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The International Development Research Centre is a public corporation created by the Parliament of Canada in 1970 to support research designed to adapt science and technology to the needs of developing countries. The Centre's activity is concentrated in five sectors: agriculture, food and nutrition sciences; health sciences; information sciences; social sciences; and communications. IDRC is financed solely by the Parliament of Canada; its policies, however, are set by an international Board of Governors. The Centre's headquarters are in Ottawa, Canada. Regional offices are located in Africa, Asia, Latin America, and the Middle East.

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Annual Report 1980-1981

International Development Research Centre



Contents

| | |
|---|----|
| Letter of transmittal from Chairman | 2 |
| Introduction | 3 |
| Board of Governors | 14 |
| Officers of the Centre and Regional Directors | 15 |
| Projects for which funds were approved during the fiscal year 1980-1981 | |
| Agriculture, Food and Nutrition Sciences | 16 |
| Cooperative Programs | 23 |
| Health Sciences | 23 |
| Information Sciences | 27 |
| Secretary's Office | 29 |
| Social Sciences | 29 |
| Special Governing Board Activities | 39 |
| Division activity projects | 40 |
| Financial analysis and statements | 41 |
| Fellowship Program | 58 |
| Publications and films/publications et films | 64 |



INTERNATIONAL DEVELOPMENT RESEARCH CENTRE

CENTRE DE RECHERCHES POUR LE DEVELOPPEMENT INTERNATIONAL

June 30, 1981

The Honourable Mark MacGuigan
Secretary of State for External Affairs
Lester B. Pearson Building
Ottawa, Ontario

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, 1981, 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 sincerely,

Donald S. Macdonald

Hon. Donald S. Macdonald, P.C.
Chairman of the Board

Introduction

The past year marked the beginning of IDRC's second decade. It was a year that saw a significant increase in project activity as well as the establishment of a new cooperative program through which the Centre will bring Canadian and developing country research institutions into closer partnership.

The need for increased support for applied research in the developing countries has never been greater. Ironically, some of the achievements of science and technology in recent years serve well to illustrate how much remains to be done.

A generation ago smallpox was a scourge affecting millions of people. During the 1970s it was totally eradicated. But this is only a beginning: researchers are still seeking ways to combat major tropical diseases such as malaria, schistosomiasis, leishmaniasis, and leprosy. Diarrheal diseases continue to affect 90 percent of the rural people in some developing countries and account for an estimated 40 percent of the deaths of children under age 5 in the tropics. Only 30 percent of rural people in the Third World have adequate sanitation facilities, and every day some 25 000 people die because of lack of clean water. New water and sewer technology could save millions of lives.

Also in the 1970s, for the first time, population growth showed signs of slowing down, but the number of people on our planet is still growing at close to 80 million each year. In some regions, population is increasing at a rate double the global average, and in such regions disaster looms. Africa, for example, is unable to increase its food production fast enough to meet the needs of a growing populace.

Agricultural science has so far managed to keep worldwide food production increasing at an unprecedented rate and thus successfully to remain abreast of short-term demand. And some more enduring gains have been recorded: India is now in a position to export some foodstuffs: neighbouring Bangladesh, which was in a desperate food-deficit situation only a few years ago, is fast approaching food self-sufficiency. Nevertheless, more than 100 countries in 1980 ate more food than they produced. According to FAO (Food and Agriculture Organization of the United Nations), cereal production dropped by 9 million tonnes in the same year, and global food reserves are at a dangerously low level.

Increased demand resulting from growing populations and rising expectations is only one of the pressures on agriculture. Many of the new cereal varieties require applications of petroleum-based fertilizers, herbicides, and pesticides that are now too expensive for many of the countries that need them most. Moreover, food crops are in some instances now threatened with competition from fuel crops for "gasohol" as countries desperately seek an alternative to costly imported oil.

Oil prices and population increases are also combining to accelerate the destruction of the world's forests as more and more people come to depend on wood as their sole source of fuel for cooking and heating. At the present rate of deforestation, about half the world's wood supply will be used up by the year 2000, with incalculable, and perhaps irreversible, effects on the global ecology.

IDRC is supporting research in developing countries to control the spread of disease and the growth of population, to increase food production and reduce food losses, to improve the management of natural resources, and to study the human factors involved in underdevelopment. In the fiscal year 1980-81, the Centre's Board of Governors approved 211 new research grants totaling more than \$28 million — making this the busiest year in the Centre's history. Measured against the need for research into the problems of the Third World, it is a small contribution. Yet its impact is increased and its benefit enhanced because virtually all the research is carried out within the developing countries by local scientists working on projects of their own choice, thus strengthening research institutions and providing much-needed training and practical experience.

The bulk of the research supported by the Centre is managed by four program divisions: Agriculture, Food and Nutrition Sciences; Health Sciences; Information Sciences; and Social Sciences. What follows is a brief summary of new activities undertaken by these divisions during the past fiscal year. A complete listing of all the projects for which funds were approved during the year begins on page 16. A more in-depth presentation of the divisions' work is to be found in *Searching*, the Centre's annual review.

Agriculture, Food and Nutrition Sciences **62 projects — \$13.3 million**

The crops and the people of the semi-arid tropics continue to be the major concern of the AFNS division. Foremost among those crops are sorghum and the millets, hardy grains that are staples for millions of people but have often been overlooked by agricultural researchers.

The division supports a number of projects designed to improve these grains. One such project in Uganda continued throughout the troubled years of the 1970s and entered a third phase during the past year to build on the findings of the earlier stages of research. In Somalia, where about half of all arable land is planted to sorghum, a project has just begun that will develop improved varieties with higher yields. In Bangladesh, where the minor millets could provide an important winter crop and insurance against drought, researchers will attempt to increase the use of millets in rice-based agriculture.

Equally important in the semi-arid regions are the grain legumes, which not only serve as a major protein source for the rural poor but also have the ability to improve the soil by fixing nitrogen from the air. Researchers in Bangladesh recently completed the first phase of a project to upgrade local legume varieties and, in a second phase, will test the results under farm conditions. Lentils and chick-peas, staples throughout the Middle East, are the subject of a similar project in Jordan, and, in Egypt, two ongoing projects

dealing with different aspects of legume research entered second phases during the year.

Egypt is also attempting to increase its food production through cultivation of the deserts. The AFNS crops and cropping systems program is playing a part in this effort through support for a project to develop farming systems suitable for desert soils. The study of the systems approach to farming is an area in which the division has given considerable research support, and the Egyptian project will benefit from the experience, as will other new farming systems research. Similar networks of Centre-supported projects operate in Asia and Latin America, where several projects that have shown early promise are continuing with second phase activity.

Oilseeds are another important arid zone crop and have received increasing research support in recent years. Two new projects were approved during the year, one in Sudan, where the problem is low yields of ground-nuts and sesame, and the other in the highlands of Ethiopia, where low yields have resulted in a serious shortage of cooking oils.

In the Andean highlands of Peru, the division's animal sciences program is supporting a project to introduce forage plants that will thrive at these altitudes and enable local farmers to increase cattle production. And, in the same region, the division is supporting a project aimed at more fully exploiting the potential of the llama and the alpaca. Because they live at altitudes beyond the range of most livestock or crops, these camelid animals offer great economic promise for poor mountain farmers.

In Costa Rica, many cattle farmers practice a unique system of dairy and beef production that was the subject of a systematic study carried out with IDRC support. In a second phase, researchers will use farm residues and forage crops on a "model" farm to test ways to improve the system and increase both animal and dairy production. In Egypt, animal scientists have developed feeds based on a wide variety of agricultural by-products. In a second phase, they will test the experimental feeds under farm conditions and develop practical farm-level feed technology.

Farm technology is an important part of the division's postproduction systems program, which takes a systems approach to the handling of food products, from harvest to table. Grants were approved during the past year for projects in Panama and Peru to develop appropriate technologies for processing important regional crops such as bananas, plantains, and potatoes. In Asia, a project to develop a solar dryer in Thailand moved into a second phase under which the prototype dryer will be extensively field-tested. And, in Africa, a project in Zambia will develop a low-cost technology for drying vegetables that are important in the diets of low-income people.

Several projects to develop improved rice-handling technology moved into second or third phase activity during the year. In the Philippines, researchers are developing commercial-scale and village-scale mills, whereas in Korea and Ghana the emphasis is on small-scale, manually operated, portable threshers for field use.

In Thailand, a new project is tackling a different kind of primary processing problem — shelling peanuts. Researchers there aim to develop an effi-

cient, low-cost sheller for use by farmers who at present have no mechanical means of shelling the nuts. Shelling dried legumes is also a time-consuming manual process, and, in Bangladesh, researchers will develop and test simple mechanical dehullers that will help increase the popularity of the five major legumes grown in the region.

For a crop to win consumer confidence, it must be presented in acceptable form. In Tanzania, researchers are hoping to increase the use of sorghum as a dryland crop by developing sorghum-based flours and baked goods that will have popular appeal; in Ethiopia a similar project is developing modern techniques for the production of traditional foods, as well as sorghum-based baby foods.

Processing and preservation of fish present some very different problems, some of which were ingeniously solved in the first two phases of a Centre-supported project in the Philippines. Researchers developed a low-cost fish dryer fueled by rice hulls, which will be field-tested in phase three, as will improved techniques for handling, packaging, and storing dried fish. Salting and solar drying will be among the techniques used in a new fish-processing project in Peru. The use of agricultural wastes as fuel for a hot-air dryer will also be tested.

The division's fisheries program is placing increasing emphasis on research in Latin America, drawing on the extensive experience acquired in Asia over the past 10 years. Wild fish species in the Brazilian Amazon will be studied for their agricultural potential in an ambitious new project. And, in the Dominican Republic, researchers will develop fish cage-culture systems that can be used in lakes, canals, and other waterways to provide a cheap protein source for rural people.

Aquaculture includes plants and other aquatic life forms as well as fish. In Chile, researchers are working with coastal villagers to develop the potential of some of these less traditional sea products, such as molluscs and edible seaweeds. The project aims to provide additional income for people who derive their livelihood from fishing and to help prevent overfishing of the traditional catch. Sea moss is the name given to a type of marine algae found on the shores of the Caribbean island of St. Lucia. Researchers there are using an IDRC grant to develop techniques to cultivate the sea moss, which is edible and also has industrial uses, to provide income and employment for coastal villagers.

One of the main concerns of the division's forestry programs is "social forestry" — providing work, food, fuel, shelter, and fodder for rural villagers. In West Africa, the division supports a network of projects, and, in Peru, research has just begun on the second phase of an afforestation project that is attempting to improve agricultural areas through integration of forestry plantations with farming. The combination of crops, animals, and trees in a systematic way is known as agroforestry.

In 1977, IDRC helped to establish the International Council for Research in Agroforestry (ICRAF) and continues to support the Council with grants for various research activities. In addition, the Centre funds several individual projects in this field.

Although it is, strictly speaking, not a tree, bamboo is also a concern of the forestry program. This versatile plant is used for everything from food to furniture throughout much of the tropics; yet little research on it has been undertaken until recently. The program now supports several bamboo re-

search projects and, in the past year, added another with a grant to Indonesia to study simple low-cost techniques for bamboo preservation.

Health Sciences

39 projects — \$4.6 million

Support for tropical diseases research is one of the major components of the Health Sciences program, and during the year the Centre renewed its grant to the United Nations Special Programme for Research and Training in Tropical Diseases. One of the ailments not covered by this program, however, is Chagas' disease, which damages the heart and is a serious health problem, affecting millions of people in Latin America. With Centre support, researchers in Brazil are studying the relationship between the effects of Chagas' disease and those of alcoholism. In neighbouring Argentina, a new project is attempting to determine the geographic distribution of the virus causing the Argentinian hemorrhagic fever. In Egypt, a project to develop a simple molluscicidal treatment to control the snails that are vectors of schistosomiasis is now in a second phase, during which the researchers will conduct extensive field tests.

The relationship between disease and malnutrition is being studied in several IDRC-supported projects. In Senegal, a new project will study the extent to which moderate malnutrition may reduce the immune response in very young children. Parasites and gastrointestinal infections are major causes of child deaths in developing countries. A new project in Chile is looking at the impact of improved housing and sanitary conditions on diarrheal diseases in adults and children. The division also supports the World Health Organization's global program for the control of diarrheal diseases.

The division's water supply and sanitation program is concerned with the implementation and evaluation of simple, inexpensive methods of supplying potable water. In Ecuador, a grant will enable researchers to study and improve on simple sand filters, and, in Thailand, a project to develop safe catchment and storage systems for rainwater is about to start. A new project in Ethiopia is studying socioeconomic and cultural factors, such as the demand, use, and management of water supply, to develop effective installation programs. In Africa, a major effort is under way to help combat the present scarcity of trained personnel in the water and sanitation fields through a series of national and regional workshops.

Public acceptance is essential to the success of sanitation programs, so in the Philippines the division is supporting a survey of people's attitudes and behaviour to find out why toilet facilities installed in a community may or may not be used. And, in Honduras, researchers are surveying solid garbage disposal practices in a squatter settlement in Tegucigalpa with the aim of developing community-based garbage disposal programs that will be accepted by the people.

Community health services are equally important in the control of disease. Two new projects in the Philippines are part of the division's program to improve rural health care delivery. One is concerned with extending and upgrading the skills of *hilots* — the village midwives — so that they can provide first aid, recognize and refer cases requiring immediate medical attention as well as continuing to provide maternal and child health care and family

planning services. The second aims to design an improved, simplified record-keeping system for village health volunteers. Another new project in Sumatra, Indonesia, is developing a disease-reporting system for community health workers that should play a valuable role in the control of communicable diseases.

An aid to rural health workers and vaccination program managers that could prove to be of global significance is a time-temperature indicator for measles and polio vaccines that will show at a glance whether a vaccine is still potent. This is particularly important in remote areas where the health worker may not have access to refrigerated storage. The Program of Appropriate Technology in Health (PATH) will evaluate the indicator with the aid of an IDRC grant. Oral rehydration, a simple cheap treatment for young children suffering from dehydration as a result of diarrhea, is being promoted in a four-country project in Southeast Asia. This project will develop instructional materials adapted to illiterate and semiliterate populations. The two projects provide simple aids to combat two of the principal causes of child deaths in the developing world.

In Sudan, a new project will follow up work by Sudanese researchers studying mycotoxins — naturally occurring fungal toxins such as moulds that appear on food and that, if eaten, can result in serious illness. The project will pay particular attention to the effects on malnourished children, who are thought to be at greatest risk from ingestion of mycotoxins.

Family planning plays an important role in child health, as it allows the mother a reasonable space between births. The division's program of research for fertility regulation is supporting PIACT (the Program for the Introduction of Contraceptive Technology). This project will devise appropriate information packages to accompany the introduction of new contraceptive implants in three different cultural settings — in Thailand, Ecuador, and Indonesia — and a related project will train medical staff in the use of the implant method. In Chile, research is continuing in the second phase of a project to determine the feasibility of developing antibodies to interfere with the fertilization process. In Canada, the division is supporting researchers studying a possible link between vasectomy and arteriosclerosis — coronary artery disease.

The most recent addition to the work of the Health Sciences Division is the occupational health program, for which two new projects were approved during the past year. In Sudan, researchers will study the prevalence of silicosis among chromite miners and make recommendations for improving working conditions in the mines. And, in Singapore, researchers will review occupational health conditions and facilities in several Asian countries where rapid industrialization has led to an increase in work-related health problems.

Information Sciences

18 projects — \$3.1 million

One main theme of the Information Sciences program continues to be support for international cooperative information systems, which provide a framework for the sharing of information among countries and the optimum use of scarce information resources.

In the past year, the division has continued its support for AGRIS, the

global agricultural information system coordinated by the Food and Agriculture Organization of the United Nations, by helping to apply a multilingual thesaurus to the system. This controlled vocabulary of indexing terms, known as AGROVOC, will enable AGRIS participants to describe, or index, their agricultural documents by subject more completely than at present and to retrieve selected documents with more precision. In Jamaica, the national agricultural information service is being helped to participate both in AGRIS and in the Latin American regional agricultural network, AGRINTER. In Tunisia, another new project will add remote computer terminals to a mechanized agricultural information system and will train the necessary personnel.

In the field of socioeconomic information, renewed grants have been approved for two related regional networks begun with Centre support to serve ministries of planning and similar bodies in the framework of the Development Sciences Information System (DEVSI). INFOPLAN, based at the United Nations Economic Commission for Latin America (CEPAL) in Chile, and CARISPLAN, the subregional network based at the Caribbean Documentation Centre in Trinidad, will both be consolidated during their second phases and will engage the participation of as many countries as possible in their regions. At the Latin American Demographic Centre, another United Nations body located in Chile, a further grant enabled the Latin American population documentation system (DOCPAL) to continue operation.

Another main theme of the division's program is to support specialized information analysis centres, which evaluate information in tightly defined fields and make it available in the most suitable form for various types of user. During the past year, renewed grants have enabled the Asian Institute of Technology (AIT) in Thailand to continue such centres — the Asian Information Centre for Geotechnical Engineering and the International Ferrocement Information Centre. New projects have been developed and approved for an information centre on buffaloes, located in Thailand, and a rattan information centre, located in Malaysia.

At the International Council for Research in Agroforestry (ICRAF), which is based in Kenya, a novel approach will be taken to providing an information service in this diffuse field. Instead of collecting literature in anticipation of demand, ICRAF will draw upon sources of information around the world to meet the requests of its own scientists and the scientists of research projects coordinated by ICRAF. In this way, a specialized file of requests, sources drawn upon, and responses given will be accumulated as the basic resource for the future service. Another unusual information service is operated in Ivory Coast by the African Institute for Economic and Social Development (INADES). This uses bibliographies, photocopies, and traveling boxes of documents to serve *animateurs* in remote rural areas. In a second phase, several branch collections of documents on microfiche, together with microfiche reading equipment, will be set up to complement the present services and to place basic resource material closer to some of the users.

In the completely different field of cartography, the Centre is helping countries make use of the data collected by remote-sensing satellites, which can be used very economically to produce maps for development purposes. A grant to the Regional Remote Sensing Centre (CRTO) in Ouagadougou, Upper Volta, will assist in the training of African research workers in natural resource studies and in the development of appropriate applications of remote-sensing technology.

In addition to the 18 official projects, the division manages a number of in-house projects, one of which is SALUS, a bibliography with abstracts on low-cost rural health care delivery. The machine-readable data base from this project is now backed by a file of microfiche of the documents that were summarized for inclusion in the bibliography. Another in-house project is the Centre library, which continues to serve the Canadian development community. The data base of the library's holdings and several other bibliographic data bases are mounted on the Centre's minicomputer and can be interrogated from remote terminals across the country in institutions where users have been trained. MINISIS, the computer software developed by the division for managing such data bases, has been significantly enhanced and the processing within the computer made more efficient. A new version of the software has been released to the MINISIS licencees, who now number 24. In the past year, agreements have been signed directly with institutions in Morocco, Ethiopia, Singapore, Malaysia, and Korea, and the commercial distributors of MINISIS have negotiated sublicensing agreements with four institutions, three Canadian and one French. MINISIS staff have presented training courses in Ottawa, Singapore, Rabat, and Addis Ababa.

Social Sciences

89 projects — \$7.8 million

The question of how development programs affect the social structures of rural life has always been a concern of the Social Sciences division and continues to be a focus of the division's economics and rural modernization program. In Indonesia, researchers are studying three villages in an effort to better understand the impact of development programs on the lives of the people, so as to be able to improve the implementation of such programs. In the remote and still undeveloped Mustang region of Nepal, the division is supporting a study that will be used to formulate effective development programs adapted to this unique, mountainous area, and, in Southern Thailand, another Centre-supported study will examine means of enhancing this region's participation in national development.

Improving rural living standards also requires more comprehensive agrarian policies. Tackling such problems as market development and the availability of credit on a piecemeal basis has done little for small farmers and landless labourers. In Brazil, the results of a new project examining agricultural improvement programs will help in the development of more comprehensive policies at both the state and the national level. In neighbouring Bolivia, a project is concentrating on analysis and improvement of present production and marketing policies. And, in Uruguay to the south, a study is being made of the impact on small farmers of the country's "open door" trade policy.

Trade policies have a major effect on all sectors of the economy. Korea, for instance, has experienced rapid development based on manufactured exports but is now reassessing some of its commercial policies. An IDRC-supported study will draw up a set of criteria for adjusting Korea's present tariff structure. Thailand, too, is reexamining its trade policies in light of a chronic balance-of-payments deficit that persists in spite of increased exports. Here, too, the Centre is supporting a study to suggest changes in the country's external economic policies. Latin American countries also face major

adjustment problems, and, in Chile, the division is supporting a series of research studies into the macroeconomic policies of countries in the region. The projects will also provide valuable practical experience in macroeconomic analysis for young researchers. The development of research capacity is the main component of a project in Ivory Coast that will help to meet the growing demand for highly qualified economists in Africa through selective support for individuals as well as for seminars and documentation.

The demographic impact of rural development efforts is a principal concern of the division's population and development research program. There were several grants during the year for projects to study the effects of government policies on rural employment. One large project, now in its second phase, is studying rural labour markets in Costa Rica, Guatemala, Honduras, and Nicaragua. A new project in Brazil is examining the causes and effects of internal migrations, particularly the impact on local labour markets. How such population movements affect fertility and family structure is the focus of a study in Argentina, where demographers are concerned about population variations and their relationship to local conditions.

International migrations of labour also affect many countries. An increasing number of contract workers, for instance, are leaving the Philippines to work in the Middle East. The division is supporting a socioeconomic study of these migrant workers, their families, and their communities, to gain a better understanding of the many consequences of this phenomenon and policies that might influence it. Guyana and Surinam are particularly concerned about the negative impact of the loss of skilled labour and professionals through emigration. The Centre is supporting a joint study by the two neighbouring South American countries to analyze migration trends.

The problems of rural-urban migrants are also the subject of a number of studies. In Sri Lanka and Colombia, researchers are studying programs to upgrade squatter and slum communities in order to develop policies for city planners faced with similar problems. A project that evaluates several delivery systems of urban services based on the principle of self-help is being undertaken in Hong Kong, Korea, Indonesia, Malaysia, and the Philippines. The researchers in this project will examine the organization of low-income communities in the cities of these countries.

Creating more jobs and a better standard of living usually demands improved technology, whether in an urban or a rural setting. The division's science and technology policy program is supporting several studies of both modern and traditional technologies — in Ethiopia, Ghana, and Paraguay — with a view to developing local capacity to generate indigenous technological solutions.

At the industrial level, the program is supporting a study of local consulting engineering capacity in Peru, a review of the technological capacity of the chemical industry in Bangladesh, and an examination of how technological change affects small industries in Colombia. In Indonesia, another new project will carry out a series of studies on science and technology policy that will assist the national government in deciding which investments in science and technology may best meet its development objectives. A major new project involving six countries of Africa, Asia, and Latin America will examine the significance of national development banks and their role in technological development — an area that until now has received little research attention.

In the energy field, a number of new projects were approved during the

year dealing with energy policy and use. In Sierra Leone, an IDRC grant will enable researchers to undertake a detailed survey of energy use in the agricultural, industrial, domestic, and transportation sectors in order to develop future energy policies. In Thailand, researchers are studying various forms of renewable energy in 24 villages in an effort to develop an energy policy appropriate to the needs of the rural people. Most of Thailand's industry is fueled by imported oil, and another Centre-supported project is studying the effects that higher prices and limited supply have had on individual firms. Industry's response to the energy crisis may provide indicators for future industrial energy policy.

Technology, at whatever level, usually requires an educated work force. The division's education program supports research into education at all levels — from an evaluation of preschool education in Thailand to an analysis of adult education policies in Ethiopia, India, Tanzania, and Turkey, based on a research model developed in Canada. In Mali, a Centre grant will enable researchers to develop techniques for teaching basic arithmetic to illiterate farmers, and another new grant will support a Chilean study of the changing roles of intellectuals and the universities in public life. Also, in Chile, researchers are studying self-employed plumbers and electricians with a view to devising training programs to improve their skills and their incomes. And, in Upper Volta, researchers are evaluating a training program for village artisans that, it is hoped, will bring about the rapid spread of new agricultural implements.

The program also supports research into educational issues. In Upper Volta, researchers are studying the relationship between formal education and productive work, and, in neighbouring Zaire, a study will examine ways to improve links between the technical education system and employers. A joint project in three Latin American countries is undertaking an intensive study of the complex relationships that surround school and community, whereas in Chile another project will analyze the relationship between higher education and the country's economic development.

The role of women in resettlement programs in Zimbabwe and the best means of helping them to resume the education that was interrupted by the war in that country are the subject of another new project. A large-scale study of the educational participation of adult women is being conducted by the International Council for Adult Education with IDRC support. The study will identify problems and priorities in seven geographic regions of the developing world.

Cooperative Programs

A significant event for IDRC during the past year was the inauguration in October of a new activity: cooperative research, linking Canada's research capacity with the needs of developing countries.

Established in response to the demands made by the developing countries at the United Nations Conference on Science and Technology for Development, this sustained program of cooperative research adds a new dimension to the Centre's project support. The cooperative research program will play a catalytic role, placing Canadian research institutions in direct partnership with developing countries. Many of these collaborative activities will

complement the ongoing work of the four existing program divisions. But there will also be support for cooperative research in any subject that is of demonstrated importance to developing countries and in which there is recognized Canadian expertise.

The director of the new program took up his appointment during the summer of 1980, and the first cooperative project was approved early in 1981. With the addition of a small staff and a budget for the current fiscal year of \$1 million, there will be considerably more cooperative research activity in the months ahead.

Board of Governors

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Projects for which funds were approved during the fiscal year 1980-1981

Agriculture, Food and Nutrition Sciences

76-0001 Aquaculture (Brazil)

The Amazon is one of the largest rivers in the world with the greatest number of fish species, but only five or six of the indigenous species are now cultivated for food. Research is needed so that this natural resource can be brought to full use. With the aim of improving the nutritional, social, and economic level of the people of the Amazon region, the project will train personnel in practical methods for selecting the most suitable wild fish species for aquaculture and fish culture: such methods include studying the reproduction, growth, and feeding habits of the species. The results will be applied to breeding of the fish in captivity and developing of management techniques for raising food species effectively under commercial conditions. 36 months — \$418 900

79-0047 Animal production systems (CATIE) — phase II

In Latin America, small farmers raise different species of livestock that they partially feed with crop residues and home wastes. Cattle and small ruminants are particularly important because they transform wastes and roughage into wool, fibre, food, and work (as draft power). Based on these facts the Centro Agronómico Tropical de Investigación y Enseñanza has conducted a systematic study of cattle production: phase II of its research will be devoted to dual-purpose (dairy-meat) production systems: determining the nutritive value of crop residues, by-products, and improved forages for use in the systems and studying the agronomic management of existing cropping systems as a step toward greater returns and benefits for smallholders. 36 months — \$489 000

79-0098 Langosta (Cuba)

Cuba is a major producer of spiny lobster or langosta. However, the country needs to increase catch yield, improve the quality of the raw material and the final product, reduce losses caused by mechanical damage and injury to live lobsters, and increase production of whole frozen precooked lobster and whole frozen raw lobster. The project will improve at-sea and on-shore handling systems for lobster by studying the factors of mortality (diseases, parasites,

water quality) and designing suitable systems to ensure maximum survival under various sea-holding conditions at 12 holding centres. 24 months — \$73 700

79-0120 Desert farming systems (Egypt)

Given the increasing population pressure upon existing arable land, Egypt has no alternative but to create desert settlements that will provide increased agricultural production, generate local industries, and relieve population pressures in the overcrowded urban areas. The project will establish farming systems suitable for desert soils by studying water management, soil regeneration and fertility, drought-tolerant fodder crops, animal production, different trees for use as windbreaks and as sources for fuel, food, and fodder. 36 months — \$358 000

79-0124 Potato dehydration (Peru)

Potatoes are an indigenous and extremely important food crop for the people of Latin America. However, most processing is done in individual homes by hand, and there are problems of storage, transportation, and marketing. An improved process would produce a more uniform quality of *papa seca* (traditional dried potato) suitable for marketing and would increase revenue. The project will develop a village-level or cooperative method for processing of potatoes for market in Peruvian urban and rural centres. 24 months — \$74 300

79-0134 Grain legumes (Bangladesh) — phase II

Pulses (dried legume seeds) provide a major part of the protein intake of the population of Bangladesh. But production, land under cultivation, and yields of pulses have shown a downward trend in the past 10 years. Phase I of this project tested improved legume cultivars (grass-pea, chick-pea, lentils, black gram, and pigeon pea) and identified the most promising ones for increased production. Phase II will continue breeding improved cultivars; determine agronomic practices that provide adequate returns to farmers; identify appropriate resistances to diseases and pests; improve nitrogen-fixing characteristics; and study suitable irrigation, planting, intercropping, and mixed cropping patterns. 36 months — \$400 800

79-0140 Millets (Bangladesh)

The minor millets are extremely important food crops with a great potential. They give a quick crop during the winter period and are an insurance for times of

drought or disaster from floods. In order to increase the utilization of these crops in the rice-based cropping systems of Bangladesh, this project will breed improved cultivars and study farmers' practices. 36 months — \$282 700

79-0156 Banana processing (UPEB)

Although the banana industry in Central America provides a major source of export revenues, few benefits accrue to small producers. Approximately 15-20 percent of the banana crop, which does not meet export standards, is wasted. The Union de Países Exportadores de Banano will develop a rural banana-processing industry for this wasted resource to produce low-cost food products, such as banana cake, puree, chips, beer, etc., for the benefit of rural producers and consumers. 24 months — \$160 500

79-0160 Cage culture (Dominican Republic)

Inland fish is the cheapest source of animal protein to be found on the market in Dominican Republic (even cheaper than sea fish or chicken) and perhaps has the greatest potential to satisfy protein needs in the diets of rural communities. Thus, simple cage-culture systems that exploit fish resources in the lakes, dams, canals, and ponds available in the country should help improve the nutritional levels and incomes of small producers in rural areas and contribute toward an improved attitude regarding water use in their environment. The project will test cages and enclosures of various designs under different local conditions with native and introduced species that can be farmed singly or in combination. 36 months — \$140 100

79-0172 Food legume insect control (Upper Volta)

Cowpeas are particularly important in farming systems in many developing countries because of their nitrogen-fixing capability that improves soil fertility and because of their spreading habit that protects the soil from erosion. Insect damage is the main limiting factor to cowpea production. The bruchid, in particular, causes severe losses, its damage starting in the field and continuing in the stored crop. This pest is the focus of a project that aims to develop cowpea breeding materials resistant to attack by bruchids: to investigate the biology and ecology of the pest; and to determine the efficacy of traditional methods of cowpea protection. 24 months — \$144 300

79-0173 Farming systems (Tanzania)

This project builds on earlier cropping systems research in Tanzania supported by IDRC. It will form part of a network of farming systems projects in Africa and will draw on experience gained in similar networks in Asia and Latin America. The project will design, adapt, and test practical technologies and study farm management practices in several diverse areas of the country. 36 months — \$169 000

80-0002 Sea moss (St. Lucia)

The seasonal nature of St. Lucia's fisheries, combined with the scarcity of alternative employment opportunities, means that many inhabitants are without a steady income. Diversifying the fishing industry is one

way to cope with fluctuations in demand for labour. In view of the local and regional demand for sea moss as food and as raw material for industries, this plant has particular promise and is being investigated in a project to develop cultivation techniques for marine algae among fishing village communities in St. Lucia. Specific objectives are to study growth rates and limiting factors in the fishing industry as well as to establish profitable operational methods for different species by test cultures. 36 months — \$172 300

80-0003 Fertilizer development (IFDC) — phase III

Phases I and II of a project undertaken by the International Fertilizer Development Center were to determine the value of various types of phosphate rock (as plant and soil nutrients) for crop production in Latin America. Results indicated that indigenous phosphate rock deposits could be used to increase the fertility of the acidic soils. The third phase of the project is to develop a phosphorous management strategy for the various crops and cropping systems now employed in the subtropical and tropical areas of the region, to evaluate the effectiveness of the native sources for, and application of, phosphate fertilizers, and to continue experiments and basic studies. 24 months — \$384 000

80-0006 By-products (Egypt) — phase II

In phase I of this project, feeding animals agricultural and agroindustrial by-products (rice hulls, sugarcane bagasse, pea pods, orange peel, etc.) was shown to be a feasible means by which to increase the amount of animal feeds in Egypt. Phase II will improve the nutritive value of low-quality roughages by physical, chemical, and microbiological treatments and implement practical processing methods in animal feeding trials on a semicommercial level in farmers' fields. 36 months — \$298 900

80-0009 Faba bean diseases (Canada)

Faba beans or broad beans are the fourth most important pulse crop in the world and an important source of dietary protein throughout Egypt, Northern Sudan, Ethiopia, and elsewhere in North Africa. *Ascochyta* blight (*A. fabae*) is a disease that builds, spreads rapidly, and is devastating wherever faba beans are grown under dryland conditions. This project will enable the University of Manitoba to conduct the basic backup research needed by ICARDA (the International Center for Agricultural Research in the Dry Areas) in a program to breed new lines of faba beans that are resistant to *Ascochyta* blight. 24 months — \$114 300

80-0010 Sorghum utilization (Ethiopia)

Sorghum is an important food crop in the semi-arid regions of Ethiopia. New, improved varieties mean that the crop is less dependent on rainfall, is less affected by fluctuations in moisture, and is producing higher yields than ever before. Still, there is a need to increase its production and adoption both for domestic and for industrial purposes, especially in the making of bread and infant foods. The project will increase the use of sorghum in popular and widely

consumed foods in Ethiopia: quantify the existing methods, equipment, ingredients, costs, and product qualities for bread and injera (a traditional, fermented pancake-like bread); develop formulas for bakery bread; and test the acceptability of the bread and of infant foods. 36 months — \$108 300

80-0011 Phosphate fertilizers (IFDC/West Africa)

In the Sahelian countries, the soils are relatively infertile and acidic. However, it has been found that soil acidity liberates phosphate in the underlying rock and makes it available for crop growth. Capitalizing on this finding is the aim of the International Fertilizer Development Center in a project to increase the contribution of rock phosphate fertilizer to food production in Mali. Specifically, it will determine the dissolution characteristics of various phosphates related to rock treatment, crop and climate characteristics, and determine ways of applying results in the region. 36 months — \$302 000

80-0012 Isabela postharvest system (Philippines)

Although small-farm postharvest facilities for drying, storing, and transporting crops are available in the Philippines, few farmers possess or can afford them. Thus, the technology is not widely accessible and postharvest losses continue to be high. A project to improve the delivery system for available techniques is under way. It will work with farmers in a typical cooperative, determine the most suitable postharvest system for them, verify the system's acceptability, and establish four postharvest centres within the area. 24 months — \$96 200

80-0013 Small-farm equipment (Ghana) — phase II

Rice is the major crop grown by the farmers in Ghana, but, at present, harvesting and processing activities are so labour-intensive that they are limiting production. Easing the labour requirement is the aim of this project, phase I of which developed pedal-operated rice threshers and determined their acceptance by farmers as well as their reliability and costs. Phase II will improve the performance and durability of the existing threshers: test and evaluate a winnower; and determine the social, economic, and manufacturing parameters of the equipment in several rice-producing regions of Ghana. 30 months — \$51 800

80-0014 Postharvest rice technology (Philippines) — phase II

Phase I of this project established a package of equipment and operating procedures for a *cono* — a large commercial rice mill — and developed a village-type rice mill (*kiskisan*) that is more efficient than the existing mill. Phase II will work with rice mill operators to develop a pilot *cono* mill; it will also modify the *kiskisan* rice mill so that it can be manufactured locally and will conduct technical and economic evaluations of predrying and prethreshing handling studies. 24 months — \$85 100

80-0017 Bamboo preservation (Indonesia)

In Indonesia, bamboo is an important multipurpose

raw material used for construction, furniture, kitchenware, and tools. But the durability of bamboo is generally low when it is exposed to weather or when it comes in contact with the ground. This project will obtain information about the effectiveness of traditional methods of protecting bamboo against insects and fungi and will study the life cycle of the main bamboo borers in the area. It is hoped the information will provide the basis for simple and cheap preservation methods. 24 months — \$29 100

80-0021 Lentil and chick-pea improvement and mechanization (Jordan)

Lentils and chick-peas are consumed by the majority of people in Jordan and throughout the Middle East and are an important source of food protein. At present, much of the demand is met by imports, local yields being low because of insects, diseases, and poor harvesting techniques. To increase the production of the two crops, this project will improve mechanized harvesting, develop improved cultivars and cultural practices suitable for different ecological conditions, and test and adapt the locally developed harvesting machine. 36 months — \$266 500

80-0027 Casuarina (Egypt) — phase II

Phase I initiated research into the breeding and improvement of *Casuarina* for shelterbelts and woodlots in Egypt: many superior trees were selected, several seed production areas were identified, and new lines of research were initiated. Phase II will pursue the program to obtain genetically improved vegetative material, selecting fast-growing and well-adapted trees with desirable stem, crown, and branch characteristics that will offer good protection to cultivated land. Specific objectives are to carry out field trials of the plant material to determine its performance under different climatic conditions and investigate the nitrogen fixation and reproduction characteristics of *Casuarina* species. 36 months — \$175 300

80-0028 Afforestation (Peru) — phase II

Phase I of the afforestation project consisted of trials in three major agrarian zones of Peru to select suitable tree species for the establishment of forest plantations. It also investigated nursery and plantation techniques and the possible integration of plantation forestry with pastoral farming. Phase II will continue species trials and will develop techniques to establish tree plantations on marginal agricultural sites so that wood and food production can be increased in rural communities. 36 months — \$384 000

80-0032 International Council for Research in Agroforestry (ICRAF) — phase IV

Phase IV of this project will enable the International Council for Research in Agroforestry to continue channeling the resources in agroforestry research and promoting the adaptation, among developing countries, of the useful knowledge and systems derived from such research. 12 months — \$300 000

80-0055 Fish processing (Malaysia)

In Malaysia, the main source of animal protein is fish that is sun-dried under conditions far from ideal. As

the drying season is short, the drying time and, therefore, the quality of the sun-dried product, its storage life, and market price vary significantly. This project will develop a hot-air dryer for production of salted, dried fish, test the drying technology in a rural fishing cooperative, and evaluate its operational acceptability and economic feasibility. 36 months — \$131 300

80-0056 Sorghum and millets (Uganda) — phase III

In Uganda, finger millets are a staple food used as a flour, either alone or mixed with cassava, to make the local unleavened bread *atap*. Sorghum replaces finger millets in areas where rainfall is less reliable and soils poorer. Both crops are important to smallholder farmers and to the diets of the rural people. Phase III of this project will continue to develop cultivars, the aim being better and more consistent yields, and will establish a foundation seed production program. 36 months — \$307 300

80-0057 Fish culture (Singapore) — phase II

As a result of the new Law of the Sea negotiations, Singapore has limited areas for marine capture fishing. Demand for fish and fish products is high and is likely to continue; therefore the government has placed a high priority on maximizing fish production through intensive aquaculture. Research toward this priority is the aim of an IDRC project entering phase II. The objectives of phase I were to develop intensive culture techniques in cages and raceways, techniques of induced breeding, mass culture techniques for production of micro- and macroorganisms as live food for fish, and fish feed technology based on inexpensive raw materials. Phase II will continue to work on the same objectives with particular emphasis on testing the system for commercial application and further testing and optimization of a setup that recycles fresh water. 36 months — \$239 200

80-0058 Pasture management (Peru) — phase II

Phase I of this project designed experimental pasture management techniques, introduced new grass and legume forage species, and studied their ability to maintain pasture productivity during the dry months and to restore, economically, the productivity of degraded lands. Phase II will continue research into pastures for livestock and meat production in the high Andean region of Peru, its objectives being fundamentally the same as those of phase I. 36 months — \$263 400

80-0059 Postharvest rice systems (Korea) — phase III

The objective of phase I of a postharvest rice systems project in Korea was to reduce the postproduction grain losses, which are particularly high with the new high-yielding varieties. Phase II developed a thresher that is capable of threshing wet rice and is easily moved from field to field. Phase III will continue to modify small-scale rice systems, improving the field paddy thresher and extending research into storage techniques, improvement of small-scale rice mills, and modification of binders or reapers to reduce grain

losses caused by shattering during harvesting. 24 months — \$114 600

80-0060 Solar rice drying (Thailand) — phase II

There is no question of the importance of rice in the Thai diet, as the country's 44 million people obtain more than 80 percent of their daily calories and protein from rice. New varieties and irrigation methods have made increased production possible, but harvest takes place during the wet season and losses from spoilage are high. These problems required a low-cost, simply constructed rice dryer suitable for the second high-moisture paddy crop harvested on small Thai farms. Phase I developed a method that freed the product from impurities, minimized losses caused by moulds and animals, and prevented the harvest from being ruined by rain or dew. Phase II will optimize the dryer prototype and determine its acceptability, technical feasibility, and economic viability. 24 months — \$109 800

80-0062 Legume processing (Bangladesh)

The decline in pulse (dried legume seeds) consumption in Bangladesh is mainly attributable to lack of a pulse-dehulling method, the traditional one being inefficient and time-consuming. This project will introduce an improved, dehulling system to increase the quantity and quality of pulses available to the people of Bangladesh, compare it with the existing mechanical system, and determine its capabilities and weaknesses; field-test the best improved systems under usual conditions; and recommend pulse dehulling systems suitable for rural use. 36 months — \$123 500

80-0064 Vegetable dehydration (Zambia)

Vegetables are major ingredients in the sauces and stews eaten in Zambia and are especially important in the diets of low-income urban and rural consumers. They are very perishable, and because of seasonal gluts and scarcities and the inadequate transportation system between production and consumption areas, there are substantial losses. This project will develop a simple low-cost technology for dehydration to improve the quality of dried vegetables, maximizing the vitamin A content, flavour, colour, and texture of dried vegetables as well as the operation and performance of the prototype vegetable dryer. 36 months — \$101 000

80-0065 Legume processing (Indonesia) — phase II

Velvet beans are an important and nutritious low-cost substitute for soybeans in the fermented food *tempeh* in Indonesia. However, boiling (which facilitates the peeling and cooking of the beans) requires quantities of water that are often not available in the dry regions. Phase I conducted a survey of the varieties of velvet beans in four provinces and focused on processing techniques requiring small amounts of water. Phase II will continue to improve the quality of velvet bean *tempeh*; further develop improved processing steps (boiling, soaking, peeling, and mincing); and determine processing characteristics of new high-

yielding varieties of velvet beans. 36 months — \$93 500

80-0066 Fish processing (Peru)

Peru is one of the major fishing nations in the world: yet an insignificant proportion of its catch reaches the domestic food markets. Most of the catch is used in fishmeal production, which is a major source of foreign exchange. Small fisherfolk supply the domestic market, where there is a large and unsatisfied need for protein, particularly among urban poor. Much of the time fish is unavailable because of poor handling, processing, storage, and distribution techniques. This project will design, in a remote Peruvian fishing village, fish salting and drying procedures for producing stable products. Use of local agricultural waste materials as low-cost fuel sources in a hot-air fish dryer and solar drying will be investigated. 36 months — \$128 900

80-0072 Rural university (Colombia)

FUNDAEC (the Foundation for the Application and Teaching of the Sciences) believes that what rural people need is not minimum learning but the application of higher education and scientific insight and the opportunity to collaborate with experts from their own area committed to their development. This project will focus on an approach to the training of new kinds of rural personnel through a "rural university" that offers experimentation with new agricultural practices and technologies appropriate to the peasant economy. Specifically, it will test improved crop and animal production subsystems, develop village-level tutorial extension programs, and evaluate the larger rural development strategy of the rural university concept. 36 months — \$164 150

80-0076 Village woodlots (Niger) — phase II

In several areas of the Sahel region south of the Sahara, there is an increasing shortage of firewood because of the gradual disappearance of natural forests. This project aims to enable the rural peoples to plant and grow trees with their own means on their lands to produce firewood and lumber. A promising start was made in the first phase of research, including the establishment of some successful woodlots. Phase II will continue testing species as well as methods of producing plants and planting trees: teach villagers the appropriate forestry techniques; and develop methods of protecting natural regeneration of trees. 36 months — \$165 000

80-0082 Food grain improvement (Sri Lanka) — phase II

Pulses are an important component of the Sri Lankan diet, contributing relatively cheap protein to the great majority of the people; food grains, too, are important, and their production at the local level has become more of a priority as subsidies on imported grains have been removed. To aid Sri Lankans in growing as much of their own pulses and food grains as possible, a project for crop improvement is under way. Phase I produced more productive cultivars of green gram, cowpea, finger millet, sorghum, etc.

Phase II will continue to develop improved cultivars and will emphasize agronomic techniques, including cultural and economically sound chemical methods, of controlling pests and diseases. 36 months — \$279 900

80-0102 Oilseeds (Sudan)

Groundnuts and sesame are important oilseed crops for smallholders in Sudan. The average yields are low, however, because of low-yielding varieties and poor cultural practices. These two problems are the focus of a project that will develop improved, high-yielding, disease-resistant, and drought-tolerant groundnut cultivars; develop improved sesame cultivars for rainfed agriculture; and investigate the cultural practices most suitable for the selected varieties. Soybean production will also be investigated. 36 months — \$256 000

80-0103 Sorghum improvement (Somalia)

About half of all arable land in Somalia is planted to sorghum. Sorghum is well-adapted to the semi-arid conditions prevailing in the country, but there is a need to develop high-yielding, drought-tolerant, fast-maturing varieties that are resistant to disease and birds in order to make progress toward self-sufficiency in this staple. This project will improve sorghum cultivars, develop soil and crop management practices suitable for the different agroecological zones in Somalia, and test the varieties for consumer acceptability and storage quality. 24 months — \$276 900

80-0107 Invertebrates-seaweeds (Chile)

On the continental shelf of the Chilean coast, there are many important marine species of invertebrates and algae that could be cultured under semicontrolled conditions. This project will attempt to increase and diversify production of some of the nontraditional sea species such as various molluscs and seaweeds. The researchers will work closely with fishermen and women in several villages to study their present practices and develop practical programs for the cultivation of new species to prevent overfishing of other species. 36 months — \$280 000

80-0109 South American camelids (Peru)

The alpaca and llama are able to live at high altitudes beyond normal livestock or crop production ranges. They provide meat, wool, and skins to poor highland peasants in the Andes region. However, the full potential of these camelids is not exploited because little is known of their production characteristics. This project will develop improved management techniques and associated feeding systems, disease prevention and control schemes, and appropriate animal husbandry techniques to increase the alpaca production efficiency and to extend the new technology among peasant producers. 36 months — \$243 300

80-0114 Cropping systems (Nicaragua) — phase II

In Nicaragua, there is a wide range of food production problems and a lack of resources to upgrade the research capability. Phase I of this project collected

data on existing farming practices, constraints influencing production and agronomic practices, and tested various experimental systems with promising results. Phase II will see a substantial expansion of this work, particularly in on-farm trials of apparently successful systems and evaluation of new crops and varieties. The project will also support the development and improve the capacity of national agricultural research and extension institutions. 36 months — \$302 500

80-0115 Quinoa (Bolivia) — phase II

Quinoa, a plant indigenous to the Andes, has been a main source of food energy and nutrients for Amerindians of the High Andes for as long as recorded history. The seeds of quinoa have a superior protein composition to any known cereal grain or food legume, and the genetic improvement and development of better agronomic practices in the production of quinoa was the focus of phase I of this project, including an evaluation of the germ-plasm bank, reproduction studies, genetic studies, seed production of improved varieties, and training activities for both staff and farmers. Phase II will continue to improve quinoa through hybridization and crosses; to study the genetics of the crop; to improve agronomic practices; and to train technical personnel, students, and quinoa producers. 36 months — \$352 600

80-0116 Cassava mealybug (CIBC) — phase II

The cassava mealybug (CMB), *Phenacoccus manihoti*, appears to have been introduced into tropical West Africa from South America in recent years. Since its discovery in Congo and Zaire in the early 1970s, it has spread to Angola, Benin, Gabon, Gambia, Nigeria, and Senegal. Biological control of the pest is the aim of a project conducted by the Commonwealth Institute of Biological Control. Phase I research in South America indicated that the mealybug is controlled in its original habitat by a large complex of natural enemies. Phase II continues to investigate the biology and ecology of the mealybug and parasite-host interactions. The idea is to provide natural enemies of the mealybug to all affected African territories. Further surveys will be undertaken in cassava-growing areas to discover additional predators and parasites. 36 months — \$143 500

80-0118 Food legume improvement (Egypt) — phase II

Phase I of this project identified disease-resistant, better-yielding, higher-protein varieties of faba beans, lentils, and chick-peas. Phase II will continue breeding varieties suitable to the different agroecological regions of Egypt for better seed quality, major disease resistance, and higher protein content. Lentils will be adapted to nontraditional areas of production; economic evaluation of production technology of faba beans and lentils on farmers' fields will be completed; and the potential of introducing new early-yielding varieties into the Egyptian cropping system will be explored. 36 months — \$311 200

80-0120 Cropping systems (WINBAN) — phase II

To improve land use and the nutritional base of rural people in the Windward Islands, the Windward Islands Banana Growers' Association (WINBAN) has conducted experiments that demonstrated that several food crops can be grown with bananas and plantains. In the second phase of research, the group will further develop and demonstrate the most promising intercropping systems, which include peanuts, sweet potatoes, dasheen, maize, and tannia; introduce grain legumes such as cowpeas, mungbeans, or groundnuts to create new cropping patterns; and continue to study the effects of intercrops on the plantain and banana production. 36 months — \$432 900

80-0121 Crop intensification (Syria) — phase II

The traditional farming system in the rainfed lands of Syria barely manages to provide subsistence. In attempting to develop more productive and stable cropping systems for small farmers, phase I of this project designed new, improved crop rotations and selected a large volume of breeding material for cereals, food legumes, and oilseeds. Phase II will continue to assess the effects of the new crop rotation, develop fertilizer management and soil moisture conservation techniques, and continue the evaluation of the most promising varieties of wheat, faba beans, lentils, and chick-peas. 36 months — \$311 300

80-0125 Faba beans (Egypt) — phase II

Phase I of this project sought to identify the agronomic and storage factors affecting cooking and nutritional quality of faba beans. Phase II will continue this research to develop simple, rapid methods for evaluating and predicting the cooking quality of beans to guide plant breeders and others in efforts to develop improved varieties and better storage practices. 30 months — \$160 200

80-0126 Solar dehydration (Egypt) — phase II

To develop methods of using available solar energy for drying and preserving fruits, vegetables, and fish, phase I of this project designed a community size solar dehydrator and a family-sized dryer. Phase II will optimize and field-test the designs and train a staff of engineers and technicians. 24 months — \$161 500

80-0127 Legumes: postharvest technology (Bangladesh)

In Bangladesh, where animal protein is too expensive for the majority of the rural population, this project aims to increase the quantity and quality of legumes available to Bangladesh consumers. It will attempt to decrease losses following harvest by developing improved on-farm drying, storage, and management for five major legumes (vetch, lentils, chick-pea, black gram, and pigeon pea) and by developing suitable training methods to demonstrate and encourage adoption of improved postproduction systems. 36 months — \$187 400

80-0128 Groundnut shellers (Thailand)

Thai farmers produce approximately 150 000 tonnes of groundnuts a year. They sell their crop unshelled immediately after harvest primarily because they do

not have access to shelling machines or adequate storage facilities. A simple, low-cost, efficient ground-nut sheller would increase considerably the value of the harvest and is the goal of this project. Researchers will select four of the most promising available shellers, test, evaluate, and modify them to produce a suitable prototype. Finally the sheller will be tested under farm conditions, and demonstration and training programs developed to ensure widespread dissemination of the technology. 24 months — \$47 700

80-0129 Sorghum utilization (Tanzania)

In Tanzania, sorghum has a great potential as a dry-land grain crop. However, there is a relatively low demand for sorghum because the removal of the pericarp or hull involves hard domestic work, and the flour from it may have a less-appealing taste, texture, and consistency than maize or wheat flours. To increase the utilization of sorghum and sorghum flour, this project will identify the flour-based products in which sorghum could be substituted for other flours; determine the performance of sorghum flour in these products; and test the consumer acceptability of these products. 36 months — \$89 900

80-0130 Agroforestry (IITA) — phase II

In phase I of this project, the International Institute of Tropical Agriculture completed field surveys to identify present agricultural and land-use systems combining food and tree crops. It also initiated intercropping trials of woody species and staple food crops in the humid and subhumid zones of Nigeria. In phase II, researchers will plant woody species and cultivate crops of yam and cowpea between the rows of trees; observe the effects of root interaction and shading; evaluate the growth performance of tree and shrub species and their responses to different frequencies and heights of pruning; and correlate soil fertility parameters. 12 months — \$180 400

80-0131 Highland oil crops improvement (Ethiopia)

In Ethiopia, oilseeds supply the basic fat in the diet of the majority of the population. However, yields are low and result in a serious shortage. This project will improve the production of five major oilseeds (noug, linseed, rapeseed, mustard, and sunflower) through developing stable, high-yielding cultivars resistant to diseases, frost, lodging, periods of water stress, and bird predation. 36 months — \$375 300

80-0132 Oilseeds network (Eastern African and Indian Region)

Vegetable oils and fats from groundnuts, sesame, oil palm, sunflower, coconuts, and safflower are vital to the diets of people of the developing world and there are several projects under way to improve the crops from which the oils are derived. A network will be established to link the many individual projects so that there is a steady flow of information, plant materials, experiences, and ideas between them. A network adviser located in Ethiopia will provide information, gather and distribute germ plasm, and conduct workshops for involved scientists. 36 months — \$324 100

80-0137 Fish processing (Philippines) — phase III

Hot-air dehydration of fish is the method of preservation that absorbs the least amount of energy. Phases I and II of a project on fish processing developed and tested various dryers using electricity, liquid propane, and kerosine as heating sources. Ultimately, cost factors eliminated these sources, and further research led to the development of an efficient low-cost, rice-hull-burning fish dryer. Phase III will continue to improve the rice-hull dryer; test improved procedures for drying, handling, packaging, and storing dried fish; and study the economic factors affecting adoption by potential users. 30 months — \$121 600

80-0138 Food processing equipment (Thailand)

This project is closely linked to another IDRC-supported project in Thailand (Village Food Processing Centres, 78-0078). Several processing equipment problems associated with toasting and grinding locally grown ingredients into infant foods have been identified. To develop a more appropriate system for processing infant foods in the village food processing centres, this project will evaluate and compare grinding and toasting equipment and determine their efficiency in processing rice, legumes, and oilseeds. Cost of equipment, power requirements, capacity, and ease of operation and maintenance are other factors that will be studied. 24 months — \$74 400

80-0166 Fertilizer efficiency (Egypt) — phase II

Many soils of the developing world are phosphorus-deficient. The phosphorus fertilizers that are added to the soils are rapidly immobilized. To retard the process with additives was the goal of phase I of this project. Phase II will continue to investigate the beneficial use of crystal-growth inhibitors in calcareous soils; explore the use of mycorrhizae as a means to improve phosphorus availability for field crops; and establish a system for management of phosphorus in calcareous soils. 36 months — \$312 000

80-0167 Timber grading (Mexico) — phase II

The development of appropriate code rules and design specifications for the use of lumber is a major task in a country like Mexico because of the scarcity of technical information available. Phase I of this project conducted a series of mechanical tests to determine design values for Mexican lumber and other technical data of importance for the use of wood in construction. Phase II will verify the application of the grading rules developed for other lumber sizes and other uses of the country, derive suitable design values for various strength properties, and test the applicability of mechanical-stress grading for Mexican pine. 24 months — \$71 800

80-0184 Irrigated forest plantations (Mali) — phase II

In Mali, large areas of land that is at present uncultivated could be turned to production of firewood and forage. This is the underlying premise of a project for irrigated forest plantations in the country. Phase I saw the establishment of a research station, the training of young researchers, and promising results from

tree plantations at a modest cost. Phase II will continue to select and study species appropriate for the region, develop planting techniques that require little water, and disseminate the results to the farmers. 36 months — \$203 200

Cooperative Programs

80-0144 Sorghum milling TADD method (PRL)

Until recently it has not been possible to evaluate the dehulling characteristics of the large number of sorghum cultivars, due to the absence of a convenient method for evaluating small samples. This changed with the development by the Prairie Regional Laboratory (Edmonton, Canada) of the prototype tangential abrasive dehulling device (TADD), which evaluates milling characteristics in the laboratory. This project will field-test the TADD prototype in sorghum breeding programs in Mali, Ethiopia, and India and evaluate its effectiveness as a research tool for routine use. 24 months — \$158 000

Health Sciences

79-0102 Malnutrition-immunocompetence (Senegal)

Malnutrition continues to threaten the health and survival of infants and children. Infections aggravate malnutrition, and malnutrition lowers the child's resistance to infections. There is an intimate relationship between nutrition, immune response, and infection; any disturbance of one of these factors will affect the other two. More information is needed about the extent to which marginal and moderate malnutrition may weaken the immune response in children between the ages of 6 months and 3 years. The project will select and assess the nutritional status of 300 children and test the potency of various vaccines (tuberculosis, measles, and tetanus) in relation to their status. 36 months — \$219 310

80-0023 Personnel training project (Africa)

In the developing world, a special effort must be made to overcome the lack of adequate water supply and sanitation facilities, the scarcity of adequately trained personnel, and the lack of information on newly developed low-cost technologies. A training project comprising regional and national workshops will be set up to provide information on research studies and other technical advances to key personnel involved in planning and training in their respective countries. This will enable them to upgrade present curricula in country training programs and to equip the professional, technician, and field assistant-worker

with the necessary background to meet the increased activities expected in this field. 9 months — \$108 100

80-0024 Fertility research (Southeast Asia) — phase III

Phase III of this project aims at upgrading skills in data handling and analysis through a series of training sessions and provision of the necessary equipment. The project will also finalize studies initiated during previous phases and undertake three new studies. 36 months — \$290 000

80-0025 Fluorosis (India)

High levels of fluoride in drinking water are a major public health problem in India; excessive intake of fluoride adversely affects teeth formation and causes abnormal hardening of bones, leading to a condition known as fluorosis, which is enhanced by poor diets with calcium and vitamin deficiencies. This project will test possible measures to arrest the pathologic process of fluoride poisoning, probe the mechanism of action of fluorides on tissues, and provide patients with a water supply containing permissible levels of fluoride and nutritional supplements. 36 months — \$220 000

80-0026 Septic abortion (India)

In spite of the fact that legal abortion facilities exist in India, septic abortion is still a major health problem. This project will examine the effectiveness of different treatment regimens used for septic abortion in hospitals; make recommendations for improvements and standardization of techniques; determine the reasons for the high dropout rate for medical termination of pregnancy (MTP); and improve the delivery of MTP services. 30 months — \$125 000

80-0030 Silicosis (Sudan)

Silicosis is one of the most serious of the dust diseases related to occupation, leading to fibrosis and often accompanied by tuberculosis. In developing countries, conditions in many industries are primitive, allowing little protection for the health of the individual. The project will assess the working conditions inside the mines (dust level, degree of thermal comfort) in Ingussana, Sudan, determine the prevalence of silicosis among the chromite miners there, and assist in making recommendations for implementing measures to control dust in the mines. 9 months — \$16 355

80-0035 Vasectomy arteriosclerosis (Canada)

Vasectomy, or male sterilization, has become a significant component of national family planning programs in developing countries and is very popular in developed countries. Recent studies have given rise to concern about a possible link between vasectomy and increased risk of arteriosclerosis. Given the increasing number of men who have undergone vasectomy, the project will attempt to clarify, by immunologic studies, the relationship between vasectomy, the subsequent presence of antisperm antibodies, and arteriosclerosis (coronary artery disease) in men between the ages of 30 and 60. 12 months — \$24 550

80-0040 Occupational health inventory (Singapore)

Rapid industrialization in urban areas and in the agricultural sector of rural areas has led to a marked increase in a number of diseases and accidents related to occupation. The lack of trained occupational health and safety personnel adds to the difficulties of implementing and supervising preventive measures that could improve working conditions. This project will carry out an in-depth study of occupational health conditions and facilities in several Asian countries to determine the number of physicians, safety officers, industrial hygienists, and other personnel; investigate industrial health services for large and small establishments; and make recommendations for improved occupational health programs. 12 months — \$42 350

80-0044 Water demand and design criteria (Guatemala)

The majority of the rural villages in Guatemala lack systems to provide water in sufficient quantity and quality on a regular basis. To be both technically and economically efficient, the water systems must be based on reliable design criteria. This project will evaluate actual water demand, considering the population, water-use practices, the seasonal variations, in five rural communities and recommend design standards for water supply. A second component is to evaluate three different types of existing systems and recommend improvements compatible with available resources. 12 months — \$31 020

80-0068 Family planning materials/PIACT (Global)

The Program for the Introduction and Adaptation of Contraceptive Technology recognizes that, if new methods of contraception are to be adopted, they must be accompanied by adequate information. In this project the PIACT will introduce a hormonal silastic implant (Norplant) in three different cultural settings, Thailand, Indonesia, and Ecuador, and provide a series of instructional materials — pamphlets for accepters, including one for illiterates; a fact book for suppliers; and an institutional manual for doctors and nurses — on proper use and other relevant information. 18 months — \$150 552

80-0069 Time-temperature indicators (Global)

The development of vaccines against certain communicable diseases has been a major step in the fight against mortality and morbidity. However, the biggest obstacle to successful immunization programs is keeping vaccines safe and effective through refrigeration from manufacture to use. Vaccines deteriorate when exposed to sunlight or increasing temperature, and health personnel have no way of knowing whether a vaccine is still effective. This project will focus on the evaluation of a promising new time-temperature (t-t) colour indicator for measles vaccine. The indicator will provide a simple means to warn the health worker that the vial of deteriorated vaccine should be discarded. 12 months — \$75 000

80-0077 Oral rehydration (Southeast Asia)

Fluid and electrolyte loss is the major cause of death in infants and young children with infectious diarrhea. A simple, cheap oral rehydration therapy has been developed for home use. However, inadequate packaging, labeling, and instructions for use are limiting the proper use of the oral rehydration salts (ORS). This project will promote the acceptability and proper use of ORS by adapting packaging and labeling to meet individual country needs, and it will develop instruction pamphlets easily understood by illiterate and semiliterate populations in four developing countries (Bangladesh, Thailand, Indonesia, and Philippines). 12 months — \$190 000

80-0083 Gastroenteritis (Chile)

Because of rural-urban migration, 80 percent of the population in Chile lives in urban areas, many in slums with unsatisfactory sanitary conditions. The consequence of poor sanitation is repeated gastrointestinal infections and generally reduced health levels, which affect child growth and development. This project will study the "before" and "after" conditions of a population moving from slum dwellings, with high rates of enteric infection, to new housing; it will record the possible alterations in intestinal absorptive function among adults and the nutritional status of children. From these findings, the impact of a change in environment on the individual's health status will be assessed. 18 months — \$89 600

80-0088 Water management (Ethiopia)

In Ethiopia, only 3 percent of the rural population has access to an improved water supply. As a basis for suitable water supply programs, there is a need to collect data related to the local management of the water supplies, so that after installation, the communities can operate and maintain the systems. This project will assess different types of water sources in terms of accessibility and suitability for local operation and maintenance; study the methods of collecting, transporting, storing, and using water; and document consumer needs and preferences on the installation and management of water points. 24 months — \$73 130

80-0090 Sperm inhibition (Chile) — phase II

In the past years, the changing attitudes in different cultures and the reluctance of some women to practice contraception have led to an increased interest in developing male contraceptive methods. Phase II of this project will focus on two enzymes (hyaluronidase and acrosin), which may be responsible for the penetration of the spermatozoa through the layers of the female ovum. Specifically, it will isolate and purify these substances and then use them to induce specific antibodies. This study could produce a vaccine to induce infertility in males. 30 months — \$196 900

80-0119 Water loss (Ecuador)

The deterioration of water pipe networks resulting from lack of maintenance is a serious problem in most developing countries. Water pressure is diminished, and water is lost through pipe and valve

leaks. This project will evaluate the hydraulic efficiency of the water supply network in the city of Ambato in Central Ecuador, assess its state of disrepair, determine the present demand for water, and set up a repair and maintenance program for the system. 12 months — \$11 420

80-0123 Chagas' disease (Brazil)

Chagas' disease is a major public health problem in Central and South America that causes damage to the heart muscle. Alcoholism is also known to be associated with a heart condition similar to that found in Chagas' disease, but little is known about the mechanisms involved in the damage or the combined effects of alcohol consumption and Chagas' disease. This project will determine whether there are significant differences in the evolution of chronic cardiomyopathy between alcoholic and nonalcoholic patients with Chagas' disease, and it will study the clinical forms of the disease with relation to heart size and degree of cardiac conduction defects. 21 months — \$8975

80-0133 Hemorrhagic fever (Argentina)

Argentinian hemorrhagic fever occurs annually in epidemic form in a wide area centred on the town of Junin, where it was first reported. Humans acquire the disease through contact with infected rodents, and research is needed to determine whether the rodents living in areas that are "marginal" for Argentinian fever are in fact reservoir hosts for the Junin virus. This project will determine the geographic distribution of the virus, study its presence in the species of rodents that are important vectors of the disease, and assess the danger of other areas becoming endemic in the future. 15 months — \$70 150

80-0143 Population management evaluation (Malaysia)

Lack of management skills has probably been the most important weakness in the implementation and operation of family planning programs in most developing countries. ICOMP (International Committee on the Management of Population Programs) has provided important inputs and training for staff of family planning programs. This project will assess management assistance inputs by international agencies over the last decade and identify the conditions for and the characteristics of those projects that appear to have been successful in Colombia, Mexico, Egypt, Kenya, Bangladesh, India, Indonesia, and the Philippines. 18 months — \$25 000

80-0146 Implants (Indonesia)

Research into new contraceptive techniques resulted in the discovery of the hormonal silastic implant (Norplant), which provides long-acting protection against pregnancy. The method requires staff trained in the insertion and removal of the device. This project will introduce the Norplant in two different areas of Indonesia: evaluate the implants in terms of acceptance, continuation, effectiveness and side effects; train a medical core in the use of the method; assess users' reactions to the contraceptive; and compare it

with other contraceptive methods currently in use in Indonesia. 36 months — \$114 200

80-0158 Roof catchment (Thailand)

The lack of drinking water of an acceptable quality is a significant problem in Thailand. For many villagers, rainwater is the most viable solution to this problem, the water from wells being polluted or highly saline. In order to improve existing rainwater catchment practices, this project will determine the potential availability of rainwater in various localities, study the changes in taste, smell, and quality of water stored in various types of containers, determine the technical suitability of various kinds of materials for tank construction, and establish techniques for repair and maintenance of the system. 30 months — \$45 800

80-0159 Blindness: Sulawesi (Indonesia)

The World Health Organization has estimated the blind population of the world at 42 million — 90 per cent are in developing countries. Blindness in Indonesia is estimated at about 10/1000, or about 1.3 million people, and studies have suggested that 3-8 percent of the population has some form of impaired vision. To provide a basis for the development of intervention programs to help minimize the effects of blindness on the individual and the community, this project will determine the causes and distribution of blindness in South Sulawesi, Indonesia. 15 months — \$63 400

80-0163 Diarrheal diseases program (Global)

In the developing countries, diarrheal diseases are probably the greatest cause of mortality and morbidity among children under age 5 and are a serious health problem among the adult population. This project will support the World Health Organization's global program for the control of diarrheal diseases (CDD). This program, which began in 1978, includes activities for the control of diarrheal diseases at the national level with the development of new drugs, vaccines, and diagnostic tools. 24 months — \$350 000

80-0168 Tropical disease research IV (Global)

The Special Programme for Research and Training in Tropical Diseases of the World Health Organization (WHO) and the United Nations Development Programme is working to eradicate malaria, schistosomiasis, filariasis, trypanosomiasis, leishmaniasis, and leprosy. This grant will provide support for the Programme in its efforts to develop new tools for the prevention, diagnosis, and treatment of tropical diseases and to strengthen the research capabilities of endemic countries by providing training for personnel in biomedical sciences to enable them to find solutions to health problems. 24 months — \$450 000

80-0179 Low-cost sanitation (Ecuador)

Providing affordable sanitation services to squatter settlements is a problem facing all cities in developing countries. It encompasses sanitation education to ensure acceptance, proper use, and maintenance of the facilities, and improvements in personal hygiene. This project will test a pit latrine, water-sealed toilet, and

septic tank and low-cost sewer system to evaluate their technical feasibility and costs and to determine the population's willingness to contribute to the installation and maintenance of such latrines. 24 months — \$170 100

80-0180 Mycotoxins (Sudan)

Mycotoxins are toxic compounds produced by the fungal contamination of foodstuffs, and they cause fever, vomiting, convulsions, and often death. Crops grown and stored in tropical or subtropical areas with high humidity and warm temperatures are more likely to be contaminated with fungi than those in temperate areas. This project will seek to identify the possible relationship between ingested mycotoxins and unexplained liver disease in children in the Sudan by determining the levels of mycotoxins in stored foods in rural and urban areas and by developing new methods to determine mycotoxin levels in body fluids. 36 months — \$272 180

80-0181 Rural teachers health program (Paraguay) — phase II

The use of teachers as health promoters to extend rural health care services has been successfully demonstrated in Paraguay. Phase I of this project evaluated the impact of this program and its acceptance by the community. Phase II will expand the health program to the entire population of the Departamento de Cordillera. All the teachers will be trained in preventive and curative health services at the school level. The researchers will design and test a continuous health education program and determine any changes in environmental sanitation, nutritional status, and childhood mortality resulting from the program. 36 months — \$213 000

80-0182 Leishmaniasis (Brazil)

This project will study some of the epidemiological aspects involved in the spread of American visceral leishmaniasis (AVL), which is endemic in some regions of Latin America. The vectors of the disease are sandflies of the genus *Phlebotomus*, which feed on animals and humans. The roles of both wild and domestic animals in the spread of the disease will be studied, and the researchers will also examine human transmission of the disease. The parasites that cause the disease and the sandflies will also be closely studied, both in nature and in the laboratory. 24 months — \$160 360

80-0194 Bilharzia (Egypt) — phase II

Schistosomiasis is a debilitating parasitic disease that affects millions of people in the tropics. In Egypt, it constitutes a major health problem and is spread by three species of blood flukes or worms. The control of the disease is the focus of a project, phase I of which showed that a wild herb, damsissa, has a definite molluscicidal effect on the snails that are the vectors of the disease. Field tests in the Alexandria area indicated that the herb is not harmful to local plants and fish. Phase II will monitor snail population fluctuations in canals and drains around Alexandria, compare the effects of various concentrations of damsissa on snail populations, and more closely de-

fine the schistosomiasis transmission season. 15 months — \$40 100

80-0197 Dynamic filters (Ecuador)

The dynamic filter, which is a simple, cheap above-ground filtration method, is a promising tool to provide potable water to underserved areas. It consists of a concrete channel in which graded river sand is placed. Of the untreated water piped to the filter, 10 percent passes through the sand and is piped to the community. Evaluation of this method and its maintenance in the mountainous and hilly areas of Ecuador is the purpose of a project that will compare five existing dynamic filters, refine the design parameters, and determine the most efficient method for operation and maintenance. 24 months — \$55 100

80-0198 Solid wastes (Honduras)

On the hillsides surrounding the city of Tegucigalpa some 120 000 people live in squatter settlements where water supplies, sewers, and garbage collection are limited, nonexistent, or too expensive. To develop a solid waste, garbage collection system acceptable to the squatter communities, this project will build storage bins at selected collection points in the community. The garbage in the bins will be transferred to city collection points for delivery to final disposal sites. The project will conduct surveys on garbage disposal practices, garbage content and quantity, and evaluate the feasibility of implementing the system in all squatter sectors of Tegucigalpa. 24 months — \$62 700

80-0201 Sociocultural context of defecation (Philippines)

Even when water supplies and sanitation facilities are provided at little or no cost, public acceptance is often minimal if the social, cultural, and economic factors influencing behaviour are ignored. This project will seek information on the knowledge, attitudes, and practices of the residents of a selected area of Cebu City in terms of defecation habits and use and nonuse of latrine facilities. It will collect data on the availability of adequate latrine or toilet facilities and provide research experience for selected faculty and students at the University of San Carlos. 6 months — \$8050

80-0203 Hilots: primary health care (Philippines)

Hilots are traditional midwives, usually older women who attend the majority of births in their communities. Because trained health personnel and facilities are insufficient to provide coverage of the population, *hilots* would be a logical choice for extending maternal and child health and family planning services to rural areas. This project will determine the feasibility of using *hilots* as primary health care workers by adding simple, curative services to their current functions. A new job description incorporating their new tasks will be prepared, and a training program will be designed to strengthen their skills. The project will also determine what other functions *hilots* may be capable of performing. 24 months — \$43 450

80-0204 Health worker record system (Philippines)

Katiwala is the local name for village health volunteers in the Philippines who deliver primary health care to the people of their communities. A program based on the volunteers was oriented to urban *barrios* when it began in 1972 but has now shifted to rural areas. The record system developed initially is now proving to be cumbersome and difficult for many of the rural *Katiwala*. To enable managers to identify problems rapidly and take corrective action, this project will establish a revised manual information system that will collect relevant program data efficiently, train each level of worker in reporting requirements and use of the system, and implement the system on a trial basis. 15 months — \$34 000

80-0205 Disease recording system (Indonesia)

The West Sumatra Department of Health has developed a comprehensive recording and reporting system for health centres. Its main drawback is that the section for disease diagnosis is too complicated for most health centre staff, who have limited diagnostic experience and few backup diagnostic facilities such as well-equipped laboratories. This project will develop a simple, practical, and reliable disease index form suitable for use at the health centres and in the field. It will also increase the research capability of members of the faculty of the University of Andalas through participation in a community health project. 12 months — \$19 400

Information Sciences

78-0083 Potable water supplies and sanitation journal (Global)

IDRC's contribution will assist Intermediate Technology Publications Ltd in establishing a new journal aimed at professional and technical staff engaged in water and sanitation programs in rural and urban fringe areas. Entitled *Waterlines*, it will concentrate on appropriate technology in small-scale water and sanitation systems but will also cover health problems related to water, together with organizational, institutional, and financial aspects. 36 months — \$220 000

78-0127 Computers (Tanzania)

By evaluating both the present and the potential applications of computers in Tanzania, this project will provide badly needed information on which to base plans for future expenditures on computers and reviews of the efficacy of current computer installations. It also aims to look specifically at the potential social and economic impact of computers on rural development in a decentralized economy. 18 months — \$48 400

80-0019 AGROVOC: implementation in AGRIS (Global)

The full exploitation of AGRIS, the computerized global information system for the agricultural sciences, managed by FAO for the participating countries, de-

pends on the ability of users to interrogate the data base quickly, accurately, and on precise subjects. To achieve more precise subject indexing, a controlled vocabulary for agriculture (AGROVOC) with a list of agreed terms in English, French, and Spanish has been compiled. This new thesaurus will be used for indexing AGRIS input for compiling current and cumulative subject indexes, and for specific subject retrieval and improved use of the magnetic tapes output from AGRIS. This project will enable indexers in national AGRIS centres to be trained and AGROVOC to be tried in practice. 15 months — \$99 000

80-0029 International Irrigation Information Center (Global) — phase III

Support is given for a third phase to enable the International Irrigation Information Center (IIIC) to continue to disseminate information about on-farm irrigation, by means of bibliographies, question-and-answer services, reviews of particular irrigation topics, directories, and other special publications. 36 months — \$445 800

80-0053 National AGRINTER Centre (Jamaica)

Jamaica is participating in AGRINTER, the Latin American and Caribbean regional agriculture information network and AGRIS, the global network. This project will strengthen the National Agricultural Information Service (NAIS), established to make the nation's agricultural literature more accessible to scientists, planners, and administrators. It will enable the Ministry of Agriculture to capture, store, and disseminate current agricultural information and to participate more effectively in AGRINTER and AGRIS. 24 months — \$66 000

80-0063 National agricultural information (Tunisia)

The National Centre for Agricultural Documentation (CNDA) is responsible for all agricultural documentation in Tunisia and acts as the liaison centre for the international information systems coordinated by FAO-AGRIS for literature and CARIS for records of current research. The national system is computerized. This project will fund training seminars and the acquisition of the necessary equipment to provide on-line input and output from remote computer terminals. 12 months — \$49 550

80-0085 Information services in agroforestry (Global)

Because it is virtually impossible to collect all information on so diverse a topic as agroforestry, ICRAF (International Council for Research in Agroforestry) will set up in Nairobi a question-and-answer service, drawing on all appropriate sources of information in the world. This novel approach will allow ICRAF to gradually build a collection of material for which there is a demonstrated need and to base upon it a responsive information service to the growing number of research workers in this field. 24 months — \$126 500

80-0086 Asian Information Center for Geotechnical Engineering (Southeast Asia) — phase III

The Asian Information Center for Geotechnical En-

gineering (AGE) was created to establish an appropriate document storage and retrieval system on soil engineering in Asia. It offers current awareness, information retrieval, and document delivery services through seven serial publications and two "on-request" services. Phase III will introduce new outputs in the fields of groundwater information and road information, continue acquiring geotechnical literature relevant to Asia, explore the possibilities of international cooperation, and further strengthen the links between AGE and other soil-engineering organizations. 24 months — \$20 705

80-0093 Remote sensing (West Africa)

Applied research and thematic cartography using Landsat (satellite) imagery offers advantages in natural resource studies, especially in the developing countries. The remote-sensing data collected by the satellite can be used to compile small-scale maps, especially for large and inaccessible areas. This project will provide support for applied research and training activities through the Ouagadougou Regional Remote Sensing Centre (CRTO). It will undertake and execute various studies proposed by national institutions relating to renewable natural resources and disseminate the results in the form of thematic maps. 36 months — \$357 500

80-0095 International Ferrocement Information Center (Southeast Asia) — phase II

The International Ferrocement Information Center (IFIC) was established because of the clearly demonstrated interest in Asia in this new building material. Simple monographs and state-of-the-art reviews have been published and a question-and-answer service has been established with phase I funding. Phase II will continue the publication of the *Journal of Ferrocement*, maintain a bibliographic record of publications relating to ferrocement, publish more booklets of the do-it-yourself kind, and compile presentation sets of slides and photographs with descriptive manuals on various applications of ferrocement for use by extension workers in rural areas. 36 months — \$34 941

80-0140 Permanent question-answer service (West Africa) — phase II

The question-and-answer service set up at the African Institute for Economic and Social Development (INADES) is designed to assist those in charge of rural information and education programs who are isolated from documentation centres and reference works. The service has performed this function by supplying bibliographies and photocopies and by organizing traveling book boxes. Phase II will enable INADES to expand its service outside the Ivory Coast by preparing a series of pertinent documents, which will be microfiched and deposited with the necessary microfiche readers, in four institutions as mini-libraries — thus giving access to the original and complete information. 36 months — \$208 900

80-0145 Caribbean Agricultural Research and Development Institute Literature Service (Caribbean)

To help the Caribbean Agricultural Research and Development Institute (CARDI) to satisfy the demands made by its scientists in field locations on the various islands, this project will establish a scientific literature service and provide special publications to Caribbean agriculturalists, particularly up-to-date information on commodities and production practices specific to the area. 36 months — \$303 500

80-0154 INFOPLAN (Latin America) — phase II

The objectives of phase I of this project were to design a Latin American information network on social and economic planning, seek its endorsement by Latin American ministers of planning, and initiate a pilot program that would include subregional and national participation. Phase II will enter the operational stage by establishing subregional nodes of INFOPLAN and by bringing in more countries to participate in the system. Cooperation with other regional information systems will ensure compatibility and the exchange of bibliographic information. Four issues of *PLANINDEX*, a computerized bibliographic index of abstracts of socioeconomic planning information, will be produced. In addition, an experimental nonbibliographic referral file be will compiled. 24 months — \$513 889

80-0155 CARISPLAN (Caribbean) — phase II

Phase I of this project laid the groundwork for a subregional component of the socioeconomic information system known as INFOPLAN, coordinated by the UN Economic Commission for Latin America. It promoted the optimum utilization of Caribbean information resources and provided a mechanism for exchanging social and economic information for decision-making by planners. Phase II will consolidate the information activities of the countries already participating in the subregional system, which is now known as CARISPLAN (Caribbean Information System for Economic and Social Planning), extend participation to all countries in the Caribbean, and lay the groundwork for computerized information processing at the office of the Caribbean Documentation Centre in Port-of-Spain, Trinidad. 24 months — \$456 707

80-0164 DOCPAL retrenchment (Latin America)

The Latin American Population Documentation System (DOCPAL) is a regional information system operated by the Latin American Demographic Centre — a body of the United Nations Economic Commission for Latin America (CEPAL). IDRC's contribution will enable CEPAL to retain two key DOCPAL documentalists who are involved in the preparation of operating manuals and the training of staff, while POPIN, the international cooperative information network for population, is being further elaborated. 9 months — \$67 800

80-0176 Development information UN-DIESA (Global) — phase II

Two of the UN's regional economic commissions (Latin America and Africa) have begun to operate re-

gional systems for exchanging socioeconomic information needed by ministries of planning, and about 15 countries have mounted experimental national operations. Phase II of this project will enable the United Nations Department of International Economic and Social Affairs (UN-DIESA) to continue operating a mechanized system for UN documents and to offer technical and advisory support to the UN regional economic commissions. 12 months — \$52 800

80-0193 Apicultural source materials (Global)

In many rural areas, apiculture provides a welcome source of cash income. Honey is an energy food; beeswax is an important source of foreign exchange; and bees play an important role as pollinators in the agricultural production system. IBRA (the International Bee Research Association) publishes manuals, bibliographies, periodicals, and an abstract journal for scientists and beekeepers. This project will enable IBRA to collect and present information in a series of pamphlets dealing with subjects especially relevant to the Third World. 12 months — \$40 600

80-0206 Lake Malawi-Upper Shire River flood risks (Malawi)

The government of Malawi faces serious problems of recurrent and increasing flooding in the Lake Malawi-Upper Shire River area. This project will study the hydrology of Lake Malawi and the Upper Shire River in historic times; measure, date, and map ancient beach levels to determine beach and river level patterns; determine the areas affected by particular floods in the past; and study the importance of movements of the earth's crust in the study area so that settlements in the area can be planned with a better knowledge of the flooding risks. 12 months — \$12 000

80-0217 Rattan information centre (Southeast Asia)

In many countries of the tropics, and of Southeast Asia in particular, rattan is the most important nontimber forest product and is used for a great many purposes. As the demand in the world market is increasing significantly, this project will develop an information centre on rattan at the Forest Research Institute of Malaysia to acquire, classify, and store all relevant information on rattan and disseminate this information in various forms to those interested. 36 months — \$60 000

Secretary's Office

80-0104 Royal Society of Canada and International Foundation for Science (1981)

The International Foundation for Science was created to provide young Third World scientists and technologists of outstanding merit financial and other support to undertake research of benefit to their regions. IDRC's contribution will enable the IFS to support 30-40 young scientists involved in research in their

own countries and enable the Royal Society of Canada to continue to participate in international scientific meetings and in promoting the Foundation. 12 months — \$250 000

Social Sciences

78-0063 Nomad resettlement (Somalia)

Somalia suffered severe droughts in the 1970s that resulted in a large exodus of nomads from the dry northern plains to the agricultural land in the south. However, little has been done to evaluate, monitor, and improve resettlement schemes. This project will gather socioeconomic data on the nomads and attempt to provide a better understanding of the processes involved in the transition from nomadic pastoralism to settled agriculture. 12 months — \$69 000

78-0089 Modern and traditional technologies (Ethiopia)

Finding ways to generate technologies that will be most appropriate for rural areas has proved to be a major problem for policymakers in many developing countries. Scientific research often reflects the priorities of developed countries, and researchers are usually located in urban centres; thus the scientific community is often isolated from the central problems facing the mass of people in poor countries. The project will refine a process for generating technologies that is based on the method developed by an Argentinian scientist and that involves collaboration between scientists and peasants, the upgrading of traditional methods, and the use of modern methods to generate new solutions. 36 months — \$245 000

79-0155 Parents and children project (Chile)

In Chile, the Parents and Children Project, which brings together mothers and encourages them to talk about aspects of child-rearing, hygiene, family management, etc., is important because it enables mothers to learn more about child care and changes their attitudes toward learning and development. The project will assess the impact of this innovative program in adult education and community development and describe how and why the program works. 18 months — \$64 000

80-0001 Women and adult education (Canada)

Though women form the majority of participants in adult education programs in the Third World, few of the programs and research projects concerned with adult education deal with their particular needs. The project will assist the International Council for Adult Education to develop an agenda of research needs, priorities, and problems, as identified by women working in the field, that bear on the participation of women in adult education and development. The study will be carried out in seven geographic regions: South Asia, Southeast Asia, the Caribbean, Latin America, Africa, the South Pacific, and the Arab States. 26 months — \$42 200

80-0004 Rural fertility and migration (Peru)

Whereas fertility differentials between rural and urban areas have been noted in a number of national surveys, little is known about the determinants of these differences. The purpose of this project is to examine how agricultural development policies have influenced reproductive patterns and related demographic behaviour in three particular regions of Peru, by an examination of possible links between reproductive and migration behaviour that reflect variations in the surrounding agricultural conditions. 15 months — \$39 000

80-0005 Rural handicraft (Upper Volta)

The government of Upper Volta has recognized the importance of introducing, concurrently, new agricultural implements and a local capacity to service and maintain them. The CNPAR (National Centre for the Training of Rural Artisans) has been very active in training village artisans so that implements can be properly serviced at the village level. The purpose of this project is to examine the activities of artisans and farmers in the Volta Noire district so that the success of the training program can be assessed and the factors affecting the rate at which implements and methods are being adopted and diffused among farmers can be identified. 18 months — \$35 000

80-0007 Education-production liaison (Upper Volta)

There is a growing interest in the relationship between formal schooling and young people's integration into the productive life of their communities. Still little research has been done in this area. The project will aim to incorporate democratic learning principles in the classroom and production-oriented work into the school system as well as to assess whether the link between schooling and production increases self-financing of education. 15 months — \$12 000

80-0008 Comparative teaching strategies (Nigeria)

In the area of teacher effectiveness studies, two questions are particularly important: What teaching behaviours should be taught to young teachers? And what methods should be used to teach them? The project will examine and compare the efficacy of university and teacher training college programs in Nigeria and study the effectiveness of one particular method of teacher training, micro-teaching, a method that involves the video-taping of teachers practicing specific skills before a small group of pupils. 21 months — \$29 500

80-0015 Analysis of local technological capabilities in agroprocessing (Ghana)

The importance of technology as a critical resource for economic and social development is now widely accepted in Ghana. However, there is a need for more complete information on the use of technology in the agroprocessing sector. In order to establish local technology capability (skilled personnel, equipment, training courses, etc.) in Ghana's major agroprocessing industries (cocoa, palm oil, sugar, cotton, and rubber), this project will undertake a survey to

establish the contribution of local resources to technology; the factors determining the level, direction, and quality of the technological capability; and effects on the performance of the agroprocessing industries. 12 months — \$33 500

80-0016 Plumbers and electricians (Chile)

The "informal" sector of employment, which consists of small firms and self-employed workers, is, in general, poorly understood; in particular, its potential for improved training and higher productivity has been neglected. The project will study the economic characteristics of plumbers and electricians, the trends in the labour market for these occupations, and their priorities for training to determine the viability and effectiveness of training programs in increasing income and alleviating poverty and unemployment in this sector. 14 months — \$32 500

80-0018 Agrarian policies in Pernambuco (Brazil)

National agrarian policies in Brazil have had little success in improving the lot of small farmers and landless labourers. Technical advances, market development, and credit availability policies have only accentuated the differences in incomes between small and large farmers. The project will provide data and analysis on the results of national and state agrarian policies in Pernambuco district as a basis for corrective proposals and improved communications among a number of key institutions. 24 months — \$118 900

80-0031 Preschool education (Thailand)

Early childhood education plays an important role both in the cognitive and emotional development of children and in their future success in school. There is a need to determine what kind of early education is efficient and effective, especially for children of marginal rural and urban population groups. The project will compare the effectiveness of preschool experiences of various types and identify aspects of the home, the community, and the school that facilitate or inhibit the achievement of educational goals. The study will focus on three different groups of children: preschool children, first graders, and third graders. 20 months — \$64 000

80-0033 Sources of economic growth (Latin America)

In Latin America, a major study examined sources of growth in seven countries. The results revealed major differences among countries in the productivity of capital and labour and important divergences in the social and private rates of return to capital. Further research is needed into the variables underlying the changes occurring in the size and quality of the labour force. This project will update previous estimates; determine the qualitative components of labour force in terms of age, sex, education, fertility; and examine the influence on labour of factors such as education and health policies, international and domestic migration, and changing social mores. 36 months — \$106 000

80-0034 Teaching arithmetic to illiterates (Mali)

Arithmetic skills are important to a population com-

posed mainly of farmers and stockbreeders who must constantly buy and sell. However, these producers may encounter difficulties in learning operations like multiplication and division in a classroom, as they are used to mental arithmetic from their daily market experience. This project will identify the most appropriate means of furnishing rural adults with a written arithmetical capacity sufficient for their everyday needs and will design a manual, training program, and evaluation system for future users. 18 months — \$10 000

80-0036 Renewable energy policy (Thailand)

Price rises in petroleum have forced Thailand, which derives 80 percent of its commercial energy supplies from oil, to try and reduce its dependence on imports. The rural population (four-fifths of the population of Thailand) depends predominantly on noncommercial sources of energy such as wood. Supplies cannot meet levels of demand and fuel future developments in the rural areas. This project will develop policy guidelines for the development of renewable energy resources such as biomass, agricultural wastes, wind, and solar energy in Thailand. Surveys undertaken in 24 villages to determine the appropriate pattern of renewable energy use in relation to the social and economic circumstances and constraints will provide policy-relevant information. 18 months — \$44 000

80-0037 Science and technology policy studies (Indonesia)

Although the Indonesian National Development Plan identifies the use of science and technology (S&T) as a crucial element in the successful implementation of development programs, very little capability exists to research and formulate the means by which investment in S&T can be most effectively related to national objectives. This project will provide an overview of implicit instruments of policy (toward imports, taxation, credit) that have important indirect consequences on S&T; study the demand for local technologies by Indonesian industries, in particular the textile industry; and compare how new technology is acquired by small and large operators, how it is transferred, received, and supplied. 18 months — \$40 300

80-0038 Experimental in-service teacher training (Latin America)

The "effective" teacher plays an important role in educational reform and in the achievements of the pupils. But the questions of what characterizes an effective teacher and how such a teacher can be efficiently trained continue to puzzle researchers. In Latin American societies, teacher training efforts are often highly academic and unrelated to the needs of the teacher, the pupil, or the community. The purpose of the project is to develop, within participative workshops, new teacher training methods to improve teaching skills and the teachers' awareness of their developmental role in classroom and community. 14 months — \$132 300

80-0039 Technical education and economic development (Zaire)

The lack of links between technical education and employment in Zaire has produced both a crisis in skilled labour supplies and a decline in the quality of technical and vocational education. This project will survey teachers and employers to gather data on needs for a plan for reorganizing and improving technical education. 12 months — \$15 100

80-0041 Communication research review and development (Latin America)

Latin Americans have pioneered many local approaches to the use of communication for development that have ranged from national attempts to tiny, local innovations. However, little is known about the many innovative approaches to communication in marginal urban areas and in rural communities. Through a series of review and development activities, the project will summarize the research experience; clarify the varied methods adopted by Latin American agencies, institutions, and individuals concerned with communications research; and emphasize the development of methods for more effective use of communication in urban and rural settings. 12 months — \$69 500

80-0042 Agricultural marketing in Potosi (Bolivia)

One of the key bottlenecks for economic development in the rural areas of Bolivia is small-scale farmers' inadequate access to markets for their production. The money received by farmers does not compensate them for labour and cash they have invested in producing a crop. This project will analyze the production volumes, production costs, marketing systems, and price level for fruit crops in the Potosi region, Bolivia, and recommend ways of establishing alternative channels for marketing. 15 months — \$66 900

80-0045 Comparative adult education policies (Canada)

Adult education is the sector that is the least regarded in many developing countries. This sector has been difficult to analyze because it means many things besides literacy learning and policies toward it differ dramatically from one area to another. However, learning opportunities for adults need to be analyzed more thoroughly and put in the context of broader economic and social systems. This project will analyze policies in Ethiopia, Tanzania, Venezuela, India, and Turkey, using as a model research undertaken in Canada. 9 months — \$16 100

80-0046 Literacy and cooperatives (Mali)

Mali is one of the nations that have developed new forms of village cooperation, linking literacy training to information about improved cash cropping. Village associations based on these literacy training programs and traditional authorities provide a dual leadership in many villages. This project will examine how the two modes of leadership interact and whether the village association can be a means of responding to a community's continuing education needs and providing the resources to support it. 18 months — \$91 000

80-0049 Planning and development (Egypt)

Public and private sector investment in Egypt has traditionally been directed to the large metropolitan centres: the distribution of the country's population and socioeconomic resources is clearly unbalanced, with a chronic underdevelopment in the rural areas. There is a need for a better approach to planning and the allocation of resources to accelerate development in the rural areas. This project will assess the effectiveness of nationally formulated development programs in promoting social, agroindustrial, and infrastructural development; identify the critical planning factors involved in promoting or retarding development; and evaluate the role of local authorities. 15 months — \$67 700

80-0051 Quality of rural primary schooling (Thailand)

The efficiency and effectiveness of schooling are particularly important in disadvantaged areas where the school has the role of transmitter of national culture and the teacher is a "change agent." This project will determine the quality of primary schools in relation to the environmental characteristics of rural Thailand and interaction of teachers and pupils. It will also examine in detail the processes of teaching and learning and the interactions between the school and the community. 22 months — \$54 000

80-0052 Trade and development (Korea)

Korea's rapid development has been characterized by a reliance on foreign trade to provide markets for Korean goods and services in exchange for imports of raw materials. Increasing costs, economic structural changes, increased competition, and growing protectionism are compelling the country to reassess its commercial policies. This project will examine the role played by tariffs in the protection of Korean industries, compare these practices with those of other countries, and provide a set of criteria for adjustments in tariff policy. 24 months — \$73 500

80-0061 Canadian area-specific learned societies — 1981-82 (CAAS) — phase IV

The objectives of area-specific learned societies are to achieve links among researchers, foster relations between Canadians and developing country scholars, and help Canadians better understand developing countries. This contribution will enable the Canadian Association for African Studies to pursue several activities, such as travel support for African scholars and researchers attending the annual meeting of CAAS, the publication and distribution of its newsletters in Canada and Africa, and distribution in Africa of the *Canadian Journal of African Studies*. 24 months — \$66 500

80-0067 Engineering firms and technological development (Peru)

Consulting and engineering design services are required in many investment projects to carry out such activities as prefeasibility studies, basic engineering, plant construction, and maintenance. Policymakers in the Third World are concerned that the decisions are now being made by expatriate experts and organiza-

tions and they wish to encourage the development of local CEDOs (consulting and engineering design organizations). This project will analyze the way these services have been acquired in a few investment projects in Peru, assess the impact on these projects of using foreign or local services, and improve the effectiveness of local groups in the design and implementation of investment projects. 18 months — \$72 700

80-0070 Mustang development survey (Nepal)

Mustang is a very isolated region of Nepal where trading has virtually ceased and earnings and diet have deteriorated as a result. This project will provide basic information and analysis on the anthropological, social, and economic aspects of life in the Mustang region and the data will be used to formulate development assistance programs adapted to the area. 36 months — \$92 000

80-0071 Macroeconomics and balance-of-payments research (Chile) — phase I

Several Latin American countries have encountered inflation: declining industrial production; unemployment; and a growing external debt. This project consists of a series of studies to investigate current macroeconomic processes and balance-of-payments adjustment problems in several Latin American economies. The studies will analyze the coherence and consistency of various statistical indicators that measure economic trends. They will also investigate the origin and application of indexing of wages, taxes, and various debt instruments and its effects on inflation, income distribution, and economic stability. In addition, the project will provide training in macroeconomic analysis to young professional economists. 15 months — \$298 400

80-0072 Rural university (Colombia)

FUNDAEC (the Foundation for the Application and Teaching of the Sciences) believes that what people in rural areas need is not minimum learning but the application of higher education and scientific insight and the opportunity to collaborate with experts from their own area committed to their development. This project will focus on an approach to the training of new kinds of rural personnel through a "rural university" experimenting with new agricultural practices and technologies appropriate to the peasant economy that is the key curriculum. Specifically, it will test improved crop and animal production subsystems, develop village-level tutorial extension programs, and evaluate the larger rural development strategy of the rural university concept. 36 months — \$164 150

80-0073 Evaluation of comprehensive rural education (Brazil)

In Brazil's northeast region, a large integrated development program with an education component has been put into a marginal, severely depressed area. This project will develop a system to assess the operation of the Integrated System of Rural Education (SIER), which provides a basic village school, an intermediate school, and a centre of rural education

in the region. Evaluation will focus on community participation and system management by local personnel with limited technical skills and resources. 12 months — \$82 300

80-0074 School and community in Latin America (Colombia, Bolivia, Venezuela)

The complex relationships between the student, the classroom, and the community are beginning to be recognized as a key issue in attempts to improve the quality of education. Particularly important are the possible effects of teachers on pupils' successes and failures — effects that can be assessed adequately only through long-term, intensive observations of the school and the community. This project will study teacher qualifications; the availability of resources and teaching aids; the economic, social, linguistic characteristics, beliefs, and values of the community; and the actual roles of schoolteachers in Colombia, Bolivia, and Venezuela. 20 months — \$202 000

80-0075 Building capacity in classroom research — OISE (Canada)

Research into classroom activities and interactions is now recognized as a prerequisite for the analysis of educational quality and the improvement of teaching practice. There is a need to know why children fail, what methods appear effective, and how pupil attitudes toward work and school are formed. This project will enable the IAEEA (International Association for the Evaluation of Education Achievement) to determine the link between teaching practice and classroom environment and educational outcomes, recommend teaching methods, develop teacher education programs, and evaluate new teaching practices. 36 months — \$235 000

80-0078 Survival strategies of small farmers (Uruguay)

In the last decade, Uruguay adopted an "open-door" trade policy that played down the importance of domestic markets to promote exports of agricultural and industrial goods. Some of the impacts of this policy were a reduced demand for food crops, as wages and incomes declined; increased food imports; and an altered structure of rural employment. This project will examine these and other impacts on small and medium-sized farmers and how they have shifted production strategies to cope with change. 18 months — \$63 300

80-0080 Rural employment (Central America) — phase II

Central American governments have implemented rural development programs involving granting of credit to farmers, land reforms, the introduction of new varieties of crops, etc. Now there is a need to know the impact of these policies on employment. This project developed, during phase I, a more explicit description of productive agricultural organization, labour markets, and policies affecting rural employment. Phase II will describe the operation of rural labour markets and the degree and manner in which they absorb labour, determine how government mechanisms regulate the productive process and

attend to social needs, and study the different policies in Costa Rica, Guatemala, Honduras, and Nicaragua that affect employment. 18 months — \$202 500

80-0081 Coffee exports and income distribution (Colombia)

As a result of the integration of developing countries into a global economy characterized by the movements of goods across international borders, policymakers have suggested that reliance on primary exports (coffee, cotton, peanuts, iron, gold, etc.) benefits only a small segment of the population and leads to an overdependence on the export revenues from these products. This project will analyze the distribution of revenues from coffee among the groups involved in production and marketing, measure the indirect transfers of incomes from their immediate beneficiaries to the remainder of the population, and make recommendations to achieve growth and distribution goals. 18 months — \$75 200

80-0084 International migration (Guyana, Surinam)

In small countries such as Guyana and Surinam, the emigration of professional and skilled labour can have a significant negative impact on the agricultural, industrial, and service sectors of the economy. This project will analyze trends and levels of migration: the effects on the various sectors; the influence of private and governmental policies such as migration laws, repatriation schemes, and labour training programs; and the motivations of migrants. 18 months — \$58 000

80-0087 ADC regional research and training program (Asia)

The Agricultural Development Council (ADC) aims to upgrade the capacity in Asia to deal with the social and economic problems of rural development by funding fellowships, seminars, etc. IDRC project funds will enable the ADC to improve the research and training capabilities of young scholars and mid-career professionals in dealing with development, make available material relevant to the region for use in teaching and research, and provide opportunities for professional interaction among Asian social scientists. 12 months — \$350 000

80-0089 Local labour markets and internal migration (Brazil)

In Brazil, government planners are conscious of sub-regional differences in the country that lead to unequal distribution of, among other things, population as a result of changes in labour markets. To expand knowledge of how migration and family behaviour are affected by the productive structure, this project will observe, in six types of habitat in Brazil, seasonal and permanent migrations and their link with variations in productive organization. The project will develop migration profiles, including type of migration (rural-urban, rural-rural, rural-small town) and characteristics of migrants and their families (age, life cycle stage, fertility). 24 months — \$80 000

80-0092 Socioeconomic survey of urban renewal area — Bogota (Colombia)

The Colombian government has instituted a number of housing policies, including the provision of low-cost housing and the renewal of old sections of Bogota. To determine the impact on the population dislodged from their homes, the project will study the present living conditions of residents of poor housing units, analyze how incoming migrants are absorbed in the system and the effect on the receiving community, recommend measures to renovate and upgrade multidwelling residences, and suggest how residents can be relocated with the fewest adverse effects. 14 months — \$85 000

80-0094 Demographic impact of reforestation program (Thailand)

Population pressure in Thailand has led to increased migration of rural people not only to urban areas but also to the deep forest, with resultant serious deforestation. The Thai government has established a reforestation program to alleviate the problem. This project will study the socioeconomic changes associated with this program and the benefits it offers, such as land, employment, improved amenities, and social services. The study will be carried out in a total 90 forest villages where the demographic impact of the changes will be assessed as a first step toward a clearer picture of the impact of this long-term, large-scale program, which affects some 300 000 rural people. 16 months — \$112 000

80-0096 Science and technology in Mexican public health (Mexico)

Researchers consider that decisions about the allocation of health resources are key decisions for a society and are decisions in which technology plays an important role. However, little is known about these decisions because of the relative secrecy of the bureaucracy. This project will analyze how resource allocation decisions are taken within the administrative structure of the Mexican social security system concerning parasitic diseases, nutrition (children's welfare programs and new nutritional packages), and promotion and distribution of family planning equipment and materials. 24 months — \$48 000

80-0098 National development banks and technological development (Global)

Although the relationship between investment and capital accumulation has been frequently studied in developing countries, there has been little research on the relationship between the role of financial institutions and their behaviour toward technological investments. This pilot project will review the evolution of the development bank system and explicit technology policies, and it will assess the objectives, practices, and technological component of the activities of financial institutions in developing countries to develop a framework for more extensive research. 6 months — \$67 000

80-0099 Rural technological communication study (Peru)

Talpuay is an appropriate technology group in Peru.

Its objective is to identify and promote useful traditional farming methods that can improve the welfare and the income of the local population who cannot afford newer techniques. To evaluate the effectiveness of Talpuay's communication and diffusion of indigenous technologies, this project will compare the group's experience with that of a number of extension services, determine the effects of Talpuay's experiments on the peasants' use and knowledge of rural technology, encourage communication between peasant groups in the region, and assist in improving Talpuay's future performance. 12 months — \$32 000

80-0100 Technical change — small-scale industry — Medellin (Colombia)

The growth of the manufacturing sector in Colombia has been based on large firms because of their accessibility to credit and funds as well as their economies of scale in production based on modern technology. Development has bypassed small and medium-sized firms, which need to improve their production methods through changes in technology and better organization. This project will identify the range of technologies used by small and medium-sized industry in the furniture and auto parts sectors of Colombia, the opportunities and constraints for improved economic performance, and the contribution of technology and administration to increased productivity. 12 months — \$28 000

80-0101 Rural transformation (Colombia)

Rural conditions are rapidly changing in Latin America because of the high rates of rural-to-urban migration. Although the rates are well-documented, the factors underlying the process remain largely unexplored. This project will expand knowledge of modern agrarian and socioeconomic conditions that have produced high rates of outmigration from rural areas by providing an analysis of agricultural, socioeconomic variables determining the technology, use of labour, and size of landholdings in agriculture. It will also address important questions about employment, distribution of land, and income. 8 months — \$24 600

80-0105 Rural development alternatives (Indonesia)

The relationship of rural development strategies to beliefs and social structures at the village level is not well understood. Strategies that take into account local sensitivities and resources would improve the chances for success in rural development programs. This project will formulate a typology of social change in Indonesia by conducting a survey of rural development policies and programs, examining the impact of development strategies on three Indonesian villages, and identifying the factors underlying effective rural development policies. 15 months — \$13 800

80-0108 Economic research (Ivory Coast)

Although the numbers of Ivorian graduates in economics have grown substantially, few have engaged in research because of competing demands from government departments and private companies. To help meet the growing demand for trained

economists. this project will promote the development of Ivorian research capacity in economics through selective support of the staff development program of the Centre ivoirien de recherches économiques et sociales. Specifically, the project will assist in meeting the costs of field-work for Ivory Coast studies and provide support for research documentation and seminars. 27 months — \$192 000

80-0111 Energy use patterns (Sierra Leone)

To plan future development in Sierra Leone, it is necessary to determine demand and supply characteristics for all sources of energy in both rural and urban areas. This project will conduct a survey of energy users in the agricultural, industrial, domestic, and transport sectors to determine, particularly, the use of noncommercial fuels such as fuelwood and crop residues. It will also determine the characteristics and practices of energy users and study changes in the demand for energy in relation to changes in the size and distribution of the population, income, economic activity, and government policy. 18 months — \$25 000

80-0112 Internal migration, fertility, and family structure (Argentina)

In Argentina, little attempt has been made to link subregional variations in population distribution to their demographic and socioeconomic implications. More studies are needed to investigate the relation between agricultural conditions and outmigration, fertility behaviour, and variations in family structure. This project will compare the behaviour of poor rural families in Santiago del Estero living in three types of agricultural areas: describe the differences in fertility, migration, development, and productivity; determine the impact of outmigration on family ties and structure; and determine the economic interdependency between Santiago del Estero and new surrounding regions. 18 months — \$74 000

80-0113 Risk and technology adoption (Argentina)

A study has shown that one of the constraints to the adoption of technology has been the farmers' aim to maximize their total profit by minimizing overall risks rather than maximizing profit for each particular commodity. This project will develop a new model of farm behaviour for the region based on the theory of games with particular reference to mini-max theory; construct a series of sequences relating to the effect of farm behaviour on technical decisions; and determine the explanatory power of previous econometric models. 7 months — \$16 000

80-0117 Agricultural credit (Philippines)

In recent years, many Filipino farmers have been forced to relinquish title to land because of their inability to secure credit. This project will determine the extent of rural indebtedness and the sources of credit in five communities near Cabanatuan City: determine the causes of defaults on loan repayments; identify farmer preferences with regard to terms and procedures for securing and repaying loans; and study the lending procedures of rural financial institutions. 12 months — \$27 000

80-0122 Livestock sector strategy (Korea)

As per-person income has risen in Korea, so has the demand for meat. This trend is of particular importance for the agricultural sector, if farmers are to shift production to accommodate demand in a country where small farmers specialize in cereal and vegetable production. To provide the basis for a sound livestock development policy, this project will undertake a comprehensive economic analysis of the principal components of the livestock sector in Korea: analyze consumption of the principal livestock products; study the meat wholesaling system; identify the available resources and government support policies; determine grain requirements for animal feed; and determine optimal locations, size, and type of distribution for commercial feeds. 36 months — \$349 900

80-0124 Trade policy (Thailand)

In spite of recent increases in exports, Thailand still faces a chronic balance-of-payments problem in international trade. This project will examine the future potential of Thailand's international trade and suggest policies for overall economic development. Specifically, it will study the recent export performance of six leading Thai commodities: rice, cassava, rubber, maize, tin, and textiles, and assess their impact on Thai industry, earnings, and employment. Problems that restrict or expand Thai imports will be identified, and the impact of certain tariff and non-tariff policies on Thailand's agricultural and industrial development will be determined. 24 months — \$52 300

80-0134 Studies in income distribution (Southeast Asia)

Studies of income distribution have attempted to measure the distribution of national income within and among countries, but they have failed to identify the diverse factors associated with poverty. In an attempt to identify the circumstances surrounding poverty as well as the causes, this project will analyze the social, economic, and geographic factors influencing poor people in the Philippines, Indonesia, and Thailand, including the earnings, schooling, occupation, employment, industrial attachment of household members, rainfall, roads, drainage, and social facilities. 24 months — \$124 300

80-0135 Training program for intermediate level scholars (Thailand)

In Southeast Asia, there is limited research capacity in the area of social sciences generally, and population studies in particular. The objective of this project is to encourage studies on population and development interactions in Thailand and to increase the skills of competent intermediate-level researchers in the country. Support will be in the form of an award program incorporated within the Microlevel Studies Program (MLSP), administered by the Thai University Research Association (TURA). 24 months — \$130 000

80-0136 Participatory urban services (Asia)

In Asia, the gap between the demand for and supply of urban services continues to widen; however, it would be reduced if the spirit of self-help in the region could be channeled toward community-based

urban services. This project will describe the structural arrangements of the existing services, evaluate the effectiveness of various forms of self-help service delivery — such as in road and housing construction, installation of sewerage lines — and recommend policies for city planners administering or contemplating such schemes. 24 months — \$250 000

80-0139 Peasant technology survey (Paraguay)

Increasing population density, lack of opportunity to migrate or colonize new lands, and the growth of commercial agriculture are three economic changes directly affecting traditional peasant agriculture in Paraguay, thus forcing the farmers to change their farming methods. This project will provide information about current farming methods, the use of technology and response, and it will recommend ways by which technological change could be made known to and used effectively by smallholder farmers. 30 months — \$265 000

80-0142 Experimental migration survey (Barbados)

Accurate measurement of international migration is of great concern today because of the rapid increase in the number of migrants, both skilled and unskilled, to developed countries and the rapidly industrialized Middle East. This project will develop a method to improve statistics of international migration: for example it will design special questions for censuses and sample surveys. It will obtain estimates of the level of outmigration from Barbados and ascertain the feasibility of the method for application in other countries. 18 months — \$36 000

80-0147 Women, education, and resettlement (Zimbabwe)

The roles and experiences of women in the war economy within Zimbabwe and the camps of Mozambique are important elements for the shaping of resettlement policy, not only because of women's major role in agricultural production but also because of pressure on the government to accelerate adult education for women, whose studies were interrupted by the war. This project will review experiences of rural settlement involving the participation of women: identify the aspirations and needs of women now preparing for resettlement; tap the experiences of women leaders involved in women's education in camps; and plan a comprehensive program of women's education. 18 months — \$71 600

80-0148 Higher education and economic development (Chile)

In the last decade, Chile has undergone major transformations in both the education system and the economy. To provide information for an analysis of the relationship between higher education and economic development, this project will study the influence of economic policies in terms of enrollment and internal changes in the university and of the social composition of students and professors. The strategy and conditions through which graduates are inserted in the work structure of the economy will be described and the new objectives of the government

for higher education will be compared with the political and economic goals of Chile's development model. 12 months — \$45 400

80-0149 Instructional improvement in primary schools (Nepal)

For Nepal to improve its basic education system, it needs to understand more fully the educational process in rural primary schools and then develop methods to help teachers contribute more directly to the improvement of educational quality. This project will develop programs to train primary schoolteachers in improved teaching methods and orient parents to techniques that encourage and facilitate pupil learning at home. It will also evaluate the impact of these techniques on pupil achievement. 36 months — \$154 000

80-0150 Nontraditional roles of teachers (South-east Asia) — phase II

Educational innovations are often rendered ineffective when disseminated by teachers who have been trained in traditional ways. The overall objective of this project is to develop new ways to change teachers' methods and attitudes to help them meet new demands on their services. Phase I developed modular, self-instructional teacher preparation packages (TPPs) and preliminary results indicate that they are an effective means of training. Phase II will evaluate more rigorously the training packages and determine the costs involved in utilizing these packages in various kinds of training programs. 24 months — \$260 000

80-0151 Experimental communication of research results (Chile)

Many findings derived from education research do not reach the final users — parents, the community, teachers, and principals — on whom educational change and innovation depend. This project will evaluate a method by which results and recommendations of educational research can be effectively communicated to teachers. It will discuss the results of previous research with preschool and grade-one teachers and promote the teachers' understanding of factors related to access to schools and achievement among children of differing social classes. Appropriate changes will be encouraged and the ways used to communicate research findings to the teachers evaluated. 12 months — \$43 000

80-0152 Universities and the training of intellectuals (Chile)

The training of intellectual leaders is of particular interest in a developing country when it undergoes a series of rapid changes in the political sphere that alter the structure and function of higher education. To detect any pattern in the changes that have affected the Chilean universities in recent years, this project will analyze the links between different types of intellectuals and the universities, political and public pressure groups, social movements, workers, and the church. The role of intellectuals in public communication will be studied, and the ideologies and policies of

the universities themselves will be analyzed. 12 months — \$58 800

80-0153 Training and the informal sector (Chile)

In the informal sector of the Chilean economy, wages are low, hours irregular, atmosphere competitive, and working conditions far from ideal. It is doubtful that a training program could improve productivity. However, there are a number of trades where access to training could have a significant impact. This project will examine some of the occupations in urban Chile that offer scope for improvement through training and will identify skill programs aimed at improving the employability of young workers. It will also examine the effectiveness of national institutes of vocational training in reaching workers in the informal sector and develop a tailor-made curriculum for training young workers. 18 months — \$69 000

80-0156 Dissemination of research on the informal sector (Chile)

To help those within the informal sector understand better their own situation in terms of broad social problems and to help groups working in action programs to develop activities directed at problems in that sector, this project will conceive and develop a pilot video-cassette television program on employment in the informal sector of the Chilean economy. The program will reach the university public, low-income groups, labour unions, and peasants' organizations. The project will include an evaluation of the impact of this form of dissemination of research findings. 4 months — \$35 000

80-0157 The impact of overseas training (West Africa)

Lacking indigenous training facilities, the governments of Zaïre and Cameroon have sent many students abroad to acquire advanced knowledge and skills. This project will evaluate the social and economic impact of Canadian postsecondary training programs on former students now working in their home countries. The project will review the training policies of the Zaïrian and Cameroonian governments, assess the impact of the Canadian programs on the individuals' occupational skills and career aspirations, and examine their perceptions of the relevance of the training received to national development needs. 30 months — \$72 000

80-0160 Delivery system for mass primary education (Malaysia) — phase II

Project Inspire (integrated system of programed instruction for the rural environment) is a response to the urgent need to improve the quality of primary education in Malaysia. Phase I of this project developed curricula, produced instructional materials, trained teachers, and focused on written achievement tests. Phase II will continue to increase the effectiveness of teaching and learning in rural primary schools. It will assess the effects of the Inspire system on pupils' attitudes and academic achievement and on the performance and role definitions of teachers. 30 months — \$132 000

80-0162 Fertility and agrarian conditions (Colombia)

Recently, there has been a notable decline in fertility in Colombia, but little is known about variations according to regions, subregions, type of economic activity, and family organization. To determine the degree to which fertility has been affected by population policies and agrarian conditions, this project will survey the differences in fertility and migration behaviour of families involved in various types of production activities; determine whether they are linked to differences in the implementation of population policies or agricultural productive organization; and examine the impact of seasonal migration of heads of families on family structure and organization of family labour. 18 months — \$39 000

80-0170 Institutional support — CISEA (Argentina)

CISEA (State and Administration Research Centre) was founded in 1977 to undertake research into social, political, and economic aspects of Argentina and Latin America. IDRC's contribution will enable CISEA to undertake research in four areas (state and public policy, agriculture, industry, and the political and social systems); increase the number of junior researchers and commence a training program; and improve its infrastructure including the library and publications. 36 months — \$225 000

80-0172 Integrated urban slum and squatter rehabilitation (Sri Lanka)

Colombo is one of the many cities facing the problem of proliferating slums and shanties within the urban area. This project aims to provide the knowledge needed not only to improve housing but at the same time to increase employment, income generation, environmental sanitation, and other essential services. The researchers will examine the process involved in upgrading a slum community in the Kirillapone area of Colombo. They will determine the social and economic impact on the inhabitants, describe the social and power structure of the community, and analyze the respective roles of the government, the Save the Children Fund, and the Kirillapone community in the upgrading program. 24 months — \$31 000

80-0173 Frontier expansion (Brazil) — phase II

Ambitious large-scale development projects such as the settlement of the Amazon Basin in Brazil often bring about rapid demographic and socioeconomic changes. But little is known about relationships between development and such changes. Phase I of this project undertook a complete baseline survey of economic activities and demographic characteristics in one representative community, Sao Felix. Phase II will analyze the process of change in the area as part of a larger process of frontier expansion and in relation to evolving government policies regarding Amazon development. 18 months — \$88 000

80-0174 Public enterprises (Nepal)

In Nepal a large number of public enterprises control a wide range of economic activities. But because the

Nepalese economy is stagnating, the role of public enterprises, and of financial institutions in particular, is being questioned. This project will conduct a comprehensive economic analysis of the principal types of public enterprises and financial institutions. Specifically, it will examine the administrative and regulatory environment within these enterprises, analyze their performance, evaluate their behaviour in terms of the government's economic policy objectives, and recommend policy prescriptions to enhance the usefulness of government corporations. 24 months — \$70 000

80-0186 Development prospects (Southern Thailand)

In Thailand, in addition to rural-urban disparities, there are significant regional imbalances in economic progress. Southern Thai farmers in Pattani province form a distinct ethnic and religious group and face social and economic constraints preventing their full participation in Thailand's development. In order to improve their participation in regional progress, this study will examine in detail the socioeconomic structure of the region with a view to developing a set of effective strategies for a balanced, integrated development program for Southern Thailand. 18 months — \$44 000

80-0187 Canadian area-specific learned societies — 1981-82 (CALACS) — phase IV

The Centre has supported three Canadian area-specific learned societies since 1974. The societies foster cooperation in research on development problems between developed and developing regions for their mutual benefit. Phase IV of this project will provide CALACS (the Canadian Association of Latin American and Caribbean Studies) with support for visiting scholar exchange, exchange of graduate students between Latin America and the Caribbean and Canada, distribution in Latin America and the Caribbean of CALACS' journal *North South*, and publication and distribution of the society's newsletter in those regions. 24 months — \$58 600

80-0191 Canadian area-specific learned societies — 1981-82 (CASA) — phase IV

The Centre has supported three Canadian area-specific learned societies since 1974. The societies foster cooperation in research on development problems between the developed and developing regions for their mutual benefit. Phase IV of this project will provide CASA (the Canadian Asian Studies Association) with travel support for visiting Asian scholars and researchers and for attendance of Asian graduate students in Canada at the annual general meeting of CASA; funds will also go toward the society's newsletter and journal and distribution of important research papers. 24 months — \$64 500

80-0192 Multivariate data analysis workshop (Middle East)

The Arab countries of the Middle East and North Africa lack both the information and the expertise for policy implication analysis of their population problems. Improving information and research capacity requires a range of program efforts and individuals with

advanced multivariate data analysis skills. The Middle East Population and Development Awards (ME awards) secretariat (Egypt) and the Bogazici University (Turkey) will organize a workshop to bring together a network of regional scholars interested in that field, familiarize the participants with a variety of multivariate techniques and their application to regional demographic data, and enable them to use these techniques on their own data sets by providing programming assistance and computer time. 1 month — \$37 000

80-0195 Sugar trade (Thailand)

Sugar is one of the most important commodities of Thailand and the country's third most valuable export. However, because of the "boom-and-bust" cycle of sugar production and the failure of stabilization policies for sugar prices and farm incomes, there has been a sugar crisis in Thailand. This project will study the domestic market for sugar within Thailand, evaluate the appropriateness of the government's fixed price for sugar, and study its policy on the sugar trade, whom it benefits, and the prospects for the future. 18 months — \$25 000

80-0196 Technological responses to rising energy prices (Thailand)

Like most developing countries, Thailand depends heavily on imported oil. The purpose of this project is to examine the technical changes that have occurred in the Thailand manufacturing industry as a result of changes in the price and availability of oil during the 1970s, to consider how this experience might influence future policies, and to recommend more appropriate technical responses to new energy situations. The project will identify the technological capabilities required, by analyzing the level of energy use in the manufacturing industry and establishing the nature of technical changes that have occurred in response to rising energy prices. Specific limitations in the technological resources and capabilities of individual firms will also be studied. 36 months — \$63 800

80-0200 Technological capacity in the chemical sector (Bangladesh)

The industrial sector in Bangladesh plays an important role in generating foreign exchange. The three branches of the chemical sector (fertilizers, pulp and paper, and rayon) illustrate the difficult choices facing a poor country such as Bangladesh in establishing an appropriate technology policy. This project will examine the role of technological capability and its contribution to the chemical sector; the levels and trends of productivity indicators as means to identify the nature of technical changes and their influence on plant performance; the influence of power failures, raw material shortages, markets, and government policies on technological behaviour; and ways of improving technological capability. 30 months — \$62 000

80-0202 Effects of international contract labour (Philippines)

The Philippines is one of several Asian countries

that have been sending an increasingly large number of contract workers to the Middle East. Little is known of the effects, both positive and negative, of international contract labour on the economic, demographic, and social conditions at the individual, household, and community levels. This project will study the socioeconomic profile, work history, occupations, salaries, and skills of migrant workers. The problems experienced by family members during the migrant worker's absence, at the community level, the physical changes and the benefits and disadvantages for the community at large will also be examined in light of future policy formulation. 12 months — \$54 000

80-0207 Income generation for women (Nepal)

Recently, the government of Nepal has established local institutions for the training and "skill development" of rural women. This project aims at examining the impact of these activities upon fertility attitudes and behaviour of village women. The project will determine the most appropriate types of income-generating activities, describe the present economic activities of rural women, and evaluate the impact of income generation upon women's fertility behaviour. 9 months — \$17 000

80-0208 History of national literacy crusade (Nicaragua)

In March 1980 the Nicaraguan government launched a 6-month National Literacy Crusade. Some 200 000 workers were enlisted in a vast and apparently successful campaign to teach 850 000 illiterates. To ensure that the experience of the Crusade is not lost, this project will enable scholars and technicians who participated to write the history of that campaign, analyze its political background, describe the experiences of teachers and students, and present a statistical analysis of the outcomes of it. 5 months — \$26 500

80-0212 Brain drain (Tunisia)

Developing countries are faced with the increasing emigration of doctors, teachers, engineers, lawyers, and administrators. This "brain drain" is a major obstacle to the socioeconomic development of many countries. Tunisia, because of its location, is a major loser. This project will study the social, economic, and political causes of the brain drain and determine its effects on the development of Tunisia. The researchers will recommend new policies to reduce both the causes and the consequences of this migration. 18 months — \$29 000

80-0213 Regional development and indigenous social structure (Chile)

In Chile, the spread of agricultural technology, land consolidation, and the government's free market trade policy have combined to force many small farmers off the land. This effect of modernization and the recent expansion of forestry production are threatening the economic and cultural survival of a particular ethnic group, the Mapuche. This project will study the agricultural changes in the Chilean economy as they relate to the employment, seasonal

migration, and socioeconomic conditions of small peasant farmers, and in particular the Mapuche population. 18 months — \$72 000

80-0214 Integrated population programs (Malaysia)

To lower fertility levels, many countries are trying to integrate family planning programs into their economic activities. In Malaysia, the Federal Land Development Authority (FELDA) has integrated family planning into its New Land Settlements Program. Field workers and informal community leaders are responsible for educating, motivating, and informing the community about family planning. This project will analyze the demographic and socioeconomic impact of the FELDA mode of integrating family planning with community development. 18 months — \$60 000

80-0215 CEUR/institutional support — 1981 (Argentina)

The Urban and Regional Studies Centre (CEUR) is an independent centre in Argentina undertaking research in urban and regional settlements and planning. IDRC's contribution will enable CEUR to continue its research on urban and regional issues and human settlements; provide support for CEUR's professional and administrative costs; and assist CEUR in its support for the Urban and Regional Commission of CLACSO (the Latin American Council for the Social Sciences). 12 months — \$65 000

80-0216 Analyses of educational research capacity (Cameroon and Jordan)

In developing countries, there is a need to determine the skills and competencies of educational research institutions, the facilities available, and the interventions likely to be most successful in enhancing educational research capacity. This project will conduct studies in Cameroon and Jordan to describe, analyze, and evaluate the educational research environment in both countries. The studies will form part of a wide-scale project examining the research capacity of more than a dozen developing countries. 4 months — \$15 700

Special Governing Board Activities

80-0171 Development of finance and administrative capabilities of IDRC-assisted institutions — DEVFIAD (Asia)

Some developing country institutions lack the personnel to handle the financial requirements of research projects. In most projects, coordinators are technical specialists and do not possess the necessary financial or administrative skills. The objectives of this project are to conduct two workshops in Asia to promote effective training for developing country personnel in financial and administrative systems, identify problems, and make recommendations on the provision of services to research scientists and donor agencies. 10 months — \$68 500

Division activity projects

In addition to the projects listed on the preceding pages, the Centre also funds numerous relatively small projects that are in one way or another supportive of the ongoing activities of the program divisions. For instance, some are to support workshops or seminars to identify priority research areas in a particular region or field. Others are to enable developing country researchers to attend international meetings of experts in other parts of the world, whereas still others are to provide funds for an expert from one country to visit and assist a project team in another.

The great majority of such projects are in fact to cover the costs of meetings and consultancies related directly or indirectly to IDRC-supported research projects in developing countries. During the past fiscal year, 211 division activity projects were approved at a total cost of \$29 000 000. Project grants ranged in size from a few hundred dollars to twenty thousand or more. A few examples of the activities funded under this program are:

- A regional workshop for education researchers from several Latin American countries to discuss teacher effectiveness and to prepare proposals for future research activity;
- A consultancy for an anthropologist to assist researchers in Somalia to develop evaluative research on the resettlement programs for nomadic peoples in the drought-stricken Mogadishu area;
- A visit of health science researchers to an IDRC-supported project in Guatemala that is developing techniques for treatment and control of diarrheal diseases;
- A consultancy for 12 case studies of research networks supported by IDRC and an evaluation of the advantages and disadvantages of the network concept and different linking mechanisms;
- A review and analysis of the report of the Brandt Commission at a special workshop of the North-South Round Table held at the Institute for Development Studies;
- A survey, by a Kenyan engineer, on wind power for energy generation in Kenya, with particular reference to the choice of technology and possible training requirements;
- A visit to Canadian university libraries by the senior librarian of Uganda's Makerere University, and shipment of a collection of books donated by University of Guelph through the Overseas Book Centre in Ottawa;
- A visit by a senior researcher to several developed country research centres to study new developments in microelectronics with a view to analyzing their potential impact on industry and employment, particularly in the developing world;
- Attendance of researchers from IDRC-supported projects in Egypt and Sierra Leone at an international symposium on solar energy utilization at the University of Western Ontario;
- A visit by an Israeli expert in fish genetics to a project in Thailand to make recommendations for research, training, and equipment; and
- Attendance, by participants from six Asian countries, at a meeting in Sri Lanka on regional trade sponsored by the Committee on Studies for Cooperation in Development in South Asia with the aim of developing a joint research proposal.

Financial analysis and statements

Fiscal 1980-81 was a renewal year for the International Development Research Centre, during which the Centre was able to increase the level of new projects beyond that experienced in either of the previous 2 years. The year saw the Centre recover somewhat from the effects of having only a minor increase in its Parliamentary grant in 1978-79 and no increase for the fiscal year 1979-80. Over the last 4 years, the Centre has averaged a nominal annual grant increase of 7.2%.

The growth in overall revenues in 1980-81 permitted the Centre to resume a level of operations consistent with its resources and long-term growth pattern. The Centre expanded both its project appropriations and its expenditures dramatically. At the same time, it allowed for some growth in the areas of research support and administration, which had been previously curtailed so that the Centre could direct its limited financial resources toward new project development.

A review of revenues and expenditures — in tabular form following this text — confirms that the Centre, for the most part, achieved its budgetary objectives in 1980-81.

Revenues

The Parliamentary grant for 1980-81, set at \$42.0 million, represented an increment of 13.9% over the previous year. Additional revenue came from high interest rates earned on short-term investments by the Centre. Other income was derived mostly from MINISIS licencing fees, \$58 000 for 1980-81 compared with \$67 000 last year. Interest and other income totaled \$2.2 million, a 27.2% growth over the 1979-80 level. In summary, Centre revenues were 14.5% higher than the level experienced the previous year and 0.9% over the level budgeted for 1980-81.

The Centre's grant for 1981-82 has been increased by 10.0% to \$46.2 million. Coupled with interest income, which has been conservatively estimated in anticipation of some softening in the short-term money market, this increase is expected to mean a rise in overall revenues of only 10.9% over the current year.

Development research and related expenditures

The level and the distribution of expenditures between research and other cost categories are real indicators of how well the Centre achieved its financial objectives. As a result of the increment in the Parliamentary grant and the interest income generated in 1980-81, the Centre was able to increase overall expenditures 9.3% to \$42.9 million in contrast to the minor decline that occurred in 1979-80.

Development research expenditures, those concerned with direct research project payments, increased 9.6% to \$26.8 million in 1980-81 after suffering an absolute decline of 2.2% in 1979-80. Research-related activities increased 12.5% to \$3.3 million. The largest elements in this latter increment, as with last year, were a result of the higher level of activity and the associated higher production and dissemination costs of publications. The Centre's development research library also experienced an expansion of its periodical services.

As evidenced by the following table, the Centre has continued to maintain a high proportion of direct project research expenditures compared with overall expenditures (70%).

At the same time, a nominal decrease occurred in the proportion of research operational support, which was combined with a minor increase in the proportion of expenditures related to the overall administration of the Centre.

| | Expenditures (thousands of dollars) | | | | | |
|------------------------------|-------------------------------------|--------------|-----------------|--------------|-----------------|--------------|
| | 1981 | % of total | 1980 | % of total | 1979 | % of total |
| Development research | \$26 766 | 62.4 | \$24 422 | 62.3 | \$24 971 | 63.4 |
| Research-related activities | 3 271 | 7.6 | 2 907 | 7.4 | 2 606 | 6.6 |
| Total research | \$30 037 | 70.0 | \$27 329 | 69.7 | \$27 577 | 70.0 |
| Research operational support | 8 848 | 20.7 | 8 332 | 21.2 | 8 213 | 20.9 |
| Administration | 3 990 | 9.3 | 3 556 | 9.1 | 3 566 | 9.1 |
| Total overall | \$42 875 | 100.0 | \$39 217 | 100.0 | \$39 356 | 100.0 |

One of the reasons that the Centre is able to plan and control its operations with some accuracy is its method of monitoring expenditures. The Centre has developed a series of ratios and key indicators based on the interrelationship of project appropriations, commitments, and expenditures. The close and regular monitoring of these factors during 1980-81 assisted the Centre in achieving most of its financial objectives.

Project appropriation and commitment activities were reasonably close to those projected. These activities are monitored constantly because they translate into future expenditures. The appropriation level for 1980-81 totaled \$49.9 million, compared with the \$41.8 million experienced last year (increase of 19.4%), and represented 97.5% of the budgeted level for 1980-81. Project commitment levels, at \$48.1 million, represented 103.5% of budget as well as a 35.8% increase over the levels experienced in 1979-80.

The trend noted in previous years toward a larger ratio of funds disbursed to committed projects abated somewhat in 1980-81. Funding requirements for previously committed projects were originally forecast at \$20.1 million; actual expenditures amounted to \$20.4 million. In 1980-81, the Centre was able to increase its funding for new projects. Such expenditures amounted to \$9.6 million compared with \$6.5 million for 1979-80. The growth in overall project expenditures can be attributed to a marked increment in the commitments occurring in 1980-81. Such commitments, \$6.0 million during March 1981 alone, corresponded to an increase of \$1.4 million in actual project expenditures.

Research operational support expenditures

Expenditures on the infrastructure utilized by the Centre in achieving its mandate include support for its overseas regional and liaison offices, which are maintained to facilitate effective contact with grant recipients and to enhance the Centre's ability to respond to Third World development issues. Also included are the costs of program personnel, who provide technical support, monitoring, project development, and management advice on research projects.

Through the increased Parliamentary grant for 1980-81, the Centre was able to offset some of the adverse effects of cost-control measures previously instituted in response to reduced funding. Two important actions taken during 1980-81 were:

- The reopening of the East Africa Regional Office in Nairobi, Kenya. Establishment costs will continue in 1981-82 as this office becomes fully operational.
- An increase in staffing levels. This is reflected in the increase in technical support expenditures in that a number of staff were posted to regional offices.

Although total 1980-81 research operational support expenditures increased 6.2% to \$8.8 million from \$8.3 million in 1979-80, as an allocation of total expenditures, they represent a reduction to 20.7% from 21.2% in 1979-80 — a ratio well within acceptable limits.

Contract research

The Centre continues to administer research projects on behalf of other donor organizations. Funds for such projects are provided by the donor and are reported in the Centre's financial records when project disbursements occur. Donor funds in excess of recorded expenditures are reported as a liability on the Centre's balance sheet. For the year ended 31 March 1981, contract research expenditures totaled \$0.9 million and represent continued support for the International Council for Research in Agroforestry (ICRAF) as well as the Control of Wildlife Diseases project supported by CIDA.

Administration expenditures

To support its overall operations, the Centre requires certain policy, executive, as well as administrative and service functions. Within the context of IDRC, such functions are represented by the offices of the Board of Governors, Chairman, President, Secretary and General Counsel, and Comptroller General and Treasurer.

For 1980-81, administration expenditures totaled \$4.0 million, a 12.2% increase over the previous year. This level was below the 1980-81 budget level and represented only nominal growth in relation to total Centre expenditures (9.3% from 9.1%). The major portion of such growth can be attributed to the higher number of Centre employees who became eligible for separation benefits. The Centre recognizes the cost of such benefits as they become vested. Other expenditures involved the enhancement of the Centre's management information system as well as a reorganization of the administration division.

Equity of Canada

The equity account increased by \$1.3 million in 1980-81 in contrast to a reduction of \$0.64 million and \$1.2 million experienced during 1979-80 and 1978-79, respectively. This overall increment for 1980-81 can be attributed to the growth in revenues (14.5%), which exceeded the increase in total expenditures (9.3%). As a result, as of 31 March 1981, Equity of Canada now stands at \$4.1 million of which \$1.6 million represents the undepreciated capital value of property and equipment and \$1.0 million, the minimum funding reserve established by the Board of Governors.

The Centre manages the use of its equity balance in such a manner as to allow management to maintain a consistent level of research expenditures. The Centre anticipates continued use of this management practice for 1981-82 in that \$1.0 million of its equity balance will be required to fund projected levels of Centre activities in the forthcoming year. This practice will allow expenditure levels to increase a budgeted 16.6% while total revenues are expected to rise by 10.9%.

The way ahead

The Parliamentary grant for 1981-82 has been established at \$47.2 million, which includes \$1.0 million directly attributable to a new activity, Cooperative Programs. Management responsibility for Cooperative Programs has been accepted by the Centre, on behalf of the Government of Canada, as part of a commitment made by Canada at the United Nations Conference on Science and Technology for Development (UNCSTD). The resumption of increases in Parliamentary grants, combined with the use of a portion of the Centre's equity, will enable the Board of Governors to approve a total appropriation budget of \$62.2 million for 1981-82.

The 1981-82 appropriation budget will represent a resumption of the growth plan of the Centre that had been interrupted in 1979-80 and 1978-79. Total appropriations are expected to rise 24.7% over the current year and 48.9% over that experienced in 1979-80. The largest portion of this higher level of appropriations (77.5%) will be allotted to the support of new research projects, 17.5% will be assigned to research operational support, and the remaining 5.0% to administration. Administration costs in total are expected to increase 15.3% but will still represent only 9.2% of total expenditures, a *decrease* from the current year. The fiscal year 1981-82 will see some further growth in staffing levels that will ensure sufficient capacity for new project development and will enable ongoing monitoring of more than 1000 active Centre-supported projects. One must keep in mind that the management of the Centre must address such persistent economic realities as inflation, both in Canada and, more importantly, in the Third World, the decreasing value of the Canadian dollar, increased oil prices, and legislated salary increases. The 1981-82 operating budget is the result of the Centre's assessment of the most effective use of its limited financial resources toward the attainment of its objectives in meeting the need for continued assistance to Third World research endeavours.

FINANCIAL HIGHLIGHTS

(thousands of dollars)

| | 1981 | 1980 | % change |
|---|------------------|------------------|--------------|
| RESULTS OF OPERATIONS | | | |
| Revenues | \$ 44,181 | \$ 38,581 | 14.5% |
| Grant from Parliament of Canada | 42,000 | 36,867 | 13.9 |
| Interest and other income | 2,181 | 1,714 | 27.2 |
| Expenditures | \$ 42,875 | \$ 39,217 | 9.3% |
| Development research | 26,766 | 24,422 | 9.6 |
| Research related activities | 3,271 | 2,907 | 12.5 |
| Research operational support | 8,848 | 8,332 | 6.2 |
| Administration | 3,990 | 3,556 | 12.2 |
| Excess of revenues over expenditures | \$ 1,306 | \$ (636) | |
| FINANCIAL POSITION | | | |
| Total assets | \$ 13,974 | \$ 11,085 | 26.1% |
| Current assets | 12,299 | 9,348 | 31.6 |
| Other assets | 1,675 | 1,737 | (3.6) |
| Total liabilities | \$ 9,843 | \$ 8,259 | 19.2% |
| Current liabilities | 7,704 | 6,238 | 23.5 |
| Other liabilities | 2,139 | 2,021 | 5.8 |
| Equity of Canada | \$ 4,131 | \$ 2,826 | 46.2% |
| PROGRAM ACTIVITY | | | |
| Appropriations | \$ 49,892 | \$ 41,783 | 19.4% |
| New projects | 37,054 | 29,895 | 23.9 |
| Regional and liaison offices | 2,066 | 2,032 | 1.7 |
| Technical support | 4,602 | 4,100 | 12.2 |
| Division management | 2,180 | 2,200 | (0.9) |
| Administration | 3,990 | 3,556 | 12.2 |
| Commitments | \$ 48,123 | \$ 35,428 | 35.8% |
| Projects | 35,285 | 23,540 | 49.9 |
| Regional and liaison offices | 2,066 | 2,032 | 1.7 |
| Technical support | 4,602 | 4,100 | 12.2 |
| Division management | 2,180 | 2,200 | (0.9) |
| Administration | 3,990 | 3,556 | 12.2 |

Above data do not include amounts related to contract research.

1980-81 ACTUAL vs BUDGET

(thousands of dollars)

| | Actual | Budget | % change |
|---|------------------|------------------|----------------|
| FINANCIAL ACTIVITY | | | |
| Revenues | \$ 44,181 | \$ 43,800 | 0.9% |
| Grant from Parliament of Canada | 42,000 | 42,000 | — |
| Interest and other income | 2,181 | 1,800 | 21.2 |
| Expenditures | \$ 42,875 | \$ 42,123 | 1.8% |
| Existing projects | 20,428 | 20,095 | 1.7 |
| New projects | 9,609 | 8,727 | 10.1 |
| Regional and liaison offices | 2,066 | 2,193 | (5.8) |
| Technical support | 4,602 | 4,642 | (0.9) |
| Division management | 2,180 | 2,262 | (3.6) |
| Administration | 3,990 | 4,204 | (5.1) |
| Excess of revenues over expenditures | \$ 1,306 | \$ 1,677 | (22.1)% |
| PROGRAM ACTIVITY | | | |
| Appropriations | \$ 49,892 | \$ 51,172 | (2.5)% |
| New projects | 37,054 | 37,871 | (2.2) |
| Regional and liaison offices | 2,066 | 2,193 | (5.8) |
| Technical support | 4,602 | 4,642 | (0.9) |
| Division management | 2,180 | 2,262 | (3.6) |
| Administration | 3,990 | 4,204 | (5.1) |
| Commitments | \$ 48,123 | \$ 46,476 | 3.5% |
| Projects | 35,285 | 33,175 | 6.4 |
| Regional and liaison offices | 2,066 | 2,193 | (5.8) |
| Technical support | 4,602 | 4,642 | (0.9) |
| Division management | 2,180 | 2,262 | (3.6) |
| Administration | 3,990 | 4,204 | (5.1) |

Above data do not include amounts related to contract research.

MANAGEMENT REPORT
for the year ended March 31, 1981
(thousands of dollars)

| Sector/activity | Approved budget | Approved appropriations | Commitments | Cumulative commitments 1980-81 | Cash payments during 1980-81 | As at March 31, 1981 | | |
|---|--------------------|----------------------------|------------------|--------------------------------------|---------------------------------------|-------------------------------|----------------------------|-----------------------|
| | | | | | | Uncommitted appropriations | Outstanding commitments | Total encumbrances |
| 1-Program Operations | | | | | | | | |
| Agriculture, Food and Nutrition Sciences | \$ 15,729 | \$ 16,002 | \$ 16,381 | \$ 33,384 | \$ 12,846 | \$ 5,258 | \$ 20,538 | \$ 25,796 |
| Health Sciences | 6,268 | 5,683 | 3,776 | 8,845 | 3,947 | 2,736 | 4,898 | 7,634 |
| Social Sciences | 10,106 | 10,213 | 9,797 | 17,464 | 9,243 | 4,578 | 8,221 | 12,799 |
| Information Sciences | 6,415 | 6,302 | 6,542 | 9,801 | 5,267 | 2,703 | 4,534 | 7,237 |
| Special Governing Board Activities | 612 | 268 | 143 | 200 | 132 | — | 68 | 68 |
| Cooperative Programs | 300 | 302 | 144 | 144 | 115 | 158 | 29 | 187 |
| 2-External Liaison and Relations | | | | | | | | |
| Office of the Vice-President — Planning | 2,685 | 2,530 | 2,501 | 2,574 | 2,433 | — | 141 | 141 |
| Office of the Senior Vice-President | 366 | 337 | 384 | 684 | 566 | — | 118 | 118 |
| Fellowship Program | 2,454 | 2,205 | 2,477 | 3,266 | 2,410 | 1,987 | 856 | 2,843 |
| Communications | 2,033 | 2,060 | 1,988 | 2,281 | 1,926 | — | 355 | 355 |
| 3-Administration | | | | | | | | |
| General Management | 4,204 | 3,990 | 3,990 | 3,990 | 3,990 | — | — | — |
| TOTAL | \$ 51,172 | \$ 49,892 | \$ 48,123 | \$ 82,633 | \$ 42,875 | \$ 17,420 | \$ 39,758 | \$ 57,178 |

Above data do not include amounts related to contract research.

International Development Research Centre
and
The Honourable Mark MacGuigan, P.C., M.P.
Secretary of State for External Affairs
Ottawa, Ontario

I have examined the balance sheet of the International Development Research Centre as at March 31, 1981 and the statements of expenditures and revenues, equity and changes in financial position for the year then ended. My examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as I considered necessary in the circumstances.

In my opinion, these financial statements present fairly the financial position of the International Development Research Centre as at March 31, 1981 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Rhéal Chatelain

Senior Deputy Auditor General
for the Auditor General of Canada

Ottawa, Ontario
June 12, 1981

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

BALANCE SHEET
as at March 31, 1981

| | 1981 | 1980 |
|---|----------------------|----------------------|
| ASSETS | | |
| Current Assets | | |
| Cash | \$ 144,834 | \$ 232,986 |
| Short-term deposits (Note 3) | 11,386,591 | 8,397,191 |
| Amounts receivable (Note 4) | 574,657 | 624,657 |
| Prepaid expenses | 192,866 | 92,908 |
| | <u>12,298,948</u> | <u>9,347,742</u> |
| Recoverable deposits | 81,390 | 85,024 |
| Property and equipment (Note 5) | 1,593,721 | 1,652,138 |
| | <u>\$ 13,974,059</u> | <u>\$ 11,084,904</u> |
| LIABILITIES AND EQUITY | | |
| Current Liabilities | | |
| Accounts payable and accrued liabilities (Note 6) | \$ 7,374,467 | \$ 5,921,184 |
| Funds provided for contract research | 329,744 | 316,947 |
| | <u>7,704,211</u> | <u>6,238,131</u> |
| Provision for employee separation benefits | 2,138,683 | 2,020,953 |
| Total Liabilities | <u>9,842,894</u> | <u>8,259,084</u> |
| Equity of Canada | 4,131,165 | 2,825,820 |
| | <u>\$ 13,974,059</u> | <u>\$ 11,084,904</u> |

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

Approved:

R.J. Audet
Comptroller General
and Treasurer

Ivan L. Head
President

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE

**STATEMENT OF EXPENDITURES AND REVENUES
for the year ended March 31, 1981**

| | 1981 | 1980 |
|--|----------------------------|----------------------------|
| EXPENDITURES | | |
| Development research | | |
| Project grants | \$ 21,974,523 | \$ 19,656,331 |
| Centre projects | <u>4,791,256</u> | <u>4,765,551</u> |
| | <u>26,765,779</u> | <u>24,421,882</u> |
| Research related activities | | |
| Project development and support | 1,068,809 | 1,071,635 |
| Information dissemination | 1,422,398 | 1,142,834 |
| Development research library | <u>780,038</u> | <u>692,981</u> |
| | <u>3,271,245</u> | <u>2,907,450</u> |
| Research operational support | | |
| Regional and liaison offices | 2,066,131 | 2,031,420 |
| Technical support | 4,602,042 | 4,099,672 |
| Division management | <u>2,180,022</u> | <u>2,200,417</u> |
| | <u>8,848,195</u> | <u>8,331,509</u> |
| Contract research | | |
| Project grants | <u>927,704</u> | <u>813,280</u> |
| Total research and support expenditures (Schedule 1) | <u>39,812,923</u> | <u>36,474,121</u> |
| Administration expenditures (Schedule 2) | <u>3,990,243</u> | <u>3,555,727</u> |
| | <u>43,803,166</u> | <u>40,029,848</u> |
| REVENUES | | |
| Grant from Parliament of Canada | 42,000,000 | 36,867,000 |
| Interest and other income | 2,180,807 | 1,713,818 |
| Contract research | <u>927,704</u> | <u>813,280</u> |
| | <u>45,108,511</u> | <u>39,394,098</u> |
| EXCESS OF REVENUES OVER EXPENDITURES (expenditures over revenues) | <u>\$ 1,305,345</u> | <u>\$ (635,750)</u> |

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

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE

**STATEMENT OF EQUITY
for the year ended March 31, 1981**

| | 1981 | 1980 |
|--|----------------------------|----------------------------|
| EQUITY OF CANADA — BEGINNING OF THE YEAR | \$ 2,825,820 | \$ 3,461,570 |
| Excess of revenues over expenditures (expenditures over revenues) | <u>1,305,345</u> | <u>(635,750)</u> |
| EQUITY OF CANADA — END OF THE YEAR | <u>\$ 4,131,165</u> | <u>\$ 2,825,820</u> |

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

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE

**STATEMENT OF CHANGES IN FINANCIAL POSITION
for the year ended March 31, 1981**

| | 1981 | 1980 |
|--|----------------------|---------------------|
| SOURCE OF FUNDS | | |
| Excess of revenues over expenditures (expenditures over revenues) | \$ 1,305,345 | \$ (635,750) |
| Add (deduct) items not requiring funds | | |
| Loss (gain) on disposal of property and equipment | 4,897 | (7,101) |
| Depreciation and amortization | 302,355 | 285,277 |
| Accrual of employee separation benefits | 402,159 | 523,963 |
| Funds provided by operations | 2,014,756 | 166,389 |
| Net increase in current liabilities | 1,466,080 | 1,144,233 |
| Proceeds from disposal of property and equipment | 13,438 | 16,520 |
| Decrease in recoverable deposits | 3,634 | — |
| | 3,497,908 | 1,327,142 |
| USE OF FUNDS | | |
| Increase in recoverable deposits | — | 2,342 |
| Net increase in other current assets | 49,958 | 245,531 |
| Additions to property and equipment | 262,273 | 225,773 |
| Payment of employee separation benefits | 284,429 | 220,726 |
| | 596,660 | 694,372 |
| INCREASE IN FUNDS FOR THE YEAR | 2,901,248 | 632,770 |
| FUNDS — BEGINNING OF THE YEAR | 8,630,177 | 7,997,407 |
| FUNDS — END OF THE YEAR | \$ 11,531,425 | \$ 8,630,177 |
| Represented by: | | |
| Cash | \$ 144,834 | \$ 232,986 |
| Short-term deposits (Note 3) | 11,386,591 | 8,397,191 |
| | \$ 11,531,425 | \$ 8,630,177 |

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

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE

NOTES TO FINANCIAL STATEMENTS

March 31, 1981

1. Nature and objectives

The International Development Research Centre is a Corporation, without share capital, established by the Parliament of Canada through the International Development Research Centre Act which received Royal assent on May 13, 1970. The annual grant received from the Parliament of Canada is pursuant to External Affairs Votes 45 and 55 for the years ended March 31, 1980 and 1981 respectively.

The objectives of the Centre are 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.

2. Significant accounting policies

The accompanying financial statements have been prepared in accordance with Canadian generally accepted accounting principles. Significant accounting policies are as follows:

Research expenditures

Certain expenditures for development research, research related activities and contract research are charged to the accounts at the time of disbursement and as they become due under the terms of contractual agreements. All research expenditures are recorded in the accounts on an accrual basis.

Foreign currency translation

Monetary assets and liabilities are translated into Canadian dollars at the rate of exchange in effect at year end. Non-monetary assets are translated at rates prevailing at the respective transaction dates.

Foreign currency transactions are translated into Canadian dollars by the use of an average exchange rate which closely approximates the rate in effect at the transaction date. Exchange gains and losses are reflected in the results of operations for the current period.

Contract research revenue

The Centre has entered into agreements to undertake contract research on behalf of various donor agencies. The Centre recognizes contract research revenue at the time related expenditures are incurred. Funds received in excess of contract research expenditures incurred are reflected in current liabilities.

Depreciation and amortization

The methods and rates employed annually to provide for the depreciation and amortization of property and equipment are as follows:

| | Method | Rate |
|--------------------------------|---------------------|------------|
| Leasehold improvements | Straight line | 5-15 years |
| Office furniture and equipment | Diminishing balance | 20% |
| Computer hardware and systems | | |
| software | Straight line | 5 years |
| Vehicles | Diminishing balance | 30% |
| Residence | Straight line | 25 years |

3. Short-term deposits

| | <u>1981</u> | <u>1980</u> |
|---|---------------------|---------------------|
| Canadian chartered banks | \$ 7,156,133 | \$ 8,094,791 |
| Commercial enterprises | 2,889,000 | — |
| Provincial government | 960,950 | — |
| Exchange certificates in a foreign bank | 380,508 | 302,400 |
| | <u>\$11,386,591</u> | <u>\$ 8,397,191</u> |

4. Amounts receivable

| | <u>1981</u> | <u>1980</u> |
|--|-------------------|-------------------|
| Staff travel advances | \$ 110,061 | \$ 189,391 |
| Accrued interest income | 241,999 | 198,382 |
| Costs recoverable from other organizations | 84,142 | 100,699 |
| Operating advances | 70,380 | 82,282 |
| Others | 68,075 | 53,903 |
| | <u>\$ 574,657</u> | <u>\$ 624,657</u> |

5. Property and equipment

| | <u>Cost</u> | <u>Accumulated depreciation, amortization</u> | <u>1981 net</u> | <u>1980 net</u> |
|---|---------------------|---|---------------------|---------------------|
| Leasehold improvements | \$ 1,208,510 | \$ 508,210 | \$ 700,300 | \$ 782,633 |
| Office furniture and equipment | 740,888 | 477,682 | 263,206 | 293,785 |
| Computer hardware and systems software | 759,388 | 383,288 | 376,100 | 345,384 |
| Vehicles | 274,315 | 121,759 | 152,556 | 124,601 |
| Residence | 104,076 | 27,517 | 76,559 | 80,735 |
| Land | 25,000 | — | 25,000 | 25,000 |
| | <u>\$ 3,112,177</u> | <u>\$ 1,518,456</u> | <u>\$ 1,593,721</u> | <u>\$ 1,652,138</u> |

6. Accounts payable and accrued liabilities

| | <u>1981</u> | <u>1980</u> |
|---|---------------------|---------------------|
| Accrued liabilities — projects | \$ 5,201,327 | \$ 4,089,992 |
| Accrued annual and other leave benefits | 1,318,964 | 1,178,468 |
| Other liabilities | 854,176 | 652,724 |
| | <u>\$ 7,374,467</u> | <u>\$ 5,921,184</u> |

7. Contractual commitments and contingent liabilities

Project grants and project development and support

The Centre is committed to make payments totaling \$36 820 000 during the next 4 years, subject to funds being provided by Parliament and subject to compliance by recipients with the terms of project agreements.

The Centre has also submitted formal grant offers to prospective recipients totaling \$7 060 000 and is awaiting acceptance of these offers.

Leases

The Centre has entered into various lease arrangements for office premises, equipment and staff accommodation, in Canada as well as various countries. The total liability over the next 5 years under such lease arrangements is as follows:

| | |
|------|---------------------|
| 1982 | \$ 1,420,000 |
| 1983 | 730,000 |
| 1984 | 120,000 |
| 1985 | 90,000 |
| 1986 | 70,000 |
| | <hr/> |
| | \$ 2,430,000 |
| | <hr/> |

Contract research

The Centre has commitments under various contract research agreements totaling \$330 000 which will be met by funds provided under such agreements.

Claims

The Centre is a defendant in actions for damages and costs allegedly sustained by the plaintiffs. Management and counsel are of the opinion that the Centre has defenses against all significant claims and accordingly no provision has been made in the financial statements in respect of these claims.

8. Related party transactions**Pension costs**

Employees of the Centre are covered by the Public Service Superannuation Plan administered by the Government of Canada. Contributions to the Plan are required from the employees and the Centre. These contributions represent the total liability of the Centre and are recognized in the accounts on a current basis.

Income taxes

The Centre is exempt from any liability for income taxes.

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE
SCHEDULE OF RESEARCH AND SUPPORT EXPENDITURES
for the year ended March 31, 1981

| | Development research | Research- related activities | Research operational support | Contract research | 1981 total | 1980 total |
|--|-------------------------|------------------------------------|------------------------------------|----------------------|----------------------|----------------------|
| Programs | | | | | | |
| Agriculture, Food and Nutrition Sciences | \$ 10,755,000 | \$ 204,399 | \$ 1,886,925 | \$ — | \$ 12,846,324 | \$ 11,284,603 |
| Social Sciences | 7,174,576 | 314,061 | 1,754,702 | — | 9,243,339 | 7,519,697 |
| Information Sciences | 3,306,728 | 102,311 | 1,077,588 | — | 4,486,627 | 4,860,508 |
| Health Sciences | 2,920,562 | 101,031 | 925,905 | — | 3,947,498 | 3,536,096 |
| Fellowship Program | 2,409,744 | — | — | — | 2,409,744 | 2,032,217 |
| Cooperative Programs | — | 36,426 | 78,148 | — | 114,574 | — |
| Program-related activities | | | | | | |
| Regional and Liaison Offices | — | 63,665 | 2,066,131 | — | 2,129,796 | 2,078,211 |
| External Liaison and Relations | 191,861 | 106,439 | 570,609 | — | 868,909 | 1,819,354 |
| Information Dissemination | 15,616 | 1,422,398 | 488,187 | — | 1,926,201 | 1,738,765 |
| Development Research Library | — | 780,038 | — | — | 780,038 | 692,981 |
| Special Governing Board Activities | (8,308) | 140,477 | — | — | 132,169 | 98,409 |
| Contract research | — | — | — | 927,704 | 927,704 | 813,280 |
| TOTAL RESEARCH AND SUPPORT EXPENDITURES | \$ 26,765,779 | \$ 3,271,245 | \$ 8,848,195 | \$ 927,704 | \$ 39,812,923 | \$ 36,474,121 |

Schedule 2

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE

SCHEDULE OF ADMINISTRATION EXPENDITURES
for the year ended March 31, 1981

| | 1981 | 1980 |
|--|---------------------|---------------------|
| Salaries and benefits | \$ 2,602,145 | \$ 2,325,114 |
| Rent and accommodation | 405,157 | 393,410 |
| Office expenses | 236,668 | 175,203 |
| Professional and special services | 204,189 | 169,558 |
| Travel and relocation | 206,283 | 163,862 |
| Governors' meetings | 98,192 | 99,176 |
| Depreciation and amortization | 97,673 | 97,369 |
| Telecommunications | 87,178 | 84,457 |
| Insurance | 52,758 | 47,578 |
| TOTAL ADMINISTRATION EXPENDITURES | \$ 3,990,243 | \$ 3,555,727 |

Fellowship Program

The general objective of the Fellowship Program is, simply stated, to improve the competence of individuals in the field of international development. This is achieved through a varied program of grants for study, travel, and training.

The primary focus is on training and upgrading scientists and professionals from developing countries in fields that parallel the research interests of IDRC. However, support for Canadian professionals in development-related activities remains an important element of the program, particularly in the context of the Centre's new commitment to place Canadian expertise at the service of developing countries through cooperative research projects.

The program's orientation is now toward professional upgrading rather than basic training, with consequent emphasis on short-term awards not exceeding 12 months. Program priorities are also being aligned more closely with those of the four program divisions. This realignment is reflected both in the new short-term management training courses designed by the divisions and in the increased support for pre- and post-project awards.

The award categories in 1980-81 were:

- Senior fellowships;
- Pearson fellowships;
- Professional development awards (Canada);
- Professional development awards (developing countries);
- Pre- and post-project awards;
- Management training awards;
- Research management awards; and
- Centre internships.

In addition to individual awards (listed below), the Centre supported the enrollment at the Hague Academy of International Law of 20 young trainees from developing countries, who will benefit both from the training and from the exposure to international law. Also during the year under review, the Centre provided a grant to the International Foundation for Science that will enable 25 young scientists from developing countries to carry on individual research projects in their own study environment.

Senior fellowship

The senior fellowship award enables a senior researcher from a developing country or Canada to spend a 12-month sabbatical producing a work of mutual concern and benefit to IDRC and the fellow. During the year under review, one award was granted:

R.J. Moore, Guyana

To examine diplomatic representation of developing countries in developed countries with suggestions for reorientation. Location: Georgetown, Guyana

Pearson fellowships

The Pearson fellowships are designed for young public servants from developing countries so that they may pursue their professional interest in Canada. The Canadian

missions in developing countries are responsible for nominating candidates. The fellowships are concentrated each year in a particular field. During 1980-81, 10 fellowships were awarded in the field of social sciences:

- | | |
|--|--|
| I.G. de Aleman, Panama To study different aspects of public administration. Location: Ottawa, Ontario | particular the development and training of public service administrators and managers. Location: Ottawa, Ontario |
| M. Azcueta, Peru To study recent trends in research on and teaching of social sciences as well as horizontal and community communication. Location: Montreal, Quebec | S.S. Lee, Korea To study the policies and practices needed to develop a program of international scientific technical cooperation. Location: Ottawa, Ontario |
| E.R. Cayetano, Belize To study techniques of supervision in the educational system of Ontario. Location: Toronto, Ontario | R.N. Meghji, Tanzania To perform a comparative study of multiple levels of cooperative organization and development. Location: Toronto, Ontario |
| N.N. Constantine, Lebanon To study different aspects of financial support in education. Location: Ottawa, Ontario | M.B.M. Sinon, Malaysia To study planning and coordination procedures for monitoring government programs and expenditures. Location: Ottawa, Ontario |
| M.D. Demercado, Jamaica To study marketing research management and operations. Location: Hamilton, Ontario | R. Promentilla, Philippines To study policies and practices of livestock marketing. Location: Winnipeg, Manitoba, and Ottawa, Ontario |
| A. Dumbuya, Sierra Leone To study aspects of public administration, in | |

Professional development awards (Canada)

Professional development awards provide sabbaticals for Canadian professionals at midcareer to undertake training, personal study, or investigation. The aims are:

- To allow professionals already involved in international development to improve or update their skills and knowledge; or
- To permit professionals with no specific exposure in the field of international development to investigate the possibility of adapting their skills to development efforts through study or on-the-job training.

Eight awards (person-years) are offered annually to Canadian citizens or landed immigrants with 3 years' residence in Canada. The recipients in 1980-81 were:

- | | |
|--|---|
| Pierre Bonin, Quebec To study territorial and regional development based on methods and strategies similar to integral rural community and soil-habitat self-development. Location: Canada, Rwanda, Cameroon | thousands of native tribal Indians. Location: Various organizations in Latin America and the USA |
| W. Chodorowska, Quebec To produce a feasibility study of the use of rice fields for fish rearing. Location: Rwanda | S.A. Heslip, British Columbia To investigate and assess group care programs for children in Cuba and Costa Rica. Location: Cuba, Costa Rica, and Jamaica |
| P. Hazelton, Alberta To work on settlement problems of Paraguayan Chaco, especially as they affect | Nicholas R. Liley, British Columbia To research factors controlling reproductive behaviour of fishes and their relevance to aquaculture. Location: Malaysia |

Wendy Quarry, Quebec

To undertake a work-study program in development-support communications.

Location: India and Colombia

Michael J. Risk, Ontario

To research the effect of deforestation and soil erosion on tropical coastal ecosystems.

Location: Australia

Sheila A. Robinson, Alberta

To study the personnel development process for rural primary health workers.

Location: Sudan, Tanzania, and India

Sidney G. Ryle, Nova Scotia

To examine the potential for import substitution of livestock feed and products through development of local resources in the de-

veloping countries of the English-speaking Caribbean.

Location: Trinidad

Gordon J. Young, Ontario

To assess the contribution made by glaciers to stream flow from the Andes and the Himalayas as well as the implications for water supply to hydroelectric and irrigation projects.

Location: Peru, Chile, Argentina, Pakistan, India, Nepal, and China

S. Zippan, Ontario

To aid in the struggle against desertification in the West African Sahel by the study of new indigenous building techniques that eliminate the need for wood.

Location: Republic of Niger

Professional development awards (developing countries)

The objective of these awards is to improve and upgrade senior personnel in developing countries. The awards consist of a sabbatical of 4-12 months in which midcareer professionals pursue further training, personal study, or investigation closely related to the needs and development of their career.

During 1980-81, 17 award holders took up tenure (some of these were candidates selected the previous year) and 12 candidates were recommended for awards. This program will not be offered after 1981-82.

Awarded

Ralph I.T. Alles, Sri Lanka

Comparative study and assessment of career training programs for secondary school students and graduates in Singapore, Sri Lanka, Thailand, Canada, United Kingdom, and West Germany.

Carmen Browne, Jamaica

M.Ed. (vocational education).

Location: University of New Brunswick, Fredericton, Canada

Graciela Corvalan, Paraguay

Studies on research methods in sociolinguistics and education.

Location: Department of Linguistics, State University of New York, Buffalo, USA, and Centro Paraguayo des Estudios Sociologicos, Asunción, Paraguay

T. Dharmalingam, India

A course in epidemiology and medical statistics.

Location: London School of Hygiene and Tropical Medicine, London, England

Cheikh Dieng, Senegal

A comparative study of cooperative manage-

ment in cooperative banana plantations in Casamance — 1970-80.

Location: École des Hautes études en sciences sociales, Paris, France

Seham Fiad, Egypt

A study of some antinutritional factors affecting the quality of edible oils in Egypt.

Location: Department of Nutritional Sciences, University of California, Berkeley, USA

Carlos H. Filgueira, Uruguay

A comparative study entitled "Roles of the entrepreneur and the state in the development of the Uruguayan livestock industry."

Location: Institute of Development Studies, Brighton, Sussex, England

M.H. El-Lakany, Egypt

Studies on *Casuarina* as a multipurpose tree for arid lands.

Location: Commonwealth Scientific and Industrial Research Organization, Canberra, Australia

Brij Kishore, India

Research on legal and institutional aspects of environmental management.

Location: Department of Political Studies, University of Guelph, Guelph, Canada

- A.S. Murty, India
Research on the occurrence of insecticides and herbicides in mineral and organic soils used for vegetable production.
Location: Agriculture Canada research institute, London, Canada
- J.M.N. Mwasa, Uganda
Ph.D. thesis: "Some problems and solutions for implementation of educational innovations in Canada and USA and their implications for implementation of educational innovations in Uganda."
Location: Ontario Institute for Studies in Education, Toronto, Canada
- T. Ramaprabhu, India
Study and research on the problem of aquatic weed control.
Location: University of Florida, Gainesville, USA
- José Santos Rojas, Chile
Studies on research methods in virology and potato breeding and production programs.
Location: Agriculture Canada research stations in Vancouver and Fredericton, Canada
- Carmen Schmitt, Chile
Studies and research in communications.
Location: Department of Communication Studies, University of Windsor, Windsor, Canada
- Sing Ching Tongdee, Thailand
Research and study on postharvest technology for fruit and vegetables.
Location: Division of Food Research, Food Research Laboratory, Commonwealth Scientific and Industrial Research Organization, North Ryde, Australia
- José Varea-Teran, Ecuador
Training in research methods for the study of congenital hyperthyroidism.
Location: Université Libre de Bruxelles, Brussels, Belgium
- Mohamed Zain Karim, Malaysia
Study on the role of growth substances in plant propagation, fruit development, and postharvest physiology of fruits.
Location: Wye College, Kent, England, and the University of Florida, Gainesville, USA
- Recommended (April 1981)**
Abate Alula, Ethiopia
Boubacar Barry, Senegal
Carl E. Brockmann, Bolivia
Edgar Coss Zelaya, Bolivia
Robert Dodoo, Ghana
Mozammel Hossain, Bangladesh
Hermes A. Marroquin, Guatemala
José F. Martín, Argentina
Joseph K. Mukiibi, Uganda
Sinnathamby Nallainathan, Sri Lanka
Jagveer S. Sindhu, India
Andemichael Teferi, Ethiopia
Maxime Fayon, Seychelles

Pre- and post-project awards

One of IDRC's programs is intended to provide training for developing country personnel who either are slated to participate in an IDRC-supported project or have already been associated with one. Nominations and selections for this award are made by the program divisions in cooperation with the Fellowship Program. The number of grants awarded annually varies as does the amount of each grant: the nature and location of training are dependent upon the individuals selected. For 1980-81, eight individuals received pre-project awards and nine, post-project awards:

Pre-project awards

- I.K. Doukouré, Senegal
To obtain a master's degree in photogrammetry.
Location: Laval University, Quebec, Canada
- K. Pranee, Thailand
To participate in the International Graduate Summer School Programme: Librarianship and Information Sciences.
Location: College of Librarianship, Wales, Great Britain
- T.O. Honrado, Philippines
To complete a master's degree in computer science.
Location: McGill University, Montreal, Canada
- A.A. Khan, Bangladesh
To attend a course in library sciences.
Location: University of the Philippines, Quezon City, Philippines
- M. Youssef, Egypt
To undertake a study on "product develop-

ment and determination of faba beans' qualities; composite flour technology and quality control."

Location: University of Manitoba, Winnipeg, Canada

N. Malee, Thailand

To participate in a seminar entitled "Classroom environment study."

Location: Twente University, Enschede, Netherlands

N.V. Ross, Guyana

To obtain a diploma in library studies.

Location: University of the West Indies, Kingston, Jamaica

R. Wilson, Trinidad

To obtain a master's degree in library science.

Location: Case Western Reserve University, Cleveland, USA

Post-project awards

M.N. Islam, Bangladesh

To attend courses and seminars at the M.Sc. level in the history and social studies of science and to write a revised version of the report produced in connection with an IDRC-supported project on biogas technology.

Location: University of Sussex, Sussex, England

L.F. Justiniani, Philippines

To obtain a master's degree in public health with emphasis on biostatistics and epidemiology.

Location: University of the Philippines, Manila, Philippines

R. Chaiwat, Thailand

To complete Ph.D. studies in rural sociology.

Location: University of Wisconsin, Madison, USA

D.J. Watson, Canada

To undertake studies toward a master's degree in fisheries.

Location: University of Guelph, Guelph, Canada

P. Muschett, Jamaica

To complete studies toward a master's degree in social work.

Location: Rutgers University, New Brunswick, USA

K. Rashid, Lebanon

To complete studies in legume pathology toward a Ph.D.

Location: University of Manitoba, Winnipeg, Canada

J. Cubillo, Chile

To attend courses of the graduate program in information and computer science.

Location: Georgia Institute of Technology, Atlanta, USA

W. Lee, Malaysia

To attend the certificate course in tropical medicine and hygiene.

Location: Liverpool School of Tropical Medicine, Liverpool, England

K.G. Mohiuddin, Bangladesh

To complete studies in international comparative management toward a Ph.D.

Location: University of California, Los Angeles, USA

Management training awards

The objective of the management training awards is to assist in the upgrading of middle level and senior administrators in those national research institutions and universities in developing countries in which a number of IDRC-funded projects are centred. These awards provide 6 months of practical work attachment and formal training in Canada. During the year under review, two awards were given:

Ibrahim El-Eraki, Egypt

To take courses as well as practical work attachments with McGill University Administration followed by a period at IDRC, Ottawa, and to visit other institutions and agencies.

Roberto Gayahan, Philippines

To undertake financial management training in the Treasurer's Office at IDRC, Ottawa, and financial management courses at the Public Service Commission of Canada and Carleton University.

Research management awards

Research management awards are designed to provide practical and formal training in Canada to managers and directors of research institutions in developing coun-

tries. Training programs of 3-4 months are established in cooperation with Canadian universities and government departments. During 1980-81, two awards were given:

A.M. Kabaara, Kenya

A study of research management at Agriculture Canada's Research Branch, Ottawa, and field visits to England, USA, Mexico, Colombia, and Nigeria.

Z.M. Nyiira, Uganda

A study of research management at Agriculture Canada's Research Branch, Ottawa, with field visits to England, USA, Mexico, Colombia, and Nigeria.

Centre internships

The purpose of Centre internships is to provide in-house training to young researchers from developing countries in the processes of administration and development of research projects. The program may take place in Ottawa or be divided between head office and a regional office. During the year under review, two awards were given:

M.P. Mainali, Nepal

Location: Education Program,
Social Sciences Division,
IDRC, Ottawa

P. Apinan, Thailand

Location: Office of the Vice-President,
Planning, IDRC, Ottawa, and
IDRC, Asia Regional Office, Singapore

Publications and films

Publications et films

The Centre has always placed great importance on the publication and dissemination of research results. IDRC's Communications Division produces a wide range of technical and scientific materials for worldwide distribution, particularly in the developing countries, as well as more general materials to inform the public about the work of the Centre. A list of publications and films produced by the Centre during the fiscal year follows.

By the very nature of their work, IDRC staff are frequently called upon to participate in workshops and seminars, to speak at conferences, and to contribute to scientific journals. A list of many of these external publications by Centre staff constitutes the second part of this section.

Many of the research projects supported by IDRC generate their own publications — reports, texts, newsletters — that, although not produced or distributed by the Centre, form an important part of the effort to disseminate research results as widely as possible. The third part of this section includes as many of these publications as were available at the time of publication of this report.

Catalogues of IDRC publications and audiovisual productions in English, French, and Spanish can be obtained from the Communications Division, IDRC, Box 8500, Ottawa, Canada K1G 3H9. If the material listed under other headings 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 researchers in developing countries.

Le Centre attache une extrême importance à la publication et à la diffusion des résultats des travaux qu'il subventionne. C'est pourquoi la Division des communications produit et distribue dans le monde entier — surtout dans le Tiers-Monde — un large éventail de documents scientifiques et techniques, ainsi que des publications et films visant à renseigner le public sur les activités du CRDI. Ci-après, la liste des films et publications du Centre produits au cours du dernier exercice.

Les employés du CRDI, de par la nature même de leurs fonctions, sont souvent appelés à faire des conférences, à participer à des colloques ou à des séminaires et à collaborer à des revues scientifiques. Une liste de la plupart de ces communications extérieures figure dans la deuxième partie de la présente section.

Plusieurs projets de recherche subventionnés par le CRDI débouchent sur la publication de documents, rapports ou bulletins qui, même s'ils ne sont pas publiés et distribués par le Centre même, constituent une part importante des efforts de diffusion des résultats des recherches. La troisième partie de cette section donne la liste de toutes les publications parues au moment de la rédaction du présent rapport.

On peut obtenir les catalogues complets des publications et des productions audiovisuelles du CRDI actuellement disponibles en français, anglais ou espagnol, en s'adressant au Service de distribution, Division des communications, CRDI, B.P. 8500, Ottawa (Canada) K1G 3H9. S'il est impossible de trouver un document donné chez les dépositaires habituels, (auteurs, bibliothèques ou librairies) le CRDI s'efforcera de fournir les exemplaires demandés.

Vu l'approvisionnement limité pour certaines publications, les stocks en voie d'épuisement seront, de préférence, réservés aux chercheurs des pays en développement.

Centre publications Publications du Centre

IDRC annual report 1979-1980/Rapport annuel 1979-1980 CRDI, Ottawa, IDRC/CRDI, 1980. 126 p. (IDRC-003/80e,f)

L'homme et l'arbre en Afrique tropicale: trois essais sur le rôle des arbres dans l'environnement africain, G. Poulsen, Ottawa, CRDI, 1980. 31 p. (IDRC-101f) (Also available in English, IDRC-101e)

Fisheries and aquaculture in the People's Republic of China, G.I. Pritchard, Ottawa, IDRC, 1980. 32 p. (IDRC-115e)

Herramientas de progreso: ciencia y tecnología para el desarrollo, D. Spurgeon, editor, Bogota, CIID, 1980. 214 p. (IDRC-131s) (Also available in English, IDRC-131e; disponible également en français, IDRC-131f)

Dissemination of scientific information in the People's Republic of China, K.P. Broadbent, Ottawa, IDRC, 1980. 60 p. (IDRC-148e)

Devindex 1978: index to 1978 literature on economic and social development. Index de la littérature sur le développement économique et social produite en 1978, G. Morin-Labatut, editor/rédactrice, Ottawa, IDRC/CRDI, 1980. 183 p. (IDRC-149e,f)

Búsqueda: informe anual de actividades del CIID 1979, Ottawa, CIID, 1980. 40 p. (IDRC-150s). (Also available in English, IDRC-150e; disponible également en français, IDRC-150f)

Cassava cultural practices: proceedings of a workshop held in Salvador, Bahía, Brazil, 18-21 March 1980, E.J. Weber, J.C. Toro M., and M. Graham, editors, Ottawa, IDRC, 1980. 152 p. (IDRC-151e)

An end to pounding: a new mechanical flour milling system in use in Africa, P. Eastman, Ottawa, IDRC, 1980. 64 p. (IDRC-152e)

Low-cost rural health care and health manpower training: an annotated bibliography with special emphasis on developing countries (Volume 6), R.M. Bechtel, editor, Ottawa, IDRC, 1980. 157 p. (IDRC-153e)

Wastewater treatment and resource recovery: report of a workshop on high-rate algae ponds, Singapore, 27-29 February 1980, Ottawa, IDRC, 1980. 47 p. (IDRC-154e)

Rattan: a report of a workshop held in Singapore, 4-6 June 1979, Ottawa, IDRC, 1980. 76 p. (IDRC-155e)

International cooperative information systems: proceedings of a seminar held in Vienna, Austria, 9-13 July 1979, Ottawa, IDRC, 1980. 111 p. (IDRC-156e)

Rural energy in Fiji: a survey of domestic rural energy use and potential, S. Siwatibau, Ottawa, IDRC, 1980. 132 p. (IDRC-157e)

Le rôle des arbres au Sahel: compte rendu du colloque tenu à Dakar (Sénégal) du 5 au 10 novembre 1979, Ottawa, CRDI, 1980. 92 p. (IDRC-158f)

Bamboo research in Asia: proceedings of a workshop held in Singapore, 28-30 May 1980, G. Lessard and A. Chouinard, editors, Ottawa, IDRC, 1980. 228 p. (IDRC-159e)

Nutritional status of the rural population of the Sahel: report of a working group, Paris, France, 28-29 April 1980, Ottawa, IDRC, 1981. 92 p. (IDRC-160e)

État nutritionnel de la population rurale du Sahel: rapport d'un groupe de travail, Paris (France), 28-29 avril 1980, Ottawa, CRDI, 1981. 96 p. (IDRC-160f)

Priorities for science and technology policy research in Africa: report of a seminar held at the University of Ife, Ile-Ife, Nigeria, 3-6 December 1979, Ottawa, IDRC, 1981. 32 p. (IDRC-162e)

Les priorités de la recherche sur la politique scientifique et technique en Afrique: compte rendu du colloque tenu à l'Université d'Ife, Ile-Ife, (Nigeria) du 3 au 6 décembre 1979, Ottawa, CRDI, 1981. 32 p. (IDRC-162f)

Searching: review of IDRC activities 1980 ... and a look back at IDRC's first decade 1970-1980, Ottawa, IDRC, 1981. 40 p. (IDRC-164e)

Quête d'avenirs: rapport d'activité du CRDI

en 1980 ... et petite revue rétrospective de la première décennie du CRDI 1970-1980, Ottawa, CRDI, 1981. 40 p. (IDRC-164f)

Búsqueda: informe de actividades del CIID 1980 ... y una mirada a la primera década del CIID 1970-1980. Ottawa, CIID, 1981. 40 p. (IDRC-164s)

Science and technology for development, STPI module 1: a review of schools of thought on science, technology, development, and technical change, F. Sagasti, Ottawa, IDRC, 1980. 56 p. (IDRC-TS18e)

Science and technology for development, STPI module 2: the evaluation of industry in STPI countries, O. Cardettini, F. Sagasti, G. Carrido Lecca, F. Gonzalez Vigil, Ottawa, IDRC, 1980. 69 p. (IDRC-TS19e)

Science and technology for development, STPI module 3: the evaluation of science and technology in STPI countries, F. Sagasti, Ottawa, IDRC, 1980. 45 p. (IDRC-TS20e)

La reproduction provoquée chez les poissons : théorie et pratique, B.J. Harvey et W.S. Hoar, Ottawa, CRDI, 1980. 48 p. (IDRC-TS21f) (Also available in English, IDRC-TS21e)

Science and technology for development, STPI module 4: the present situation of science and technology in STPI countries, A. Aráoz, Ottawa, IDRC, 1980. 67 p. (IDRC-TS22e)

A review of teacher effectiveness research in Africa, India, Latin America, Middle East, Malaysia, Philippines, and Thailand: synthesis of results, B. Avalos and W. Haddad, Ottawa, IDRC, 1981. 128 p. (IDRC-TS23e)

Reseña de la investigación sobre efectividad de los maestros en Africa, América Latina, Filipinas, India, Malasia, Medio Oriente y Tailandia: síntesis de resultados, B. Avalos y W. Haddad, Ottawa, CIID, 1981. 118 p. (IDRC-TS23s)

The determinants of school achievement: a review of the research for developing countries, E. Schiefelbein and J. Simmons, Ottawa, IDRC, 1981. 44 p. (IDRC-TS24e)

Los determinantes de rendimiento escolar: reseña de la investigación para los países en desarrollo, E. Schiefelbein y J. Simmons, Ottawa, CIID, 1981. 36 p. (IDRC-TS24s)

Rural water supply in China, Ottawa, IDRC, 1981. 92 p. (IDRC-TS25e)

Science and technology for development, STPI module 5: policy instruments to build up an infrastructure for the generation of technology, A. Aráoz, Ottawa, IDRC, 1980. 59 p. (IDRC-TS26e)

Science and technology for development, STPI module 7: policy instruments to define the pattern of demand for technology, S. Barrio, Ottawa, IDRC, 1980. 91 p. (IDRC-TS27e)

Science and technology for development, STPI module 8: policy instruments to promote the performance of S and T activities in industrial enterprises, F. Sagasti, Ottawa, IDRC, 1980. 27 p. (IDRC-TS28e)

Science and technology for development, STPI module 9: policy instruments for the support of industrial science and technology activities, S. Barrio, K.M. Chung, and A. Tillett, Ottawa, IDRC, 1980. 55 p. (IDRC-TS29e)

Education, work, and employment: a summary review, M. Woodhall, Ottawa, IDRC, 1981. 52 p. (IDRC-TS30e)

Educación, trabajo y empleo: reseña sumaria, M. Woodhall, Ottawa, CIID, 1981. 40 p. (IDRC-TS30s)

Science and technology for development, STPI module 10: technical changes in industrial branches, F. Sercovich, Ottawa, IDRC, 1980. 47 p. (IDRC-TS31e)

Science and technology for development, STPI module 11: technology behaviour of industrial enterprises, F. Sercovich, Ottawa, IDRC, 1980. 59 p. (IDRC-TS32e)

Science and technology for development, STPI module 6: policy instruments for the regulation of technology imports, Ottawa, IDRC, 1980. 75 p. (IDRC-TS33e)

Science and technology for development, STPI module 12: case studies on technical change, F. Sercovich, Ottawa, IDRC, 1980. 35 p. (IDRC-TS34e)

Connecting worlds: a survey of developments in educational research in Latin America, R.G. Myers, Ottawa, IDRC, 1981. 88 p. (IDRC-TS35e)

Educational innovation in the Philippines: a case study of Project Impact, P.V. Flores, Ottawa, IDRC, 1981. 88 p. (IDRC-TS36e)

CDS/ISIS and MINISIS: a functional analysis and comparison, R.L. Valantin,

Ottawa, IDRC, 1981. 88 p. (IDRC-TS37e)

The biology and artificial propagation of farm fishes, Chung Ling with Lee You Kwang, Chang Shung Tao, Liu Chia Chao, and Chen Fun Cheong, and **Grass carp and silver carp: production of fry**, Minoru Tsuchiya, Ottawa, IDRC, 1980. 284 p. (IDRC-MR15)

A survey of international news coverage by the Canadian media, Dennis Schroeder, Ottawa, IDRC, 1980. 163 p. (IDRC-MR20)

Science and technology for development: a selection of background papers for the main comparative report of the STPI project, part A: science and technology policy and development, G.H. Oldham, O. Cardettini, and Maximo Halty Carrere, contributors, Ottawa, IDRC, 1980. 84 p. (IDRC-MR21)

Science and technology for development: a selection of background papers for the main comparative report of the STPI project, part B: consulting and design engineering capabilities in developing countries, A.K. Malhotra, Ottawa, IDRC, 1980. 72 p. (IDRC-MR22)

Science and technology for development: a selection of background papers for the main comparative report of the STPI project, part C: technology transfer in developing countries, C. Contreras, F.C. Sercovich, A. Malhotra, and A. Nadal E., contributors, Ottawa, IDRC, 1980. 80 p. (IDRC-MR23)

Science and technology for development: a selection of background papers for the main comparative report of the STPI project, part D: state enterprises and technological development, F.S. Erber, Sulamis Dain, D.M. Monteiro, I. Avalos, R. Rengifo, A. Nadal E., contributors, Ottawa, IDRC, 1980. 99 p. (IDRC-MR24)

A current awareness bibliography for IDRC-supported fisheries projects, volume 4, number 2, compiled by D. Turnbull, Ottawa, IDRC, 1980. 25 p. (IDRC-MR25)

Parasitic weed control: a review of research on *Striga* and *Orobancha* control using synthetic germinators, A.D.R. Ker, Ottawa, IDRC, 1980. 33 p. (IDRC-MR26)

Synopsis of biological data on the broad-headed sleeper goby, *Dormitator latifrons*, prepared by D.A. Turnbull, Ottawa, IDRC, 1980. 16 p. (IDRC-MR27)

A current awareness bibliography for IDRC-

supported fisheries projects, volume 4, number 3, compiled by D. Turnbull, Ottawa, IDRC, 1980. 26 p. (IDRC-MR28)

Informe del seminario sobre aspectos económicos en la prestación de servicios de salud, Bogotá, Colombia, junio 3-5 de 1980, Ottawa, CIID, 1980. 115 p. (IDRC-MR29)

Sorghum milling — a new agro-industry for Botswana, R.S. Forrest and G. Yaciuk, Ottawa, IDRC, 1980. 32 p. (IDRC-MR30)

Increasing national capacity for educational research: issues, dynamics, and alternatives, S.F. Shaeffer, Ottawa, IDRC, 1980. 58 p. (IDRC-MR31)

A current awareness bibliography for IDRC-supported fisheries projects, volume 4, number 4, compiled by D. Turnbull, Ottawa, IDRC, 1980. 26 p. (IDRC-MR32)

Proceedings of the Canadian agricultural research priorities symposium: Ottawa, Canada, 6-7 November 1980, Ottawa, IDRC, 1980. 230 p. (IDRC-MR33)

***Strombus gigas* (the Queen Conch) and *Turbinella pyrum* (the Indian Chank): a selected bibliography**, compiled by D. Turnbull, Ottawa, IDRC, 1981. 15 p. (IDRC-MR42e)

A current awareness bibliography for IDRC-supported fisheries projects, volume 5, number 1, compiled by Deborah Turnbull, Ottawa, IDRC, 1981. 25 p. (IDRC-MR43e)

***Chanos chanos* (the milkfish): a bibliography**, compiled by D.C. Ramsingh, W.E. Vanstone, and Deborah Turnbull, Ottawa, IDRC, 1981. 65 p. (IDRC-MR44e)

Ex Libris, IDRC Library publication. Ottawa, IDRC, Information Sciences Division.

MINISIS Newsletter/Bulletin MINISIS, vol. 1-2, May-Dec. 1980. Ottawa, IDRC, Information Sciences Division.

The IDRC Reports/Le CRDI Explore/El CIID Informa, Michelle Hibler, editor-in-chief/rédactrice en chef

Published in three separate language editions, this is a quarterly magazine of report and comment on the work supported by IDRC and on related activities in the field of international development. Total circulation of the English, French, and Spanish editions is about 15000 per issue, of which just over 50% is to developing countries, 40% within Canada, and the remainder to other industrialized countries.

The magazine is published in January, April, July, and October, and is available through the Centre's Communications Division.

Cette revue trimestrielle est consacrée aux recherches financées par le Centre de recherches pour le développement international et aux activités connexes dans le domaine du développement international. Son tirage est de 15 000 exemplaires — éditions anglaise, française et espagnole — dont à peu près 50% sont distribués dans les pays en développement, 40% au Canada et le reste dans des pays industrialisés.

Le CRDI Explore paraît en janvier, avril, juillet et octobre et peut être obtenu sur demande à la Division des communications.

IDRC Feature/Reportage CRDI

This monthly news feature service on scientific, technical, and educational subjects related to development is provided free of charge to selected newspapers and magazines in the developing world. During the past year, 38 articles, many of them written by IDRC staff, others by selected contributors, were distributed in English and French to some 500 publications in 86 countries. Although it has not been possible to obtain a complete record of the number of *IDRC Features* actually published, it is known that the series is widely used and appreciated, with clippings and comments being received from Argentina to Zambia.

Ce bulletin mensuel d'information sur l'actualité scientifique, technique et éducative relative au développement est distribué gracieusement aux principaux journaux et revues publiés dans le monde en voie de développement. Au cours de l'année écoulée, 38 articles, écrits en français et en anglais par des employés du Centre et des correspondants choisis, ont été distribués à environ 500 publications dans 86 pays. Bien qu'il soit impossible de connaître le nombre exact d'articles reproduits à l'étranger, nous pouvons affirmer qu'ils sont largement utilisés et lus avec intérêt, si on en juge par l'abondant courrier qui nous arrive de l'Argentine à la Zambie.

Films

(Produced by/Réalisés par Neill McKee)

L'adieu au pilon, 16 mm, 15 min, démonstration d'un décortiqueur simple créé pour épargner la corvée du décortilage aux producteurs

et consommateurs de sorgho du Botswana. (English version: *An end to pounding*)

Le message des guérisseurs africains, 16 mm, 25 min, une synthèse de deux documentaires réalisés au Zaïre, qui présente quelques-unes des principales traditions thérapeutiques de l'Afrique ancestrale.

A message from African healers, 16 mm, 25 min, a synthesis of two lengthy documentary films made in Zaire that examines the relevance of traditional medicine to the needs of modern Africa.

Fish by-catch — bonus from the sea, 16 mm, 25 min, shows how a pilot project in Guyana is turning "waste" fish from shrimp trawlers into a major food source for the people of the region.

La pêche secondaire — un cadeau des mers, 16 mm, 13 min, décrit comment la Guyane a réussi à réduire le gaspillage de millions de tonnes de poissons comestibles rejetés à la mer par les chalutiers pêchant la crevette.

La pesca colateral — un regalo del mar, 16 mm, 13 min, muestra los barcos camaroneros en operación en las costas de Guayana, y una planta piloto construida para procesar la nueva pesca colateral.

Choices: the role of science and technology for development, 16 mm, 28 min, illustrates how the scientists and planners of Africa, Asia, and Latin America are seeking solutions to the development problems of their regions through practical research.

Alternatives: la science et la technique au service du développement, 16 mm, 28 min, montre comment les chercheurs du Tiers-Monde s'attaquent aux problèmes du développement et proposent des solutions simples ou complexes, mais toujours appropriées.

Publications and texts by Centre staff

Publications et textes rédigées par les cadres du Centre

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