the innovation, over the current technologies or practices.

2. User / adopter

The framework's second element is the user or adopter, the individual or group who makes the decision to adopt, use or purchase a product or service. The key concept is that of decision-maker, since the underlying principle in utilization is to influence the decision-maker to adopt a technology. This is different from the beneficiary. For example, when using oral rehydration to curb the effects of diarrhea in children, the beneficiary is clearly the child, but the adopters of the technology are more likely to be the parent and the primary health care nurse. Consequently, the utilization strategy should

be geared to the adopters. Identifying that adopter is a critical step in the process.

CASE EXAMPLES OF PRODUCTS AND ADOPTERS

a. In the Philippines, rattan is a bamboo-like grass used to make furniture for export, a sector generating several million dollars a year. This crop grows wild in the forest, and until recently, little attention was paid to supply. Concerns over depletion of the crop led to an interdisciplinary project in planting and harvesting techniques, processing and utilization. In this case, the product would be a series of new practices that would effectively extend the supply of rattan, and the users or adopters of the technology are clearly the rattan growers and furniture industry.

b. In Jamaica, oysterculture has been promoted to increase domestic protein production. Research was carried out to determine the appropriate species to cultivate, the sites for demonstration culture beds, and the types of beds. The research determined among other things that old tires sliced and tied with a rope form an ideal substrate on which to grow the oysters. The product, in this case, consists of the new cultivation methods, and the users will be the oyster farmers. The adopters will also be the marketers and new consumers of oysters, who will now be eating oysters instead of some other seafood.

c. Remote communities, because of their isolation, are at a disadvantage in providing adequate education to children. In Chile, an experimental community development project, called "Parents and Children", attempted to overcome this geographical disadvantage by providing parents with educational material and programs for pre-school children, hoping to give them a head start. IDRC hired an innovative professor to evaluate the effectiveness of the project. The consultant came with a novel evaluation technique, and wrote a book on it. Here, depending on how we chose to define the project, the product can be either the community development approach, or the new evaluation technique. In the first case, the user would be the remote community in Chile, who would be implementing the development approach. In the second case, the users would be the invisible college of peers, of fellow consultants and evaluators, and of donor agencies. The choice really depends on how the project

leader wants to present the primary objective of the project.

d. Support to think tanks can also be bivalent in terms of products and adopters. When IDRC provided core support to an Argentine centre for urban and regional studies (CEUR), was the product a viable institute, or was it the collection of research studies? If one chooses the viable institute, then the users would be the researchers who draw salaries from the institute. In the second alternative, the users would be the government agencies and departments that will be reading and acting upon the research recommendations.

There can be several degrees of freedom available to the program officer or the recipient institution in defining what a project is really about. The final definitions of products, users, and adopters should reflect the priorities set in the program, and the initial objectives of the project. This definition should be done as early as possible in the life of a project, since it will likely influence the future course of the project, such as consultations with key constituencies, product design, and development of a utilization strategy.

3. Market Potential

When designing a utilization strategy, it is critical to know early on how wide a dissemination effort is required. The market potential is the total number and location of all possible users. It essential that this data be as quantified as possible. The more precisely a market can be defined, the easier it will be to develop a dissemination strategy. The issue is not trivial since most developing countries have inadequate statistical and demographic data, in comparison with industrialized countries.

CASE EXAMPLES OF MARKET POTENTIAL

a. In Panama, agricultural research was carried out to improve the effectiveness of feeding systems for dual purpose cattle, i.e farms with cow herds that provide both meat and milk. The research project summary document states clearly that there are 30,000 such small farms in Panama, a market size definition necessary to plan any extension effort.

b. Refugees in Thailand come from neighbouring Laos. IDRC funded a project to research appropriate educational material that could be turned into text books. The

market potential for these books is the total number of Lao and Hmong refugees in Thailand, Laos, China and those in repatriation camps in North America.

c. A five country study of the economic impact of tourism in Asia resulted in a major report. The market for this report is the total number of key policy officials in government that have a say in the tourism sector in each of the five countries. The number would not exceed one hundred in each country, and is probably in the tens. Such low numbers generally apply in most policy-type research. The total market of relevant and influential government officials in a specific policy area can usually be pinpointed to specific names, titles and telephone numbers, and can be easily reached through lunches, personal interviews or workshops.

4. Economic and political environment

In every development project, there are always factors and constraints resulting from the political and economical environment of the country that will affect the design of the product or service, its distribution or its acceptance. Among these, we can include pricing policies, regulations, government policies and programs, and other bureaucratic obstacles. While not always directly linked with research, often these policies can make or break a technology, regardless of the latter's technological merits or social acceptability.

CASE EXAMPLES OF ECONOMIC/POLITICAL FACTORS

a. In the Thailand project to research and produce textbooks for Lao refugees, one political issue was the difference in political ideology between Thailand, which was capitalist, and Laos, which was communist. The Thais were negotiating the eventual repatriation of the refugees to Laos. The Laotians were not keen on seeing this new wave of "émigrés" to be influenced by capitalist teachings, while the Thai government was against the idea of providing books with a communist flavour to refugees staying in its country. The key was to produce ideologically neutral books, to satisfy both sides.

In this case, the nature of the product and its design were strongly influenced by political factors.

b. In Egypt, research was conducted to develop a superior fava bean that would contribute to reducing the significant import of these food legumes. Once the superior bean was developed, however, the technology did not progress, because there was no incentive for the farming system to adopt the new species. This lack of interest was due to the comprehensive government agricultural policies, which included government subsidies to farm inputs, eg. grains, seeds, fertilizers, government control of gate prices for farm outputs, and government control of the market, through rationing cards. These combined policies and regulations discouraged completely any shift to the new type of fava bean.

This is a classic example where a seemingly superior technology can be stopped in its tracks by inhibiting government sector policies. This does not mean that the economic policies were necessarily bad. All it points out is that for this particular commodity, the overall economic policy framework did not favour domestic production of the crop.

c. In the case of the Argentine research institute in urban and regional development (CEUR), one political issue at the time was the repressive attitude of the military government to research establishments. Unlike universities which were seen to be hostile to the regime, CEUR appeared less threatening. This proved to be an important factor in the survival of the institute.

In this instance, the very nature of the research could have been politically sensitive. This is particularly true in many policy-related social science research.

In short, political and economic factors pervade almost every aspect of IDRC research, and can rarely be ignored in any utilization analysis.

5. Distribution Channels:

In almost every research endeavour, the technology has to pass through and in some cases be transformed by a number of other organizations, agencies and intermediary bodies before it reaches the ultimate end-user. Identifying these actors or agents in the utilization process, understanding their respective roles in the dissemination and implementation process, and developing strategies for better management of these relationships is probably one of the more important components in the development of a project.

EXAMPLES OF DISTRIBUTION CHANNELS (1)

Project: Rural Sanitation (Sierra Leone)

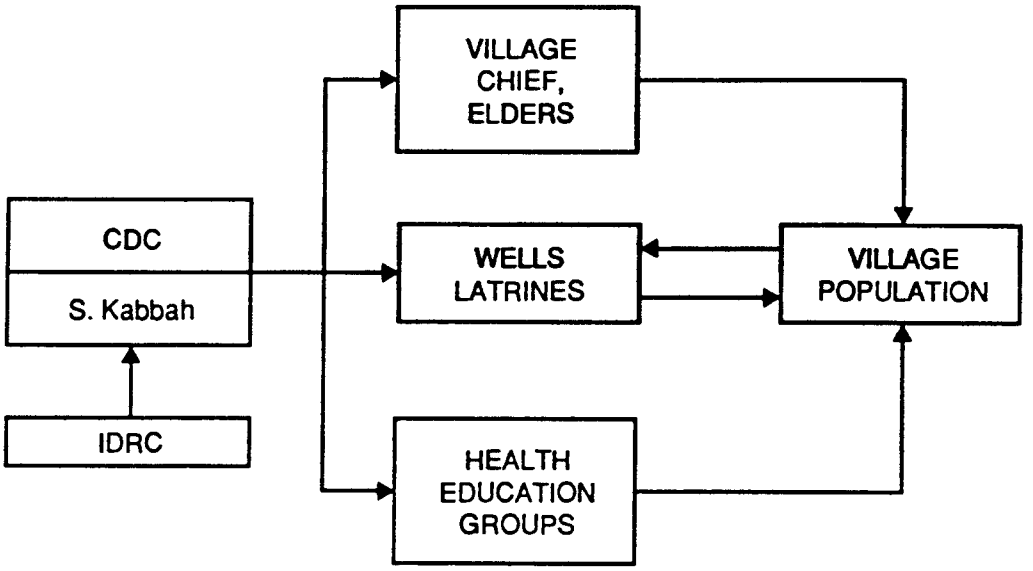

FIGURE 1

There are many ways to describe these links. The one chosen in this paper is that of flow charts, which show each actor or organization as a box, and the flow of technology as a line with an arrow.

CASES EXAMPLES OF DISTRIBUTION CHANNELS:

a. In the project on rural sanitation in Sierra Leone, IDRC funded a very small NGO, called CDC and headed by Mr.S.Kabbah, to demonstrate the use of wells and latrines in three rural villages (shown on the left of Figure 1). There were many such projects attempted previously, most of which failed. Kabbah devised an ingenious approach to involve the villagers. He first convinced the chief and elders of each village of the project's merits, and then urged them to motivate all the villagers to actually build the wells and latrines. This proved so successful, that the chief would impose a small fine on any villager who would not participate in the building project. Furthermore, Kabbah created health education groups composed of village members that would reinforce proper hygienic habits and encourage further the use of the water wells and latrines.

   This is shown schematically in the first example of Figure 1. The double arrow linking the villagers and the box with the wells and latrine indicates that the villagers were both participants in the dissemination process and users. By building the latrines themselves, the villagers appropriated the technology, increasing the chances of long-term utilization.

b. In the Philippines, the Ministry of Health (shown on the extreme left of Figure 2), with the help of major donor agencies such as WHO, UNICEF and US AID, funded a large program for the control of diarrheal disease. A major component of that program was the creation of a primary health care network, operated largely by volunteers. A major tool of the program was the use of oral rehydration salts, which when dissolved in clean water, would restore quickly lost body fluids. IDRC's portion of the program was small, but strategically significant. It funded a very small NGO, called Kabalikat, to research the user population, which was largely illiterate, and to develop suitable information packages, including posters and pamphlets.

EXAMPLES OF DISTRIBUTION CHANNELS (2)

Project: Oral Rehydration (Philippines)

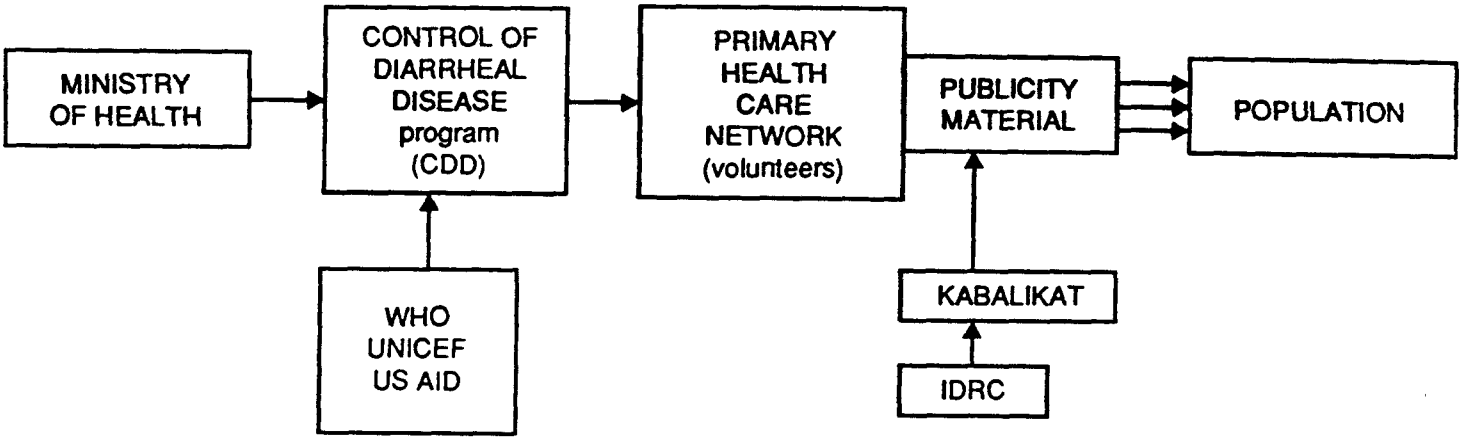

FIGURE 2

EXAMPLES OF DISTRIBUTION CHANNELS (3)

Project: Oyster culture (Jamaica)

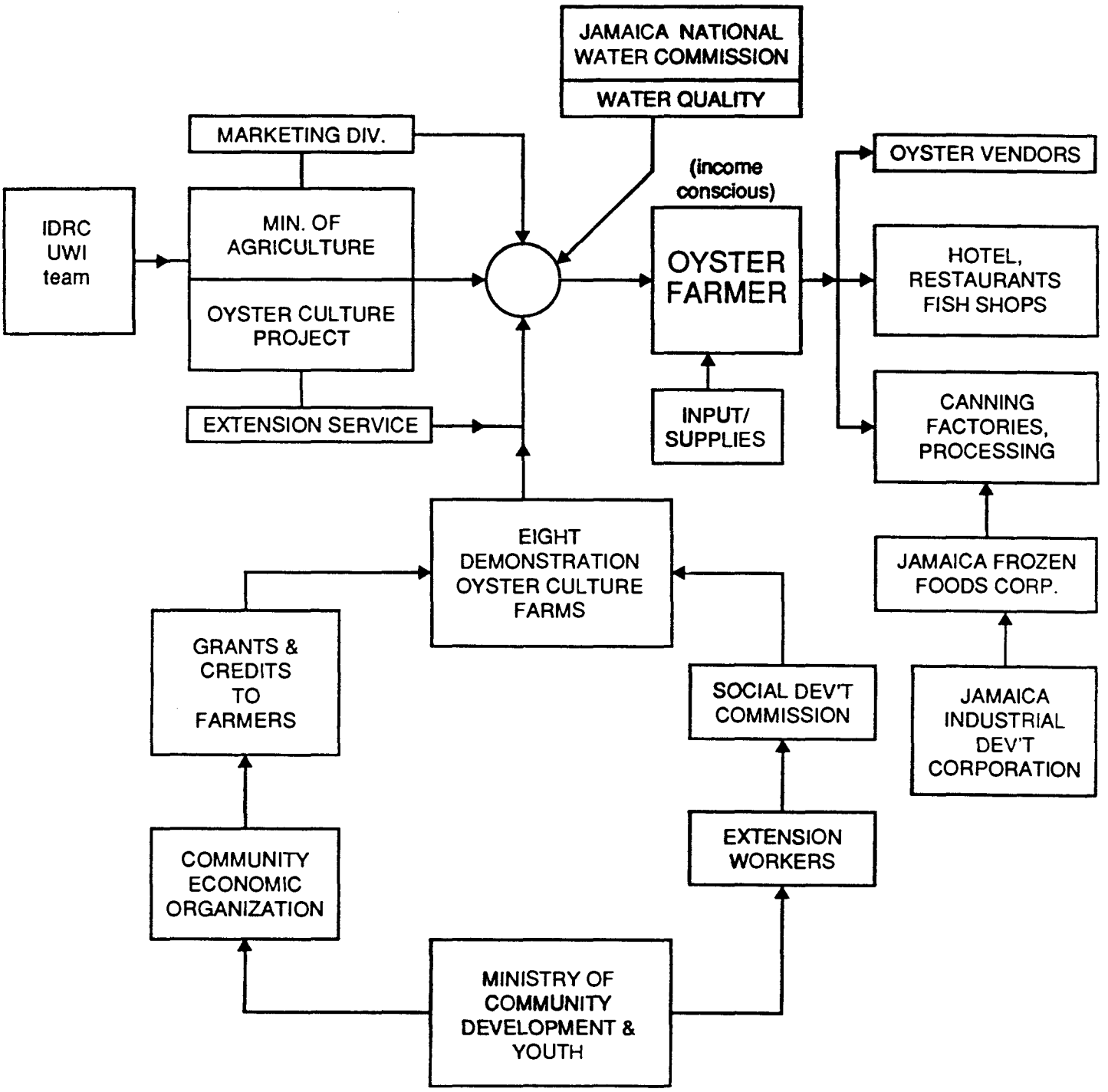

FIGURE 3

As this project indicates, it is difficult to appreciate the full importance of an IDRC project, without first understanding the chain of events and actors involved in the whole dissemination process.

c. The oysterculture project in Jamaica is a good example of an integrated approach to utilization. The purpose of the project was to develop techniques for cultivating oysters in the coastal waters of Jamaica. IDRC funded a team of researchers at the University of West Indies (Shown on the top left hand corner of Figure 3), which then cooperated closely with the Ministry of Agriculture. The Ministry created a project team, and used its marketing division to examine market potential for selling the new oysters, and its extension service to demonstrate the technology. This led to the setting up of eight demonstration farms. The institutional support for these farms is shown in the lower part of Figure 3. It involved obtaining the support of the Ministry of Community Development and Youth, who through its own Extension and Social Development Commission hired the farmers to run the demonstration farms. The Ministry's Community Economic Organization also provided grants and credits to the farmers. Another agency, the Jamaica National Water Commission, tested the water quality at the sites chosen for the demonstration farms for pollution.

   The oysterfarmer, the first user or adopter of this technology, is very income conscious, and has to balance the investment costs, including equipment and inputs, with his revenues. His products will be sold to oyster vendors, to hotels, restaurants and fish shops, and to canning and processing factories. These factories, under the Jamaica Frozen Foods corporation, are supported through the Jamaica Industrial Development corporation.

This diagram shows the complex type of linkages involved when a technology moves from the research bench to the market. All these agencies have to connect at one time or another if the technology is to be successfully marketed. As an aside, it is worth noting that even if all these elements are in place, success is not necessarily guaranteed. In late 1988, hurricane Gilbert destroyed all the demonstration farms in the project.

It is not always practical to sketch accurately all the interactions in a project. In cases where there are many consultations with several constituencies, the flow diagram can quickly become very complex and unintelligible. The objective of this exercise is not to represent graphically all the interactions in the distribution network. Rather, it is to serve

as an "aide mémoire" for the project leader to make him fully aware of the critical actors who must be identified and engaged fully in the dissemination process.

6. Promotion:

Promotion includes all the venues and channels used to carry information and awareness to the users and adopters of the technology. Sometimes, these users can be the intermediate bodies in the distribution network. This type of communications is much broader than the traditional channels for conveying scientific research results, i.e. scientific articles in peer reviewed publications, conferences, etc.

Promotion can include a variety of communications, information and education techniques. It can include videos, networking, demonstrations, advertising, and awareness campaigns. As with other framework elements, promotion is necessary in any diffusion effort, but by itself it is not enough to guarantee success.

CASE EXAMPLES OF PROMOTION:

a. In the Jamaican oysterculture project described above, the Marketing Division of the Ministry of Agriculture sponsored some brochures and TV ads to promote the consumption of oysters. At one point, efforts were also made to ensure an adequate market supply of the spicy "oysterman's sauce", a condiment without which no Jamaican would eat oysters.

b. In Niger, in the Sahel, IDRC sponsored a reforestation project in villages (Bois de Village). While the project was not deemed a roaring success, it used community awareness and popularization programs, to influence villagers to plant trees. The difficulties were unrelated to the promotional efforts, and principally due to the land tenure system. But the project's approach was adopted by several very large donor agencies.

c. In the community development project in Chile "Parents and Children", a key instrument for keeping information flowing to the parents was a small local radio station, which provided not only educational support, but also formed a strong community link.

d. In Togo, reducing insect damage through research into better storage systems has been a priority for some time. An IDRC-sponsored research team at Togo's Université du Bénin used

promotion in a very effective way. Once they solved the research problem, the project leaders developed a multiple communications strategy. They produced a scientific report with supporting technical articles targeted to the research communities, the international donor agencies and the Ministry of Rural Development. They wrote a less technical handbook intended for extension workers, and they are producing a popular and well-illustrated brochure for the mostly illiterate farmers, who will be applying the method. Finally, to reach the public at large, Togolese television will be producing a video for national broadcast. If possible, the video will be adapted for use by the extension workers in their educational efforts.

The last case illustrates very well the differences between several target audiences, all playing a vital but distinct role in disseminating a particular technology -- in this case a better storage method -- to the end-user, the farmer.

Promotion, in these four cases included the use of print, radio, television, rural community awareness programs, and even the provision of a condiment for a food product. Promotion ensures that the "message gets through", and that the end-user at least has the opportunity to be aware of the technology.

7. User/adopter behaviour:

Ultimately, the decision to adopt or not to adopt a technology rests with the user or adopter. Understanding what makes the user "tick" is an important aspect of any utilization strategy. A user may need a product, but he or she may not necessarily want it. A villager, for example, may need a handpump to provide him with fresh water which would cost him money, but social pressures might lead him to spend it instead on a ghetto blaster.

This question has been studied extensively in North America as part of the discipline of marketing. The concept, known as consumer behaviour, seeks to explain the characteristics of a buyer and his or her decision process to buy or not to buy a product. Some of the factors influencing an adopter can be cultural, social, personal, or psychological. (See Philip Kotler, "Principles of Marketing" Third edition, Prentice Hall, 1986. Chapter 6)

When an adopter is a group or community, a similar analysis can be made in terms of what decisions are made, who participates in the decision-making process, what are the main influences on the

decision-makers, and what is the decision-making process. (See Kotler, Chapter 8)

CASE EXAMPLES OF USER/ADOPTER BEHAVIOUR:

a. In Zaire, Cassava is the staple diet. In conditions of malnourishment, the thiocyanate in the Cassava is released in the body and can cause severe medical problems for the individual, including goitre and in extreme cases, cretinism. Research determined that the problem can be eliminated if the Cassava is soaked for several days. However, this would require a fundamental change in cooking habits for the village women, who would now be required to spend three to four days to prepare a meal, instead of two hours. This problem proved to be insurmountable, even with the most cooperative households.

In this case, while the research discovered a technological answer to the toxicity of the local Cassava, the behaviour and cultural background of the adopter, that is the women who did the cooking, made the technology totally unacceptable.

b. In Peru, the International Potato Research Centre (CIP) was researching ways of improving potato productivity in rural areas. A key step was to store appropriately seed potatoes, to start the crop for the following season. The ideal storage conditions could not be either total darkness or direct daylight, because the potatoes would sprout or loose its seeding characteristic. The scientists discovered that the optimal storage conditions requires indirect or diffuse lighting. But the challenge was how to find or build a shelter with diffuse lighting in a farm in the Peruvian Andes?

   The CIP scientists joined up with some anthropologists and interacted with a sample of farmers. As a three-way team, the group quickly discovered that most farmhouses had verandas or porches, and that the seed potatoes could be easily stored under the porch, where they received the correct amount and quality of light. The bonus of this form of participatory research was that farmers, because they had been involved in the process, were now able to improve on the design, and in fact suggested a number of helpful variations.

In this case, the researchers teamed up with anthropologists in order to discover first hand how the farmer would react to the proposed technology, and under what circumstances would he adopt

it. The technology utilization question is understood as not being one that could be answered by agricultural science, but one that requires the input of social science.

c. In Andra-Pradesh, in India, efforts were made to encourage the consumption of sorghum, a locally produced cereal. A major technological breakthrough was achieved with IDRC's dehuller, a relatively simple mechanical device that greatly facilitated the task of processing the grain. However, this did not solve the problem of whether the local population would in fact consume more sorghum-based products. To try and answer this question, Mrs.Pushpama, the project leader, organized a survey of 2,000 families in the region to discover their cooking and eating habits, what kind of flour they used and how they stored it. This data proved invaluable in designing her demonstration phase. Based on the survey results, she was able to determine that the most popular items would be luxury food such as cookies and buns. And this is what the demonstration bakery produced.

This example demonstrates very clearly the use of survey technology, a classical social science investigative tool, to discover the behaviour of potential adopters. It also points out indirectly that a number of the elements required to do a proper utilization strategy require significant study and research, in some cases as much (if not more) than the original research that led to the technology in the first place.

8. Price/cost

Most decisions to adopt a technology do not come free. The user has to pay a price, be it in money, in extra time, in changed behaviour (eg. eating habit), social status, or -- in the case of governments -- in political credibility and power.

There are many instances where a technology has been developed, works, and satisfies the user completely, but the price is simply unaffordable.

The question of price or cost of the technology to the user should be distinguished from that of the project cost, and the cost/benefit ratio of the research effort. These are questions that concern primarily the donor agencies and governments in their decisions for funds allocations. For instance, should a project end up with a higher cost than the total benefits, it is likely that it will receive a negative evaluation, and not be funded in the future. The issue relevant to utilization is whether the price of a technology can be paid by the potential

user, or whether it will prove to be an insurmountable barrier to adoption.

CASE EXAMPLES OF PRICE AND COST:

a. In Kenya, IDRC sponsored a particularly entrepreneurial individual to design and manufacture a ceramic-lined wood stove that would be more energy efficient and consume 30-50% less wood. A key point in the selling of the ceramic Jiko stove, other than its ease of manufacturing, was its money-saving fuel efficiency, and its relatively low cost.

Here, the price and economic factors were integrated in the overall product design.

b. In the rural sanitation project in Sierra Leone, there was a price attached to the non-participation by villagers in the building of latrines. Small fines would be levied by the village chief on those who would not share in the communal tasks.

In this case, the negative cost of a fine is used as an incentive to become involved with the technology.

c. In Thailand, farmers in the highlands are notorious for their cultivation of opium poppies. The very high price paid by middlemen made it a cash crop almost impossible to resist. But opium is not only illegal, its cultivation damages the environment and depletes the soil. The government has tried many ways of discouraging this practice, both legal and technical. One such attempt involved providing the highlanders with alternative choices for their crops, luxury fruits, which would provide them with comparable income. These fruits, however, required cool storage. IDRC sponsored a research project to design a storage system that would preserve the fruits, could be easily built, and would not require electricity or other form of power. The resulting system was a room cooled by passive solar energy, and was cheap enough to provide a viable economic alternative to the farmers, given the premium price the market offered for the fruits.

Unfortunately, even though the technology met all the original specifications, the economics were still unfavourable to the highland farmers. Because of the huge markups on opium, the buyers were able simply to raise their

offering price above that of the fruit market, and still make it far more attractive to the farmers to grow opium.

Here we see that although a technology was devised to meet the original price requirements of the adopter, much more powerful market interests -- the opium middlemen -- because of their vastly superior purchasing power and huge profit margins, were able simply to raise the purchase price well above the proposed fruit growing and storage technology. Presumably, a strategic analysis of market competition would have foreseen such an outcome.

d. In the Cassava toxicity project discussed previously, the price of the new technology, this time expressed in additional labour of cooking time -- days vs. hours -- proved too high for the potential users.

The above examples illustrate the various ways in which price can play a role in a technology.

MAKING THE FRAMEWORK WORK

The eight point framework provides a strategic planning discipline to utilization. It should be used as a checklist to see whether any elements should be included in a project proposal or project summary, eg. market potential, or distribution network.

Not all questions need be or in fact can be answered at that point. Some will require time and additional research -- possibly additional resources and outside help -- and should be addressed as the project evolves. For instance, one such task would be identifying and establishing strategic links with the critical members of the distribution chain.

Another notion that will emerge as the framework is used is the feedback that the researcher and project leader receive at all stages of the of the utilization strategy. Understanding the user better will undoubtedly influence the researcher's perception of what the ultimate product should be. Examining the complex distribution chain to get the product to the user might suggest to the project leader to have meetings, discussions and negotiations with these actors early on the project, and win their support. Awareness of key government regulations might suggest a different approach, or perhaps a discussion with relevant officials to have the regulations amended. This ongoing interaction between the utilization and the research side is very

enriching, and, particularly if it starts at the very beginning of a project, will generally result in better development.

CONCLUSION

A major assumption of this paper is that the utilization of research results is a process that requires energy and focus. For it to be effective, it should be addressed from the very beginning of any research activity. Also, without addressing utilization concerns, any research activity in support of development becomes essentially a wasted effort.

There are may ways of encouraging the broader utilization of research results in development. This can be done by forging linkages between research organizations and agencies that are concerned with extension and dissemination, by educating research managers and other leaders of the opportunity for utilization, eg. through executive training courses, and by conducting research into methods of utilization and dissemination.

The framework presented here is only one small element intended to advance the thinking and planning of the process. As a final comment, it's worth repeating that the eight point framework should no be seen as a constraint but as a tool or a help to improve the probability that research results will be used. It will not guarantee success. There are still many factors that can stop this from happening, as we saw in the case of hurricane Gilbert and the Jamaican oysterculture project.