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# IDRC Annual Report 1975/76



IDRC 003, 75e.1

## **International Development Research Centre**

The International Development Research Centre is a public corporation established by Act of the Canadian Parliament "to initiate, encourage, support and conduct research into the problems of the developing regions of the world and into the means for applying and adapting scientific, technical and other knowledge to the economic and social advancement of those regions, and, in carrying out those objects,

- (a) to enlist the talents of natural and social scientist and technologists of Canada and other countries;
- (b) to assist the developing regions to build up the research capabilities, the innovative skills and the institutions required to solve their problems;
- (c) to encourage generally the co-ordination of international development research; and
- (d) to foster co-operation in research on development problems between the developed and the developing regions for their mutual benefit."

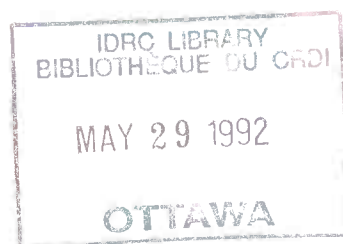
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# Annual Report 1975-1976

## International Development Research Centre



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INTERNATIONAL DEVELOPMENT RESEARCH CENTRE  
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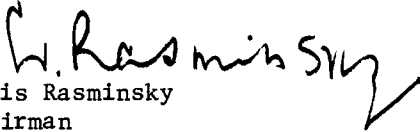
July 26, 1976

The Honourable Allan J. MacEachen  
Secretary of State for External Affairs  
Ottawa, Canada

Dear Mr. Minister:

I have the honour to transmit  
herewith the Annual Report of the International  
Development Research Centre for the fiscal year  
ending March 31, 1976, for submission to Parliament  
as required by section 22 of the International  
Development Research Centre Act (Revised Statutes  
of Canada, 1970, 1st Supplement, Chapter 21).

Yours very truly,

  
Louis Rasminsky  
Chairman

## The Board of Governors

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\*Appointed August 1975

°Executive Committee member at 31 March 1976

†Finance Committee member at 31 March 1976

## Introduction



Looking back on the first five years of the International Development Research Centre, the dominant impression is one of growth. A total staff of over 300 around the world is not large by comparison with many other international organizations, but it is a far cry from the small group of two dozen or so under whose care the Centre began operations in 1970.

During the past year, however, the rate of staff growth has levelled off, and I expect that any future increase will be at a much reduced rate. Which is not to say that the Centre as it enters its second five-year period is in any way pulling back or slowing its pace. On the contrary, the year under review has been as exciting and stimulating as those that went before, and I am confident that in the years ahead the Centre will continue to expand its ability to provide the sort of expertise, encouragement and assistance for which it was created.

During the past 12 months the Board of Governors approved funding for 109 new projects, a total financial appropriation of \$23.5 million. This brings to 366 the number of projects undertaken by the Centre since its inception and raises the total amount of funds appropriated to \$67.3 million. Some 52 projects have now been completed, 14 of them during the past year.

The Agriculture, Food and Nutrition Sciences Division continues to reflect the Centre's emphasis on research in support of the rural peoples of the developing world with 44 new projects totalling \$10.9 million. The Social Sciences and Human Resources Division undertook 31 new projects costing \$5.5 million; the Population and Health Sciences Division 15 new projects for \$4.5 million; and the Information Sciences Division 17 new projects for \$2.3 million. The activities of the newly-formed Publications Division during its first full year of operation are covered elsewhere in this volume. A further \$1.9 million was committed during the year under review in support of 177 Division Activity Projects. These are activities such as seminars and workshops, and are usually preliminary to the undertaking of a full-scale project (for example, the Centre this year is supporting a two-year project seeking an appropriate potato processing technology for the lowland tropics — the project proposal was based on the recommendations of an IDRC-sponsored seminar the year before). Last but by no means least the Centre's Human Resources awards program, an investment in the training

and development of young professionals, made available grants totalling \$1,082,265 to 63 individuals committed to careers in the field of international development.

These are the bare statistics of the past year, and as such they tell only a small part of the story. The narrative that follows this brief introduction is an attempt to flesh out the figures, presenting a broad overview of the Centre's activities during the year.

During the past year a formal agreement was signed with the Government of Kenya enabling the establishment of the new IDRC Regional Office in Nairobi. Under the direction of Anthony Price, formerly director of the West African Regional Office in Dakar, the new office will be responsible for the Centre's relations with the developing nations of East and Central Africa, and is indicative of the Centre's increasing involvement in research on the African continent. The Centre's Regional Office for North Africa and the Middle East was moved temporarily from Beirut to Cairo at the end of the year as a result of the increasing difficulties of operating in the Lebanese capital.

On a personal note, I was honoured to be nominated as Canada's official candidate for the position of Director-General of the UN Food and Agricultural Organization, which became vacant at the end of 1975. The outcome of that election is now history: the delegates chose, not entirely unexpectedly, a candidate from a Third World country, and for my part I was delighted to be thus able to accept the Board of Governors' offer of a second five-year term as President of the Centre. At the outset of the campaign I stated that the FAO was perhaps the only post that could tempt me away from the Centre. Thus my reaction to placing second in the race was a mixture of both regret and relief.

The time spent on that campaign, however, was by no means wasted. The extensive travel it involved took me to many countries where I had the opportunity to renew old acquaintanceships and to strike some new ones, not to mention visiting many Centre-supported projects. Distilling the impressions of all those visits and discussions, I find both good omens and bad.

The positive news is that, more than ever before, I found government officials at all levels stressing the importance of indigenous research as a pre-condition for successful development programs. This heightened recognition of the importance of research by Third World decision-makers must be reflected in future Centre programs. Against this, however, must be set the singular weakness of national research programs in the Third World generally. Too often they remain isolated from the mainstream of international research and are woefully limited in facilities, manpower and resources needed to effectively screen and assess the applicability of new technologies.

Recognizing these two facts, I believe that in the next few years the Centre must give increasing attention to the dissemination of existing technologies — including the technologies of social management and administration — and to strengthening the ability of national research organizations to adapt such technologies to meet the needs of their own development plans.

It will not be easy. It will require a great deal of effort, experiment and innovation. But it will be both exciting and rewarding.

*W. David Hopper*  
*President*

## Officers of the Centre

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Vice-President, Canada and Donor Agency  
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Gill (from 26 September 1975)

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East Africa  
E. Anthony Price

West Africa  
Stanislas Adotevi

Middle East and North Africa  
Salah Dessouki

Latin America  
Henrique Tono T.



## People Must Eat



*Triticale crop in Ethiopia.*

On 26 March 1976 the world's population was officially estimated to have passed the four billion mark. Four billion people with one thing in common: they all have to eat to survive.

During this same year the world's food reserves were estimated at a perilously low 31 days' supply. That means that in the event of a major worldwide drought resulting in large-scale crop failures, millions of people would starve — most of them in the Third World.

The World Food Conference in Rome two years ago called for a global reserve food supply of 10 million tons. To build such a stock, assuming it were possible, would cost in the region of \$40 billion or more. A similar amount would be needed to develop the vast food production potential of regions such as India's Ganges Plain or the Southern Sudan: projects that could double the world's food output.

These are the stark statistics of the world food problem. In the face of a problem of such magnitude and complexity it is evident that only a concerted effort on the part of both governments and other agencies can hope to bring about any lasting solution. On such a scale even the total resources of the IDRC appear insignificant.

Nevertheless the Centre does have a significant role to play in helping to feed the world's peoples — as a catalyst in bringing together governments, agencies and institutions to tackle specific research problems; as a source of both expertise and risk capital to support the scarce resources available to researchers in the Third World; and, equally important, as a disseminator of research findings.

The IDRC is one of the Consultative Group of some 30 donor agencies that supports a network of international agricultural research centres (IARCs). Their work is now a central factor in the activities of the Agriculture, Food and Nutrition Sciences Division: during the year ahead the IDRC will contribute approximately \$2 million to this network directly, and considerably more indirectly through national and regional programs linked in one way or another to the work of the IARCs.

In addition to playing a vital role in agricultural research, the international centres provide training programs for scientists from the less developed countries, and in this way they are a continual source not only of new

knowledge but also of new skills. Equally important, they are able to support, both directly and by example, the kind of regional and national research programs so urgently needed if the less developed countries are to become more self-sufficient in food.

Another way in which the IDRC plays an international role in agricultural research is through its support for agricultural information services. The main focus continues to be the FAO's International Information System for the Agricultural Sciences and Technology, known simply as AGRIS, which went into regular operation at the beginning of 1975. AGRIS collects bibliographies from national and regional centres and compiles them into a periodical bibliography of the world's agricultural literature. This collection network is already proving important in "capturing" valuable unpublished literature that had previously not been disseminated further than its institution of origin.

The IDRC has continued to assist regional centres in Latin America and Southeast Asia in developing regional networks for collecting data for AGRIS and providing output services to users in the regions. Computer techniques are gradually being introduced as the large numbers of documents require mechanized handling.

The input specifications for the central AGRIS processing by FAO proved to be too stringent for many developing countries lacking the necessary technology, and so the IDRC has assisted the FAO in setting up a special unit that converts material from these countries into machine-readable form which can be accepted by the AGRIS computer.

At another level, the IDRC is supporting specialized agricultural information centres that frequently provide the only comprehensive source of information on specific topics, such as particular crops. It is anticipated that these centres should eventually become part of the network of specialized services that will make up the AGRIS system.

One of the newest specialized information centres supported by the IDRC is the International Irrigation Information Centre (IIIC) in Israel, which began a two-year pilot operation in 1975. The objective of the Centre is to provide information on irrigation science, technology and equipment, and the use of irrigation on the farm. Through various media, such as an abstracts journal, a newsletter and a question-and-answer service it will reach a broad range of workers — from research scientists to civil engineers and agricultural extension officers. The centre will serve primarily the semi-arid regions, which include the Middle East, large parts of Africa and Latin America, most of India and parts of central Asia.

Increasing food production is not only a question to be dealt with by food and agricultural scientists — it also involves statisticians, managers, computer scientists, librarians . . . and social scientists.

In Senegal the National Centre for Agronomic Research established in the late 1960s several "experimental units". Each unit consists of several villages and surrounding farms, and each serves as a test area for the introduction of new farming techniques, experimental crops and agricultural technology.

Initially the introduction of new methods brought excellent results, but another limiting factor soon became apparent — land ownership. To obtain the maximum benefit from the improvements it would be necessary to reorganize much of the farmland, but to do so meant becoming entangled in a web of traditional and imposed land law. For the past two years the IDRC has been supporting a project in the experimental units aimed at untangling that web. So far the results have been promising, with fewer, larger, more regular

## Trees help to hold back the desert

Windbreaks are not new. For centuries farmers have planted trees to protect their farms. But now, as African and Arab states face the need to check the advance of deserts and to bring more land under food crops for their increasing populations, greater knowledge is urgently needed of the best species to plant in shelterbelts, as well as the best cultivation practices — spacing, cycle for replanting and so on.

As the Nile Valley becomes even more crowded, planners in Egypt hope to settle new communities in cities and on farmland to the west, in addition to filling in empty areas towards the Suez Canal. There is water in plenty to irrigate millions of acres, the major physical problem is that the wind blows from the west and carries sand that covers the land.

Dr Hosny El-Lakany, of the University of Alexandria's Forestry Department, has been concentrating on casuarina trees as most suitable for use in shelterbelts. Casuarina is a native of Australia and Southeast Asia, an evergreen that has the appearance of a pine but the properties of the broadleaved species that furnish hardwoods for wood-using industries. It has spread through the world's tropical and sub-tropical regions, and is already common in many parts of Egypt. Here the most promising species of *Casuarina equisetifolia*, which is resistant to termites and has the capacity to fix atmospheric nitrogen in root nodules, and thus will not compete with agricultural crops for soil nitrogen when growing in soils with low nitrogen content.

Farmers have already noted these qualities. In a village in the Thawra district along the desert road from Alexandria there are avenues of casuarina trees (of mixed species) planted in a grid. To the east, or leeward, smallholders who have moved from the Delta are harvesting good crops of corn,



Farming beside casuarina shelterbelt in Egypt.

beans and clover in the shelter of trees planted 12 years ago. There are hundreds of other such villages.

Dr Hosny has big ideas. He is planning a shelterbelt 50 metres deep running north-south for 30 kilometres. In front of the most westward line of casuarina will be planted acacia and shrubs that can break the force of the wind and take off much of the sand. At West Nubaria mechanical farm, an enterprise begun with Soviet help, his team has increased the nursery production of casuarina seedlings from about 50,000 to more than a million in a year.

While this first long shelterbelt may be planted in the next three years, he also has longer-term plans. Clonal seed orchards are to be established to produce seeds with improved characteristics. A close watch is being kept in different regions on some 200 especially good casuarina trees from which scions may be taken for these orchards. Dr Hosny is visiting Australia for three months to study some of the 40 or more casuarina species that have not yet spread to other lands. In the University of Alexandria's wood technology section, tests will be done on the fitness of casuarina for uses such as parquet flooring, fibreboard or furniture. To make shelterbelts more profitable, Dr Hosny also hopes to develop improved species that can reduce the growing cycle from 12 years to just seven.

fields providing for more efficient agriculture, increased yields and the introduction of new crops. In the process many long-standing disputes over land ownership have also been settled. As an example of agriculture and the social sciences working together, the land tenure project is being closely watched by a number of African countries faced with similar problems of land reform.

Reorganizing land is one way to increase food production, reclaiming land for agriculture is another. All over the world there are deserts and arid zones where once there was forest or farmland. Examples of "desertification" caused by man's misuse of the land are to be found everywhere: in North and South America, in Asia, Africa and the Middle East. Once the vegetation has been destroyed — by over-grazing, perhaps, or by decimation of the forests — erosion takes place rapidly, and the arid lands advance. An added problem seen all too clearly in recent years in the Sub-Saharan savannah region of Africa, is that the people too must pull back, creating additional pressures on the remaining farming and grazing land.

Awareness of the dangers of this situation has grown in recent years, and as a result a cooperative regional network has been formulated that now encompasses 11 projects dealing with various aspects of savannah forestry, many of which are supported by the IDRC. In 1974 the Centre also sponsored a meeting of a Working Group on savannah forestry that established research priorities for the network.

The establishment of shelterbelts — long plantations of drought-resistant trees that help prevent further erosion of agricultural land — and village woodlots to provide not only shelter but badly needed firewood and building materials, are high on the list of priorities. An important forest product and export commodity for several of the countries in the savannah belt is gum arabic — used in the manufacture of many food, chemical and pharmaceutical products — and its increased production is another research priority. Other projects in this network deal with plantation forestry, wood utilization and preservation, and minor forest products.

Forest research is by its very nature a long-term process, and not one that yields immediate results. In the long run, however, the cooperative approach being taken by the governments of the region should do much to improve the environment and benefit the people of the five million square miles that make up the sub-Saharan region of Africa.

Similar problems are to be found in the semi-arid zones of the Middle East, where few tree species are at present capable of survival. In Egypt the IDRC is supporting a project to establish shelterbelts using the fast-growing *Casuarina*, a tree that originated in Australia (see box). In Jordan, where any kind of vegetation is sparse and forested areas represent less than one-half of one percent of the total land area, the IDRC this year began supporting a national afforestation program that aims at producing nine million seedlings annually within the next few years.

This three-year project will study new techniques for planting trees in desert areas by harvesting run-off water, and train local forestry officers in experimental methods with a view to providing more trained workers for an expanded future afforestation program.

Where more land is simply not available, it is also possible to increase production through the improvement of the plants themselves. In previous Annual Reports a good deal of space has been devoted to the development of new high-yielding cereal varieties and to the hybrid grain triticale developed at the International Maize and Wheat Improvement Centre in Mexico.

## Triticale helps to feed the children

The land in Indibir district, 150 kilometres southwest of Addis Ababa, is not thought good for farming. The rainfall at this altitude of about 2000 metres is fair, but the common pasture-land is overgrazed and the valley slopes eroded. The farmers keep oxen, to provide their families with occasional meat, but do not use them for ploughing. In hand-tilled plots near their houses where it can be fertilized (the land is deficient in phosphate), they grow a little wheat and barley; their basic food comes from the ensete, or "false banana", whose stem and upper root is cut and left for months to ferment and then pounded until it can be worked into a flat-cake known as kemuse. It is starchy food, and malnutrition shows in the bodies of the children. The Guragie people who live in this part of Shewa province are sometimes known as "the Germans of Ethiopia", industrious people whose menfolk migrate to the towns and set up as small businessmen to supplement the meagre income from family farms. There is little incentive to remain on the land.

When the program of triticale research was extended from Mexico and Manitoba to Ethiopia (as well as five other countries), the project leader Hailu Geb-ramariam was keen to interest farmers in Indibir district in this new cereal — and their wives in using it as an ingredient in traditional dishes to improve their nutritive value. Six families at Gura near Indibir agreed to cooperate.

At the Holetta research station above Addis, Hailu Gebramariam is experimenting with his own triticale hybrids — using wheats from Kenya as well as from Canada and Mexico, and triticale lines

from Hungary produced from winter wheat. To the farmers near Indibir he offered seeds from four established lines, and he also set up a demonstration plot of five hectares in the district to test more varieties in local conditions. A technical assistant, Getachew Kassaye, looks after the plot; but the Holetta team, including the nutrition assistant Maaza Kersi, visit Indibir regularly.

Walking round the farmers' plots, Hailu sees which of the four lines are doing well. In Ato Berga Sorballa's plot, as elsewhere, the best performer is Bacum, a Maya 2 cross. His wife, Bezunesh Fasha, has prepared kemuse made of one part triticale to three parts kocho (the product of ensete). At another house in the village Murgat Seffraga, wife of Imam Kedir, has increased the triticale proportion even more. The kemuse is light in the middle.

In an official report compiled by Maaza, the wives at Indibir said that triticale helped improve four local foods — debo, genfo, injera (although it made this favorite dish "slightly sticky") and kemuse. "It makes the colour, odour and texture of the kocho better," Bezunesh is reported as saying. To a visitor Ato Berga put it more graphically: "I've lived here 20 years, and was almost ready to leave and go some other place. But for the last two years with the new cereals I am able to feed my children properly". Imam Kedir added: "With ordinary kocho we get heartburn. It is much better with this mixture".

As the research continues, more villagers will be involved. But the families in Indibir, have given the program an encouraging start.

in the Philippines a two-year project is underway to develop cheap and efficient facilities for processing, packaging and storing fish products.

This has been a necessarily brief review of some of the Centre's activities during the past year that were in one way or another connected with food production. As can be seen, it is a concern that involves each of the Centre's program divisions to some extent, and in simple cash terms food production is easily the predominant activity of the Centre, accounting for better than 40 percent of its expenditures over the past five years.

As will be seen in the following sections, however, the Centre is also concerned with a wide range of other development activities.



## Satellites & Stained Glass Windows



*Studying imported technology in Latin America.*

The gap between the so-called developed countries and the developing countries is above all a technological gap. It remains that way because the majority of the countries in the Third World are virtually dependent on imported technology — machines and methods that are both complex and expensive, are not always appropriate and are often wasteful.

The technological gap applies not only to industry, but also to agriculture and food production, health services, sanitation, education and habitation. It affects both urban and rural peoples, and has a direct bearing on employment, on living standards, in fact on every aspect of life. Research into the development of new, appropriate technologies, and the transfer and adaptation of existing technologies, is therefore a vital part of the IDRC's role, and one that involves every program division.

One of the largest projects in this field — in fact one of the largest projects ever organized on this subject — has been the Science and Technology Policy Instruments project (STPI). The IDRC, in cooperation with the Organization of American States, has been supporting this project since 1973, and in the coming year will provide additional support for the dissemination of project results. Researchers in Argentina, Brazil, Colombia, Egypt, Korea, India, Peru, Venezuela and Yugoslavia are participating in the project, which is aimed primarily at finding the means to put policies into practice. Too often science and technology policies are made in a vacuum, unrelated to the realities that affect technological development, whether the technology is indigenous or imported.

This project — conceived, organized and carried out by Third World researchers — should help to develop and make better use of indigenous capabilities, and, where the importation of technology is essential, link such technology to indigenous activities, minimize its detrimental effects and maximize its beneficial effects. Above all it will provide the participants with the opportunity to link science and technology directly to national development goals.

A similar concern with the impact of imported technology is the basis for two regional projects in Latin America, where, although a great deal of technical hardware is imported, mainly from the US and Europe, little research has been done to ascertain how such hardware is acquired or how it is used.



*TECHNONET extension officers visit a small industrial plant in Manila, Philippines.*

Four countries — Brazil, Colombia, Mexico and Peru — are cooperating in the Management of Technology project, which focusses on the food industry, particularly products and processing. By studying individual firms the researchers from schools of business administration in the participating countries hope to learn more about the decision-making process within a firm as it relates to the choices and use of technology.

Colombia and Mexico are also participants in the Market for Technology project, which is studying the acquisition of imported technology. Three industries are being studied — synthetic fibres, food preservation and shirt manufacture — and the researchers are attempting to answer such questions as: who supplies the hardware, how is it purchased, how much information is available, how competitive is the market, and how do would-be purchasers evaluate the alternatives?

In Uruguay another project begun this year is making a study of the printing industry, which, according to the Association of Uruguayan Printers, is in a critical state. The Uruguay project aims to rationalize the purchase of equipment — often second-hand and always imported — and the development of skills in a vital national industry. The project is supported by the Association of Uruguayan Printers, which will also produce the final report.

At the International Potato Centre in Peru, the IDRC is supporting the search for an inexpensive low-energy technology for processing and preserving potatoes. The project has implications far beyond Latin America, since it is largely the problem of storage that has prevented potatoes from becoming widespread in the lowland tropical regions of the world, where they could provide a valuable additional source of protein-rich food. Western-style refrigerated warehouse storage is too expensive, as are the large-scale techniques used to produce dehydrated "instant potato". Concentrating on simple methods of dehydration and the use of solar and other natural energy sources, the scientists' objective is to produce a technology suitable for village-level operations, that would ensure a year 'round economical supply of potatoes.

The development of small-scale industries is also seen to be of great importance in Southeast Asia, where the IDRC has been supporting the industrial extension service known as TECHNONET since 1973. The project

is intended to provide technical extension and information services to indigenous small and medium-sized industries, and to provide training for industrial extension officers. The industries involved range from the manufacture of automobile exhaust systems to coloured glass windows, from fish by-products to bricks made from waste paper (see box).

The year under review saw the second meeting of the autonomous TECHNOnet Council, and the first Asian Industrial Extension Officers' Conference. The latter resulted in the formation of a professional industrial extension officers' association. With the first phase of the project now virtually completed and considered a success by the 11 participating organizations from nine countries, planning for a projected second phase is already well underway.

## Building industrial expertise

TECHNOnet was established in April 1973. It was recognized at the time, of course, that this innovative project could run into the kinds of problems encountered by any new venture, and more so in the field of industrial extension which is relatively new to Asia. In the short space of three years, however, TECHNOnet has made considerable progress. The number of participating organizations now stands at 11, from nine Asian countries, whereas the project originally envisaged a membership of six. Training programs have been organized in India, Canada and the Philippines for industrial extension officers, and a professional group with its own ideals and standards is now emerging. As a result, TECHNOnet's directions are set by the TECHNOnet Council, on which the network's 11 participating organizations are represented. Also, industrial extension officers have formed an Asian Industrial Extension Officers Forum, through which their links with each other will be further strengthened.

TECHNOnet publishes an informative monthly Newsletter, and stores technical information that can be retrieved as required. It operates a technical inquiries service, serving as a referral point for the region. It also supports the publication of state-of-the-art reviews on various aspects of industry.

TECHNOnet's success is best measured by what has been achieved in small and medium-scale industries as a result of industrial extension. Two examples illustrate the forms of assistance provided.

"Patis" is a fish sauce popular in workaday cuisine throughout the Philippines, and in some neighbouring countries. This pale amber liquid is produced by fermenting fish or shrimp in brine for three months, then filtering and diluting the essence to a required concentration. A Filipino producer needed help to expand and upgrade production capacity. Starting with such simple changes as improving the physical layout of the plant and working up to a partly-mechanized production process, an industrial extension officer worked out a program that would increase the production of "patis" by some 150 percent.

In Malaysia, the Handicraft Board wanted help at increasing the rate by which the long trunk of the bamboo, a basic raw material, could be split into pieces of useable size. The method traditionally used cut the trunk into two pieces at a time, a time-consuming process. A local industrial extension officer designed a special knife with six cutting blades within a circular frame. Response to the change was enthusiastic, and the original six-blade knife now runs to eight blades. Local handicraft workers are able to work faster, and earn faster, as a result.

As the process of industrial extension grows in Asia, the national organizations now participating in TECHNOnet will deal directly with each other, and the project could then wind itself up having accomplished what it set out to do. Meanwhile, it is helping to build up a body of industrial expertise and to enhance skills in a region where industry needs rapid advancement.



Another project in this region that is supportive of small-scale industry is the development of Regional Adaptive Technology Centres. This project is intended to harness the resources of non-metropolitan universities to encourage technical change in local production centres.

Oriented to small-scale manufacturing operations, the RATCs are based within provincial universities, and through multi-disciplinary teams are able to provide research, training, development and advice to local entrepreneurs. In addition the teams carry out detailed surveys of the operations of local firms. The first such centre involved in the project is based at the Yuengnam University in South Korea. It is a rare attempt to link the technical capabilities of university staff members with the problems of the district they serve, and as such is providing an important example for other non-metropolitan universities, not only in Korea but throughout Southeast Asia.

So far we have looked at projects dealing largely with industrial applications of technology. In India, however, the IDRC in cooperation with a number of international agencies, is supporting a large-scale project to develop and improve contraceptive technology. And in Africa a number of projects got under way this year concerned with another vital aspect of health: sanitation and the disposal of human wastes.

Flush toilets require an enormous amount of capital for sewer construction and an almost unlimited supply of water — two commodities that are simply not available in much of developing Africa. Traditional waste disposal systems exist, but are usually inefficient, unhygienic and ecologically damaging. In Tanzania a search for an alternative waste disposal system

*Construction of compost toilet in Tanzanian village.*



began in 1974. These scientists are attempting to adapt such technologies as a Swedish designed "compost toilet" — that converts both human wastes and kitchen refuse into a usable fertilizer — for use in tropical conditions.

In Botswana a project begun during the past year concentrates on the problems of sanitation in urban squatter settlements, where facilities are at present non-existent. The researchers will adapt or invent techniques, and during the second phase the most promising prototypes will be field tested in a variety of locations. A similar project dealing with sanitation practices in rural areas was also begun during the year in Ghana.

All three projects will also examine ancillary factors such as cost-effectiveness and the best means of disseminating the successful techniques. Studies have shown that up to 75 percent of communicable diseases in developing countries are spread as a result of the lack of sanitary facilities: diseases such as gastroenteritis, the leading cause of infant mortality in Africa. The significance of these projects for all of Africa is therefore immense.

In spite of the astronomical costs, there is also a place in the developing world for space age technology. By making use of data provided by existing orbital satellites such as the American-launched LANDSAT, developing countries can have access to this highly sophisticated technology in developing their national resources at a minimal cost to themselves. The IDRC is supporting a growing network of Third World scientists who are acquiring expertise in the interpretation and use of satellite data.

Two LANDSAT projects were begun with IDRC support in 1974 in Bolivia and Sudan, and have now completed the training phase. During the past year the Centre approved a third project, in Tanzania. The first step is the training of Tanzanian scientists in the sophisticated techniques of space age cartography. The next phase will involve ground surveys and the production of a series of thematic maps of the Rukwa area chosen by the Tanzanian government for the project. They will show vegetation, land use, soils, hydrology and, if possible, land potential.

The Rukwa area, in spite of better than average rainfall, has a low population density, consisting mostly of subsistence farmers. The data provided by LANDSAT is basic planning information, essential before the land can be properly developed. The use of satellite pictures reduces the time required to collect such data, provides a more accurate overall picture, and does it for about one-twentieth of the cost of conventional cartography.

The Centre also continues to provide strong support for DEVSIS, a program for a worldwide computerized network designed to collect and disseminate information on social and economic development. In addition to seconding senior staff to Geneva to help in establishing the feasibility of the system, the Centre is experimentally inputting relevant Canadian material, and is cooperating with Unesco to produce a DEVSIS thesaurus in English, French and Spanish, and a newsletter to inform users about the program's progress. To help ensure the system's effectiveness at both the national and regional levels, the Centre is also supporting a number of projects in developing country institutions that will enable them not only to benefit fully from DEVSIS but to provide valuable inputs as well. Perhaps the most important benefit initially, however, is that through participation in DEVSIS developing countries are able to bring their own documentation under proper control.

Technology — whether it means satellites or stained glass windows, processed potatoes or processed data — is essential to balanced development, but to close the technology gap means selecting the right technology — selecting, testing, adapting, innovating — otherwise self-reliance remains simply a slogan.

## Participation, Information, Education



*Tsetse fly.*

As basic a requirement as good food is good health — many would describe it as a basic right. Yet as many as one billion people in the Third World suffer from one or other form of debilitating disease. The vast majority of them live in rural areas or squatter settlements and have little or no access to any kind of health services.

It is with these people that the IDRC is primarily concerned in its support of projects that relate directly or indirectly to health care.

In the preceding section we have seen how adaptive technology is being applied to problems of sanitation. The IDRC is similarly concerned with related problems, such as the adequate supply of fresh drinking water — apart from the obvious hazards of drinking unclean water, one recent study in East Africa noted that a high percentage of bone fractures among women result from falling while carrying heavy containers full of water!

Water. Life cannot exist without it, yet it also harbours many of the insects and parasites that carry the most common tropical diseases — such as malaria, schistosomiasis (snail fever), onchocerciasis (river blindness), trypanosomiasis (sleeping sickness) and the various forms of leishmaniasis. Any one of these diseases can be crippling, even fatal, and the best estimate available is that at any given time up to a billion people may be suffering from one or more of them.

Again the size of the problem is beyond the scope of any single government or agency. This is why the IDRC is collaborating with the World Health Organization and other international institutions in an intensive long-term program to combat tropical diseases. This program has as one of its main goals the training of African scientists — recognition of the ironic fact that most of the expertise in the field of tropical diseases resides not in the tropics but in the industrial north. Networks of collaborating research laboratories are also being established, and their work will be backed up by scientific task forces formed to tackle specific problem areas.

The IDRC has been supporting a number of specific projects in the field of tropical diseases for several years. Since 1972 the Centre has been supporting the work of teams of scientists in West Africa and Canada who are attempting to develop a means of biological control of the blackfly *Simulium damnosum* which causes river blindness — a disease that affects at least one million people in West Africa alone.

During the year under review the Centre approved a further grant for a three-year second phase of this project, during which activities will be expanded to attempt the mass breeding of a parasitic worm that preys on the blackfly. Earlier research has indicated that the introduction of these parasites to the fly's breeding grounds leads to sterilization or death of a significant percentage of the blackflies.

A similar approach is being taken in a new project, begun during the past year, aimed at the biological control of the tsetse fly, which carries sleeping sickness — another of the major tropical diseases that can be fatal if untreated. The project resulted from the recommendations of an IDRC-sponsored symposium in 1974, at which it was agreed that not enough work has been done on the biological control of the tsetse fly, and that a great deal more research is needed.

The project is being carried out in cooperation with the Commonwealth Institute of Biological Control, through their regional facilities in East Africa. The first objective is to collate and catalogue all existing scientific knowledge on the subject, a work that in itself should be of tremendous value to other researchers in the future.

Beyond this the scientists will begin studying two of the tsetse fly's natural enemies: the velvet ant and the bee fly, both of which are common in Kenya. Once the biology of these two predators has been explored, mass-breeding techniques will be developed and the insects released in a tsetse-infested area where the results of the "invasion" can be studied.

During the two years of the project a team of young African scientists and laboratory technicians will receive on-the-job-training that will enable them to continue with work in the field of biological control beyond the experimental period.

The need for information on all aspects of health care is paramount in the developing countries. Since 1973 the IDRC's Information Sciences Division has been collecting and collating literature needed by people who are planning, operating or evaluating health care delivery systems in developing countries. Using the Centre's ISIS computerized information retrieval system, two bibliographies have already been published, and two further volumes will appear during the year ahead.

Another unique effort in the field of health care information was the launching at the end of 1974 of a popular-style magazine in French-speaking West Africa entitled *Famille et Développement*. Since that first trial issue the magazine — which is being supported for its first three years by the IDRC and is published from the Centre's regional office in Dakar — has gone into regular production and is building a considerable readership throughout the region.

Dealing in plain language with issues such as family health, birth control and sex education, as well as broader development issues, the magazine has evoked much favourable comment and is highly sought after especially in the small towns and rural areas.

"You cannot imagine all the good this periodical does for our youth", wrote one reader. Another, a school director, commented: "This periodical . . . arrives at just the right moment for our continent . . . (it) will be one of the most interesting tools for our educational institutions."

The concept of the magazine was developed by Africans, and it continues to receive its direction from a committee with members from eight nations in the region. With subscriptions coming in at the rate of 500-600 a month, the long-term future looks bright for *Famille et Développement*.

## Traditional healers play an important role

In the West African country of Zaire, as in most of the continent, traditional medicine continues to serve a far higher percentage of the people than does modern medicine. Even when people have a choice, they often prefer the services of a traditional healer — or they “play it safe” and consult both.

Now the government of Zaire, with the IDRC’s support, is attempting to find out more about traditional medicine, its practitioners and its clients, with a view to the possible eventual integration of the healers’ services into the country’s health care delivery system. In the process the research team will interview some 250 traditional healers, make a detailed study of their therapeutic rites, and produce two films in cooperation with the Voice of Zaire, the national radio and television network.

In November 1975, Dr George Brown, of IDRC’s Population and Health Sciences Division, was in Zaire, and accompanied by members of the project team was able to visit a number of healers and witnessed some of their rites. He described one “group practice” where 13 healers work together in conjunction with a nearby health centre.

“Each of the healers specializes in certain groups of diseases. For instance, one of them specializes in madness, depression, migraine, and neurological disorders including polio. A second specializes in gynecological problems and a third in infant diseases. They work in rotation and refer cases among each other. They also refer cases to the health centre.”

“Each of the healers in turn presented one or two patients who were under treatment or had been successfully treated. This included two cases of madness, one infant with polio and one woman with lower abdominal pain. It was, of course, impossible for me to evaluate the impact of this treatment, however all the patients looked fairly

well . . . and the child who had been treated for polio could indeed walk.”

A very different style of practice was carried on by Mr Kobi, a faith healer, reports Dr Brown. “Mr Kobi works in a modern house surrounded by photographs of successful cases — mostly couples with young children that he has helped in curing their sterility. There were perhaps 60 people waiting in the courtyard. He frequently sees individuals for a few minutes and takes their problems into consideration, has a vision or a dream, and then makes his divination individually to that person.”

“Mr Kobi is a young man in his 20s, but has been working in this way for 10 years. He had no training as a healer until he had a vision 10 years ago. Now he has several assistants and a fair degree of material wealth. He believes he has some psychic powers, and he certainly has a large following.”

Dr Brown also witnessed the “graduating” ceremony of a woman who had been undergoing treatment for “what looked like a classic case of anorexia nervosa”. He reports: “The women all performed in a line, gradually moving around the circle. They seemed to get in an almost transcendent state where they were totally inside themselves. Some of them were in a deeply emotional state, and it was profoundly beautiful to watch.”

“The patient danced with the others, and my impression was that she was holding herself — well — more erect and more proudly than I had seen her before. All the others had an elegance and a presence about them that was striking.”

The study, which should be completed next year, will provide an objective view of the healers’ role. But more important, says Dr Brown: “The existence of the project gives recognition to the existence of the healers, and they are extremely proud of the fact.”

In its health programming the Centre has not neglected research into traditional forms of health care, and their potential as part of a modern health care delivery system. Thus the Centre supported a study, completed in 1974, of the role of traditional midwives in Thailand, and during the past year began funding an 18-month study of traditional medicine and its practitioners in Zaïre (see box). In a number of countries, where it is simply not possible to provide physicians and hospital services for every rural community, another approach has been attempted: the use of trained village health workers or auxiliaries to provide basic health care and referral service.

In Mexico this past year the IDRC began supporting an experimental program using trained obstetric nurses working in cooperation with auxiliaries and village health workers to bring basic health care to the most remote parts of that country. Recently graduated obstetric nurses (who are obliged to undertake a period of rural service in Mexico) receive a three-months intensive program in family planning, human reproduction and population dynamics as part of their training. Nurses will be assigned to four selected areas, where their job will be to provide health information, education and family planning services to the communities in their area.

Once she has set up a health post, each nurse will select and train a female health auxiliary who will serve as her assistant. This done, she will begin a series of systematic home visits, making the health service known to the people, and identifying potential volunteer health workers who may be able to act as motivators in public health and family planning, and as distributors of contraceptive materials.

The project is being managed by the non-government Population Studies Foundation, which, in addition to running some 90 health and family planning centres throughout the country, provides education and training for medical and paramedical personnel. After 18 months the experiment will be evaluated, and if successful may provide a model basic health care service for thousands of people who previously had no access to any such service.

During the year the Centre also began funding a similar project in rural Thailand, where the objective is to use specially trained local people to distribute family planning information and supplies (see box).

Another large, and continually growing, group of people in the Third World who are also deprived of basic health care services are the urban squatters — rural migrants who flock to the cities in tens of thousands and, finding no place to live, create their own shanty towns, or "pueblos jóvenes" (youngtowns) as they are known in Peru.

The city of Arequipa in southern Peru has some 95 youngtowns with an estimated population of 120,000. In reality the youngtowns are often the worst kind of slums, where the people live in shacks built from whatever materials they can scavenge, and where even the most basic facilities are usually non-existent.

In five of these slums, with a combined population of about 48,000, the IDRC is supporting an experimental attempt by the local authorities to provide the squatters with a basic health service. The project is based on a similar program underway in Cali, Colombia, which was demonstrated at a seminar jointly sponsored by the IDRC and the Ford Foundation in 1974. The Peru project represents the first serious attempt to adapt the approach in another country.

The project has been developed at least partly as a result of the demands for better services put forward by "committees for promotion and development" that have been formed among the youngtown inhabitants.



Thus the experimental model will be based on strong community participation at all levels.

Participation, information, education — a combination that could go a long way towards helping the mass of the people of the Third World to attain that basic right: good health.

## The village volunteer is one of us

A recent survey in rural Thailand showed that three out of four mothers wanted no more children — they were aware that fewer babies usually meant a healthier, happier family. So far, so good for the Ministry of Health in its ambitious program to reduce the population growth rate. But this raises another problem: how to provide family planning services on such a scale when only one village in 10 is covered by a health worker?

The problem called for a new approach, and the Ministry, in cooperation with the Faculty of Health of Bangkok's Mahidol University and the IDRC, appears to have found one: recruiting and training village volunteers to distribute contraceptive supplies and provide family planning advice and referral service.

The volunteer scheme was the inspiration of Dr Debhanom Muangman, the dynamic young Dean of Mahidol University's School of Public Health who is Director of the two-year pilot project. Mahidol University had earlier conducted the successful action research project to involve traditional midwives in the public health service. Now Dr Debhanom focussed on another need — how to make family planning services available to the most villagers at the least cost.

It hasn't been easy. The district of Po-Thong, with a population of 52,000, was selected for the pilot project. When the project team arrived in May 1975 to conduct a detailed advance survey of some 1,000 families they faced some unexpected difficulties. Noted the Director: "The main obstacles were heavy rainfall, bad roads . . . and cobras! As the rains had flooded their holes, the snakes came up for air. We killed cobras almost every day."

With the groundwork completed, the next task was the selection of one volunteer for each village. This was done last summer by the village headmen and the local health worker. In December 28 local health workers and 92 village volunteers — most are married, about



*How to provide family planning?*

half are farmers, the others mainly shopkeepers — attended their second training course together. There had been few drop-outs since recruitment.

The volunteers are supervised in their work by the health workers, and are the first "non-health" personnel to receive certification from the Ministry. They also receive a small commission on sales of contraceptive pills and condoms.

It is too early yet to judge the project a success, but early reports are optimistic. During the August to December period the volunteers registered some 700 new pill acceptors, and sales of condoms also showed a marked increase. The project's cost-per-acceptor is low — \$1.67 (Cdn) compared with the current national average of \$8 to \$9. But perhaps most important is the degree of involvement of the villagers themselves. They seem well satisfied that the volunteer "is one of us, and his services are next door."

The main objective now, says Dr Debhanom, is to maintain that initial level of enthusiasm and to evaluate which type of village volunteer is most effective. And for the long term? The Dean looks forward to the day when the village volunteer service can be expanded to include other basic health services, such as nutrition advice and parasite control, that are urgently needed by the villagers.

## Projects Are About People



*Education by radio in Bolivia.*

International development. It is a term that has become very familiar in the past 25 years or so — what with the growth of development assistance programs and agencies, and a succession of Development Decades declared by the United Nations. Yet the word “development” and its derivatives are still hard to define. No one has yet been able to describe the perfect state of “developedness”.

Lately the term “less-developed” has begun to replace “under-developed” and “developing”. This is good, for it more accurately conveys the sense of relative position: there is no such thing as a developed country, there are only countries which are more — or less — developed than others. And development, or the lack of it, is primarily concerned with people and the way they live.

The next few pages too are concerned with projects that do not fit comfortably under the headings of Food, Technology or Health (although they may have much to do with one or all of them). Projects that are concerned with people and the way their lives are affected by the change that development brings in its wake.

During the past several years the IDRC has been supporting a number of projects in rural areas of Africa and Asia that will collectively contribute much to the understanding not only of how change can be brought about, but how it affects people, and why. In Nigeria, Kenya, Tanzania, Malaysia, Korea, Indonesia, the Philippines and Sri Lanka researchers are attempting to analyze and understand the intricate web of relationships that makes for a successful rural development project, or a failure.

Such projects usually involve agricultural improvement, irrigation, water supply, roads, schools, housing, health: projects that may be imposed by one or other level of government, or brought about by the demands — and the efforts — of the rural people themselves. By studying the impact of such projects, the researchers hope to be able to show how governments can best respond to such demands and support self-help programs, and how the people can prepare themselves to cope with the expectations created by a government trying to bring modernization and change to the country without destroying the traditional way of life.

All these independent studies are linked through the IDRC to form a network of researchers that is providing a growing storehouse of factual



information about the process of modernization and change. Such a pooling of data should prove invaluable to the policy-makers, the planners and the people for years to come.

Another problem common to many nations of the Third World is the predominance of young people in the population. In many countries more than half the population is under 25 years of age, a situation that places enormous demands on the education system and the job market. The end result is that millions of young people find themselves (with or without an education) unemployed, or at best under-employed.

Although the problem is a relatively new one, a number of innovative attempts have been made to improve the young peoples' lot and to channel their energies into the national development effort. One approach that has been developed in various forms in several countries during the past 10 years or so is the study-service scheme. Although such schemes vary widely in specifics, most such programs, as the name implies, are designed to involve young people in some form of community service as part of a (formal or non-formal) learning process.

The growth of study-service programs, and the apparent success of some of them, prompted the IDRC to support a request for a multi-country evaluation of such programs. Research teams in Thailand, Indonesia, the Philippines and Sri Lanka (see box) began work in 1974 gathering data about study-service schemes and studying individual community projects.

The study also aims at developing an information exchange network not only among the participating research groups, but with interested groups in other countries. Another major objective is to identify the best type of program to maximize the benefits for all involved and allow small-scale pilot projects to develop into national programs.

There was a lot of talk during 1975, International Women's Year, about women's socio-economic role in the development process, and specifically about increased participation of women in the labour force. Yet surprisingly little is known in most developing countries about the full extent of women's present economic role, both within the family and at the national level; about the types of work women do, and why; or about the likely impact on national



*Study-service volunteers meet with villagers in Thailand.*

## Learning and serving

There is no such thing as a “typical” study-service program. Each is as distinctive as the culture in which it has arisen, varying in structure, organization, recruitment and operation. Some are organized by educational institutions, others by government departments, others grew from the grass-roots efforts of concerned individuals or groups. The term of service may be voluntary or compulsory, full-time or part-time, long-term or short-term.

One thing all study-service programs share, however, is a common objective to offer young people a worthwhile educational experience by involving them in practical activities to help meet the basic needs of other people. It is a process of serving and learning.

Sri Lanka's Sarvodaya Shramadana movement is one of the oldest of the study-service programs in the research and information network being supported by the IDRC. It began in 1958 when a high school biology teacher, Mr A.T. Ariyaratne, took a group of young people from an elite school in the capital, Colombo, and set them to work with the people of a remote, poverty-stricken village. In spite of the social and economic differences between them, in spite of the reservations of the “experts”, an enthusiastic rapport was established between the villagers and the young people, and the project was a success.

Over the years the movement has attracted the attention — and the support — of other teachers and students, social service organizations, community groups and trade unions. By 1972 it was a fully-fledged national movement for rural development with some 20,000 volunteers working with 80,000 families in 500 villages, and Mr Ariyaratne was obliged to resign from teaching to become the movement's full-time Organizing Secretary.

Today the movement offers advanced training courses at its headquarters near Colombo, encompasses perhaps 1,000 villages, and is still growing both in size and reputation. Although it now receives strong government support, the movement still guards its independence.

Contact with a village usually comes when the people ask for assistance. Together with members of the movement they identify the most pressing need — the construction of an irrigation reservoir, perhaps, or the building of a new road. The movement then helps the village establish a Shramadana, a voluntary work camp at which local villagers, people from other villages already involved with the movement, and volunteers from the towns and cities, work together for eight hours a day, then spend up to another four hours on education through discussion, song and dance.

In the camps the villagers are organized into children's groups, youth groups, women's groups, farmers' groups, and so on. These form the basis of future development in the village. Through them the people are able to discuss their problems, needs and wishes with each other and with officials, and plan what action to take.

Part of the reason for the success of Sarvodaya — besides the drive, energy and inspiration if its leader — is its strong philosophical foundation, which is based on a mixture of Gandhian and Buddhist spiritual thought, and reaches deeply into the national culture and tradition. Cooperative labour in rural Sri Lanka, as in much of Asia and Africa, is a practice that dates back to well before colonial times. And it is here perhaps that Sarvodaya — the word means “awakening” or “liberation” — shares a common bond with study-service programs in other parts of the Third World.

development of a major increase in the female labour force, especially in the light of the current high levels of unemployment and under-employment.

Following an IDRC-sponsored workshop in June 1975 on the subject of women's economic participation, three Latin American countries approached the Centre for support in making a survey that would answer some of these basic questions and enable policy-makers to plan on a more informed basis. Separate teams of researchers in Argentina, Bolivia and Paraguay will make detailed studies of women at work and of the labour force as a whole, and will analyze changes in the working populations of their countries over the past 25 years. By comparing results the researchers will be able to identify distinct trends, and put together a clearer picture of the situation on which to base future policies leading to greater participation for women in their countries.

Almost since its inception the IDRC has been closely involved with an innovative multi-purpose rural development project in the mountainous Eastern Cundinamarca region of Colombia. Although the primary aim of the project is to increase farmers' incomes through the improvement of farming methods, it is also concerned with "household management", covering such areas as health, nutrition, sanitation and education. This aspect of the program entered a new and promising phase during the past year with the successful completion of a pilot pre-school program.

An earlier study of the eating habits of some 259 families in the area had shown that most did not get enough essential calcium and vitamin A nutrients in their diet. The double-barrelled response of the research team was to establish two pre-school centres in 1974 with the cooperation of local teachers. Twice a week the children would come and learn what school was all about (and enjoy a simple high-protein meal) while their mothers attended courses in improved nutrition.

The centres were run by specially trained local girls, and at the end of the first year the results exceeded expectations, with parents, teachers and children being so enthusiastic that 11 centres were set up in 1975. In addition, the National Department of Planning, on seeing the results, offered to finance both the training program and the first full year of operation.

The pre-school centres will also continue to provide a base for further research on the effects of malnutrition. In future the researchers from the Colombian Agricultural Institute, which runs the entire program, hope to establish whether or not there is a link between learning disability and vitamin A deficiency. A positive result would at least partly explain slow learning in school, and would be of enormous significance to people in poor rural areas throughout the Third World.

For many people in remote parts of Latin America the only regular form of communication with the outside world is the radio — it is also often their only access to education. In Bolivia, where an estimated 4 million people live in rural areas, the IDRC is supporting a study of 12 independent community radio stations that together form an informal association called ERBOL, the Radiophonic Schools of Bolivia. The aim of the study is to determine if it is feasible (or desirable) to create a fully integrated radio network out of the present informal grouping, and whether such a move would increase the stations' ability to provide non-formal educational programming for the rural people.

In the Dominican Republic the Centre is supporting another study of community radio programming. This study involves analyzing audience response to a series of programs dealing with sex-education and family

## Becak — a bicycle made for three



*The becak, and a motorized competitor.*

The cry of "becak, becak" follows potential passengers down the streets of most Indonesian cities, reaching a high pitch in the market place, where dozens of the vehicles and their drivers line the curb. A colourful part of the city scene, these brightly painted, bell-festooned tricycles are the main mode of transportation for many of the cities' inhabitants.

For those with strong backs and few skills to offer — often migrants from the countryside unable to find any other form of work — they also provide a valuable, if brutally exhausting source of employment. For others becak driving is a seasonal occupation providing important extra income during lulls in work on the farm.

But just as the introduction of the becak in the 1930s spelled an end to the horse-drawn cart, so the ever-increasing fleets of minibuses and other motorized vehicles are weakening the becak's monopoly in urban transportation systems. There are other factors too. Where once the becak was adequate, the rapid pace of modern cities requires a faster means of getting about. Slow and cumbersome, becaks are frequently blamed for accidents and traffic congestion. The longer distances they must travel in the expanding cities also mean increased fares, compelling customers to favour communal motorized transportation. The ensuing stiffer competition for fares often leads drivers to ignore or violate traffic regulations.

Moving to lessen some of the inconveniences caused by the becaks, municipal authorities have adopted several policies. In Jakarta, for instance, becaks are banned from the city centre and main thoroughfares. In parts of the city special lanes have been provided, and based on a colour code, becaks are restricted to specific areas, necessitating numerous transfers to reach one's destination. Public opposition to these policies has been strong.

In an attempt to help policymakers gain a better understanding of the becak's function, both as a transportation system and as a means of employment, researchers from the Gadjah Mada University and the Bandung Institute of Technology are gathering and analyzing information about the vehicles, their owners, operators and customers. This study is part of a multi-city analysis of low-cost transportation systems being supported by the IDRC in a number of Asian countries where, although the vehicles may differ, the problems are much the same.

Similar to the now-completed study of the role of hawkers and vendors in Asian cities, this project aims at assisting municipal authorities in their efforts to manage and integrate the vehicles in the urban transportation system in a way that is acceptable to the city planners, the becak operators and their passengers.



planning. In addition to assessing the value of such programming and providing guidelines for program producers, the study will provide valuable research experience for the staff members of CIACOP, the Inter-American Center for Training in Communication for Population and Family Planning, which will conduct the survey and disseminate the results.

The year under review also saw the completion of a unique project that involved a study of the role of hawkers and vendors — street traders — in several major Asian cities. As a conclusion to the project a conference of mayors and municipal leaders was held in Kuala Lumpur in October at which the researchers presented their final report and recommendations. The report, together with a slide presentation and a booklet summarizing the findings, were well received, and may do much to rationalize the situation, making life simpler and better for the hawkers, their clients and the city officials in future.

An equally colourful aspect of Asian city life are the various “informal” methods of public transportation — from bicycle-powered passenger carts to mini-buses. Like the street traders, they cater largely to the poor, and, also like the street traders, they present headaches for city planners (see box). The IDRC is supporting a further urban study aimed at providing a better understanding of the role of these low-cost vehicles and their operators, and making recommendations on how they can be made to fit into the total modern urban system.

In the limited space available in these pages it has not been possible to give a comprehensive report on all the new and on-going projects with which the IDRC is concerned. Rather the aim has been to present a cross-section, a kaleidoscopic viewpoint illustrating the complex and interrelated nature of the problems that are being faced by the countries of the Third World. The IDRC's purpose is not to solve these problems, but to provide the resources, the training, the information, the encouragement, and, where necessary, the expertise to enable the people of the developing nations to resolve their own problems in their own way according to their own priorities.



*Their own priorities: participants at an IDRC-supported seminar on rural water supply in Africa.*

**PROGRAM PROJECTS  
APPROVED IN FISCAL YEAR 1975-76  
(1000's)**

Region of Activity	PROGRAM DIVISIONS						% OF TOTAL
	Agriculture, Food & Nutrition Sciences	Information Sciences	Population & Health Sciences	Social Sciences & Human Resources	Publications	TOTAL	
Africa	3,259	106	942	874	-	5,181	22.0%
Asia	5,430	575	3,142	2,218	72	11,437	48.6%
Caribbean & Latin America	1,583	547	155	744	-	3,029	12.9%
Global	113	252	-	-	-	365	1.6%
Canada	520	860	266	1,868	-	3,514	14.9%
<b>TOTAL</b>	10,905	2,340	4,505	5,704	72	23,526	
<b>% OF TOTAL</b>	46.4%	10.0%	19.1%	24.2%	0.3%		100%

**PROGRAM PROJECTS  
APPROVED TO MARCH 31, 1976  
(1000's)**

Region of Activity	PROGRAM DIVISIONS						% OF TOTAL
	Agriculture, Food & Nutrition Sciences	Information Sciences	Population & Health Sciences	Social Sciences & Human Resources	Publications	TOTAL	
Africa	8,278	1,343	2,379	2,637	-	14,637	21.8%
Asia	13,413	1,976	4,728	7,863	72	28,052	41.7%
Caribbean & Latin America	5,605	1,229	2,210	3,839	-	12,883	19.1%
Global	281	1,402	1,244	3,465	-	6,392	9.5%
Canada	1,645	1,192	340	2,171	-	5,384	7.9%
<b>TOTAL</b>	29,222	7,142	10,901	19,975	72	67,312	
<b>% OF TOTAL</b>	43.4%	10.6%	16.2%	29.7%	0.1%		100%

## Projects for which funds were approved during the fiscal year 1975-76

### Agriculture, Food and Nutrition Sciences

#### **Cassava Ecuador (CIAT)**

For the International Centre for Tropical Agriculture (CIAT), Cali, Colombia, to provide information on the cassava production process for establishing priorities in research and government policy on cassava in Ecuador. \$5578 – 6 months

#### **Cassava (India)**

For the Indian Council of Agricultural Research (ICAR), New Delhi, to strengthen and broaden the cassava research capacity of ICAR's Central Tuber Crop Research Institute, in Kerala, and to establish viable and economic techniques for disseminating cassava research findings to small farmers. \$361 000 – 3 years

#### **Cassava cooperative research (Latin America)**

For the International Centre for Tropical Agriculture (CIAT), Cali, Colombia, to develop a network of national cassava research programs to ensure that useful results of research at CIAT and elsewhere are demonstrated to and adapted by the region's cassava producers, particularly the smallholders. \$379 000 – 4 years

#### **Cassava cooperative research (Asia)**

For the International Centre for Tropical Agriculture (CIAT), Cali, Colombia, to enable CIAT to encourage and support, among cassava-producing countries of Asia, and between these countries and CIAT, cooperative research aimed

at improving cassava production and utilization systems, and to ensure that useful results are demonstrated to and adopted by Asian cassava producers, particularly the smallholders. \$440 000 – 3 years

#### **Cassava microbiology (Guelph), phase III**

For the University of Guelph, Ontario, Canada, to enable the University to continue its research on the development of a low-cost process for the production of high-protein animal feed by converting cassava starch and inorganic nitrogen into microbial protein. \$7500 – 1 year

#### **Polyphenols (Sheffield)**

For the University of Sheffield, England, to enable Dr E. Haslam to recruit a post-doctorate fellow from India and, using a refined technique of two-dimensional paper chromatography, attempt to isolate and identify the principal polyphenols present in "high tannin" sorghums. \$25 100 – 2 years

#### **Sorghum/millet/legumes (ALAD), phase II**

For the Ford Foundation, New York, U.S.A., to enable it to support the Arid Lands Agricultural Development Program (ALAD), Beirut, Lebanon, until the eventual takeover of the ALAD program by the proposed new International Centre for Agricultural Research in Dry Areas. \$600 000 – 1 year

#### **Sorghum/maize hybrid (PRL)**

For the Prairie Regional Laboratory, Saskatoon, of the National Research Council of Canada, to carry out research to determine the feasibility of creating a viable fertile hybrid, that would

combine the desirable characteristics of maize and sorghum, through tissue culture. \$104 500 – 2 years

#### **STRIGA (Sussex), phase II**

For the University of Sussex, England, to continue the synthesis of organic substances related to Strigol and to test their potency in terms of their ability to induce germination in seeds of Striga and Orobanche species. \$44 500 – 16 months

#### **STRIGA (Sussex), phase II, supplement**

For the University of Sussex, England, to cover expenses related to the legal protection of technology developed in this project, and to cover the cost of negotiations required for its commercial development. \$43 000

#### **Sorghum/triticale/oilseeds (Rwanda)**

For the Institute of Agricultural Sciences of the Ministry of Agriculture of Rwanda, to collect and adapt stable, high-yielding and disease-resistant varieties of sorghum, triticale, sunflower and rape seed, and to train Rwanda researchers in selection and plant breeding techniques. \$197 000 – 3 years

#### **Sorghum milling (Botswana)**

For the Botswana Agricultural Marketing Board, Gaborone, to develop a suitable village-level milling system for processing sorghum into flour that is as acceptable in quality and price as imported maize meal. \$125 000 – 2 years

#### **Sorghum improvement (Ethiopia), phase II**

For Addis Ababa University, to continue and develop the research carried out in the first phase of the project, aimed at improving the region's sorghum crop through collection, screening and testing of improved sorghum varieties and field trials by local farmers, and to establish a test cooking and quality control facility. \$560 000 – 3 years

#### **Sorghum breeding, intercropping and grain preservation (Senegal), supplement**

For the Government of Senegal, to enable the National Agronomic Research Centre in Bambey to continue its program introducing improved sorghum varieties in mixed systems with millet, cowpeas and groundnuts within village communities. \$160 000

#### **Triticale (Lebanon)**

For the American University of Beirut, to investigate the optimum methods for growing triticale under a wide variety of ecological

conditions in Lebanon, and to compare the yield adaptation and grain quality of a number of triticale lines with durum wheat, bread wheat, and barley. \$107 000 – 2 years

#### **Crop rotations (Kenya)**

For the University of Nairobi, to study alternative established crop rotations, with particular attention to the effect that different rotations exert upon the growth and yield of the main crop, maize. \$87 400 – 4 years

#### **Intercropping (Tanzania), phase II**

For the University of Dar-es-Salaam, to study the productivity of various crop combinations under differing fertility levels and rainfall patterns, and to develop stable, high-yielding varieties of sorghum, millet, cowpeas and other legumes. \$597 000 – 3 years

#### **Multiple cropping (Philippines), phase II, supplement**

For the International Rice Research Institute, Manila, to cover salary, travel cost and living allowance increases. \$9250

#### **Multiple cropping (UPLB)**

For the University of the Philippines at Los Baños, to continue its demonstration, testing and evaluation of multiple cropping technology, and to develop and evaluate an applied research and training program at the graduate level. \$174 000 – 2 years

#### **Pigeon peas (Kenya)**

For the University of Nairobi, to conduct a pigeon pea selection and breeding program in order to provide growers with improved, higher-yielding, and more disease-resistant varieties that are suited to all of Kenya's relevant agroclimatic conditions. \$103 000 – 2 years

#### **Sesame (India)**

For the Indian Council of Agricultural Research, New Delhi, to develop a wider variability of sesame types by intensifying the breeding program to combine yield increase, improved resistance to pests and diseases, and drought tolerance in newly-developed strains. \$167 000 – 3 years

#### **Sesame (Israel)**

For the Faculty of Agriculture of the Hebrew University of Jerusalem, to do research aimed at reducing sesame losses through indehiscence induction and/or strong placentation by a mutation breeding program. \$69 700 – 3 years



**Grain legumes (Caribbean), phase II**

For the University of the West Indies, Kingston, Jamaica, to expand the pigeon pea breeding program in Trinidad and Tobago, to do research on farming systems with grain legumes, and to develop a cowpea improvement program. \$309 500 – 2 years

**Grain legumes (ICRISAT), phase II**

For the International Crops Research Institute for the Semi-Arid Tropics, Hyderabad, India, to support its program for the development of stable and high-yielding varieties of pigeon pea and chick-pea. \$998 000 – 2 years

**Root crops (Caribbean), phase II**

For the University of the West Indies, Kingston, Jamaica, to continue its research aimed at increased production of the region's root crops, particularly yam production in Jamaica, to survey cassava production practices and integrate the region's cassava program into a newly-developing international testing network. \$156 100 – 2 years

**Root crops (Philippines)**

For the Philippine Council for Agricultural Research, Los Baños, to establish a national root crop research, demonstration, and training network for the Philippines, and to provide effective links with CIAT's (International Centre for Tropical Agriculture in Cali, Colombia) international root crop information system. \$302 600 – 4 years

**Cropping systems (Indonesia)**

For the International Rice Research Institute, Manila, Philippines, to enable the Central Research Institute for Agriculture of the Ministry of Agriculture of Indonesia, to develop improved cropping systems for small farmers under particular agroclimatic conditions, and to pilot test these systems under actual farm conditions. \$230 250 – 2 years

**Cropping systems (Sri Lanka)**

For the Department of Agriculture of the Government of Sri Lanka, to develop more productive cropping systems for small farmers on rainfed or partially irrigated rice lands and upland crop areas, and to train research extension officers in cropping systems methodology. \$201 000 – 2 years

**Pasture management (Mexico)**

For the National Institute for Agricultural Research, Mexico City, to develop increased forage production using simple mixtures of pasture

grasses and legumes, to obtain maximum use of these crops through improved grazing systems and pasture management practices, and to train Mexican scientists in the field of forage production and utilization. \$330 000 – 3 years

**Postharvest rice technology (Indonesia)**

For the Badan Urusan Logistik of the Government of Indonesia, Djakarta, to study existing rice processing technologies and practices in Indonesia and other countries of the region, and to test their technical and economic suitability under small-farm conditions. \$200 000 – 3 years

**Postharvest rice technology (Philippines)**

For the University of the Philippines at Los Baños and the Philippine National Grains Authority, Quezon City, to study the alternative methods available to farmers and rural millers for handling and processing rice in order to maximize production benefits. \$241 000 – 3 years

**Post harvest rice technology (Thailand)**

For the Ministry of Agriculture of Thailand, to enable the extension of the harvest season by selecting and testing appropriate systems of drying crops such as rice, maize and grain legumes, and to train technicians and farmers in the use and maintenance of efficient drying facilities. \$78 000 – 2 years

**Grain storage (Swaziland)**

For the University of Botswana, Lesotho and Swaziland, Malkerns, to do comparative research on the techniques and economics of grain storage among small farmers in Swaziland in order to direct suitably future research and outreach activities. \$3500 – 2 years

**By-product utilization (Guatemala), phase II**

For the Pan-American Health Organization, to enable the Institute of Nutrition of Central American and Panama, in Guatemala, to continue its research aimed at eliminating toxicity in coffee pulp so that pulp can be safely used in animal feeds, and to test the new technology under commercial conditions. \$246 800 – 3 years

**Bovine diseases (Guelph), phase II**

For the University of Guelph, Ontario, Canada, to define more clearly the pathogenesis of African animal trypanosomiasis, particularly *Trypanosoma congolense* infection in cattle, in support of concurrent research in East Africa. \$219 800 – 2 years.

**Food legume processing (PRL), phase II**

For the National Research Council of Canada, to enable its Prairie Regional Laboratory in Saskatoon, to continue the evaluation of simple grain milling equipment, and to study the effect of mechanical decortication on the nutritional quality of Nigerian grains and legumes. \$44 000 – 2 years

**Food legume utilization (Saskatoon), supplement**

For the University of Saskatchewan, Canada, to conduct research on the production of an African-type bread from composite flours and on the foaming characteristics and related qualities of cowpea flours, and to support the Maiduguri Test Kitchen in Nigeria in its evaluation of the acceptability of recently developed high-protein foods. \$16 000

**Household grain processing (India)**

For the Indian Council of Agricultural Research, New Delhi, to develop techniques to increase the quantity and quality of traditionally-processed cereal and legume foods available to the consumer through improved handling, processing and utilization methods in the villages. \$72 500 – 3 years

**Potato processing (CIP)**

For the International Potato Center, La Molina, Peru, to develop and evaluate a practical, inexpensive and labour-intensive potato processing method for the production of dehydrated potatoes, for use in village-level operations. \$156 000 – 2 years

**Dryland agriculture (ICARDA)**

To enable the Agriculture, Food and Nutrition Sciences Division of IDRC, to sustain early research operations of the International Centre for Agricultural Research in Dry Areas, which is being established to serve the arid and semi-arid regions of the Near East and North Africa. \$550 000 – 1 year

**Oysterculture (Sabah)**

For the Division of Fisheries of the Ministry of Agriculture, Sabah, West Malaysia, to identify potential areas in Sabah for oysterculture, develop practical and efficient methods of production and processing, establish a seed supply facility, and train local personnel for extension activities. \$105 600 – 3 years

**Fish pituitary extracts (B.C. Research)**

For B.C. Research in Vancouver, Canada, to establish a system for the bulk collection and preparation of salmon pituitary glands, for application in tropical fish breeding. \$128 200 – 1 year

**Fish processing (Philippines)**

For the University of the Philippines at Los Baños, to develop and test cheap, efficient drying and smoking facilities for fish, and appropriate procedures for the drying, packaging and storage of fish products. \$78 400 – 2 years

**Agrisilviculture (Ghana)**

For the Council for Scientific and Industrial Research of the Government of Ghana, Accra, to enable its Forest Products Research Institute, in cooperation with other Ghanaian institutions, to increase food and wood production through the creation of an agrisilviculture system that would increase land productivity and raise the income of small-scale farmers. \$280 000 – 3 years

**Shelterbelts (Nigeria)**

For the Department of Forest Research of the Ministry of Agriculture and Natural Resources of Nigeria, to study techniques for the establishment of shelterbelts on dry agricultural lands, and to evaluate, for the farmer, their economic and agronomic effects. \$274 900 – 4 years

**Casuarina (Egypt)**

For Alexandria University, to enable its Faculty of Agriculture to initiate a breeding program for the improvement of casuarina species for shelterbelt plantation, to develop techniques for vegetative reproduction, and to train agricultural officers involved in afforestation. \$134 400 – 3 years

**Afforestation (Jordan)**

For the National Planning Council, Amman, to improve afforestation methods on severely eroded and biologically degraded land, evaluate tree-growing potential of selected sites in the arid zone, and train local researchers in experimental forestry research. \$168 200 – 3 years

# Canada and Donor Agency Relations

## **CSAS – national secretariat**

For the Canadian Society for Asian Studies, to enable it to establish a permanent secretariat in Ottawa, and to continue its organizational and scholarly activities promoting cooperation between scholars in Asia and Canada. \$77 200 – 2 years

## **CALAS – national secretariat, phase II**

For the Canadian Association of Latin American Studies, Ottawa, to permit CALAS to continue its activities aimed at stimulating productive contacts between Canadian and Latin American scholars and researchers, and enable it to become financially independent. \$57 750 – 3 years

# Information Sciences

## **Education bibliography (West Indies)**

For the University of the West Indies, Kingston, Jamaica, to enable its Documentation Centre in Education to make a final compilation, edit and publish the lists of documents presently on cards, and to distribute the bibliography to governments, organizations and agencies concerned with education in the Caribbean. \$4000 – 8 months

## **Health care bibliographies**

To enable the Information Sciences Division of IDRC to publish two bibliographies on health care delivery systems. \$121 000 – 1 year

## **Triticale abstracts**

For the International Centre for the Improvement of Maize and Wheat (CIMMYT), Mexico, to enable CIMMYT to join with the Commonwealth Agricultural Bureaux in the publication of a quarterly abstract journal *Triticale Abstracts*. \$19 700 – 2 years

## **Development Reference Service (SID)**

To enable the Information Sciences Division of IDRC to assign to Paris, France, a bilingual

reference librarian, to strengthen and assist in reorienting the Development Reference Service of the Society for International Development program, and undertake studies related to the Development Sciences Information System (DEVSIS). \$49 500 – 1 year

## **Macrothesaurus: Indonesian version**

For the University of Indonesia, Djakarta, to enable its Faculty of Economics to produce an Indonesian version of the *Macrothesaurus* to facilitate the storage and retrieval of information about economic and social development in Indonesia. \$13 600 – 8 months

## **DEVSIS thesaurus**

For Unesco's Division of Scientific and Technological Documentation and Information, Paris, France, to manage, in cooperation with other organizations, the preparation of the English, French and Spanish versions of the DEVSIS thesaurus, to publish the thesaurus and to make it available on magnetic tape, and to publish a Newsletter to inform users of the progress of the work. \$75 000 – 2 years

## **DEVSIS Canada**

To enable the Information Sciences Division of IDRC, to collect and index, according to the guidelines proposed for the DEVSIS system, Canadian literature on social and economic development, and to publish a comprehensive bibliography. \$37 900 – 18 months

## **ISIS outreach**

To enable the Information Sciences Division of IDRC, to recruit a computer-trained individual to advise developing countries and international organizations in the use of ISIS – the Integrated Set of Information Systems – and to assist in its implementation. \$80 000 – 2 years

## **AGRIS Latin America (preliminary), supplement**

For the Inter American Institute of Agricultural Sciences, San Jose, Costa Rica, to cover the salary of a computer specialist for two years, and the costs of travel and training in AGRIS techniques and computer time. \$82 500

## **Agricultural Information Bank for Asia, supplement**

For the Southeast Asian Regional Center for Graduate Study and Research in Agriculture, Los Baños, Philippines, to enable the Agricultural Information Bank for Asia to continue its activities while its future program is being elaborated. \$10 400 – 5 months

**Agricultural Information Bank for Asia, phase II**

For the Southeast Asian Regional Center for Graduate Study and Research in Agriculture, Los Baños, Philippines, to consolidate an agricultural information bank for Asia, and thus provide a mechanism for national organizations to participate in FAO's International Information System for the Agricultural Sciences and Technology (AGRIS). \$564 600 – 3 years

**Industrial extension service (Southeast Asia and Canada), supplement**

To enable the Information Sciences Division of IDRC to continue to support the activities of TECHNOnet, a technical extension and information service to small and medium-size indigenous industries in Southeast Asia. \$162 000

**Grain Legume Information Centre, supplement**

For the International Institute of Tropical Agriculture, Ibadan, Nigeria, to cover increases in salaries and the purchase of equipment. \$26 200

**Latin American population documentation service (DOCPAL)**

For the Latin American Demographic Centre, Santiago, Chile, to improve the dissemination of information in the field of population through the establishment and operation of a permanent Latin American Population Documentation System. \$392 600 – 2 years

**POPINS feasibility study**

For the United Nations Population Division, New York, to enable an Interim Steering Committee and a Technical Task Force to study the feasibility of establishing a worldwide network to disseminate information on population, to be known as POPINS – Population Information System. \$27 100 – 9 months

**General survey of Bolivian Radiophonic Schools (ERBOL)**

For the Catholic University of Bolivia, La Paz, to examine and describe the activities of the 12 stations affiliated to the Bolivian Radiophonic Schools (ERBOL) in terms of their orientation, structure and operations, and to define the extent to which these stations constitute a system. \$37 965 – 2 years

**Minicomputer development (ISIS)**

To enable the Information Sciences Division of IDRC to redesign IDRC's ISIS applications and implement them on a dedicated in-house minicomputer, and to develop a complete low-cost minicomputer package that could be

offered to developing-country institutions engaged in AGRIS/DEVSI/ISIS applications. \$409 457 – 18 months

**Family planning and sex education through radio (CIACOP)**

For the Inter-American Centre for training in Communications for Population and Family Planning, San Jose, Costa Rica, to analyze a sample of letters written to the radio program "Hacia una Nueva Familia" by urban and particularly rural audience members, and to develop tentative guidelines for program producers. \$9875 – 6 months

**Rural cassette forums**

For the Institute of Socio-Economic Promotion of Uruguay, Montevideo, to conduct a pilot, systematic, and controlled experiment on the introduction into Uruguay of rural cassette forums (tape-recorded messages presented to guided discussion groups) as a means of improving social communication in rural areas. \$42 834 – 29 months

**LANDSAT/Tanzania (Rukwa Region)**

For the University of Dar-es-Salaam, to produce a series of thematic maps of the Rukwa Region dealing with hydrology, soil, vegetation, land use, and land potential through the analysis of LANDSAT (Land Satellite, formerly called ERTS – Earth Resources Technology Satellite) imagery and data, and to train the necessary personnel. \$105 990 – 2 years

## Industrial and Engineering Sciences

**Regional industrial cooperation (Southeast Asia)**

For the Singapore Institute of Standards and Industrial Research, to enable it to respond to requests for advice and assistance, in the field of industrial research, from organizations in Southeast Asia. \$30 000 – 2 years

# Population and Health Sciences

## **Village health workers (Iran), supplement**

For Pahlavi University, Shiraz, to cover the costs of a regional village health worker seminar to be held from 6–11 March 1976 in Kavar, Iran, and to publish the proceedings. \$24 600

## **Volunteer health workers (Thailand)**

For Khon Kaen University, to train volunteer health workers for individual villages of Thailand, use them to link the villages to the existing health care system, and to evaluate the volunteers' effectiveness. \$253 500 – 3 years

## **Simplified medicine (Peru)**

For the Peruvian Association of Faculties of Medicine, Lima, to provide low-cost health care to several slum areas or "Pueblos Jóvenes" (youngtowns) of the city of Arequipa, and to test the feasibility of adapting the Colombian rural health development program called PRIMOPS to the area. \$254 200 – 3 years

## **Traditional medicine (Zaire)**

For the National Research and Development Board of the Government of Zaire, to do an analysis of traditional medicine in rural and urban settings in an effort to provide a base for integrating traditional medicine with other health services. \$133 200 – 18 months

## **Obstetric nurses/family planning (Mexico)**

For the Population Studies Foundation, A.C., Mexico City, to implement and to evaluate a simple family planning/basic health services program using obstetric nurses during their compulsory service in rural areas. \$38 600 – 18 months

## **Supervision teams evaluation (Dominican Republic)**

For the National Council of Population and Family, Santo Domingo, to assess the functions and performance of five regional family planning supervision teams, and to determine the modifications necessary to increase efficiency. \$14 450 – 15 months

## **Biological control tsetse (Kenya)**

For the Commonwealth Institute of Biological Control, Trinidad, to enable the Institute to contribute to the eradication of trypanosomiasis through research into the biological control of the tsetse fly. \$42 400 – 2 years

## **Vector control onchocerciasis (West Africa), phase II**

For the Organization de coordination et de coopération pour la lutte contre les grandes endémies, Bouake, Ivory Coast, and Memorial University of Newfoundland, Canada, to continue the research undertaken in Phase I on the biological control of the blackfly vector of onchocerciasis (African river blindness) through the use of a parasitic mermithid worm, with emphasis on field work in West Africa. \$393 233 – 3 years

## **Health/family planning "Ban" chiefs (Korea)**

For the Korean Institute for Family Planning, Seoul, to determine whether the utilization of non-clinical voluntary community leaders of an administrative network of "bans" can contribute to the maximization of family planning acceptance, and to the improvement of general health in slum areas. \$49 500 – 2½ years

## **Hilots maternal child health/family planning aides (Philippines)**

For the Institute of Community and Family Health, Quezon City, to conduct an experiment using traditional birth attendants (hilots) to supervise other hilots in promoting the national maternal and child health and family planning programs in remote rural areas. \$18 000 – 15 months

## **Shigella (Bangladesh)**

For the Cholera Research Laboratory, Dacca, to study factors relating to the transmission of Shigella (dysentery) in rural Bangladesh, and to develop a simple and effective method of therapy applicable to other epidemic areas. \$170 000 – 3 years

## **Literature review: innovative hand pump technology**

For the Waterloo Research Institute, Ontario, Canada, to review pertinent literature in areas of engineering particularly concerned with high reliability pumping, to review innovative technologies in the field of fluidics that could be applied to the development of a cheap and reliable water pumping system for rural areas. \$7180 – 6 months

## **Role of women/fertility behaviour (Korea)**

For Yongsei University, Seoul, to enable its Centre for Population and Family Planning to determine the role of Korean women and determine their relationship to fertility behaviour and to the social and economic organization of the family and community. \$48 000 – 1 year

**Rural fertility surveys (Latin America)**

For the Latin American Demographic Centre, Santiago, Chile, to publish, in Spanish, a single integrated volume summarizing the principal results of the IDRC-supported Fertility Research and Training seminars. \$4000 – 8 months

**Fertility research (Canada)**

For the Canadian Committee for Fertility Research, Montreal, to assist in the formation of a Scientific Advisory Committee, and in the design and implementation of research studies. \$259 000 – 3 years

**Squatter settlement sanitation (Botswana)**

For the Division of Urban Affairs of the Ministry of Local Government and Lands, to develop appropriate technologies for excreta disposal for sites and services and squatter upgrading projects. \$95 890 – 26 months

**Groundwater iron removal (Ghana)**

For the University of Science and Technology, Kumasi, to adapt and develop known unit processes for the removal of iron and manganese from water in Ghanaian villages. \$42 950 – 2½ years

**Disposal of human excreta in rural areas (Ghana)**

For the University of Science and Technology, Kumasi, to gather technical information and evaluate existing technologies for excreta management with a view to selecting and adapting an appropriate system that would meet rural needs. \$146 070 – 3 years

**Post-partum contraception (Egypt)**

For the International Islamic Centre for Population Studies and Research of Al-Azhar University, Cairo, to conduct research on the use of medroxy progesterone acetate (MPA) injections as a post-partum contraceptive technique, an alternative to the oral pill and intrauterine device in rural populations. \$87 970 – 2 years

**Anti-conceptive technology (ICCR(II)/India)**

For the Population Council, New York, the All-India Institute of Medical Sciences, New Delhi, and the Central Drug Research Institute, Lucknow, to enable them to support the International Committee for Contraceptive Research in expanding its activities in biomedical research on various forms of contraceptive technology and to conduct research towards the development of a safe and effective contraceptive vaccine. \$3 million – 3 years

**Sugar co-ops/family change (Peru)**

For the Centre for Population and Development Studies, Lima, to develop hypotheses on the effects of recent structural changes on family formation, and to examine possible mechanisms through which social change has influenced fertility levels. \$61 000 – 15 months

**Functional analysis Companyganj (Bangladesh)**

For the Christian Commission for Development, Dacca, to evaluate the Companyganj Health Project (a joint project with the Bangladesh Government) from a functional point of view in order to provide a basis for modifications and future recommendations, and to facilitate the project's transition to Bengali leadership. \$50 000 – 2 years

**Population research support program (South-east Asia), supplement**

To enable the Southeast Asia Population Research Awards Program to continue its program of one-year population research awards for young Asian scientists, a program jointly sponsored by IDRC and the Ford Foundation. \$42 500

**Value of children to parents (Asia), phase II, supplement**

For the Korean Institute for Research in the Behavioural Sciences, Seoul, to cover the costs of a workshop of Value of Children investigators, held in Seoul from 30 June to 4 July 1975. \$10 000

**Value of children (Korea)**

For the Korean Institute of Research in the Behavioural Sciences, Seoul, to describe and categorize the costs and values of children to parents, and to provide guidelines for population policies that would influence childbearing motivations. \$46 500 – 18 months

**Value of children (Turkey), national survey**

For Bogazici University, Istanbul, to describe and categorize the costs and values of children to Turkish parents in the nation as a whole, and to provide guidelines for population policies that would influence childbearing motivations. \$47 000 – 1 year

**Methodology for the collection of demographic data**

For the Central African Customs and Economic Union, Bangui, Central African Republic, for elaboration and technical supervision of projects in Congo and Cameroon aimed at improving



vital statistics, for training personnel from the region, and covering the costs of a regional seminar. \$197 670 – 2 years

#### **Volume and determinants of migration (Upper Volta), supplement**

For the Scientific Research Centre and the Department of Statistics of the Government of Upper Volta, to enable the completion of the collection and analysis of data, and to cover increases in salaries, travel costs and supplies. \$92 570

## **Publications Division**

#### **Science and technology information service (Southeast Asia)**

For the Press Foundation of Asia, Manila, Philippines, to distribute to Asian journalists examples of science writing to be used as models and as a stimulus for the improvement of science coverage in Asia. \$10 406 – 1 year

#### **Science news feature service (Asia)**

For the Press Foundation of Asia, Manila, Philippines, to distribute a Science News Feature Service for the purpose of enabling Asian media to expand and improve their science and technology coverage, helping Asian reporters strengthen their skills as science writers, and building links among scientists, the media and the public. \$62 000 – 2 years

## **Social Sciences and Human Resources**

#### **IDRC/SPRU training program**

For the Science Policy Research Unit of the University of Sussex, England, to design, organize and conduct a program to train developing country research workers in the area of science and technology policy studies. \$564 500 – 4 years

#### **Hawkers and vendors II (Policy Conference)**

To enable the Social Sciences and Human Resources Division of IDRC to disseminate the results of the hawkers and vendors research project carried out in six cities of Indonesia, Malaysia and the Philippines, discuss the policy and program implications of these results, and formulate specific recommendations at a conference in Kuala Lumpur, Malaysia, in September 1975. \$49 950 – 9 months

#### **Hawkers and vendors (Southeast Asia), supplement**

To enable the Social Sciences and Human Resources Division of IDRC to cover expenditures for network conferences and seminars. \$5400

#### **Advisory Committee for Education Research**

To enable the Social Sciences and Human Resources Division of IDRC to bring together a group of approximately 15 members from both developed and developing countries at a series of meetings to assess research priorities in developing countries, to recommend areas in which state-of-the-art reviews should be undertaken, to commission such reviews, and to identify areas requiring further research. \$414 000 – 2 years

#### **Market for technology (Latin America)**

For the College of Mexico and for Fedesarrollo, Bogota, Colombia, to analyze the various factors affecting the supply of technology to, and the demand for technology by, enterprises engaged in the manufacture of synthetic fibres and shirts and in conservation techniques for food products (excluding canning) in Colombia and Mexico. \$165 750 – 20 months

#### **Management of technology (CLADEA)**

For the Council of Latin American Schools of Business Administration, Bogota, Colombia, to study the management of technology by firms in the public and private sectors of Brazil, Colombia, Mexico and Peru, and to determine the effects of different forms of technological management on the profits of the firms studied. \$264 000 – 18 months

#### **Social science research training (Indonesia)**

For the University of Indonesia, Djakarta, to support a research training program on urban dynamics at its Faculty of Social Sciences in order to enhance the development of social sciences in Indonesia. \$200 000 – 2 years

### **Low-cost transport (Asia)**

For the Institute of Rural and Regional Studies of Gadjah Mada University, and the Bandung Institute of Technology, Indonesia; the City University of Manila, Philippines; the Department of Sociology and Anthropology of Chiangmai University, Thailand; the Institute of Urbanism of the Technical University of Istanbul and the Greater Istanbul Electricity and Public Transportation Authority, Turkey; to gather, analyze and make available economic and social data on low-cost transport modes in the cities of Bandung and Yogyakarta, in Indonesia, Manila in the Philippines, Chiangmai in Thailand, and Istanbul in Turkey. \$250 000 – 18 months

### **Sites and services evaluation**

For the Salvadorean Foundation for Development and Minimal Housing, San Salvador, El Salvador; the Low-Cost Housing Office, Dakar, Senegal; and the Ministry of Local Government and Housing, Lusaka, Zambia; to monitor and evaluate a selected sites and services development project in their respective countries, and to develop information that would enable the formulation of policies and facilitate international comparison of the impact of similar urban shelter schemes. \$365 000 – 3 years

### **National development foundation (Latin America)**

For the Council of Latin American Development Foundations, Santo Domingo, Dominican Republic, to analyze the social and economic impact of development foundation programs on selected Latin American communities, and to evaluate the foundations' goals and determine whether organizational and managerial practices contribute optimally to their realization. \$221 000 – 18 months

### **Regional development (Korea)**

For the Asiatic Research Centre of Korea University, to do a critical evaluation of the industrial parks approach used in the Ulsan-Masan region, and currently being introduced in the Chonju region, as a "growth pole" strategy that encourages investments in areas outside Seoul, in an effort to contribute to balanced regional growth. \$80 000 – 2 years

### **Science and technology policy instruments, supplement**

To enable the participating country teams to complete the necessary program of research for the final synthesis meeting scheduled for July 1976, and to cover increases in the costs of meetings, travel and salaries. \$163 205

### **Bureaucratic behaviour (Asia)**

For the National Institute of Administration, Djakarta, Indonesia; the Graduate School of Public Administration of Seoul National University, Korea; the College of Public Administration of the University of the Philippines, Manila, Philippines; to study the legal codes and administrative regulations in the participating countries, for identification and analysis of what is regarded as negative bureaucratic behaviour, estimate the economic and social costs of such behaviour, and assess its influence on the success or failure of development policies and programs. \$111 000 – 2 years

### **Science and technology policy instruments, phase II (dissemination)**

To enable the Social Sciences and Human Resources Division of IDRC to disseminate, through publications and a series of seminars, the results of this Centre-supported project, and to contribute to a further awareness of the potential value of technology policy research. \$285 000 – 1 year

### **Regional adaptive technology centres**

For Yeungnam University, Kyungsan, Korea, to support its Regional Adaptive Technology Centre in linking the technical capabilities of non-metropolitan universities with the private producers and government policy makers in an effort to encourage and stimulate technical change in local production sectors. \$65 500 – 18 months

### **Women's economic participation (Latin America)**

For the Centre for Population Studies, Buenos Aires, Argentina; the Centre for Social Research, La Paz, Bolivia; and the Centre for Sociological Studies of Paraguay, Asuncion; to explore the nature and extent of women's economic participation in various sectors of Argentina, Bolivia and Paraguay. \$60 050 – 18 months

### **New Village Movement (Korea)**

For Seoul National University, to evaluate the effectiveness of the New Village Movement (a government program for rural development), and to test the findings of the evaluation through experiments in selected villages. \$66 000 – 2 years

### **Institutional modernization (Nigeria), supplement**

For the University of Nigeria at Nsukka, to cover increases in salaries and travel costs. \$15 450



**Printing industry (Uruguay)**

For the Centre of Social Studies and Research of Uruguay, Montevideo, to carry out a comprehensive review of the various factors that contribute to the process of technical change in the printing industry in Uruguay. \$27 235 – 14 months

**Population research support program (South-east Asia), phase II**

To enable the Social Sciences and Human Resources Division of IDRC to continue to support the Southeast Asia Population Research Awards Program, a program of one-year research awards for young Asian scientists to carry out studies on population questions. \$190 500 – 3 years

**Fertility and mortality study (Ethiopia)**

For the Central Statistical Office in Addis Ababa, to gather confirmatory information on possible low levels of fertility and mortality in selected areas of Ethiopia, and to provide training and experience to two Ethiopians on the conduct of a survey in local conditions and the development of hypotheses related to the survey data. \$23 350 – 18 months

**Council for Asian Manpower Studies (CAMS) – II**

For the Council for Asian Manpower Studies, Ltd., Makati, Philippines, to support the research activity of two CAMS committees: Committee I – Labour Supply, and Committee III – Education. \$29 500 – 1 year

**Council for Asian Manpower Studies (CAMS) – III**

For the Council for Asian Manpower Studies, Ltd., Makati, Philippines, to continue support of CAMS committees on Labour Supply, Education and Manpower Development, Technology and Manpower Development, Foreign Trade and Employment as well as the central secretariat. \$50 000 – 18 months

**Royal Society/International Foundation for Science II (1976)**

For the Royal Society of Canada, to enable the International Foundation for Science to provide support for young scientists in developing countries to undertake research in the natural sciences related to problems facing their countries, and to allow the Society to participate actively in the activities of the Foundation. \$170 000 – 1 year

**Regional research and training program (Asia)**

For the Agricultural Development Council, Inc. (ADC), Singapore, to enable ADC to further expand its program of regional research and training. \$825 000 – 2 years.

**Resettlement and transmigration (Southeast Asia)**

For Gadjah Mada University, Yogyakarta, Indonesia; the Ministry of Social Affairs of the Government of Laos; the Federal Land Development Authority, Kuala Lumpur, Malaysia; De la Salle University, Manila, Philippines; and the Ministry of Agriculture of the Government of Thailand; to evaluate the effectiveness and social impact of government resettlement programs in these countries, and to formulate recommendations to improve existing programs. \$220 000 – 18 months

**Human resources development**

To enable the Social Sciences and Human Resources Division of IDRC, to continue, for a sixth year, its program of awards, for Canadian and non-Canadians, designed to encourage and develop individual competence in the field of development. \$1 810 000

# FINANCIAL ANALYSIS

## The 1975-76 Budget

The Program of Work and Budget for 1975-76 was developed on the assumption that cash in the amount of \$32.368 million would be available to finance operations during the year. This figure envisaged a Parliamentary Grant of \$27.0 million, which, it was expected, would be supplemented by interest earnings of \$1.635 million, and a carry over from 1974-75 of \$3.733 million.

On the basis of this level of cash resources, the Centre's Board of Governors was enabled to authorize an appropriation budget of \$47.109 million. The appropriation budget was subsequently revised to \$46.467 million, which represents an increase of 35.6% over the appropriation level of the previous year's budget.

It was estimated that, during the year, funds in the amount of \$38.909 million would be formally committed, and that cash payments of \$29.125 million would be made.

This level of activity was expected to leave the Centre at March 31, 1976 with uncommitted appropriations to the value of \$19.079 million, and outstanding commitments of \$28.538 million to be carried into the 1976-77 fiscal year. A cash carry-over of \$3.514 million as of March 31, 1976 was anticipated.

## Actual Performance

In fact, the Centre did receive the Grant of \$27.0 million requested.

However interest earnings of \$1.281 million fell short of the estimated amount while the cash carry-over amounted to \$4.293 million. Total cash resources of \$32.574 million were thus made available.

The Centre's efforts to achieve its budgetary objectives met with varying degrees of success. Appropriations, in the amount of \$38.102 million, fell short of the budget by \$8.365 million representing only 82% of the budget provision as compared to 94% in the previous year. Of the \$38.102 million, \$34.572 million or 90.7% of the total, was appropriated in support of program activities. Commitments made during the year totalled \$38.633 million or 99.3% of the budgetary objective. Cash expenditures amounted to \$27.990 million, or 96.1% of the objective established in the budget.

Generally, the performance of the Centre in 1975-76 reflected the pattern of growth established in previous years. Appropriations increased by 18.3% over the previous year; commitments were up by 32.4%, and cash disbursements increased by 38.4%. Charts 1 and 2 indicate the manner in which appropriations and expenditures were distributed by activity.

At the end of the fiscal year, appropriations as yet uncommitted stood at \$9.805 million and outstanding commitments amounted to \$29.400 million so that total encumbrances were \$39.205 million. A cash surplus of \$4.560 million will be carried forward into the new year.

## General Management Costs

In the year under review, a new operating division to handle publications and public relations was established. The costs associated with these activities, formerly attributed to Administration, are now charged to the Publications Division. In order to obtain comparative figures for 1975-76 and 1974-75, it has been necessary to transfer such costs out of General Management for 1974-75. Revised in this way, General Management expenditures for 1974-75 were \$3.121 million. Thus 1975-76 General Management figure of \$3.530 million represents a 13% increase over the previous year. In the face of the increased volume of activity and the inflationary pressures experienced over the fiscal period, this performance would appear to reflect a satisfactory measure of financial control. The ratio of General Management expenditures to total outlays was 12.6%, which exceeds slightly the objective established in the 1975-76 budget by 0.4%. The comparable figure for 1974-75 based on the revised expenditure figure was 16%.

Division Management expenditures for the year totalled \$4.640 million, or 93.7% of the budgetary allocation. These expenditures represent 16.6% of total expenditures for the year which approximates the budgeted 17%. Expenditures in support of the Regional and Liaison Offices totalled \$1.568 million, or \$0.346 million more than the actual 1974-75 expenditures. Although inflationary influences undoub-

tedly contributed to this increase, it must be noted that the operation of the Beirut Office for the full year, in the face of domestic disturbances, and the opening of the Nairobi Office, added to the total Regional Office expenditures. In spite of the increased expenditure, as a ratio of total outlays the Regional and Liaison Offices portion is 5.6%, down from the 6.0% in 1974-75. Chart 3 illustrates the manner in which expenditures were distributed by function.

## Special Projects

In March 1976, as a result of discussions with the representatives of the Auditor General, the Centre changed its method of accounting for funds provided by other agencies for special projects. Such funds are now recorded as revenue in the Statement of Revenue and Expenditure. The related expenditure is recorded under Program Expenditures. In the interest of consistency, the preceding exposition of the Centre's financial affairs has disregarded the effect of this change on the financial ratios.

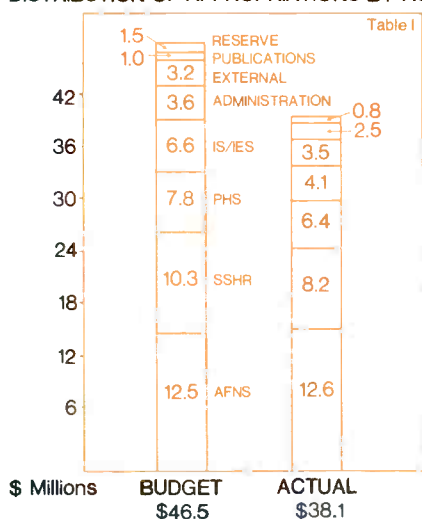
During 1975-76 the number and value of projects for which the Centre accepted management responsibility on behalf of other agencies increased considerably. Two new projects were the Executing Agency Agreement in respect of the International Centre for Agricultural Research in Dry Areas (ICARDA) and a program concerned with the control of wildlife in Kenya. Expenditures during the year rose to \$2,475,763. Administration costs borne by IDRC were estimated at \$24,330.

## HIGHLIGHTS — 4 YEARS (\$ Millions)

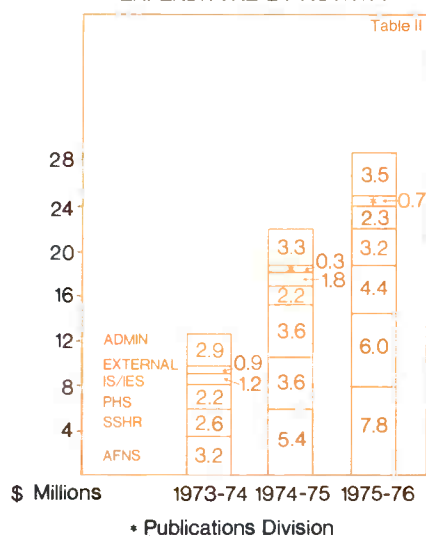
	1972-73	1973-74	1974-75	1975-76
<b>APPROPRIATIONS</b>	13.4	22.6	32.2	38.1
<b>COMMITMENTS</b>	9.8	18.2	29.2	38.6
<b>UNCOMMITTED</b>				
<b>APPROPRIATIONS</b>	4.9	9.2	11.5	9.8
<b>OUTSTANDING</b>				
<b>COMMITMENTS</b>	4.6	9.8	18.8	29.4
<b>INCOME</b>	8.3	14.8	20.3	28.3
<b>EXPENDITURE</b>	6.6	13.0	20.3	28.0
<b>SURPLUS</b>	2.8	4.5*	4.3*	4.6

\*These amounts have been adjusted to reflect a prior year adjustment recorded in the accounts during the current fiscal period.

DISTRIBUTION OF APPROPRIATIONS BY ACTIVITY



EXPENDITURE BY ACTIVITY



## Management Report

(in thousands of dollars) (Excluding Special Projects) For the twelve months ended March 31, 1976

Sector/Activity	Approved Budget	Approved Appropriations	Balance Available for Appropriation
<b>1. Program Operations</b>			
Agriculture, Food and Nutrition Sciences	12,533	12,553	(20)
Industrial and Engineering Sciences	250	141	109
Information Sciences	6,280	4,032	2,248
Population and Health Sciences	7,820	6,405	1,415
Publications	1,018	799	219
Social Sciences and Human Resources	10,293	8,156	2,137
<b>2. External Liaison and Relations</b>	3,178	2,486	692
<b>3. Administration</b>			
General Management	3,595	3,530	65
Unallocated Centre Reserve	1,500	—	1,500
<b>TOTAL</b>	<b>46,467</b>	<b>38,102</b>	<b>8,365</b>

## Allocation of IDRC Financial Resources for Projects and Management — 1975-76 and 1974-75 (in thousands of dollars)

IDRC Activities	Approved Appropriations			
	1975-76	%	1974-75	%
Program Projects	26,449	69.4	22,066	68.5
Division Activity Projects	1,915	5.0	2,083	6.5
Regional and Liaison Offices	1,568	4.1	1,222	3.8
Division Management	4,640	12.2	3,584	11.1
General Management	3,530	9.3	3,258	10.1
<b>TOTAL</b>	<b>38,102</b>	<b>100.0</b>	<b>32,213</b>	<b>100.0</b>

**DISTRIBUTION OF EXPENDITURES  
ACTUAL AND BUDGET  
(\$ Millions)**



Commitments	Cumulative Commitments 1975-76	Cash Payments During 1975-76	as at March 31, 1976		
			Uncommitted Appropriations	Outstanding Commitments	Total Encumbrances
10,855	19,538	7,824	4,084	11,714	15,798
141	146	120	—	26	26
5,074	7,440	3,101	337	4,339	4,676
6,120	9,531	4,375	1,458	5,156	6,614
799	799	737	—	62	62
9,715	13,902	5,986	3,872	7,916	11,788
2,399	2,504	2,317	54	187	241
3,530	3,530	3,530	—	—	—
—	—	—	—	—	—
<b>38,633</b>	<b>57,390</b>	<b>27,990</b>	<b>9,805</b>	<b>29,400</b>	<b>39,205</b>

Cumulative Commitments				Cash Expenditures			
1975-76	%	1974-75	%	1975-76	%	1974-75	%
45,229	78.8	28,244	72.4	17,025	60.8	10,480	51.8
2,423	4.2	2,673	6.9	1,227	4.4	1,683	8.3
1,568	2.7	1,222	3.1	1,568	5.6	1,222	6.1
4,640	8.1	3,584	9.2	4,640	16.6	3,584	17.7
3,530	6.2	3,258	8.4	3,530	12.6	3,258	16.1
<b>57,390</b>	<b>100.0</b>	<b>38,981</b>	<b>100.0</b>	<b>27,990</b>	<b>100.0</b>	<b>20,227</b>	<b>100.0</b>

*Ottawa, Ontario  
K1A 0G6*

*June 15, 1976*

International Development Research Centre,  
and  
The Honourable Allan J. MacEachen, P.C., M.P.,  
Secretary of State for External Affairs,  
Ottawa, Ontario.  
K1A 0G2

Sirs,

I have examined the balance sheet of the International Development Research Centre as at March 31, 1976, and the statements of revenue and expenditure for the year then ended. My examination included a general review of the accounting procedures and such tests of accounting records and other supporting evidence as I considered necessary in the circumstances.

In my opinion these financial statements give a true and fair view of the financial position of the International Development Research Centre as at March 31, 1976 and the results of its operations for the year then ended, in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year after giving retroactive effect to the change to the accrual method of accounting for termination benefits as referred to in Note 3.

I further report that, in my opinion, proper books of account have been kept by the International Development Research Centre, the financial statements are in agreement therewith and the transactions that have come under my notice have been within its statutory powers.

Yours sincerely,  
J. J. Macdonell  
Auditor General of Canada



**INTERNATIONAL DEVELOPMENT RESEARCH CENTRE**  
(Established by the International Development Research Centre Act)

**Balance Sheet as at March 31, 1976**

<b>Assets</b>		<b>1976</b>	<b>1975</b>
Current assets:			
Cash		\$ 124,881	\$ 143,068
Short-term investments, at cost		6,025,186	4,950,562
Accounts receivable and accrued interest		121,766	100,013
Staff travel advances		81,026	72,854
Prepaid expenses		168,591	59,590
Recoverable deposits		46,124	33,280
		<hr/>	<hr/>
Total current assets		6,567,574	5,359,367
Capital assets, at cost:			
Residence		126,758	171,084
Less: Accumulated depreciation		6,784	4,409
		<hr/>	<hr/>
		119,974	166,675
		<hr/>	<hr/>
		<u>\$6,687,548</u>	<u>\$5,526,042</u>
		<hr/> <hr/>	<hr/> <hr/>
<b>Liabilities</b>		<b>1976</b>	<b>1975</b>
Current liabilities:			
Accounts payable and accrued liabilities			
— Projects		\$ 908,631	\$ 604,966
— Others		226,343	203,924
Funds provided by others for special projects		343,235	88,363
		<hr/>	<hr/>
Total current liabilities		1,478,209	897,253
Long-term liabilities:			
Provision for termination benefits (Note 3)		649,467	335,663
<b>Equity</b>			
Surplus:			
Balance at beginning of year			
As previously reported		4,628,789	4,589,545
Prior period adjustments (Note 3)		335,663	90,214
		<hr/>	<hr/>
As restated		4,293,126	4,499,331
Excess of revenue over expenditure		266,746	(206,205)
		<hr/>	<hr/>
Balance at end of year		4,559,872	4,293,126
		<hr/>	<hr/>
		<u>\$6,687,548</u>	<u>\$5,526,042</u>
		<hr/> <hr/>	<hr/> <hr/>

*The accompanying notes are an integral part of the financial statements.*

Certified correct: R. J. Audet  
Treasurer

Approved: W. D. Hopper  
President

**INTERNATIONAL DEVELOPMENT RESEARCH CENTRE**  
**Statement of Revenue and Expenditure for the year ended March 31,**  
**1976**

	1976	1975
<b>Revenue:</b>		
Grant received pursuant to External Affairs Vote 30	\$27,000,000	\$19,000,000
Funds provided for special projects		
— CIDA	1,826,648	2,009,921
— Others	624,784	45,761
Interest and other income	1,280,851	1,296,185
Total revenue	<u>30,732,283</u>	<u>22,351,867</u>
<b>Expenditure:</b>		
<b>Programs:</b>		
Agriculture, Food and Nutrition Sciences	7,823,809	5,462,178
Social Sciences and Human Resources	5,986,231	3,682,798
Population and Health Sciences	4,375,127	3,644,890
Information Sciences	3,101,051	2,264,595
External Liaison and Relations	2,316,674	1,764,134
Industrial and Engineering Sciences	120,236	32,875
Special Projects	2,475,762	2,084,402
	<u>26,198,890</u>	<u>18,935,872</u>
Program related expenditures		
— Publications	736,707	500,706
Total program expenditures	<u>26,935,597</u>	<u>19,436,578</u>
<b>Administration:</b>		
Salaries, allowances and benefits	1,814,192	1,434,464
Accommodation	595,009	586,170
Communications	250,993	217,082
Professional and special services	195,155	135,469
Staff travel and removal	183,330	174,238
Governors' meetings, honoraria and travel	107,643	141,827
Office supplies	99,918	112,354
Printing and duplicating	81,682	73,387
Furniture and equipment	55,114	141,449
Insurance	48,850	18,453
Sundry	98,054	86,601
Total administration expenditures	<u>3,529,940</u>	<u>3,121,494</u>
Total expenditure	<u>30,465,537</u>	<u>22,558,072</u>
Excess of revenue over expenditure	<u>\$ 266,746</u>	<u>\$ (206,205)</u>

*The accompanying notes are an integral part of the financial statements.*

**Notes to the Financial Statements**  
**March 31, 1976**

**1. Accounting policies**

The costs of the Centre are recorded on an accrual basis. Certain project costs, relating to payments under contract are expensed at the time of disbursement.

Foreign currency accounts have been converted into Canadian dollars at the moving average exchange rates in effect during the year.

Fixed assets are expensed in the year of acquisition except for one revenue producing residence which is recorded at cost and is depreciated on a straight line basis at 4% per annum.

**2. Commitments and contingent liabilities**

Subject to funds being provided by Parliament, the Centre is committed to make contributions totalling \$28,940,819. The Centre also had commitments totalling \$3,310,632 which are to be met with funds provided by donor agencies under agreements entered into with those agencies in respect of development research projects.

In addition the Centre has submitted formal offers to prospective

grantees totalling \$1,089,790 and was awaiting acceptance of these offers.

**3. Provision for termination benefits**

During 1976, the Centre adopted a policy of recording in its accounts a provision for employee termination benefits earned but not yet paid. Previously the Centre had recorded such benefits only at the time of actual disbursement in the year of termination or retirement.

This policy resulted in additional expenditures for 1976 of \$313,804 which are reported in the Program and Administration expenditures. This accounting policy was also applied retroactively for comparative purposes and resulted in additional expenditures for 1975 of \$245,449.

**4. Remuneration of officers**

Salaries totalling \$435,604 were paid to twelve officers.

**5. Comparative figures**

Certain figures for the previous year have been reclassified to conform to the current year's presentation.

## Division Activity Projects

Division activity projects consist of two main types of activity:

**Consultancies**, either on a short-term basis to advise in the preparation of a specific project, or for varying periods to report on subjects of concern to the Centre in planning its overall program. Contracts were signed for a total of 74 consultancies during the year under review.

**Meetings, workshops and conferences**, were organized in support of specific projects or to explore new fields from which projects may result. The Centre participated in and supported 116 such events during the year.

During 1975–76 a total of \$1,914,795 was appropriated for division activity projects. The following table shows a breakdown of how those funds were allocated:

Figures for fiscal year ending March 31, 1976.

PROGRAM DIVISION	CONSULTANCIES	WORKSHOPS	TOTAL
Agriculture, Food and Nutrition Sciences	\$288,340	\$ 369,590	\$ 657,930
Information Sciences	48,685	207,590	256,275
Industrial and Engineering Sciences	9,000	24,000	33,000
Population and Health Sciences	182,624	168,666	351,290
Social Sciences and Human Resources	72,304	274,122	346,426
Publications	–	46,375	46,375
Vice-President International	20,000	115,915	135,915
Vice-President Canada and Donor Agency Relations	4,784	82,800	87,584
<b>TOTALS</b>	<b>\$625,737</b>	<b>\$1,289,058</b>	<b>\$1,914,795</b>

## Consultancies

Consultants were contracted to travel and give reports on a wide variety of concerns to the Centre. A total of \$625,737 was committed during 1975–76 for 61 such consultancies. The following are examples of this work:

— consultations between an American physician and representatives from health institutions in Syria, Jordan and Iraq on the feasibility of a regional study of rural integrated health services and of eventual IDRC support.

— a survey of postharvest food grains in semi-arid Africa by two Canadian scientists in collaboration with a post harvest systems group at the University of Alberta.

— a visit to the Philippines by a Malaysian educator to study the results obtained by Project IMPACT in the use of self-learning materials for teacher training.

— travel to Indonesia by a Canadian fisheries expert to assist in tackling a parasite hindering the aquaculture industry.

— support for a Latin American investigator to visit seven institutes studying the relationship between infant mortality and fertility and to report on both methodology and findings.

— a five-month study by two Latin American scientists for the agriculture and food production sectors in Ecuador and Panama in order to advise the Centre on development plans and research priorities.

— the evaluation of forest plantation trials in Africa and Latin America to assist the Centre in identifying research priorities for these regions.

— the participation of a Mexican consultant in the design of a training course on the retrieval, processing and distribution of information on trade for Andean countries wishing to establish trade information centres.

— support for two years of the work of Dr Walter Mertens and of the Population Institute at the University of Indonesia in the development of population studies in Indonesian universities.

## Meetings

The Centre also funded, either completely or jointly with other institutions 116 meetings, workshops and conferences during the year under review, of which the following are just a few examples:

— a 10-day seminar on social development organizations. Leaders in cooperative and community development from Botswana, Lesotho and Swaziland met to analyze government policies affecting cooperative and rural development and to discuss the problems encountered in this field. Held in Lesotho, the seminar was organized by the Coady International Institute, St Francis Xavier University of Canada.

— a series of workshops in Europe, Asia, Latin America and Australasia aimed at identifying gaps in world forestry research and training and at formulating research programs for the optimization of land use in tropical developing countries. IDRC staff and consultants and local forestry scientists helped to recommend ways of carrying out such research effectively and to prepare a plan of action for international donor support.

— twenty-one development editors from Andean countries met for 10 days in Bogota to review development programs in the region and to learn about the planning, writing and production of materials for use in educational and extension projects. Practical workshops complemented the seminar.

— a workshop held by the Asian Institute of Technology brought together representatives from six international geotechnical institutes and liaison officers of the recently established Asian Information Centre for Geotechnical Engineering in Bangkok to evaluate the role of this centre and plan future developments in the collection and dissemination of geotechnical information.

— under the aegis of the Faculty of Law, University of Ghana and the International Legal Centre, a workshop of West African law teachers and social scientists was held to study the applications of social science methodologies in legal research on the problems of rural development and the economy.

# Human Resources

In keeping with the Centre's commitment to invest in the training and development of young professionals, nearly every project supported by the Centre includes funds specially earmarked for this purpose.

Complementing this in-project training, the Centre has supported additional programs designed to promote the professional competence of scientists in developing countries. The Southeast Asia Population Research Awards Program (SEAPRAP), supported jointly with the Ford Foundation, disbursed two rounds of awards in 1975-76. The goal of the program is to expand population research capability in Southeast Asia by encouraging young and junior researchers to develop proposals and to execute them in a local setting under the sponsorship of a senior research advisor in his or her institution. A Program Committee of Southeast Asian social scientists guide the program by defining its policies and by evaluating and selecting applications for awards. An Asian project coordinator acts as the Executive Officer. By March 31, 1976 the program had completed its second year of activity and had approved 31 projects out of 127 applications. In consideration of the success of this program the Centre approved support for a second phase that would permit the program to continue its same form for the next two years, with two rounds of awards each year.

The Centre also approved a renewal of its grant to enable the Agricultural Development Council to expand further its regional research and training program in Asia. The new grant is for a two-year period commencing 1 January 1976. The objectives of the project are: to stimulate and improve the research and training

capabilities of young scholars and mid-career professionals in both academic and government institutions; to increase the opportunity for research on crucial problems by scholars of the region; and to make available material relevant to the region for use in teaching and research.

The Centre's Human Resources awards program, designed both to assist Third World researchers and to increase the present available resource base in Canada of professionals with training in the problems of development, was renewed for a sixth year. Some changes were made to the program in 1975-76. The Travel and Research awards were dropped as applications for this program have never been very numerous, and a new category, Ph.D. Thesis Research awards, was added for students from developing countries registered in Canadian universities on student visas.

A description of the seven award categories listed below is given on the following pages, together with a list of the candidates selected to receive awards during the coming year:

- Thesis Research awards — Ph.D. degree (Canada)
- Thesis Research awards — Ph.D. degree (Students from Developing Countries)
- Research Associate awards (Canada)
- Research Associate awards (Developing Countries)
- Senior Research Associate
- Research Fellows
- Pre-Post Project Training awards

A brief outline of the work undertaken by candidates having received awards during the year under review is also given.



## Thesis Research Awards — Ph.D. degree (Canada)

This grant is designed to support research for the thesis for the Ph.D. degree, after course work has been completed. It is intended for the Canadian graduate student who has already made a commitment to the field of development by his choice of a thesis topic. The research supported by the grant will generally be undertaken in a developing country.

Awards are for Canadian citizens and are made by means of an annual competition. Each one-year award provides a basic stipend of \$5,500, research costs of up to \$1,000, and travel costs to and within the field. In addition, funds are available to permit the thesis adviser to visit the awardholder in the field. In providing for this the Centre hopes to ensure not only that the recipients receive the necessary supervision and guidance, but also that as many links as possible are encouraged between the Canadian academic community and the developing world.

In 1975–76, six awards were committed and, in March 1976, five more graduates were recommended for awards:

### AWARDED

Award Holder	Thesis Topic	Location of Tenure
Johannes I. Bakker University of Toronto Toronto, Ontario	The Cultivation and Consignment Systems in Java: Colonization, Backwardness and Modernization	University of Indonesia
Daniel T. G. Hazlett University of Guelph Guelph, Ontario	Veterinary Virology and Immunology	Veterinary Research Laboratory, Ministry of Agriculture Kabete, Kenya
S. Ragnar Johnson Institute of Social Anthropology, Oxford University	The relationship between social change and the "symbolism of power" among the Fore of Papua New Guinea	Eastern Highlands, Papua, New Guinea
Johanna M. Lanfranco McMaster University Hamilton, Ontario	The Panchayat System of Nepal	Tribhuvan University Kathmandu, Nepal
Chukuma E. Nwachuku University of Waterloo Waterloo, Ontario	The hoe's utility as the primary production tool within Nigeria's rural agricultural environment	University of Ibadan Ibadan, Nigeria
Denis Turcotte Université Laval Québec, Québec	A comparative evaluation of linguistic policies in Upper Volta and the Ivory Coast	Institut de linguistique appliquée Abidjan, Côte d'Ivoire

### RECOMMENDED

L. G. Clarke, Department of Political Economy, University of Toronto.  
Dennis K. Freisen, Department of Land Resource Science, University of Guelph.  
Miss Barbara M. Jamieson, Department of Economics, University of Toronto.  
Gordon Mace, Département des sciences politiques, Université de Genève.  
Kenneth W. Riley, Department of Plant Science, University of Manitoba.

## Thesis Research Awards — Ph.D. degree (Students from Developing Countries)

This new award is designed to enable graduate students from developing countries, registered in Canadian universities, to undertake their thesis research in their home country. Candidates must be citizens of developing countries, in Canada on a student visa. The financial and academic terms of the awards are similar to those for Canadian students.

This program was conceived as a small contribution to counteract the "brain drain"

since many developing country students are obliged to do a "Canadian" thesis because they lack the funds to undertake their field work at home. The awards will permit a number of students to do thesis work more relevant to development problems, and to be more easily reintegrated into the research communities in their own countries.

This year one such award was committed and four more were recommended:

### AWARDED

Award Holder	Thesis Topic	Location of Tenure
Taisier M.A. Ali (Sudan) Dept. of Political Economy University of Toronto	Major Determinants of Strategies for Agricultural Development in a Developing Country in National Politics, Foreign Assistance, and the Civil Service in the Sudan	Khartoum, Sudan

### RECOMMENDED

Teshome Akalehiwot (Ethiopia), Department of Biology, University of Calgary.  
Mrs. Olivia C. Caoili, (Philippines), Department of Political Science, Queen's University.  
Mrs. Rose G. F. Leke (Cameroon), Department of Microbiology and Immunology, University of Montreal.  
C. L. Odimuko (Nigeria), Department of Geography, Queen's University.

## Research Associate awards (Canada)

The Centre has made a special effort to tap the experience of Canadian professionals who have devoted some 10 years of their working life to a particular career. By providing such people with the opportunity of a year's research, often combined with training, it hopes to allow Canadians already involved in international development to update their skills and knowledge, and it aims to encourage others who have little or no experience in developing countries to explore this field. For this purpose, the awards offer support for a year of research, specialized

training, or investigation of the problems of developing countries.

Ten awards are offered annually to Canadian citizens. Each grant provides a stipend of up to \$17,500, travel costs to cover travel to the field for the award holder and family and any field travel, as well as research/training costs of up to \$2,000. Selection of candidates for the 1976-77 awards will be made during the coming months. The ten award holders for 1975-76 are listed below:

### AWARDED

Award Holder	Subject of Research	Location of Tenure
Mlle Monique Gauthier Laval-des-Rapides, Québec	Research on stocks, identification of operations, fishing equipment and methods	Seccion de Pesca y Caza Maritima, Ministerio de Economia El Salvador

Milan B. Havlin St Bruno, Québec	The production of decorative tropical plants	Garden Club de Port-au-Prince, Haiti
Kelvin A. Jarvis Welland, Ontario	A bibliography of articles in periodical sources on Canada/West Indies relations and particular reference to Trinidad and Tobago, 1920-1975.	Dept. of Library Studies University of Technology Loughborough, England
Zdenek Kalensky Ottawa, Ontario	Thematic mapping of Natural Resources from Aerial and Satellite Images	World Meteorological Institute, Nairobi, Kenya
Alain Maillard Ste Foy, Québec	The socio-cultural and economic implications of changes in housing and living styles in West African rural regions	Centre de recherches architecturales et urbaines, Université d'Abidjan
Norman B. McLeod Toronto, Ontario	Living and working in the residential cooperative project for abandoned children "El Pueblito cultivable de mis hijos"	Paraiso de Cartago, Costa Rica
Robert J. Ogle Saskatoon, Saskatchewan	Study of real lasting effects of projects in developing countries funded by Canadian voluntary agencies	Caritas, India, Social and Economic Development Centre, Colombo, Sri Lanka
Michael J. Porter, M.D. Thornhill, Ontario	Tropical Public Health Diploma	London School of Hygiene and Tropical Medicine, London, England
John Ritchie Hudson, Quebec	Education for least cost acquisition and commercialization of technology	Escuela Nacional de Ingeniera Tecnica, Peru
Miss H. Miriam Ross Springhill, Nova Scotia	Improvement of curriculum in schools of nursing in developing countries in order that graduates of these schools may be better prepared to meet the health needs of their country	University of Washington, Seattle, U.S.A.

Of the "Recommended" candidates listed in last year's Report, Gaetan Sirois and Alan Grant were not able to accept the award. These awards were offered to alternates.

### Research Associate awards (Developing Countries)

Awards made in this category are designed to assist Third World professionals, engaged in activities associated with development in their countries, to spend a year in research or training as appropriate to their career development.

Award-holders are selected from nominated candidates, rather than by open competition, which is the case with the Canadian awards. In 1975-76 20 awards were given and nine recommended:

**AWARDED**

<b>Award Holder</b>	<b>Subject of Research</b>	<b>Location of Tenure</b>
Mohamed Hagi Abucar Somalia	Algerian Worker's Participation: A study of Participation and Development	University of Algeria
John Bosco Adotevi Togo	Study of the best use of the press in support of development	Côte d'Ivoire and Ghana
Emajuddin Ahamed Bangladesh	The Developmental Role of Higher Civil Service: Case Study: Pakistan & Bangladesh	Queen's University Kingston, Ontario, and Bangladesh
Desmond Ariph Ali Trinidad and Tobago	Fermentation of Rum Distillery Stillage	University of British Columbia Vancouver, B.C.
Wilfred R. Chan Jamaica	To study the applications of the newer analytical methods in chemistry and the methodology of research, as well as developments in curriculum and teaching methods	University of Toronto and University of British Columbia
Hyung-Joon Chi Korea	The development of new contraceptive agents and techniques for establishment of a hormone radio- immunoassay service centre in Korea	Queen's University Kingston, Ontario
Guido Delgadillo Bolivia	The efficiency of phosphorus utilization by indigenous forage species adapted to high rainfall areas in the alluvial soil regions of tropical South America	Macdonald College, McGill University, and CIAT, Cali, Colombia
Ashok Valji Desai India	Economics of energy consumption and substitution among sources of energy	University of Sussex England
Mbaye Diao Senegal	Land tenure and cooperatives	Ecole Pratique des Hautes Etudes de Paris
Antoine N. Kabwasa Zaire	Development of Extension/Adult Education in French-speaking African countries	Ontario Institute for Studies in Education, Toronto, Ontario
Beatriz Eugenia Lepe Mexico	Alkylguanidines as inhibitors of ion transport in isolated plasma membranes and modifications of ion transport in plant cells by Helminthosporium and Guanidines	Purdue University and Montana State University U.S.A.
Simoni Malya Tanzania	Training in research methodology	Ontario Institute for Studies in Education Toronto, Ontario
Jahangir Mehrbanpour Iran	Studies towards a Masters degree in Public Health	University of Minnesota Minneapolis, U.S.A.
Lusibu Nkanza Zaire	National integration, state bourgeoisie, ethnic groups and foreign economic power	Harvard University and the University of Ottawa
D. I. Obeyesekere Sri Lanka	Studies at the Columbia School of Business	Columbia University, New York, U.S.A.
Solomon Oyesola Nigeria	Health Sciences Library and Information Training programs – the needs of developing countries	University of Lagos, Nigeria
Ikram Y. Sayed Egypt	Application of psychoanalytic theory and techniques to problems of administrative reform	Center for International Affairs, Harvard University, U.S.A.

George L. Walcott Guyana	Pulping techniques and other areas of wood chemistry relative to extractives content of Guyana woods	Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia
John Wickham Barbados	Write a work of fiction or otherwise that would reflect the social physical landscape of Barbados	Commonwealth Caribbean Resource Centre, Barbados
Abdelwahid Yousif Sudan	Doctoral studies in adult education	The Ontario Institute for Studies in Education Toronto, Ontario

## RECOMMENDED

Rehman Sobhan, Bangladesh Institute of Development Studies  
 Mohammed Riad, Cairo Governate, Egypt  
 Dr F. S. J. Oldfield, Government Health Service, The Gambia  
 Afaf Deeb Kandis, Research Manager, Isticharat, Beirut, Lebanon  
 Isais Flit Stern, Industrial Research and Standards Institute, Peru  
 Edward Cumberbatch, Barbados Agricultural Development Corporation  
 R. W. M. Cuthbert, Christian Action for Development in the Caribbean, Jamaica  
 Dr Sixte Butera, Ministère de la Santé, Rwanda  
 A. Adeniji, Department of Geography, University of Lagos, Nigeria

## Senior Research Associate award

This award, introduced in 1974–75 as a supplement to the Research Associate grants, is designed for senior professionals in the field of development, both in Canada and in developing countries. Awards are offered by a process of nomination and selection by a committee presided over by the Chairman of the Board, rather than by open competition. A total of 10 one-year awards, including a stipend of up to \$25,000, are available annually. Two awards were made in 1975–76 as follows:

Award holder	Subject of research	Location of tenure
Enrique Oteiza Latin American Social Science Council, Buenos Aires, Argentina	Foreign aid as a post Second World War international institution	Institute of Development Studies University of Sussex, England
Constantine Vaitos Science Policy and Technology, Lima, Peru	Two books on economic integration and on <i>Economics, Law and Technology in the Patent System: their relevance in developing countries</i> and a reader " <i>Tecnologia para el Desarrollo</i> "	Lima, Peru

## Research Fellows

In addition to encouraging younger scientists and professionals to upgrade their skills, the Centre has also been concerned to recognize the past excellence and major contributions by senior researchers in the development field through its award of the Research Fellowships. This award provides the opportunity for these senior research scholars to draw the greatest benefit from their previous experience through a

year of research, reflection and writing. The location and nature of the activity are left to the discretion of the grantee. Up to five appointments may be made each year by the Executive Committee of the Board of Governors upon the recommendation of the President. Science 1971, 15 Research Fellows have completed tenure. Research fellows appointed this year are as follows:

Fellow	Subject of Research	Location of Tenure
Dr Daniel Hillel Dept. of Soil and Water Sciences The Hebrew University Faculty of Agriculture Rehovot, Israel	Development of Techniques for improving water use efficiency in rain-fed and irrigated agriculture, and the examination of mathematical simulation techniques applicable to the analysis of soil-plant-atmosphere weather relations	Texas A and M University College Station Texas, U.S.A.
Professor Nurul Islam Bangladesh	Preparation of a book on economic planning and development in Bangladesh	Queen Elizabeth House, Oxford, England
Dr K. K. Singh Director of Research Administrative Staff College of India Hyderabad	Follow-up on the findings of the International Project on Social Values and Political Responsibility	Centre for International Studies, Cornell University, Ithaca, N.Y., U.S.A.

## Pre-Post Project awards

This award program is intended to further the training of individuals from developing countries who have been associated with an IDRC-supported project, and to provide training for others prior to their participation. Nomination and selection for this award are made by the appropriate program division in cooperation

with the Division of Social Sciences and Human Resources. The number of grants to be awarded annually is variable, as is the level of the grant; the nature and location of training are dependent upon the individuals selected. The awards given during the year under review are:

### PRE-PROJECT AWARDS

Award Holders	Field of Training	Location of Tenure
Deepak Bajracharya Nepal	Ph.D. degree in history and social studies of science	University of Sussex, England
Danilo Baldos Philippines	Ph.D. degree in crop science	University of Guelph, Guelph, Ontario
Mme M. A. Dia Gaye Sénégal	Studies in rural domestic and economic sciences	Université Laval, Québec, Québec
Sakarno Hardin Malaysia	Lake and river fisheries survey methodology	Central Inland Fisheries Research Institute, Barrackpore, India

### POST PROJECT AWARDS

Rodrigo Arboleda Colombia	M.Sc. degree in industrial and vocational education	University of Maryland, U.S.A.
Mauricio Culagovski Chile	Ph.D. degree in sociology and anthropology	Fordham University, Bronx, New York, U.S.A.
Miss P. Thambipillai Malaysia	Master's degree in political science	University of Hawaii



# Publications and Texts

## Publications et textes

### Centre Publications

#### Publications du Centre

IDRC-003/75e,f

*IDRC Annual Report 1974-75/CRDI Rapport annuel 1974-75*, Ottawa, 1975. 40 p.

IDRC-048e

*To conquer hunger: opportunity and political will*, W. David Hopper, Ottawa, 1975. 24 p.

IDRC-048f

*Vaincre la faim: atouts techniques et options politiques*, W. David Hopper, Ottawa, 1975. 24 p.

IDRC-050e

*The science and technology policy instruments project*, Ottawa, 1975. 12 p.

IDRC-051e

*Integrated approach to local rural development: report of an interdisciplinary seminar*, Makati, Philippines, 31 Mar.–3 Apr. 1975, Marilyn Campbell, ed., Ottawa, 1975. 52 p.

IDRC-052e

*Tropical oysterculture: a selected bibliography*, D. B. Quayle, Ottawa, 1975. 40 p.

IDRC-053e

*Rice postharvest technology*, E. V. Araullo, D. B. de Padua, and Michael Graham, ed., Ottawa, 1976. 394 p.

IDRC-054e

*Bread and better things: IDRC Review 1974-75*, Clyde Sanger, Ottawa, 1975. 33 p.

IDRC-054f

*Le pain de demain: rapport d'activité du CRDI 1974-75*, Michelle Hibler, Ottawa, 1975. 35 p.

IDRC-055e

*Cowpeas: home preparation and use in West Africa*, Florence E. Dovlo, Caroline E. Williams, and Laraba Zoaka, Ottawa, 1976. 96 p.

IDRC-056e

*The delivery of health services in the People's Republic of China*, Peter Wilenski, Ottawa, 1976. 59 p.

IDRC-057e

*Hidden waters in arid lands: report of a workshop on groundwater research needs in arid and semi-arid zones*, Paris, France, 25 Nov. 1974, L. A. Heindl, ed., Ottawa, 1975. 18 p.

IDRC-058e

*Removing constraints to small farm production: the Caqueza project*, H. G. Zandstra, K. G. Swanberg, and C. A. Zulberti, Ottawa, 1976. 32 p. Also available in Spanish (IDRC-058s).

IDRC-059e

*Cassava: the development of an international research network*, Barry Nestel and James Cock, Ottawa, 1976. 70 p.

IDRC-060e

*Andean Pact technology policies*, by Junta del Acuerdo de Cartagena, Ottawa, 1976. 60 p.

IDRC-061e

*Technology policy and economic development: a summary report on studies undertaken by the Board of the Cartagena Agreement for the Andean Pact integration process*, by Junta del Acuerdo de Cartagena, Ottawa, 1976. 105 p.

IDRC-062e

*Hidden harvest: a systems approach to postharvest technology*, David Spurgeon, Ottawa, 1976, 36 p.

IDRC-063e

*The international exchange and testing of cassava germ plasm in Africa: proceedings of an interdisciplinary workshop held at IITA, Ibadan, Nigeria, 17-21 Nov. 1975*, Eugene Terry and Reginald MacIntyre, ed., Ottawa, 1976. 59 p.

IDRC-064e

*Catastrophe or new society? A Latin American world model*, Ottawa, 1976, 108 p.

IDRC-065e

*DEVISIS: the preliminary design of an international information system for the development sciences*, by the DEVISIS Study Team, Ottawa, 1976. 248 p.

IDRC-067e

*Science and technology policy implementation in less-developed countries: methodological guidelines for the STPI project*, Ottawa, 1976. (in press)

IDRC-068e

*Education research priorities: a collective view*, Ottawa, 1976. 26 p.

IDRC-069e

*Low-cost rural health care and health manpower training: an annotated bibliography with special emphasis on developing countries*, vol 2, Frances Delaney, Ottawa, 1976. (in press)

IDRC-070e

*Walking on two legs: rural development in South China*, Elizabeth and Graham Johnson, Ottawa, 1976. (in press)

IDRC-LP2

*Acronyms list; liste des sigles; lista de siglas*, IDRC Library, Bibliothèque du CRDI, Biblioteca del CIID, Ottawa, 1975. 18 p.

IDRC-LP3

*IDRC Serials list; liste des périodiques du CRDI; lista de publicaciones periódicas del CIID*, IDRC Library, Bibliothèque du CRDI, Biblioteca del CIID, Ottawa, 1975. 644 p.

IDRC-LP4

*IDRC Library catalogue* (in microfiche form only), Ottawa, 1976.

IDRC-TS1

*Food legume processing and utilization* (with special emphasis on application in developing countries), Alvin Siegel and Brian Fawcett, Ottawa, 1976. 88 p.

IDRC-TS2

*Maiduguri mill project: grain milling and utilization in West Africa*, Ottawa, 1976. 16 p.

IDRC: an updated five-panel brochure describing what IDRC is and does, Ottawa, 1976.

CRDI: nouveau dépliant à cinq volets décrivant la nature et les réalisations du CRDI, Ottawa, 1976.

### **The IDRC Reports/Le CRDI Explore/CIID Informa**

(Bob Stanley, Editor-in-Chief/Rédacteur en chef)  
Published in three separate language editions, this is a quarterly magazine about the work supported by the International Development Research Centre and about related activities in the field of international development, and is available on request from the Centre's Publications Division.

Cette revue trimestrielle, consacrée aux recherches financées par le Centre de recherches pour le développement international et aux activités connexes dans le domaine du développement international, est publiée en éditions anglaise, française et espagnole et peut être obtenue sur demande à la Division des publications du Centre.

## Publications by staff and consultants

### Publications rédigées par les cadres et conseillers du Centre

If the material listed in this section cannot be obtained from normal sources (authors, libraries, bookstores), IDRC will try to supply copies. In case of short supply, preference will be given to individual researchers in developing countries.

Si vous ne pouvez obtenir les ouvrages sous-mentionnés chez les dépositaires habituels (auteurs, librairies, bibliothèques) le CRDI s'efforcera de fournir les exemplaires demandés. Vu l'approvisionnement limité en certaines publications, les stocks en voie d'épuisement seront, de préférence, réservés aux chercheurs particuliers des pays en voie de développement.

Araullo, E. V.

Asian Working Group of Food Scientists: immediate and long-term look. Presented to the Asian Food Scientists Workshop, Manila, June 1975. 5 p.

———. Postharvest rice technology: an Asian research network in evolution. Presented to the Rice Postharvest Working Group Meeting, Singapore, 22 May 1975. 3 p.

———. Postharvest rice technology (South-east Asia). In *Rice Report 1975* (S. Barber, H. Mitsuda and H. S. R. Desikachar, ed.), Working Party on Rice Utilization, IUFoST, Instituto de Agroquímica y Tecnología de Alimentos, Valencia, 1975. p. 97–101.

Beaulieu-Gingras, S.

Contribution of IDRC towards increasing world food production. Presented at the University of Guelph, Ontario, 21 Nov. 1975, and the University of Ottawa, 26 Nov. 1975. 21 p.

Beltrán, L. R.

Alien premises, objects and methods in Latin American communication research: the general influence of alien models. *Communication Research*, Beverley Hills, Calif., vol. 3, no. 2, Apr. 1976. p. 107–134.

Beltrán, L. R. and E. Fox de Cardona

Hacia una metodología para diagnosticar instituciones estatales de comunicación. Ensayo en Venezuela como parte de la formulación de una política general para los servicios públicos de radio y televisión, Reunión de CIESPAL y CEDAL sobre Políticas Nacionales de Comunicación en América Latina, San José, 13–19 abril 1975.

Bene, J.

Impact of Third World forest industries on international forest products markets. *World Wood*, San Francisco, vol. 16, no. 12, Nov. 1975. p. 26–27.

Bourrier, G. R.

Triticale — a new food crop. Presented at Carleton University, Ottawa, 25 Mar. 1976. 14 p.

Clement, G. H.

International Development Research Centre. In *Techniques and methodologies for stimulating small scale labor-intensive industries in developing countries*, Proceedings of the Conference and Seminar, Atlanta, Ga., 10–11 Mar. 1975. p. 137–144.

Corea, E.

Asian science writers have taken the first steps — but a revolution is needed. *Media*, Manila, Oct. 1975, p. 27.

———. Aid to 3rd world colleagues.

*ISWAN*, the Newsletter of the International Science Writers Association, Montreal, 1 Feb. 1976.

Daniels, W. D.

The history and development of the International Centre for Agricultural Research in Dry Areas (ICARDA) up to January 1976. Presented to ICARDA Board of Trustees, London, 6 Jan. 1976. 12 p.

de Chantal, J.

Bibliothèques et archives du Tiers Monde: problèmes et perspectives. *Documentation et bibliothèques*, Montréal, vol. 21, no. 2, juin 1975. p. 85–95.

Dobson, W.

National population objectives are slowly taking shape, now we need policies. *Science Forum*, Toronto, vol. 8, no. 6, Dec. 1975. p. 24–27.

Doggett, H.

World sorghum improvement. Presented to Texas A & M University, 8–10 Mar. 1976. 17 p.

———. Quality improvement in sorghum and millets. Submitted for the International Association of Cereal Chemistry Study Group 32A Symposium, Vienna, 11 May 1976. 7 p.

- . Sorghum East Africa (2 p.). High altitude sorghums (3 p.). Development and testing of hybrids (3 p.). Presented to Cereal Consultative Group Meeting, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India, 14–19 Apr. 1975.
- Doggett, H., Kassam, A. H. and D. J. Andrews. Cereal physiology in relation to genetic improvement of sorghum and millet at ICRISAT. Presented to Cereal Consultative Group Meeting, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India, 14–19 Apr. 1975. 10 p.
- Doggett, H., Seshu Reddy, K. V., Gowda, B. T. S., Davies, J. C., and P. K. Lawrence. Pest resistance breeding. Presented to Cereal Consultative Group Meeting, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India, 14–19 Apr. 1975. 14 p.
- Doggett, H. and K. V. Ramaiah. Grain-grass sorghum project (7 p.). Striga resistance (3 p.). Presented to Cereal Consultative Group Meeting, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India, 14–19 Apr. 1975.
- Doggett, H. and R. Jambunathan. Breeding sorghum for improved grain quality. Presented to Cereal Consultative Group Meeting, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad, India, 14–19 Apr. 1975. 8 p.
- Dorozynski, A. When is waste waste? *Ceres*, Rome, Sept.–Oct. 1975. p. 70.
- . Nobel prize winners grapple with the social and ethical problems facing science. *Science Forum*, Toronto, vol. 9, no. 1, Feb. 1976. p. 24–25.
- . Global efforts to combat diseases in tropical areas. *The Ethiopian Herald*, Addis Ababa, 27 Feb. 1976. p. 2. (Reprinted from *The IDRC Reports*)
- Gauthier, H. and G. F. Brown. Family planning programs: sub-Saharan Africa. *Studies in family planning*, The Population Council, New York, vol. 6, no. 8, Aug. 1975. p. 283–301.
- Hopper, W. D. *A perspective on India's food production*. Coromandel Lecture 6, Vishakapatnam, Andhra Pradesh, 5 Jan. 1976. Coromandel, 1976. 30 p.
- Hulse, J. H. Research and development requirements on postharvest systems. Presented at Commonwealth Ministerial Meeting on Food Production and Rural Development, London, 4–12 Mar. 1975. 18 p.
- . Triticale. Presented to the Royal Society of Health and the Society of Chemical Industry, Manchester, 8 Jan. 1976. 21 p.
- . (Chairman, UN-PAG Working Group on Protein Methods for Cereal Breeders). Protein methods for cereal breeders as related to human nutritional requirements. In *Advances in cereal science and technology* (Y. Pomeranz, ed.), chapter 7. American Association of Cereal chemists (AACC), St. Paul, Minn., 1976. Chapter written by UN-PAG Working Group on Protein Methods for Cereal Breeders.
- Hulse, J. H. and W. D. Daniels. Economics of transfer. In *Proceedings of Western Hemisphere Nutrition Congress IV*, Bal Harbour, Fla., 19–22 Aug. 1974. American Medical Association, Acton, Mass., 1975. p. 271–277.
- Hulse, J. H., Fawcett, B. D. and W. D. Daniels. Protein supplements — world production and trade. In *Oilseeds and pulse crops in western Canada — a symposium* (John J. Harapiak, ed.), Western Co-operative Fertilizers Ltd., Calgary, 1975. p. 1–60.
- Hulse, J. H. and B. D. Fawcett. Nutritionally fortified cereal foods. Presented at Fifth International Grains Industry Program, Winnipeg, Canada. 17 Sept. 1975. 27 p.
- Kappagoda, N. M. The external debt problem — Sri Lanka case in the current international setting. *Marga Quarterly Journal*, vol. 3, no. 2, Colombo, 1976. p. 83–115.
- Laquian, A. A. Coping with internal migration in the Philippines: problems and solutions. In *Population and development in Southeast Asia* (J. F. Kantner and Lee McCaffrey, ed.), Lexington Books, Lexington, Mass., 1975. p. 235–252.

- Leatherdale, D.  
DEVSIS: Development Sciences Information System. In *Regional cooperation in agricultural information*, Proceedings of a workshop/seminar on Regional Cooperation in Agricultural Information, College, Laguna, 3–12 Mar. 1975, Southeast Asian Regional Center for Graduate Study and Research in Agriculture, 1975. p. 125–133.
- . Classification and subject categories. In *Regional cooperation in agricultural information*, Proceedings of a workshop/seminar on Regional Cooperation in Agricultural Information, College, Laguna, 3–12 Mar. 1975, Southeast Asian Regional Center for Graduate Study and Research in Agriculture, 1975. p. 205–212.
- . Provisional thesaurus on tropical grain and forage legumes. International Institute of Tropical Agriculture, Ibadan, 1975. 351 p.
- . AGRIS: aims and history. Presented at the INIS/AGRIS International Seminar, Ankara, June 1975. 12 p.
- Leatherdale, D., Schmid H. and C. Gadjokov.  
AGRIS: categorization and information retrieval based on IBM's IRMS, AGRIS, Vienna, Feb. 1976. 91 p.
- Losos, G. J. and B. O. Ikede.  
Pathogenesis of *trypanosoma brucei* infection in sheep: cerebro-spinal fluid changes. *Journal of comparative biology*, London, 85, 1975. p. 33–36.
- Mousseau-Gershman, Y.  
*Manuel de travaux pratiques en santé communautaire: perspective internationale*. Les Éditions HRW, Montréal, 1975. 155 p. (Préface par George F. Brown)
- Nestel, B. L.  
Cassava, some recent research findings. Presented to the South Pacific Commission Tropical Root Crop Meeting, Fiji, Nov. 1975. 13 p. (Report in press)
- . The future of the veterinary profession. Plenary address to the New South Wales Veterinary Association Animal Meeting, Canberra, Nov. 1975.
- . Agricultural research as a component of foreign aid. Fifteen minute talk on Australian Broadcasting Commission "Guest of Honour" program, Sydney, 2 Nov. 1975. 8 p.
- . Cassava research. Lecture at Central Tuber Crops Research Institute Training Course, India, 23 Sept. 1975, *India Root Crops Journal*, 1976. (In press)
- Oldham, C. H. G. Contribution in *The art of anticipation: values and methods in forecasting* (S. Encel, P. K. Marstrand and W. Page, ed.), Science Policy Research Unit, University of Sussex, Martin Robertson & Co., Ltd., London, 1975. 286 p.
- Peng, J. Y.  
*Malaysia: country profiles*. The Population Council, New York, Aug. 1975. 11 p.
- . The expanding role and scope of practice of all categories of midwives and traditional birth attendants in the field of family planning. Presented to the Joint Study Group of the West Asia Working Party on Training and Practices of Midwives in MCH/Family Planning, International Confederation of Midwives/International Federation of Gynecology and Obstetrics, Kuala Lumpur, 17–25 Oct. 1975. 10 p.
- Povey, W. G. and J. T. Lanman.  
Review of biomedical research in reproduction biology in the Caribbean area, Central America, and Mexico. In *Survey of institutional development needs and capabilities in developing countries* (J. T. Lanman, ed.), New York, vol. 2, 1975. p. 1–39.
- Pradervand, P.  
Opinion: alternative paths to development. *People*, London, vol. 2, no. 3, 1975. p. 22.
- Rahman, A. T. R.  
Rural development in Bangladesh. Presented at a Symposium on Bangladesh, University of Guelph, 17–18 Mar. 1976. 15 p.
- Sagasti, F. R.  
The ITINTEC system for industrial technology policy in Peru. *World development*, Pergamon Press, Oxford, vol. 3, nos. 11 and 12, 1975. p. 867–876.
- . A framework for the formulation and implementation of industrial technology policies. In *Science, government and industry for development*, (E. Ingersen and W. Bragg, ed.), ILAS, Texas University Press, Austin, 1975. p. 203–244.
- . Notes on the progress of the STPI (Science and Technology Policy Instruments) project. Reprinted from *Science and Public Policy*. London, Sept. 1975. p. 380–382.

- . Notes on technological self-reliance and cooperation among Third World countries. *Science and Public Policy*, London, Oct. 1975. p. 416-424.
- Sagasti, F. R. and M. Guerrero. *El Desarrollo Científico y Tecnológico de América Latina*. BID-INTAL, Buenos Aires. 200 p.
- Sanger, C. Billion-dollar drain. *Manchester Guardian Weekly*, Manchester, 14 June 1975. (Article on Canada's economic relations with developing countries, and the role of CIDA in providing development aid).
- . Research aiding the rural poor: cereal strains being improved. *The Ethiopian Herald*, Addis Ababa, 2 Dec. 1975. p. 2.
- . Journalists and political leaders having opposing roles and goals. In *Canada and the Third World: what are the choices?* Based on papers prepared for the 44th Couchiching Conference of the Canadian Institute on Public Affairs, Aug. 1975. p. 125-127.
- . Worldview: CIDA. *The Presbyterian Record*, Toronto, Jul.-Aug. 1975. p. 7.
- . Worldview: Ethiopia. *The Presbyterian Record*, Toronto, Mar. 1976. p. 9.
- . Worldview: Cassava. *The Presbyterian Record*, Toronto, Apr. 1976. p. 11.
- . Happy marriage. *Daily Nation*, Nairobi, 12 Mar. 1976. (Article on IDRC-supported research in East Africa).
- Siegel, A., Bhumiratana, A. and D. R. Lineback. Development, acceptability and nutritional evaluation of high-protein soy-supplemented rice noodles for Thai children. Reprinted from *Cereal Chemistry*, American Association of Cereal chemists, Inc., St. Paul, Minn., Nov.-Dec. 1975. p. 801-812.
- Silla, O. La C.E.A.O. et l'intégration économique en Afrique de l'ouest. Conférence prononcée à l'Institut de coopération internationale, Université d'Ottawa, 5 fév. 1976. 16 p.
- . Le CRDI et son action en Afrique. Discours prononcé à la conférence annuelle de l'Association canadienne des études africaines, Victoria, 19 fév. 1976. 43 p.
- Simmons, A. B. Social mobility in Bogota, Colombia. *International Journal of Comparative Sociology*, Leiden, vol. 16, nos. 3-4, 1975. p. 228-245.
- Simmons, A. B. and R. Cardona. Toward a model of migration in Latin America. In *Migration and Urbanization* (B. M. du Toit and H. Safa, ed.), Mouton and Company, The Hague, 1975. p. 19-48.
- . Hacia un Modelo General de la Migración en América Latina. *América Latina: Distribución Espacial de la Población*, Corporación Centro Regional de Población (CCRP), Bogotá, 1975.
- Simpson, D. G. Education: a policy for serving the most children. In *Canadian and International Education*, Faculty of Education, University of Western Ontario, London, vol. 4, no. 2, Dec. 1975. p. 17-22.
- Spurgeon, D. Lucknow Seminar: End of a long journey. *Vidura*, Press Institute of India, New Delhi, vol. 12, no. 4, Oct.-Dec. 1975. p. 219-221.
- . Crop with a potential: Research efforts suggest that yields of cassava could be quadrupled. *Standard Chartered Review*, London, England, May 1976. p. 3-6. (Originally published in *The IDRC Reports*).
- Steckle, J. Food utilization in Ghana: seasonal, economic and other factors affecting food utilization in households in the Volta region. Ph.D. thesis, University of Reading, 1975. 200 p.
- Swanberg, K. G. El Pequeño Agricultor, Tomo 3: Hortalizas: su Economía. Instituto Colombiano Agropecuario, Bogotá, septiembre 1975. 58 p.
- Swanberg, K. G. y L. A. Chudt. El Pequeño Agricultor, Tomo 4: Mercado y Desarrollo Rural: un Caso Concreto en Colombia. Instituto Colombiano Agropecuario, Bogotá, septiembre 1975. 65 p.
- Swanberg, K. G. and E. Shipley. The nutritional status of the rural family in East Cundinamarca, Colombia. *Food Research Institute Studies*, Stanford University, vol. 14, no. 2, 1975. p. 111-125.



Vaillancourt-Wagner, M.

Children's value to their parents. *The Canadian Nurse*, Ottawa, vol. 71, no. 8, Aug. 1975. p. 31-35.

———. L'enfant porte-bonheur ou l'enfant fardeau. *L'Infirmière canadienne*, Ottawa, vol. 71, no. 8, août 1975. p. 25-30.

———. Un double échec. *Digeste social*. Conseil canadien de développement social, mai-juin 1975. p. 55.

———. La valeur des enfants pour les parents. *L'Information médicale et paramédicale*, Montréal, vol. 27, no. 15, 17 juin 1975. p. 14-15.

———. À Mexico, les femmes n'ont pas su se parler. *L'Infirmière canadienne*, Ottawa, vol. 17, no. 9, sept. 1975. p. 28-29.

Vespry, H. A.

International Development Research Centre. *Feliciter*, Ottawa, vol. 22, no. 3, Mar. 1976. p. 4 (of supplement).

Weber, E.

Program thrusts of the IDRC toward accelerating agricultural development. Presented at the Southeast Asian Regional Center for Graduate Study and Research in Agriculture Workshop on accelerating agricultural development, Los Baños, Philippines, 26-30 Apr. 1976.

Wild, K.

DEVSIS — First steps towards the design of an international information system for the development sciences. Tudományos és Műszaki Tájékoztatás (Scientific and Technical Information), Budapest, Mar. 1976. p. 110-116.

Wild K. (rapporteur).

*Proceedings of the international expert meeting on the ways and means to an international information system for economic and social development*, 8-12 Dec. 1975, Berlin (West). German Foundation for International Development, Bonn, 1976. 115 p.

Wong L.

Dissemination of information on appropriate technologies: the Asian experience. Presented to the technical meeting on adaptation of technology to suit special market conditions of developing countries, Bangkok, 3-14 Nov. 1975. 9 p.

Woolston, J. E.

International information systems: their relation to economic and social development. Reprint from *Information systems: their interconnection and compatibility*, International Atomic Energy Agency, Vienna, 1975. p. 51-60.

———. Economic and social information: an essential element for development decision-making. Presented at a symposium on scientific and engineering secondary information transfer for the developing countries, Brussels, 23-24 June 1975. 8 p. (Proceedings in press).

———. DEVSIS: Development Sciences Information System. Presented at FID Symposium on information systems design for socio-economic development retrospect and prospect, Brussels, 30 Sept.-2 Oct. 1975. 10 p. (Proceedings in press).

Yeung, Y. M. and S. H. K. Yeh.

A review of neighbourhoods and neighbouring practices. In *Public Housing in Singapore: a multi-disciplinary study* (S.H.K. Yeh, ed.) Singapore University Press, 1975. p. 262-280.

———. Hawkers and vendors: dualism in Southeast Asian cities. Paper presented at the Association of American Geographers annual meeting. Milwaukee, 20-23 Apr. 1975. 16 p.

———. Life styles compared: squatters and public housing residents. In *Public Housing in Singapore*, Singapore University Press, 1975. p. 302-324.

———. Time budgets: extended methodology and application. In *Environment and Planning*, London, vol. 8, no. 1, Jan. 1976. p. 93-107.

———. The land value dilemma in developing economics with special reference to Singapore (Discussion paper). In *The Cities of Asia* (J. Wong, ed.), Singapore University Press, 1976. p. 211-216.

Yeung, Y. M.

Travelling night markets in Singapore. In *Internal exchange systems in Africa, Asia, and Latin America: periodic markets and hawkers* (R. H. T. Smith, ed.), Sorrett Publication Co., Melbourne, 1976. p. 142-154.

———. Activity systems as an urban research method. Presented to the Thirteenth Pacific Science Congress, Vancouver, 18-30 Aug. 1975. 13 p.

Zandstra, H. G., Swanberg, K. G. y C. A. Zulberti. *El Pequeño Agricultor*, Tomo 2: La Producción Agrícola en Desarrollo Rural. Instituto Colombiano Agropecuario, Bogotá, mayo 1975. 42 p.

———. *Experiencias en Desarrollo Rural* (segunda edición). Instituto Colombiano Agropecuario, Bogotá, julio 1975. 100 p.

Zulberti, C. A., Swanberg, K. G. y H. G. Zandstra. *El Pequeño Agricultor*, Tomo 10: Análisis Económico y Nueva Tecnología en el Proyecto Cáqueza. Instituto Colombiano Agropecuario, Bogotá, marzo 1976. 49 p.

### **Publications/research supported by IDRC Publications/recherches subventionnées par le CRDI**

*APIC Journal*, Asian Packaging Information Centre, Eldex Industrial Bldg., 12th floor, 21A Ma Tau Wei Road, Hunghom, Kowloon, Hong Kong.

*DEVSIIS Newsletter*, DEVSIIS Study Team, c/o International Labour Office, 1211 Geneva 22, Switzerland.

*DEVSIIS: key items from the DEVSIIS Study Team Report*, International Development Research Centre, Ottawa, January 1976. (Brochure).

*Famille et développement*, Centre de recherches pour le développement international, B.P. 11007, Dakar, C. D. Annexe, Sénégal.

*Irrinews*, International Irrigation Information Center, P.O. Box 49, Bet Dagan, Israel.

*Technonet Asia Newsletter*, Technonet Asia Project, Tanglin, P.O. Box 160, Singapore 10.

*Tropical Grain Legume Bulletin*, International Grain Legume Information Centre, International Institute of Tropical Agriculture, PMB 5320 Ibadan, Nigeria.

*Actes du Quatrième colloque de démographie africaine: migrations — État civil — recensements administratifs*, Ouagadougou, 20–24 janvier 1975. Institut national de la statistique et de la démographie, ministère du Plan, du Développement rural, de l'Environnement et du Tourisme, Ouagadougou, Haute-Volta, décembre 1975. 296 p. (Exemplaires disponibles à l'Institut national de la statistique et de la démographie, B.P. 374, Ouagadougou).

*Rural urban disparities: spatial dimensions of development strategies*, R. Acquah-Harrison, Toronto, 1975. 97 p.

*A review of the development administration system of the South-Eastern State*, Report by the Joint Study Committee, Rural Development Administration Unit, Department of Political Science, University of Nigeria, Nsukka, Nov. 1975. 124 p. (Available from the Department of Political Science, University of Nigeria, Nsukka).

*A review of the divisional administration system of the East Central State*, Report by the Rural Development Administration Research Team, Department of Political Science, University of Nigeria, Nsukka, Sept. 1975. 106 p. (Available from the Department of Political Science, University of Nigeria, Nsukka).

Water supply constraint: an evaluation of irrigation projects and their role in the development of Afghanistan, L. I. Z. Baron, Montreal, 1975. 313 p.

Comité Técnico-CIMDER, E. Casas, C. Cardona, y R. Aljure, Seminario Internacional sobre Evaluación de Proyectos de Desarrollo Rural, 13–17 octubre 1974, Cali. Bogotá, julio 1975. 165 p. (Asociación Latinoamericana de Desarrollo Rural (ALADER), Apartado Aéreo 53016, Bogotá, Colombia).

Import substitution, self reliance and the choice of techniques: a study of the Indian fertilizer industry, R. E. J. Culpeper, 1975. 285 p.

Curricular and training development workshop on agricultural research management, Proceedings of the workshop, 24–28 Feb. 1975, College, Laguna, Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), May 1975. (Available from SEARCA, College, Laguna 3720, Philippines).

*El Pequeño Agricultor*, Tomo 6: Análisis Comparativo y Recomendaciones Técnicas: Producción Agrícola en Cáqueza, G. Escobar, Instituto Colombiano Agropecuario, Bogotá, marzo 1976. 77 p.

Provisional bibliography of references to the aquatic fauna of ricefields, C. H. Fernando and J. I. Furtado, University of Waterloo, Ontario, 1975. 50 p.

Fourth meeting of coordinators of the national focal points of the pilot project for the transfer of technology — evaluation and final report. Organization of American States (OAS), Washington, D.C., June 1975. 42 p. (A-135 p.).

Modified Delphi technique for obtaining consensus on perceived priorities for research in education, R. C. Hughes, Northwestern University, Evanston, Ill., 1975. 207 p.

Epidemiological study of induced abortion by pregnancy screening in a rural community in Egypt, 1972-73, Ibrahim Kamal et al, the Supreme Council for Population and Family Planning, Egypt, 1975. 32 p. (Reprinted by IDRC).

Ingeniería y tecnología a escala; la ingeniería y la industria de procesos en Argentina y México, M. Kamenetzky, Buenos Aires, 1975. 343 p.

Kavar village health worker project, Department of Community Medicine, Pahlavi University, School of Medicine, Shiraz, Iran, June 1975. 125 p. (Available from the Department of Community Medicine, Pahlavi University, Shiraz).

Atención de la Salud en Áreas Rurales, Unidad Audiovisual, Julio Alban Holguin, ed., FEPAFEM, Caracas, Junio 1975. 57 p. (Federación Panamericana de Asociaciones de Facultades de Medicina (FEPAFEM), Caracas, Venezuela).

Modernisation of agriculture: a case study in eastern Uttar Pradesh, Shrinath Singh (Foreword by W. David Hopper), Heritage Publishers, New Delhi, Jan. 1976. 238 p. (Available from Heritage Publishers, M-116 Connaught Circus, New-Delhi-110001, India, \$4.00).

Proceedings of the cropping systems workshop, 18-20 Mar. 1975. International Rice Research Institute, Philippines. 396 p. (Available from IRRI, P.O. Box 933, Manila, Philippines).

Re-appraisal of the role of the Red Cross, Donald Tansley, Study Director, International Committee of the Red Cross, Geneva, Switzerland, 1975. (Volume includes Final Report and background papers 1-6; available from International Red Cross, CH-1211, Geneva 19).

Water supplies for low-income communities in developing countries, R. G. Feachem, *Journal of the Environmental Engineering Division*, Proceedings of the American Society of Civil Engineers, vol. 101, no. EE5, University of Birmingham, Oct. 1975. p. 687-702.

Creation of an international bibliographic system on population matters; some preliminary thoughts, G. K. Thompson, *CICRED Bulletin*, Paris, no. 6, Jan. 1976. p. 13-16.

Computerized approaches to the literature of economics: from ISIS to DEVSIS, K. G. Thomson, Presented to International Economic Association Symposium on the Organization and Retrieval of Economic Knowledge, Kiel, 7-12 July 1975. 13 p.

2.000 abstracts on cassava (*Manihot esculenta* Crantz), vol. 1, Cassava Information Center, Centro Internacional de Agricultura Tropical, Series HE-26, Dec. 1975. 584 p. (Available from Dr. Fernando Monge, Cassava Information Center, CIAT, P.O. Box 6713, Cali, Colombia).

Public housing in Singapore: a multi-disciplinary study, Stephen H. K. Yeh, ed., Singapore University Press, 1975. 439 p. (Available from Housing and Development Board, National Development Building, Maxwell Road, P.O. Box 702, Singapore 2, Republic of Singapore, S \$35.00).