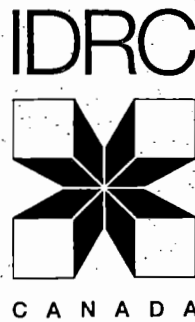


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SUCCESS STORIES FROM THE THIRD WORLD

IDRC MEDIA REVIEW — 1991

- **IDRC in 1991: The Difference a Year Makes**
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IDRC IN 1991: THE DIFFERENCE A YEAR MAKES

A simple, inexpensive test to identify HIV-contaminated blood; a portable water-quality testing kit for rural areas; high-yielding, disease-resistant vegetable varieties; better building materials from industrial wastes. These are a few recent scientific and technological breakthroughs achieved in developing countries with financial assistance from Canada's International Development Research Centre (IDRC). They represent a few examples of Canadian aid contributions that significantly improved the lives of millions of disadvantaged people.

During 1991, IDRC supported 356 new scientific and technical research projects. More than 4,700 projects have now been supported since the Centre's creation 20 years ago.

As the Centre's 1990-91 annual report points out, its parliamentary grant of \$114.1 million was slightly below the level received in 1988-89 two years earlier. In the current fiscal year, 1991-92, IDRC's grant is \$115 million, an increase of 0.8%. IDRC's budget represents less than 4% the overall Official Development Assistance (ODA) allocation.

Progress...But a Long Way to Go

According to the United Nations Development Programme's 1991 *Human Development Report*, "Developing countries have achieved in 30 years what it took industrialized countries nearly a century to accomplish." In the past three decades, for example, child mortality rates have been halved and average life expectancy has increased by 16 years, adult literacy by 40%, and per capita nutritional levels by more than 20%.

These are no grounds for complacency, however. More than one billion people still live in absolute poverty, some 180 million children suffer from serious malnutrition, one and a half billion people are deprived of primary health care, and a billion adults can neither read or write. Moreover, relentless population growth exacerbates massive rural-to-urban migration and resulting

megacities; in rural areas, population growth places unsustainable burdens on the environment.

The severity of the South's problems has led the UN to call this year for a renewed focus on human priorities, an emphasis on health, education, food, water, and employment opportunity, areas on which IDRC has always concentrated.

IDRC at a Turning Point

This year, IDRC has undergone a major internal restructuring, the result of an 18-month consultation and review process. In an effort to meet the demands of a new development context, the Centre will continue to support scientific research designed to yield results that benefit ordinary people living in poverty. Growing social needs in developing countries, political change in the post-Cold War era, global economic interdependence, and the dwindling aid budgets of donor countries are forcing IDRC to concentrate on priority areas, streamline its operation, and focus its direction.

The continuing effort to alleviating global poverty will require an unprecedented partnership between North and South. IDRC has been forging that kind of partnership by stimulating the generation and exchange of knowledge, both for problem-solving and for well-being.

There is no doubt that Canada benefits along with its Southern partners from the knowledge generated, from goodwill earned, from links forged between scientists. Research for development is an investment in our shared future.

The following pages present examples of the past year's achievements toward solving the key global problems of refugees, health, food production, disaster response, and environmental protection.

THE REFUGEE DILEMMA

The United Nations High Commission for Refugees estimates that there are 18 million refugees in the world and 22 million internally displaced people. The majority are women and children, and some 95% of them are in developing countries. Their numbers swell almost daily as a result of natural disasters, wars and civil strife, and environmental degradation. An increasing number are also fleeing the greatest scourge of all — poverty.

Africa

Africa is home to more than half the world's refugees. They are concentrated in the horn of Africa and in the countries bordering the Republic of South Africa, some of the poorest countries of the world. The plight of the displaced people and the burden they pose on countries of asylum have led to outpourings of aid. Unfortunately, many of the national and international efforts to provide assistance to refugees have proceeded without the benefit of basic data to guide policy formulation or program implementation.

In appreciation of this problem, for the past five years IDRC has sought to sensitize researchers, policymakers, and institutions to the many research needs in this field. It has done so not only by building awareness of the issues, but by supporting studies on the conditions of refugees, thereby ensuring that the issues are well placed on the agenda of African researchers and policymakers. IDRC's approach is different in that it uses Canadian aid to find durable resettlement and reintegration alternatives as identified by the refugees themselves. These realistic, long-term settlement solutions help empower some of the world's most dispossessed.

The challenge of how to settle refugees is one of the many policy issues capturing the attention of researchers, funding agencies, and policymakers. Two settlement strategies have evolved: self-settlement and government settlement. In Zambia, for example, about a third of refugees from neighbouring Angola are in organized schemes while the rest have settled "spontaneously" in rural areas.

A study launched with IDRC support in the late 1980s to assess the impact and consequences of both types of settlements has now determined that self-settled

refugees have better integrated into Zambian society, are well accepted by host communities, and intend to remain. Refugees in government schemes, on the other hand, have not adapted to their country of asylum and are not welcome by the host population. The researchers point out that international conventions as well as national Zambian legislation deny refugees freedom of movement or residence. This, they say, should be changed to enable refugees to settle where they prefer and, eventually, to apply for citizenship.

A Tanzanian study of the situation of Burundi refugees has reached similar conclusions.

Asia

On the other side of the globe, Thailand is currently faced with the daunting task of formulating a new policy to cope with refugees who have flooded into the country since 1945. With more than 100,000 Indochinese refugees in the country, the Thai government is walking a line between humanitarianism and pragmatic concern for national security. To date, Thailand has staunchly refused to grant refugees permanent residence, allowing only a temporary stay while awaiting third-country settlement or repatriation. But both processes take years during which the Thai government shoulders the political, economic, and social burden.

Voluntary repatriation is a possibility for the 14,000 or so Vietnamese asylum seekers and a number of Laotians and Cambodians. And according to the Bangkok-based Public Affairs Institute, which has been carrying out IDRC-funded policy research to aid the Thai government in its refugee strategy, the priority for those caring for Indochinese refugees is to prepare them to go back. That will be not easy. Many refugees are loathe to leave the camps because they are more comfortable than their former homes. Moreover, younger people insist on resettlement in Western countries. That given, Thailand's refugee problem is likely to be long-lasting — close to 80% of Thailand's refugee population are in their 20s.

The Middle East

In the Middle East, the problem has centred on internally displaced populations, some of whom have been living in exile for 15 years. In the early 1980s, displaced people were already Lebanon's greatest problems, but there were no solutions because there was no information on the number of people involved or their ethnic origins. A study launched jointly five years ago by Laval University in Quebec City and Saint Joseph University in Beirut has now shed light on the situation. The researchers established that the number of people displaced by war ranged between 574,000 and 662,000 out of

a total population of three million. Almost half of the displaced are under 20.

The researchers also found that all areas of the country had been affected equally, not only Beirut as had been previously believed. A new view of Lebanese life emerged from the study. For example, families have enlarged to include more children and other relatives; displaced families have grouped according to religious or political affiliation, which was not the case previously, and displacements appear to be permanent. The studies are continuing to target assistance better and help develop strategies.

SAFEGUARDING HEALTH

Two billion people, more than one-quarter of the world's population, suffer from tropical and endemic diseases. Most live in poor countries where governments spend only US \$4 per person on health care. Many factors contribute to deteriorating health conditions in developing countries, including malnutrition, lack of safe water supplies and sanitation, a shortage of health personnel, illiteracy, natural disasters, and the proliferation of disease vectors, environmental degradation, and poorly conceived development projects. War, migration, and other man-made disasters also contribute to the disease toll.

The amount of health research carried out in the South is inadequate to solve the problems. Only 4% of the global funds earmarked for health research is spent in developing countries. Despite this, much innovative research is taking place, some of which has applications for both North and South.

Some of this research, funded by Canada's International Development Research Centre (IDRC), is described here.

AIDS, A Formidable Foe

According to the UN, some 8 - 10 million adults around the world are infected with HIV (human immunodeficiency virus) and half of them are likely to develop AIDS in the next decade. It is estimated that a further 15 million new cases of HIV infection will be added in the 1990s, more than half of them in the developing world, particularly in east and central Africa.

The World Health Organization (WHO) estimates that between 5 and 10% of AIDS cases in developing countries are due to contaminated blood transfusions. The exact number of infected persons is unknown because testing for the virus is beyond the means of most developing-country health resources. (The UNDP estimates that the cost of diagnosis in some countries is more than many individuals earn in six months.)

A breakthrough this year addresses the problem. Developed by the Program for Appropriate Technology in Health (PATH) in Seattle with funding from both IDRC and the Rockefeller Foundation, the HIV dipstick screening test uses a stick of polystyrene that has been sensitized with a synthetic compound that mimics the

HIV virus. The test takes 20 minutes to perform and costs about 25 cents. It requires no laboratory, equipment, refrigeration, specially trained technician, or electricity.

The dipstick has been field-tested in Brazil, China, India, Kenya, Nigeria, Thailand and Uganda as well as evaluated by the WHO Global Program on AIDS and Canada's Federal Centre for AIDS. It has proven as accurate as conventional laboratory screening tests. Researchers are now looking at adapting the test to screen blood for HIV-2 and hepatitis B as well as other diseases. IDRC is now supporting a pilot project in Brazil to examine transfer of manufacturing the dipstick to the South.

Although a major step forward for poor countries, the dipstick is only a small weapon in the worldwide war against AIDS. Until a vaccine or a cure is found, preventing transmission is the only means of controlling the disease's spread. IDRC-supported AIDS research is now focusing on understanding and changing the behaviours that result in HIV transmission.

Tropical Scourges

The AIDS epidemic is only one cause of untimely deaths. In developing countries, some 10 million children and young adults die each year. Malaria and other tropical diseases account for many of these deaths. According to WHO, major new research and control initiatives are needed to curb a worsening situation. Those initiatives are being coordinated by the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases launched in 1975. IDRC has supported the program since 1978. In addition, it has funded other innovative research projects, a number of which have born fruit this past year.

Biochemists from the University of Victoria, in collaboration with the Kenya Trypanosomiasis Research Institute, scored a major breakthrough in the diagnosis of African sleeping sickness. Carried by the tsetse fly, it infects more than 50,000 people annually and puts another 50 million people at risk in 36 countries. The new method detects parasite antigens in the blood and cerebrospinal fluid of victims, allowing for early treatment of the disease.

Malaria is one of the most debilitating scourges of the developing world and while medications exist to fight the disease symptoms, they are usually too expensive for widespread use. What's more, both the mosquito vector and the parasites are increasingly resistant to the insecticides and drugs used against them. Prevention measures are, therefore, centring on controlling the mosquito carrier or on preventing its contact with people.

Peruvian researchers came a step closer this year to reducing the number of carriers. The method is simple.—inexpensive coconuts are used as incubators for cultivating vast quantities of *Bacillus thuringiensis* (Bti), a bacteria that is deadly to mosquito and blackfly larvae but harmless to humans and livestock. Bti has been used for decades but was previously too expensive for many developing countries. To study community control of malaria, the researchers are now introducing a Bti kit to villages.

A different approach is being taken in Bangladesh and Tanzania where researchers are testing the effectiveness of bed nets made from local materials such as polypropylene fibres recycled from sacks. Impregnated with insecticides, the nets shield sleepers from mosquito bites, thus protecting them from malaria.

Schistosomiasis is second only to malaria as the most devastating tropical disease. The snail-borne disease currently affects 300 million people and threatens a further

600 million. Most at risk are women and children. Current treatment involves expensive imported drugs and chemical molluscicides.

One tropical plant that is indigenous to much of Africa, the soapberry plant (endod), shows great potential as a botanical molluscicide. With IDRC support, the most effective varieties have been identified and evaluated for toxicological safety over the past five years. They have proven safe and the results of these tests have now been accepted internationally.

Concurrently in Kenya and Zimbabwe, studies set out to demonstrate that health education, sanitation and community participation could reduce the disease incidence. In experimental villages in Kenya, the rate of infection in children dropped from 91 to 41%. Research is continuing in Zimbabwe to test the efficacy of different community-based control strategies incorporating the new botanical molluscicide.

These projects are part of a network of more than 30 projects supported by IDRC that aim to control helminth (worm) infections, particularly in children. The information gathered from this decade of research has convinced IDRC that community-based, integrated, and multisectoral approaches to the prevention and control of intestinal parasitic infections are essential to ensure sustained success.

INCREASING FOOD SUPPLIES

More than 800 million people go to bed hungry every night. One-third of the children in the developing world — 180 million — are severely underweight, which puts their healthy development and lives at risk. There may be absolute shortages of food in some countries, but the real problem for many poor families is that they cannot afford to buy food that is available.

Solving the world food problem is not merely a question of producing more. Any available food must be nutritious, meet consumers' needs and tastes, be adequately preserved and stored, be distributed equitably, and be affordable.

Agriculture projects supported by IDRC target all points of the food production and distribution chain. Research on one commodity, soybeans, illustrates some of the approaches.

The Soybean Story

Soybean production has actually declined in Asia over the past 20 years. In Thailand, for instance, productivity dropped from 1,185 kg/ha to 562 kg/ha despite a seven-fold increase in the acreage under production. One cause for this decline in the northeast of Thailand is the traditional broadcast-seeding technique that produces low germination rates and low yields. It is also tedious, backbreaking work. Mechanization would improve productivity, but the equipment is beyond the means of many farmers.

To help solve the problem, the Asian Institute of Technology in Bangkok developed a low-cost tool that reduces the drudgery and halves the planting time while ensuring uniform seeding. The jab seeder, as the tool is called, can also make poor land useable in some regions. Manufacturers were sought for the seeder and farmers instructed in its use. The jab seeder is now being manufactured in Thailand — cost, \$10. It is one of a number of approaches to increasing productivity in the region.

In Nigeria, few people eat soybeans, although the crop has been grown since the beginning of the century. But protein-rich foods have been in increasingly short supply since the drop in the price of crude oil reduced the country's import abilities. Five years ago, the International

Institute of Tropical Agriculture and the Institute of Agricultural Research and Training, both based in Ibadan, Nigeria, set out to promote the production and utilization of soybeans as an alternative, low-cost protein source.

With financial support from IDRC, the institutions developed ways of easily processing and using soybeans so that they could be incorporated into local dishes, thereby improving their nutritive value but without affecting the taste or the price. They have met with resounding success. In the past five years, the proportion of people eating soybeans in the project region of Oyo State has risen from near-zero to 54%. In Ibadan, 15 food manufacturers now produce everything from soy milk to nursing foods. Initially, beneficiaries of this project will be children, pregnant and nursing mothers in soybean-producing areas, and farmers who gain from the new market for their crop. In the long term, it should benefit the entire Nigerian population and other African countries suited to growing soybeans. In fact, Ghana is studying the possibility of launching a similar program.

Success was also reported in Latin America in a project to establish small food processing plants for poor rural communities in Colombia's rural areas. The pilot plants produce soy milk and bakery products from local soybeans, packaged juices from local fruit, and animal feeds. The products have been well accepted by consumers and the research is now under way to replicate the pilot enterprises for local entrepreneurs in other regions. Soy milk is also being test marketed in the Colombian Institute for Family Welfare's supplementary food program.

A Varied Approach

On other food fronts, some notable recent achievements were:

- The development of a botanical piscicide to clear aquaculture ponds of predators that reduce yields. Developed by a team from Chiang Mai University in Thailand and the University of British Columbia, the product is being patented in both Thailand and Canada and a Thai company is preparing to

produce it on a commercial scale. It should benefit fish farmers around the world.

- The breeding and testing of improved strains of vegetables in Taiwan. Carried out by the Asian Vegetable Research and Development Centre, with IDRC support, the project has developed varieties of mungbean resistant to common diseases. The new varieties have yielded 20- 55% more than traditional varieties. Superior lines of cabbages produced 40% more than traditional strains. A corps of researchers has also been trained to continue the work.

- Canadian and Chinese researchers collaborating on canola have bred varieties resistant to root rot, a fungal disease that ravages the crop in Western Canada. If the plants live up to their promise through two more years of testing, they will be registered as a new Canadian variety and be made available to farmers. Other collaborative research under way in Canada and Egypt has identified new strains of Bt (*Bacillus thuringiensis*) to control pests and has resulted in the development of ways of producing large quantities of Bt cheaply and of keeping them alive for longer periods.

PROTECTING THE ENVIRONMENT

Both North and South share the concern over the increasing impact of environmental problems. They must also share the blame and co-operate in the search for solutions.

IDRC's thrusts in the environmental arena have stressed:

- the protection of lands through the introduction of appropriate farming systems and innovative approaches such as agroforestry
- the conservation of forests through the development of more efficient stoves and alternative fuel sources
- the protection of water supplies through improved sanitation practices and technologies
- the reduction of industrial wastes and the recycling of materials
- and the development of safe alternatives to damaging chemical pest controls, among others.

At the global level, IDRC has funded activities related to the internationally financed program on the Human Dimensions of Global Change, which is involving developing countries in the creation of appropriate responses to global warming, climate change, and other environmental problems. It is also supporting the preparation of papers by Southern non-governmental organizations on their position on a number of environmental concerns that will be presented at the UN Conference on Environment and Development (the Earth Summit) in Brazil in June 1992.

On a regional level, one exciting new project is support for Amazonian Indians who are developing their own agenda on how to manage 18 million hectares of rain-forest returned to their legal ownership by the Colombian government in 1988. A process of inquiry initiated among the Huitoto communities on traditional methods of environmental conservation may help to draft a sustainable forest protection regime. This is one of a network of projects that seek to develop sustainable means of exploiting the low humid tropics.

Solutions may be at hand for some local or regional problems. In Nepal, for example, overcutting forests for fuelwood in rural areas has led to serious soil erosion of slopes. But researchers have found that it may be possible to regreen Nepal by planting fast-growing species of trees that provide wood for fuel and construction, fodder for animals, and green manure. To date, more than 170,000 trees have been planted by farmers on unused farmlands and the supply of trees cannot keep up with demand.

In the Philippines, the North's appetite for colourful aquarium fish has led to the destruction of coral reefs. The reefs are the marine equivalent of rainforests, possessing a wealth of biodiversity.

Current methods of catching fish involve either dynamiting the reefs and collecting the exposed fish or spraying them with cyanide to stun the fish. Both methods kill large numbers of fish and damage the reefs, destroying the delicate balance of the marine ecosystem and diminishing the already insufficient supply of fish to feed local populations. Fishermen and their families also suffer from cyanide poisoning as a result of swimming in poisoned waters and by eating the contaminated fish.

An alternative is being developed in an ongoing IDRC project. It involves training fishermen to use small hand held nets instead of cyanide and educating them in reef conservation. The method has proven both efficient and economical — a net costs \$25 compared to \$500 a year for cyanide.

Reducing Wastes

This past year saw success in a number of research projects that make profitable use of industrial wastes, thus reducing pollution while generating income, employment, and valuable materials.

In the Philippines, some 1,500 industries generate polluting wastes that could potentially be used by others. A means of exchanging and recycling the materials is now in place, thanks to the Philippine Environmental Management Bureau and McGill University. The system is based on a huge inventory of the wastes generated by companies — acids, wood, paper, cloth, plastics, rubber, metals, and organic waste.

In Colombia, coal particles left over from the mining industry are being converted into useful activated charcoal. The process, developed by scientists from Kingston's Royal Military College, Queen's University, and the National University of Colombia, relies on a unique, two-stage, fluidized bed furnace.

Blast furnace slag, the molten leftovers from the steel industry, is being made into a low-cost alternative to expensive Portland cement in Argentina. Not only will this help manufacturers dispose of their waste, but it will reduce construction costs considerably, making more affordable housing available.

Another industrial waste, the toxic red mud produced during the mining of alumina in Jamaica, could help solve the island's housing shortage. Scientists at the University of Toronto, the Jamaica Bauxite Institute and the island's aluminium producing companies have found that adding a small amount of chemical binder to the mud causes it to harden into bricks without the need of high-cost kiln firing. Another IDRC-supported project is investigating how the bricks can be used in cyclone-resistant housing.

MITIGATING DISASTERS

During the past 20 years, natural disasters have claimed three million lives and affected nearly two billion people. This past year alone, worldwide losses from such disasters reached close to \$50 billion. And the toll keeps climbing. So much so that the 1990s have been declared the UN International Decade for Natural Disaster Reductions.

Although it may appear that little can be done to stop the unchained forces of nature, it is increasingly clear that human activities can significantly magnify these natural phenomena. Deforestation of mountain slopes leads to greater floods, to erosion, to droughts. Ill-conceived dams divert floodwaters onto agricultural lands and impede their retreat. Badly located and badly built housing contributes to injuries and deaths. As Dr. Atiur Rahman of the Bangladesh Institute of Developing Studies concludes from an IDRC-supported study of riverbank erosion in Bangladesh, most lives lost to his country's devastating floods and cyclones could be saved with better preparations and timely, well-directed assistance.

The human impact of natural disasters is now being increasingly recognized. In October, a special, high-level international council met for the first time to promote disaster mitigation.

IDRC has followed a two-pronged approach to disaster reduction: assessing hazards and formulating appropriate responses, and reducing damages to lives and property by improving the physical environment — by developing low-cost, disaster-resistant housing, for instance.

Assessing Risk

In 1985, the eruption of San Nevado del Ruiz in Colombia killed over 22,000 people, left 6,000 families homeless, and caused more than \$212 million in damages. And yet, with adequate preparations, most of the lives could have been saved.

In 1986, a team of researchers began to investigate the complex factors that led to the disaster and extract policy lessons for mitigating similar disasters in five Latin American countries. They found that despite significant advance warnings of the eruption, appropriate defensive action had not been taken. Largely to blame was a lack of

communication between scientists, media, and the public, and a lack of coordination between public bodies.

By 1988, IDRC had supported the launching of a regional network of research teams representing all six Central American countries. The studies sought to identify natural disaster high-risk zones in the region. Buffeted by recurrent seismic and volcanic activity, hurricanes, intense tropical storms, drought, and landslides, Central America is one of the most disaster-prone areas of the world. Between 1960 and 1988, for instance, the Office of U.S. Foreign Disasters Assistance registered 64 natural disasters in the region. Given this frequency, researchers now argue that many of these events are anything but unpredictable.

The researchers found that the most important factor in identifying the vulnerable sectors of the population was poverty. And although much of the population was both physically and socially at risk, few policies and programs existed to prevent or mitigate disasters: existing legislation and policies were not enforced, much housing did not comply with seismic or other building codes, early warning systems were inadequate, local governments and community groupings were weak and ineffective. Moreover, there were no government organizations explicitly concerned with and prepared for the task. This led to conflicts, duplication, and ineffectiveness. Recommendations are now being made to reduce the risk and implement effective response measures.

The researchers have also produced guideline papers and proposals for Red Cross regional action programs, for national emergency committees, and for the Association for Capital Cities of Central America and the Caribbean. The Costa Rican and Honduran research teams are making major inputs into national policy-making and, in Guatemala, IDRC is funding a ministry-level workshop on how the study results can best be used.

A more technical approach has been taken to solving the landslide problem in Rio de Janeiro where thousands of squatters build shanties on steep slopes outside the city. Destabilized by construction, the hillside soils are prone to landslides during heavy rains. Researchers have identified the process responsible for the landslides and have recommended the installation of drainage systems to

direct water away from the slopes. They are also assisting researchers in the Brazilian Northeast where similar problems of slope instability are being encountered.

Reducing Losses

Practical actions can also be taken to minimize losses and reduce deaths. Most centre on improving the housing of populations most at risk. In Peru, for example, much of the population lives in adobe brick houses that are fireproof and inexpensive. But the heavy brittle walls crush their occupants when they fall, which they invariably do during earthquakes. In 1987, researchers from the

Pontificia Universidad Catolica in Lima and Concordia University set out to improve both the house design and construction methods. They first strengthened the abode with sand and straw and reinforced the walls with horizontal supports, tied to vertical poles, linked in turn to beams that support the roof. The new techniques have now been used to build schools, community centres, and clinics.

A similar project in the Caribbean is developing cyclone resistant, low-cost housing.

Responding to Global Challenges

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IDRC in 1993-94

The past year has been fraught with problems: continuing war and strife in many parts of the globe, a faltering world economy, and the worsening of many environmental problems. It has also brought hope. Many nations of the former USSR started to rebuild their economies and societies, South Africa continued to break free of the shackles of apartheid, and governments and individuals everywhere took concerted action to stem pollution.

Some of the past year's accomplishments have passed almost unnoticed, but they are no less important for millions of people:

- ◆ more productive, disease-resistant food crops were developed
- ◆ technologies were implemented to provide clean water
- ◆ uses were found for polluting industrial byproducts
- ◆ safe methods and products were found to prevent diseases and
- ◆ sustainable job creation strategies were formulated.

These, and many more, are just a few of the results of research carried out in developing countries, with funding from Canada's International Development Research Centre (IDRC).

For IDRC, 1993/94 also marked the first full year of activities geared to meeting new challenges: at the United Nations Conference on Environment and Development (UNCED) — the Earth Summit — in June 1992, the Canadian government chose IDRC to be the key Canadian implementing agency for Agenda 21. This global action plan is designed to help both world governments and nongovernmental organizations solve urgent environmental problems.

In the months following the Earth Summit, IDRC launched an extensive consultation process to develop and strengthen strategic partnerships and help create the basis for a broadly based North-South coalition dedicated to Agenda 21. It also engaged in reflection on how best to structure its programs to meet the challenge.

The IDRC that emerged in 1993 is more tightly focused. Its mission — to help developing countries build their scientific competence — and its commitment to development research remain constant. Increasingly, however, it will bring a multidisciplinary approach to the search for new solutions to problems of environment and development.

The Challenge

For IDRC, the challenge is not only to engender the knowledge needed for new solutions, but to put that knowledge into action. In June 1993, at the first anniversary of the Earth Summit, the Centre's president, Dr Keith Bezanson, announced that IDRC would direct half of its annual budget of \$115 million towards research that will help developing countries explicitly address the links between environment and development. Over the next three years, funds allocated by IDRC will help countries in the South and elsewhere to train specialists and increase knowledge, adopt policies that integrate environmental concerns with economic and social issues, adapt environmentally sensitive technology, increase food security, understand the impact of environmental problems on health, and protect ecosystems.

The Centre is no newcomer to this endeavour. Since its creation 24 years ago, it has supported close to 5,000 projects in 100 countries, many of them in these areas. A great number have borne fruit. A few are described on the following pages.

During the past year, IDRC also welcomed the secretariat of WETV, a new global, nonprofit television network. The Centre is already home to international secretariats coordinating and directing world research efforts in the control of micronutrient deficiencies and in putting fisheries on a sustainable footing.

The Centre's vast network of contacts, as well as its non-partisan, international reputation, are also enabling it to play key research roles in some of the world's politically sensitive areas including South Africa, the Middle East, the Ukraine and Indochina. These accomplishments are described in further detail on the following pages.

Hot Spots: Rebuilding Societies and Economies

Countries emerging from years of conflict, strife and oppression face a daunting task. How best to transform instruments of war into agents of reconciliation and reconstruction? How to end isolation?

It is a problem faced by many. Lebanon, Vietnam and Uganda, for instance, have been grappling with the situation for some years. Others, such as South Africa, Angola and the Occupied Palestinian Territories, have hardly begun to address the problem. Many others, including Cambodia and Mozambique, are in the throes of reconstruction.

For many of these countries, development must start with building a new social and political order. But no recipe exists for social reconstruction, and many countries lack the expertise, information and institutions to help forge new directions.

External organizations, such as IDRC, are in a unique position to provide critical assistance at the appropriate time. Because of its international contacts and reputation, IDRC can bring together the top experts in a country and internationally to quickly pave the way to solutions. IDRC can support the research and strategic planning that is vital to policy making at local, national and international levels and also help countries learn from each other's experiences.

By the end of the 1993/94 fiscal year, the Centre was actively involved in helping a number of countries rebuild, including South Africa, Eastern Europe, the Middle East and the countries of Indochina.

South Africa: Building a Post-Apartheid Future

Early in 1992, South Africa took its first hesitant step toward democracy. With democratic elections in April 1994, the first leg of the journey has been completed. At the request of the democratic movement, IDRC has travelled along that road with South Africans, supporting the efforts of the democratic movement and facilitating the transition process.

From its initial involvement in 1988, IDRC's support has been directed to those disadvantaged by apartheid. The Centre's early South Africa program concentrated on economic restructuring, urban governance, and health.

In 1992, the importance of research and policy analysis for the future development of South Africa prompted IDRC to expand its program to include such areas as education, land use/land

reforms, restructuring the research system, and regional integration. A regional office was opened in Johannesburg to facilitate the work.

Since 1992, the focus has been on "democratic development," — on research into how government policy will be formed, on creating and supporting the networks that are producing the new policies, and on helping ordinary people become involved in the shift to democracy. For example, IDRC helped form a coalition of South African economists and top economic advisors who have worked with the democratic movement to develop economic strategies and policies for the country.

Today, IDRC-managed projects have contributed to the development of all the key new policies of the democratic movement in the areas of economic policies, industrial policy, environment, science and technology, education, local governance and public service.

Here are some examples:

- ◆ Black education in South Africa is in crisis. But democracy brings hope that the present discredited system of education can become an effective, nonracial system. The task has been entrusted to the Centre for Education Policy Development (CEPD), established in January 1993 with financial assistance from IDRC and the Canadian International Development Agency (CIDA). In its first year, CEPD has been involved in negotiations that have led to the release of a new education policy.
- ◆ Apartheid has been a major obstacle to long-term economic growth in South Africa. Even the manufacturing sector has declined, making the country's economy dependent on the export of primary commodities. With IDRC support, the Economics Trends Research Group, a network of economists affiliated with the Congress of South African Trade Unions, is developing strategies to revitalize the industrial sector while redistributing productive capacity and resources to the mass of the population.
- ◆ Under apartheid, even environmental concerns were suspect as environmental concerns were often used to justify forced removal of black South Africans from their land. In response to a request from the democratic movement for assistance in developing a new environmental policy, IDRC helped mount an international study mission this past February.
- ◆ With \$10-million from CIDA, IDRC is managing a project designed to assist the democratic movement as they prepare for their role in a new, democratically elected system of government. Directed by Canadian Al Johnson, the Public Service Policy Project includes training a nucleus of senior civil servants and government officials.

Eastern Europe: Cleaner Water for the Ukraine

Ukraine is one of the most severely polluted countries in the world due to the excessive use of irrigation, pesticides and herbicides in agriculture, the high degree of industrialization, and the Chernobyl disaster.

The contamination of the water supply is especially serious since only a small quantity of water is available per person. Some 70% of the country's residents depend on the Dnipro River, Europe's third largest river, for drinking water. But the river carries nearly 20 billion cubic metres of untreated effluent each year.

The Ukrainian government has requested international assistance to begin rehabilitating the Dniro. In late March 1994, the Bureau of Assistance for Central and Eastern Europe in the Department of Foreign Affairs announced that it will make \$5 million available for this purpose. IDRC will manage the grant, bringing together Ukrainian and Canadian institutions to work on this program.

The program aims to strengthen the management capacity of the newly created Ministry of Environmental Protection in Ukraine through training, policy development, improved information systems, and public education. It will also include environmental audits of selected industrial and municipal water treatment plants and follow-up support to improve management practices and test some new technologies. In doing so, it will forge long-term collaborative links between Canadian and Ukrainian public and private sector organizations.

The Middle East: Negotiating for Peace

The signing of the Peace Accord in Washington in September 1993, was a milestone in the search for peace in the troubled Middle East. Also important to lasting peace have been the results of a series of ongoing multilateral negotiations on five issues of pressing concern in the region: water resources, environment, economic development, arms control and regional security, and — most sensitive of all — refugees.

Launched in January 1992, the Middle East Multilateral Peace Negotiations are intended to complement the bilateral negotiations between the parties directly involved in the Arab-Israeli conflict. They allow other interested countries, including Canada, to help identify problems and find solutions. And because they do so in a practical, technical way, divorced from political concerns, they offer a unique opportunity for the adversaries in the conflict to make the personal contacts needed for progress in bilateral negotiations.

A member of all five working groups, Canada chairs the Refugee Working Group whose mandate is to improve the lives of people displaced by the Arab-Israeli conflict. Two funds were created by the Canadian International Development Agency (CIDA) to assist this peace process. The first, the Canada Fund for Dialogue and Development, promotes cooperation and builds confidence on key development issues. The second, the Expert and Advisory Services Fund, is designed to apply the unique knowledge and ability of Canadian experts and advisors to the search for solutions and supports the organization of seminars and workshops. IDRC manages this project's day-to-day operations under the general guidance of a consultative committee made up of representatives from IDRC, CIDA and Foreign Affairs.

Since the Fund's inception, IDRC has played a pivotal role by providing professional and technical support to the Canadian delegation, as well as by coordinating the activities of consultants, experts and institutions. Because of its expertise in refugee issues, the Centre also helped formulate strategies and generate project ideas. Widely successful have been brainstorming sessions set up with key academics, representing a wide spectrum of opinion. This dialogue not only helped formulate policy, but prompted new and constructive initiatives in support of the working group's activities. IDRC also provides on-site assistance to the Canadian delegation at several Working Group meetings held in Ottawa and abroad, and commissions studies and surveys.

Indochina: Charting a Path to Sustainable Economic Development

In 1986, after 40 years of Communist rule, Vietnam launched an ambitious economic liberalization program. The move to a market-oriented economy has been rapid and dramatic. In one year, for example, Vietnam moved from being a rice importing country to a rice exporter.

But, as central economic planning erodes, the effects are felt everywhere, especially in rural areas where 80% of the population lives. Education, health and social services are deteriorating as the central government budget shrinks. In cities, unemployment rates have reached 20-30%.

Aware that it lacks direct experience in the market-oriented system it is attempting to create, the Vietnamese government has requested assistance to strengthen its policy research capacity while sustaining its economic reforms and natural resource base.

IDRC has been active in the country since 1990, and is supporting a dozen projects, mainly in agriculture and resource management, economic and scientific policy management, and information system support. A major thrust of these projects has been to end Vietnam's isolation by developing linkages with Canadian and Asian institutions and experts.

The Centre's valuable experience in Indochina, combined with CIDA's greater financial resources, have now led to a three-year, \$3.5 million program to help Vietnam and other countries in the Mekong River Basin establish sustainable economic development policies. It will include integrated resource/development studies of regions most severely affected by war, the strengthening of the agri-food industry, and management plans for natural resources. The program will also help carry out reforms of Vietnam's legal system.

The emphasis is being put on strengthening research and policy institutions in Vietnam as well as in Laos and Cambodia. A small office has been set up in Thailand to coordinate the project which will draw on the expertise of many Canadian institutions.

IDRC was also instrumental in establishing the Mekong Development Research Network which is encouraging scientific cooperation between the six Mekong riverine countries: China-Yunnan, Myanmar, Vietnam, Laos, Cambodia and Thailand. In operation since September 1992, the network's members have just completed a study of the current status of the river and its basin. The aim is to increase the scientific understanding in each of the six countries of the river's resources and development constraints so that the trans-boundary ecosystems on which the people of the region depend can be better protected and the quality of people's lives improved. Further studies are planned on trade, tourism and the environment.

The network is developing trust among member countries and is leading to a sharing of knowledge and a willingness to work together on common problems.

Leveraging: Partnerships In Research

Few in the private or public sector would dispute the usefulness of making and maintaining contacts. But researchers have often been isolated, resulting in a fragmented approach and the waste of scarce resources. One way to remedy this situation is through the establishment of coordinating bodies. These provide forums for the exchange of information, present opportunities for training and working with others to enable interaction, and create a critical mass of researchers to address key problems as well as foster a wider utilization of results.

That is the role of three secretariats housed at IDRC's Ottawa headquarters: the Micronutrients Initiative, the Strategy for International Fisheries Research (SIFR), and WETV, the world's first global access television service.

IDRC's pivotal role in the establishment of these secretariats fits well within its role as a catalyst bringing together the people, the knowledge and the organizations needed to enable countries to make informed decisions and formulate sound policies.

Fish for the Future

For Canadians, the closure of Canada's east coast cod fishery this past year was eloquent proof that our fish stocks are declining. But the problem is by no means new nor unique to Canada.

World production of fish now stands at about 90 million tonnes a year, of which about 77 million tonnes are caught in the wild. Capture fishery is at or close to the maximum biological limit. By the year 2000, increased population and increased incomes will boost the world's yearly demand for fish by nearly 27 million tonnes.

Meeting this demand clearly requires new approaches, significant improvements in sustainable ecosystem management, better utilization of harvests, and increased production from aquaculture.

Unfortunately, fishery development projects have met with limited success. To understand why, and to find ways of improving them, donor organizations launched a study of International Fisheries Research in March 1989. It concluded that the level of priority and funding accorded to strategic fisheries research had been inadequate, but that, with appropriate support, fisheries could make great strides.

The research strategy that evolved calls for international collaboration to make more efficient, sustainable use of living aquatic resources. Because of its expertise and impressive track record in the support of fishery research, IDRC was asked to host the secretariat set up to translate the plan into action. The choice of IDRC also recognizes Canada's role in advocating a holistic approach to high seas fishing and coastal zone management at the 1992 Earth Summit.

The **Strategy for International Fisheries Research (SIFR)** secretariat is funded by the United Nations Development Programme (UNDP), the World Bank and IDRC. Its activities are directed by a committee composed of representatives from six major donor agencies.

Becoming involved in this international effort means that Canada and other countries are bound to benefit from research undertaken in the South because this research will lead to solutions, says Brian Davy, IDRC Aquatic Resources Coordinator and a member of the SIFR Executive Committee.

Ending Hidden Hunger

It is called "hidden hunger" — vitamin and mineral deficiencies which take their toll on the health of millions of people throughout the world. The problem stems from the fact that most vitamins and all minerals cannot be synthesized by the human body and so must be provided in the diet. Because the amounts are generally small, micrograms or milligrams a day, they are called micronutrients.

Globally, the most common deficiencies are of vitamin A, iodine and iron.

- ◆ Iodine deficiency is the most common preventable cause of mental impairment in the world. Of the more than one billion people who live in iodine-poor environments, 225 million suffer from goitre and 20 million have already suffered brain damage.
- ◆ Lack of vitamin A puts 190 million young children at risk of blindness; some 13 million have already suffered severe eye damage.
- ◆ Iron deficiency causes anemia in one billion people; another billion are iron-deficient.

Eliminating iodine and vitamin A deficiencies and reducing iron deficiency anemia in women to one third by the year 2000, was the target set by the 1990 World Summit for Children. In 1991, representatives from 60 countries met in Montreal to launch a global effort to achieve these goals. To help catalyze this complex undertaking, the **Micronutrient Initiative (MI)** was created in April 1992 by IDRC, CIDA, the World Bank, UNICEF and the United Nations Development Programme (UNDP). The MI is housed at IDRC. Dr Stephen Simon was appointed MI's first Executive Director in April 1993.

The MI supports activities in five areas judged critical to eliminating micronutrient malnutrition: developing appropriate, accessible information systems such as a "hot line" to answer queries from the field; enlarging the pool of technical expertise through such means as associate consultancies and a certification program; expanding support for national control programs; applying appropriate technologies such as food fortification; and providing sufficient intakes of vitamin A to children of 12-24 months of age through innovative delivery modalities and channels.

WETV — Voices from Around the World

There is widespread agreement that our attitudes must change if we are to survive. But it is difficult to change attitudes when the only views heard globally are those of the northern industrialized countries.

A forum is now being established for the unheard voices of the world. A unique, alternative satellite broadcasting service, **WETV** offers a vehicle for the expression of Southern — as well as Northern — ideas, issues and cultures. Launched in April 1993, it aims to foster free and balanced cultural expression worldwide to create a deeper understanding of the critical issues of sustainable development and environment.

WETV's service will begin in 1996 with a three- to four-hour block of programs to partner national or regional broadcasters. Offering alternative forms of programming, from children's programs, drama and music, to critical examinations of world issues, it will be multilingual and favour the work of independent producers.

The need for a service like WETV has been expressed in many forums over the years, most recently by the southern countries themselves at an international symposium on

communications and development held in Montreal in 1992. There, participants clearly expressed the need to make the global flow of information more democratic to permit greater South-North and South-South exchanges. Recognizing the power of communications, the Earth Summit in Rio de Janeiro also called for new and innovative uses of the mass media to bring about a global understanding of the critical issues facing the world. WETV, which was initiated by IDRC and an international group of private and public sector agencies, is a response to these demands. WETV Secretariat is directed by David Nostbakken.

Environment and Development: Some Success Stories

In March 1993, IDRC's Board of Governors approved a program which will allow the Centre to make the most effective contribution to achieving the goals of Agenda 21. The program is based on two convictions:

1. That a degraded environment hinders the development of communities and countries; and
2. That people victimized by underdevelopment are ill equipped and little motivated to preserve the environment.

As the following examples show, Centre-supported projects have already met with considerable success.

Building a Better Bean

Despite the widespread use of chemical pesticides, Mexico's bean crop is being decimated by insect pests and diseases. The problem stems from modern methods of plant breeding that concentrate on breeding uniform plants containing a single gene which protects against a specific parasite. The plant's resistance — called vertical resistance — breaks down as soon as a new strain of the parasite appears.

Using an alternative method of plant breeding that yields an entirely different kind of resistance, researchers from the Colegio de Postgraduados in Chapingo, Mexico and the University of Guelph, Ontario are developing high-yielding beans that resist parasite and pest attacks without pesticides. This "horizontal resistance" is conferred by many genes that work together to protect the plant against most major pests and diseases.

The research has so far resulted in the selection of 360 new pure lines of beans, the best of which are being multiplied for tests in farmers' fields. Each breeding cycle will yield new pure lines that are superior to those of the previous cycle. And because farmers themselves will choose the cultivars they prefer, genetic diversity will be preserved.

Within 10 years, the researchers expect to have many new bean cultivars that are permanently resistant to all major pests and parasites. This project could also yield important methods for improving beans cultivated in other parts of the world, including Canada.

An Ecological Banana

This past February, IDRC announced the breeding of the first ever banana variety that could replace the standard Cavendish dessert banana now eaten throughout the world. Known as Goldfinger, the new hybrid is the result of decades of breeding at the Honduran Foundation for Agricultural Research (FHIA) in La Lima, Honduras.

Goldfinger could save the world banana export industry from collapse. In fact, the popular Cavendish banana is now threatened with extinction as fungal diseases such as Black Sigatoka decimate plantations around the world. Controlling the disease by chemical fungicides is prohibitively expensive for all but multinational companies. And the massive applications of fungicides, as well as of chemical fertilizers, are taking an environmental toll.

Resistant to Black Sigatoka and to other diseases, Goldfinger doesn't require pesticides. It grows well in cooler temperatures and on marginal soils. In addition to being delicious ripe as a dessert banana, it is also great green, as a cooking banana. Green bananas are, like potatoes for us, a staple food throughout Asia, Africa and Latin America. What's more, Goldfinger does not turn brown when cut, making it ideal for fruit salads or purees.

While Goldfinger may save the banana export industry, the main beneficiaries will be millions of small growers and consumers throughout the world for whom the new banana promises a reliable food source. IDRC contributed almost \$1.3 million to FHIA over the past decades for banana and plantain improvement.

Battling Malaria

The most deadly of all tropical diseases, malaria kills more than one million people each year, most of them children. Some 2.2 billion people are at risk in 95 countries. And malaria is on the rise due to the proliferation of drug-resistant strains of the parasite and changes in environmental conditions.

According to the World Health Organization, prevention is key to controlling the spread of the disease. IDRC has supported a number of projects enabling communities to better control the spread of the disease:

In Benin, West Africa, McGill University's Centre for Tropical Diseases is experimenting with local production of insecticide-impregnated bednets from screening produced by a small Quebec company.

The process is simple. Once or twice a year, the screening which protects people from being bitten while sleeping during the night when the mosquitoes are active, is dipped in insecticide and dried. This makes the bednets lethal to mosquitoes that come into contact with the nets, and repels others nearby. The synthetic pyrethroid insecticides used are safe for humans and animals.

Other IDRC projects are evaluating the bednets' effectiveness in Bangladesh, Tanzania and Sri Lanka.

In Brazil, the government agency responsible for malaria surveillance and control has developed a microcomputer software package that provides a quick picture of the disease's incidence by city or region. Knowing if the disease is on the increase, where, and by how much, allows authorities to be on alert for an epidemic and take action. Developed with IDRC funding, the

SIG-MALARIA geographic information system is now also being tested in Sri Lanka and expansion into Africa is being explored.

The World's First Fish Gene Bank

Overfishing, pollution, and habitat loss to dams and industry have led to the disappearance of many species of fish worldwide. This leads to lower catches and a loss of genetic material for fish farms and hatcheries.

Following the Earth Summit, the first International Fisheries Gene Bank was created in British Columbia to solve the problem. The techniques that make the bank possible were developed by MTL Biotech Ltd of Victoria, B.C. The equipment consists of portable freezing and storage containers that allow workers to go out to remote locations to freeze fish sperm on site, and then transport it to permanent gene banks. Banked sperm has many advantages: it is easier to transport than live fish, avoids disease transmission problems, and can be used at any time.

In a project supported by IDRC, the technology is being transferred to the Shuswap Nation Tribal Council in Kamloops, British Columbia, which is collecting genetic material from four species of wild salmonids in the Deadman and Barrière Rivers. MTL is also training technicians in Colombia and Venezuela to collect and freeze sperm.

Gene banking is an ideal tool for sustainable development because banking genetic diversity from threatened stock today provides a broad genetic base for fisheries development in the future.

In January, 1994, the International Fisheries Gene Bank joined forces with the Vancouver Aquarium in a partnership that will make Canada a world leader in aquatic conservation.

Protecting the Rainforest

A management plan developed by a multidisciplinary team of researchers from the Universidad Nacional Autonoma de Mexico (UNAM) and Carleton University in Ottawa could preserve Mexico's last remaining rainforest. The northernmost tropical forest in the Americas, the Sierra de los Tuxtlas, has a wide variety of soils and climates, 3,000 plant species and more than 1,000 animal species. Many are unique. Some are also endangered.

Cattle ranching, commercial coffee production, logging, fires and colonization have reduced the forest by 80% to a mere 30,000 hectares. In the process, the Sierra's 50,000 inhabitants, mainly indigenous peoples, have been displaced and local food self-sufficiency has been disrupted. The land has also been degraded and water supplies depleted.

To ensure the forest's survival, the team of anthropologists, sociologist, biologists and geographers have proposed activities such as green manuring agriculture and the marketing of organic rainforest products from the forest core as well as alternative, sustainable agriculture on the forest's edge.

Supported by IDRC, the project is unique in that the local populations helped define the strategies for the management and use of the preserve. The strategy could become a model for solving similar problems in the rest of Mexico.

Clean Drinking Water — For North and South

When the community of Split Lake in northern Manitoba needed to find a solution to its water quality testing problems, it turned to simple technologies perfected in developing countries with IDRC funding and the assistance of the National Water Research Institute, part of Environment Canada. The tests can be used in the field, without sophisticated laboratories. They proved reliable and easy to use by village technicians trained in the course of the project.

A further phase is now underway, this time in Chile where preliminary studies have shown that existing drinking water sources are contaminated by harmful bacteria. With the help of the state water facility and a nongovernmental organization, the Split Lake technicians are now training Mapuche counterparts to run a water testing program.

Bountiful Fog

In May 1992, the Chilean Minister of Agriculture turned on a water tap in the coastal village of Chungungo, bringing water to the parched town and ending the community's reliance on water trucks. The water that flowed was the result of more than seven years of work by Chilean and Canadian researchers who had learned how to draw water from the coastal mountain fog.

The technology that made this possible is quite simple: large polypropylene nets are stretched across the mountain slopes to catch the fog and trap its life-giving moisture. The fog beads up on mesh fibres and runs into collection troughs that lead into a 100,000 litre tank. A pipeline carries the water down the mountain to the chlorination tank connected to the houses' distribution pipeline. The village now has 75 nets producing 11,000 litres of fresh water a day, making it the largest fog-water catchment system in the world.

Environment Canada developed the equipment and participated in the IDRC-funded project which has attracted the attention of many arid regions of the world. In 1993, the project was expanded to Peru. According to researchers, 47 locations covering every continent could turn local fog into reliable sources of clean water.

Using Census Data

An inexpensive software package developed in Chile is helping developing countries extract information from national census figures for analysis, planning and decision-making at the levels of towns, cities, villages, or even city blocks. Designed and implemented by the United Nations Latin American Demographic Centre (CELADE) and the University of Waterloo for IBM-compatible PCs, REDATAM (Retrieval of DATA for small Areas by Microcomputer) provides a simple means of storing and accessing large amounts of data.

Funded by IDRC, REDATAM is now being used in more than 30 Latin American and Caribbean countries and is being reviewed in Africa, Asia and Canada. The University of Waterloo is also testing REDATAM-based software for planning and implementing social and economic development projects. These include, for example, an assessment in St Lucia of the effect of tourism development on local environment and population with special regard to small-island developing countries.

Aquaculture — Preparing for the Blue Revolution

A "blue revolution" — a genetic revolution in aquaculture comparable to the Green Revolution in agriculture of the 1960s — is about to begin. But as was the case for its land-based predecessor, it is feared that the genetic diversity of aquaculture species will decline as new, improved breeds of fish are spread worldwide.

That could be averted, thanks to Canadian leading edge genetic identification probe technology developed for the management of fisheries and aquaculture. With financial assistance from IDRC, Dalhousie and Saint Mary's Universities in Halifax are collaborating with researchers in China, Indonesia and Thailand to both improve and conserve the region's best fish species. Drawing on ten years of IDRC-funded aquaculture research in Asia, the project is unique in that it integrates genetics technology with economics and sociology, then applies the results at the village level.

The work seeks to balance the conservation of biodiversity with the need to produce more food. Breeds of fish that have economic, social, cultural or genetic value for local populations will be maintained, not as frozen sperm in gene banks, but as live, productive stocks on farms. This differs from conventional approaches which presented an either/or choice: retain breeds as they are to conserve genetic biodiversity or replace them with new, high-yielding breeds.

All countries with an aquaculture industry, including Canada, should benefit from the new management tools for decision-making developed in this project.

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IDRC: 25 Years of Science in Action

Media Review 1995-96

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IDRC: 25 Years of Science in Action

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INTRODUCTION

In 1970, the first Earth Day was celebrated, Apollo 13 blasted off and Norman Borlaug, the scientist who developed the plant varieties that launched the Green Revolution, won the Nobel Prize. The year also marked the founding of the International Development Research Centre (IDRC), an organization dedicated to the promotion of scientific research in the interests of people in the developing world.

This was an innovative idea. Back in 1970, most development organizations provided short-term assistance to the Third World based on the transfer of capital and solutions from the West. Prevailing views on development, however, have evolved to reflect IDRC's original mission. Today, science and technology are seen as the keys to long-term development. Problems must be solved from within: people in the South must find their own solutions through the acquisition of knowledge and the application of research.

IDRC's philosophy of development has led to the creation of an impressive network of researchers, scientists and policymakers. In a quarter of a century, the Centre has supported more than 5,500 projects in 100 countries. Its programs have involved some 20,000 researchers and more than 1,000 institutions. Their work has resulted in real benefits for people in the South, among them, cleaner water, better nutrition and improved housing.

WORLDWIDE REPUTATION

IDRC's record has made it one of the most respected aid organizations in the world. The Organization for Economic Cooperation and Development (OECD) has said that "IDRC has a worldwide reputation for supporting research and assisting scientists in developing countries to solve development problems and for doing so in an innovative, flexible way."

This flexibility also means that IDRC can move quickly, setting up programs in countries such as South Africa, Vietnam and the Ukraine that are undergoing fundamental political and economic transformation. The Centre's special autonomy means it can build bridges in countries where, for political reasons, it is not convenient for the Canadian government to be directly involved. Along with its traditional research programs, IDRC's productive work in such "hotspots" boosts Canada's international reputation and stature.

IDRC's achievements generate other benefits for Canada. Many Centre projects are collaborative undertakings between scientists and institutions in Canada and the South. In addition to creating important links among researchers, these partnerships can produce tangible gains for Canada. For example, using a new Chinese methods of breeding canola and genetic material provided by China, Canadian researchers produced a disease-resistant hybrid that showed increases in yields of up to 15%. The new hybrid seed was introduced to Canadian farmers in the spring of 1995 — during the first year that canola was selling at a higher price on the market than wheat.

FACING TODAY'S CHALLENGE

IDRC's accomplishments over the last 25 years have proved that global inequities can be redressed through scientific research. This mandate for change is as strong at IDRC today as it was in 1970. What has changed, however, is the environment in which the organization works. All over the world, governments are reducing spending on foreign assistance. Deficit fighting in Canada has meant that \$27 million in real terms has been cut from IDRC's parliamentary allocation since 1991. At the same time, demands for international assistance and cooperation are growing.

IDRC, like other organizations in the '90s, is doing more with less. Budget cuts and program reorganization marked the Centre's anniversary year and continue to be a focus of activity in 1996. Operational budgets are being reduced in real terms by 19% and staff levels by 21%. Programs are becoming more streamlined, focusing on fewer topics. To ensure the greatest application of development benefits, IDRC is seeking out new, broader partnerships with organizations and institutions. It is also looking to other sources for funding; revenue generation is now a key priority. Last year, the Centre raised \$15 million in addition to its parliamentary grant. It is currently administering more than 50 research projects that are funded in whole or in part by other organizations.

The highlights of IDRC's activities during 1995 show how the Centre is preparing itself to meet the challenges of the future. IDRC is a leaner organization than in the past but it is well equipped to function effectively in the changing world of development.

SOCIETIES IN TRANSITION

As many countries emerge from dark periods of political, social and economic turmoil, they are proving that the developing world can be a source of good news. South Africa is struggling to overcome the legacies of apartheid to build a new democracy; Cambodia is repairing the scars of years of war and civil strife; the Middle East appears closer to peace and regional stability; and Ukraine is starting to reverse the damage of environmental devastation.

Huge challenges face these countries. To meet them, they need to marshal all their expertise and resources. Canada is reinforcing these national efforts with assistance channelled through IDRC.

REBUILDING SOUTH AFRICA

A public policy initiative targeted at the local level is helping in the democratic transformation of South Africa

In a message to IDRC in 1995, South African President Nelson Mandela said:

We have benefited immensely from the IDRC's assistance. Prior to our first democratic elections in April, 1994, the Centre played a critical role in helping the ANC and the Mass Democratic Movement to prepare for negotiations and it has supported us generously in the process. Given its foresight and confidence in the future, the IDRC was instrumental also in helping us prepare for the new phase of governance and transformation. Currently the Centre is working closely with our government in a number of key areas, assisting us in implementing the Reconstruction and Development Programme.

IDRC is helping to implement South Africa's Reconstruction and Development Programme (RDP) by supporting small businesses and local governments.

The RDP stresses the importance of small enterprises in job creation and in overall economic development. Under apartheid, this sector had been neglected in favour of gold and diamond mining and the development of a modern industrial economy controlled by whites. Apartheid placed other constraints on the emergence of black-owned small businesses. The educational system, for example, meant that blacks did not acquire technical and professional skills. Most black Africans were forced to live on poverty-stricken homelands, where there were limited business opportunities.

South Africa, like other countries around the world, recognizes small business's economic potential. With a formal sector employment rate of 40%, a thriving small business sector is an important source of jobs. It also contributes to a greater distribution of wealth and a more productive and competitive economy.

The South African Ministry of Trade and Industry asked IDRC for assistance in executing a national strategy to support the emergence of a vital small business sector. The result is a multi-million dollar project, funded by the South African government and administered during the start-up phase by IDRC.

The backbone of this project is the development of a national network of Local Business Support Centres (LBSCs). These LBSCs will help micro-entrepreneurs and small and

medium-sized businesses obtain information, advice, and training in such areas as marketing, trade development, product and manufacturing processes, research and development, quality standards, and access to financing.

Twenty LBSCs have been formally accredited to date and a further 20 will be accredited by the end of this year. Eventually, a national network consisting of hundreds of LBSCs will be established.

BUILDING BLOCKS OF PEACE

The transition to self-government in the West Bank and Gaza redefines the role of Palestinian nongovernmental organizations

The signing of the peace accords in 1993 between Israel and her neighbours introduced a ray of hope in the conflict-ridden Middle East. International donors responded by promising funds to help with the transition to Palestinian self-government in West Bank and Gaza. The bulk of these funds were earmarked to finance infrastructural changes and to help the Palestinian National Authority handle the transfer of responsibilities from the Israelis. Major donors largely overlooked the need for policy research to inform the transition process.

Nongovernmental organizations (NGOs), such as the Gaza Center for Rights and Law and the Palestinian Human Rights Information Center, conducted crucial policy-oriented research on issues related to the Israeli occupation. Some of this research provided back-up to the Palestinian teams during the peace negotiations with Israel.

Self-government, however, is changing the role of the NGOs. They are expected to supply information and expertise to an embryonic government. At the same time, they must maintain their financial and political independence so they can comment on and criticize the Palestinian National Authority. This will require a delicate balancing act. The scope of policy issues is also broadening to include economic and social development, governance and state building, democratization, human rights, and the role of women.

Palestinian NGOs are currently not well equipped to meet these new demands. They are small, scattered and isolated, with limited opportunities for collaboration. They have a low public profile and their efforts to disseminate research results have been unorganized.

IDRC, in partnership with the Ford Foundation, has stepped in to help this situation. A Centre project established in 1995 is bringing together Palestinian NGOs in a network that will enable them to do more research and to improve their ability to bring policy options to the attention of the public. A network will enable them to make an important contribution to the peaceful attainment of self-government.

STARTING FROM SCRATCH

Helping Cambodia develop an environmental policy starts with the basics

Twenty years of brutal destruction and isolation in Cambodia had the effect of a scorched earth policy — very little was left standing. Educated Cambodians were murdered, others managed to flee the country. Institutions and infrastructure were left in ruins.

The Paris Accords of 1991 that led to the general election supervised by the United Nations paved the way for democratic reforms. IDRC's presence in Cambodia dates from early after the signing of the accords. By 1995, the Centre was active in several core areas, including rural development, health, social policy, natural resource management, and the environment.

In a grisly twist, Cambodia's environment has actually benefited from the country's recent history. The low population and levels of industrialization mean that Cambodia is relatively free of some environmental problems, such as air pollution and soil erosion, that beset other Asian countries. Instead, its bountiful natural resources are relatively untouched and promise to generate economic growth.

In order to maintain such growth, it is critical that these resources be developed sustainably; Cambodia must ensure that resource use is balanced with conservation. A comprehensive environmental policy would go a long way toward achieving this balance, but a paucity of trained scientists and limited managerial, organizational and technical skills in government departments, make the formulation of any such policy extremely difficult.

IDRC is trying to overcome these obstacles by building up the expertise and knowledge of personnel at Cambodia's Ministry of Environment, itself only created in 1993. Work had to start essentially from scratch: items such as office furniture, computers, and telephones had to be obtained. English language training for ministry staff and the establishment of a simple information management system are priorities.

Another key feature of the IDRC program is to establish an understanding of the policy-making process, namely the link between research and analysis and development of policy. A number of projects support this process. A case study on an area of mangrove forests on the Gulf of Thailand, for example, produced policy recommendations regarding the production of charcoal for export and the effects of shrimp farming.

The challenge of ensuring the wise management of Cambodia's environment and natural resources is so huge that a collaborative effort is essential. To this end, IDRC has encouraged links among government departments and the private sector. IDRC is also coordinating its activities with other donors active in environmental management in Cambodia to avoid duplication of efforts and to focus interventions on key issues.

CLEANING UP IN THE UKRAINE

Canadian assistance guides an effort to rescue the Dnipro River

Environmental problems are believed to cause an estimated 80% of diseases in the former Soviet Union. The situation is most acute in Ukraine where radiation from the Chernobyl disaster, heavy applications of pesticides and herbicides, excessive use of irrigation and industrial pollution put most of the country's population at risk.

The Dnipro River, the main source of the country's drinking water is severely polluted — nearly 20 billion cubic meters of untreated waste is dumped into the river each year. In 1994, shortages in the supply of potable water sparked several riots.

Canada, through the Canadian International Development Agency (CIDA), has committed \$5 million towards the rehabilitation of the river. IDRC is managing the grant.

The program is aimed at strengthening the capacity of Ukraine's five-year-old Ministry of Environmental Protection and Nuclear Safety to manage the Dnipro water system. For example, a project is helping the ministry study changes in water payment rates. There is currently no market pricing of water — water used for agriculture is free and the public is charged only a token amount. Metered water is being introduced in the City of Zaporizhzhia. In 1995, the City of Edmonton donated 1,000 water meters, worth about \$75,000, to this project.

Control of water pollution is another focus of the program. In 1995, researchers completed a baseline water quality study of the river, the first of its kind in Ukraine. Teams are also conducting environmental audits of polluting industries. These assessments will help identify opportunities for the introduction of "green" technologies.

A final highlight of the program's 1995 activities is the establishment of an environmental management information system. This will provide timely data for policy decisions and the design of future projects.

CLOSING THE INFORMATION GAP

From its inception, IDRC has recognized that information and communication are critical to the development process. Long before the arrival of desktop computers and cyberspace, IDRC had an information science program. This program has evolved to keep pace with 25 years of rapid change in the information environment and with the growing demands for information from a wide variety of people in the developing world — from local farmers to government policy-makers.

Just as the information revolution is transforming society in the North, it will have a tremendous impact in the South. IDRC projects, like those that follow, help ensure that the impact is directed at the greater public good.

GLOBAL CONNECTIONS

An electronic forum promotes collaboration among development agencies

Shrinking budgets for foreign assistance are forcing development organizations to find new ways to save time and money without sacrificing the quality of their work. Now, these organizations can make more effective use of their resources through Bellanet, an initiative that promotes collaboration through the use of computer-mediated communication technologies.

Bellanet is a pilot project to improve cooperation and communication in the international development community. It is a forum through which donors can share information, experiences and ideas about current and future programming. It encompasses electronic conferencing, e-mail, file sharing, computer bulletin boards, and other forms of exchange. On-line discussions for collaborative planning are being established around such issues as biodiversity, indigenous knowledge for sustainable development and networking capacity development in Africa.

Bellanet began operations in 1995. Its membership is drawn from government-funded donor agencies, private foundations and United Nations specialized agencies. Governed by an International Steering Committee, it is administered through a small secretariat housed at IDRC in Ottawa. An advisory group of representatives from the South will ensure that Bellanet activities remain relevant to the needs of people in the developing world.

ONLINE BIODIVERSITY

A new CD-ROM puts biodiversity at one's fingertips

Seated in front of her computer screen, a high school student explores Thailand's marine environment. At another computer, a researcher is retrieving specialized information on biodiversity. Both are using the same software: a CD-ROM atlas called ELADA 21.

ELADA 21 is the Electronic Atlas on biodiversity created as a follow-up to Agenda 21, the plan of action that emerged from the 1992 Earth Summit in Rio de Janeiro (the United Nations Conference on Environment and Development). Agenda 21 is a reference document for those involved in policy development and implementation on sustainable development and environmental protection. It consists of 40 chapters. Many researchers and policymakers have been frustrated by the difficulty of extracting information from this mass of data. Through text, maps, tables, graphs, surveys and pictures, ELADA 21 will greatly simplify the process of using this information for anyone who has a personal computer.

In addition to information and data on biodiversity from Agenda 21, ELADA 21 incorporates country studies, documentation from other environmental institutions and interactive scenarios that link biodiversity to socio-economic issues. ELADA 21 compiles an encyclopedia of information that would otherwise be inaccessible to the average person.

The Canada Centre for Remote Sensing developed the atlas in collaboration with IDRC and several international partners. It is being distributed by IDRC Books (fax: 613-563-2476 or internet: order@idrc.ca).

BETTER IMAGES

New Canadian radar technology will help developing countries from space

In November 1995, a Delta II rocket blasted off in California. RADARSAT, an Earth observation satellite developed and built in Canada, was part of its payload. The satellite is a key part of IDRC's GlobeSAR project that is helping countries in the South develop expertise in radar remote sensing.

RADARSAT is equipped with an advanced radar sensor (Synthetic Aperture Radar). Unlike conventional satellites, it is able to "see" through clouds, haze, smoke, and darkness. This makes it ideal for use in developing countries where tropical weather conditions make gathering data difficult. Orbiting 800 kilometres above the earth, RADARSAT will record a swath 500 kilometres wide.

Through GlobeSAR, IDRC will help developing countries take advantage of the data gathered by the satellite's new radar technology. More specifically, data from RADARSAT will

be used for natural resource management, environmental monitoring, and planning. The 10 countries participating in GlobeSAR will identify their own priorities for applying the data. Thailand, for example, will use satellite imaging to assess illegal deforestation in fragile environments. In Malaysia, radar data will help identify areas prone to coastal erosion. The other participating countries are: China, Jordan, Kenya, Morocco, Tanzania, Tunisia, Uganda and Vietnam.

In October, 1995 Natural Resources Canada recognized IDRC for its contribution to the GlobeSar project. Centre staff were part of the GlobeSar team that received a Natural Resources Canada award of merit for its exceptional and distinguished contribution to the effectiveness and efficiency of the public service.

Canada is a world leader in radar imaging. Through GlobeSAR, Canadian scientists are bringing their expertise to benefit countries throughout the developing world and sharing with them the wealth of information generated by sophisticated technology.

The project is funded by IDRC, the Canada Centre for Remote Sensing (of Natural Resources Canada), the Canadian Space Agency and Radarsat International Inc.

OPENING MARKETS

A recent news story reported that Canadian investment in Chile has jumped from \$60 million to an astonishing \$7.5 billion since the end of military rule in 1990. There are currently 50 Canada-Chile joint ventures in the country and Canada is in the midst of planning a trade deal that will ease Chile's entry into NAFTA.

Chile is just one of several countries that have recently opened their doors to foreign investment. In Chile's case, it was the transition to democratic rule that stimulated the influx of capital. IDRC had a role in that transition. Through the years of the military dictatorship, the Centre funded Chilean researchers, many of whom, later became the leading economists and policy-makers of Chile's democratic government. IDRC is now helping other nations transform their economies, as two of the projects described below show.

The example of Chile also highlights the wealth of opportunities for Canadian investors in the South. Two important IDRC initiatives launched in 1995 are helping Canadian businesses explore the potential of markets in the developing world. These initiatives demonstrate that business partnerships between North and South mean more than just profits, they can also contribute to positive social change.

STUDY TOUR

Economists from Eastern Europe travel to Latin America for lessons in economic recovery

Three years ago, four leading economists from Eastern Europe boarded planes that took each to a different destination in Latin America. They were leaving countries undergoing tremendous political and social change. The scale of the transformation from centrally planned to open market economies was unprecedented. In Latin America, they would find countries that had gone through similar upheavals.

In the 1980s, many countries in Latin America underwent structural adjustment programs in an attempt to liberalize their economies and stimulate growth. The successes and failures of these programs offer valuable lessons to Eastern European countries currently undergoing stabilization and adjustment programs of their own.

The economists were part of an IDRC study that examined the economic recovery in Latin America for its relevance to Eastern Europe. They focused on several key areas: privatization in Chile, fiscal policy in Mexico, monetary policy in Argentina and trade policy in Brazil. The conclusions that they drew from their experiences are contained in a book published in 1996 — *Lessons in Economic Policy for Eastern Europe from Latin America*, edited by IDRC's Gary McMahon and co-published by IDRC and Macmillan Press Ltd. in the U.K. One of the book's most important conclusions is that for Eastern Europe to replicate Latin America's economic growth, governments must give priority to strengthening institutional capabilities.

FREE MARKET ACADEMICS

Cuban professors learn about the market economy in a Canadian university course

In 1993, its economy reeling from cutbacks in Soviet aid and the US trade embargo, Cuba took the first steps towards creating a more market-oriented economy. The problem was that few Cuban economists knew about mixed market economies — almost all had been educated in Eastern Europe or Cuba itself. Even Cuban President Fidel Castro had commented on the need for more economists who were knowledgeable about the market economy.

Carleton University in Ottawa, supported by IDRC, is helping Cuban economists acquire that knowledge. It is offering a year-long Masters program in Economics at the University of Havana. The course is based on Carleton's curriculum, but adapted for conditions in the developing world.

About half the instructors are Canadian; the rest come from Latin America. By the end of 1995, 15 students had completed the degree; 17 are currently enrolled in the program.

MAKING BUSINESS CONNECTIONS

Biotechnology yields new business opportunities

A Canadian manufacturer of a biofertilizer is looking to market its product overseas. A research company in Argentina that has developed animal vaccines needs expertise to help in the patenting process.

These two businesses can benefit from the services of CamBioTec — an international network that promotes Canada-Latin America collaboration in the application of biotechnology.

IDRC launched CamBioTec (the Canada-Latin America Initiative on Biotechnology, Environment and Sustainable Development) in January, 1995, with a grant of \$1 million.

It helps entrepreneurs and researchers in the agri-food and environmental management sectors to identify potential partners, promising technologies and funding sources.

CamBioTec builds on a history of collaboration between Canada and Latin America. Canada's biotech industry is world renowned, particularly for its applications to agriculture. Many of Latin America's leading biotechnology researchers were trained at institutions in Canada and therefore look to Canadians as natural business and research partners.

CamBioTec is active in four Latin American countries: Argentina, Colombia, Cuba and Mexico. Together, these countries have an active biotechnology sector and, as their markets open up to more foreign investment, they offer a range of opportunities for Canadian firms and institutions.

The network is organized around "focal point" institutions in participating countries. In Latin America, these focal points provide "one-stop shopping" for Canadian businesses. They broker connections with laboratories, firms, and research organizations and serve as guides to local market and technical information. They are also responsible for implementing CamBioTec activities at the national level.

The Canadian focal point is based at the Canadian Institute of Biotechnology in Ottawa, which helps companies and organizations here explore the potential of Latin America's biotechnology market.

CamBioTec is more, however, than just a business venture. It is based on the premise that biotechnology can contribute significantly to more sustainable agricultural practices and to better management of the environment. To that end, CamBioTec aims to strengthen public policies in the field of biotechnology, to assess the impact of biotechnology applications and to promote improved management of technology in biotechnology-based enterprises.

BUILDING FOOD LINKS

IDRC markets its expertise in international food and agriculture to Canadian businesses

A Canadian agri-food company teamed up with Vietnamese researchers to develop a vitamin-C rich juice made from cashew apples — formerly a waste byproduct of Vietnam's cashew nut harvest. Goldfinger, a disease-resistant banana, may soon replace the standard banana currently for sale in Canadian grocery stores.

These are just two examples of the 1,400 food-related projects supported by IDRC over the last 25 years. The Centre is applying this experience toward a new business venture launched in 1995 called FoodLinks. FoodLinks will help agri-food companies in Canada to create commercial partnerships with businesses overseas and to improve access to new products and markets.

For a nominal fee, Canadian companies will be able to tap into a database featuring a wide variety of fruits, vegetables, roots, tubers and marine products grown and processed in the South. The Centre will help to establish business links with Southern producers. Through IDRC's field offices, FoodLinks offers administrative and technical support and will even monitor local production practices to ensure that they meet high environmental and

ethical standards. Canadian companies will also benefit from the Centre's extensive network of contacts in the food and agricultural sector, ranging from farmers and researchers to governments and international agencies.

With the current emphasis on the global marketplace, Canadian businesses need to be internationally competitive. Moreover, they must also keep up with the changing tastes of Canadian consumers who are demanding more "exotic" foods, such as plantains and mangoes, and eco-friendly products.

IDRC want to work closely with private enterprises. The Centre believes that business has a role to play in building a sustainable and equitable world. FoodLinks puts this conviction into practice by linking Canadian and developing world agri-food interests in partnerships that are environmentally sound and socially responsible.

PROTECTING THE EARTH

IDRC's commitment to building a sustainable and equitable world means environmental concerns are at the heart of the Centre's research initiatives. The projects described below provide specific examples of how environmental research cuts across several disciplines – politics, economics and health. These examples are drawn from the developing world and Canada to emphasize that protecting the environment must be a priority for both North and South.

LIVING LABORATORY

An Amazonian rainforest will provide lessons in how to manage forestry resources while conserving biodiversity

The government of Guyana has provided 360,000 hectares of virgin forest to be used as a "living laboratory" for research on the management of Amazonian rainforests. In 1995, the United Nations Development Programme (UNDP) gave IDRC almost half a million dollars to help establish the project, known as the Iwokrama International Rainforest Programme.

Iwokrama means "place of refuge" in a Guyanese indigenous language. Representing about 2% of the country's tropical rainforest, it has barely been touched by human hands. Its pristine state makes it an ideal site to demonstrate how tropical rainforests can maintain existing levels of biological diversity while still generating economic benefits.

Part of the site will be designated as a wilderness preserve for research into biodiversity and the rainforest ecosystem. The remaining area will be used to demonstrate how the forest's economic potential can be tapped in a sustainable manner. Research will explore techniques and methods for the sustainable management of rainforest resources, including timber, medicinal plants and ecotourism. All work on the project will be carried out in close cooperation with the Amerindian communities in the area.

In light of the rapid rate of tropical deforestation, the Iwokrama International Rainforest Programme will have a global impact. There is an urgent need to understand how to manage the rich biological and cultural diversity in tropical rainforests in a manner that meets the needs of present and future generations.

IDRC is one of several donor agencies and organizations involved in this initiative. Others include the Commonwealth Secretariat, the UNDP and the World Bank.

A GREEN MISSION

A group of South African and international experts charts an environmental policy for South Africa

The South African constitution enshrines people's right to a clean and healthy environment. An international mission is helping to ensure that this constitutional right is upheld by policy.

The International Mission on Environmental Policy, supported by IDRC, presented its final report in 1995 to President Nelson Mandela. Members of the mission — drawn from South Africa and six other countries — participated in fact-finding tours throughout the country. Listening to experts and ordinary people, they gathered information on the threats posed by the country's environmental problems: declining soil fertility, contaminated surface water, disappearing fisheries and widespread air pollution.

The mission recognized that many of these problems were caused or exacerbated by apartheid. But the mission also warned of the potential environmental costs associated with economic renewal and reconstruction. Its recommendations are far-reaching, underscoring the fact that environmental concerns touch almost every sector of society. Its overriding message, however, is that South Africa's future economic prosperity depends on the integration of environmental considerations into mainstream thinking and planning.

Using the Mission report as a basis for discussion, South Africa's Minister of Environment Affairs and Tourism asked IDRC to help manage a national environment policy-making process. Many of the Mission members are now part of teams that have drafted a Green Paper as a first step in the process. The final result will be a White Paper that will serve as South Africa's blueprint for sustainable development.

The report on the environment is the last in a series of four mission reports on South Africa produced between 1991 and 1995. The missions were organized by IDRC in partnership with the democratic alliance, including the African National Congress, to help South Africa's transition to democracy. In addition to environmental policy, the missions helped develop policies on economics, urban issues, and science and technology.

FORESTS OF THE FUTURE

An international secretariat wants to help change how forestry is practised around the world

Forests are disappearing, victims of commercial demands and the need for agricultural land. A new approach to forest management is needed to avoid profound environmental, economic, and social consequences.

The International Model Forest Network (IMFN), a Canadian initiative, promotes the creation of local partnerships to design and implement forestry practices based on the balanced use of resources. It seeks to reconcile the often competing interests in forest

management — interests that include such things as timber harvesting, wildlife conservation, recreation and watershed protection.

In the early 1990s, Canada established a domestic model forest program with ten sites. These range from 400,000 hectares in Long Beach on Vancouver Island in British Columbia to 707,000 hectares in western Newfoundland. The sites are run by non-profit groups that bring together representatives from industry, the environmental movement, indigenous groups and local communities. Together, they develop and manage projects that contribute to sustainable forest use.

At the June 1992 Earth Summit in Rio de Janeiro, Canada expanded its program into a global network. It announced that it would provide \$10 million to help develop model forests in three other countries. Today, there are 18 model forest sites in five countries — Canada, Mexico, Russia, Malaysia and the United States. Each site has its own approach to sustainable management techniques and is involved in a diverse range of activities. For example, the plan for the Gassinski Model Forest in eastern Russia provides for important economic activities such as pine nut production and wood processing businesses, the protection of such species as the Siberian tiger, and the preservation of traditional land uses of the native people, the Nanai. Education, research projects and development activities are central to all the Model Forests.

A secretariat coordinates and oversees communication among the model forest sites. Originally based at Natural Resources Canada, the secretariat was transferred last year to IDRC in recognition of the Centre's international experience in sustainable natural resource management. IDRC will encourage other countries to join the network with the goal of having every major forested ecological region in the world represented. Eventually, the IMFN will become a self-sustaining institution supported by network members.

THE PEOPLE'S PHARMACY

Researchers fight to conserve the rich diversity of medicinal plants

From her stall in the local market in Belize City, Aunt Teresa diagnoses customers' ailments and treats them with preparations made from vines, barks, tubers and roots. Now in her 80s, she has devoted her life to using medicinal plants to cure peoples' ills.

Medicinal plants play a primary role in health care in many parts of the developing world and are used to treat everything from toothaches to tendonitis. The remedies are popular because they are cheap, easily accessible and culturally familiar.

At the same time, traditional knowledge of the use of medicinal plants is declining. This loss threatens the plants themselves — people will only protect the natural resources that they consider important. Large numbers of medicinal plants could disappear unless there is a concerted effort to promote their use in health care and safeguard their diversity.

A network for scientific research and popular use of medicinal plants is spearheading this effort in the Caribbean and Central America. Known by its Spanish acronym TRAMIL (Applied Research and Dissemination on the Use of Medicinal Plants in the Caribbean), the network brings together traditional knowledge and modern science by working with traditional communities to document popular home remedies and investigate their safe

and effective use. It began in 1984 in Haiti and the Dominican Republic and now encompasses 24 countries and territories.

In 1995, IDRC continued assisting TRAMIL's efforts by supporting the extension of the network to six countries in Central America. The TRAMIL program revolves around the identification of medicinal plants by interviewing people in local communities. Researchers collect the plants, which are then subjected to rigorous scientific analysis to validate their healing properties.

Regular workshops of TRAMIL scientists are held to evaluate significant plants based on the results of field and laboratory research. In 1995, members of TRAMIL's Central American network held a workshop in San Andres, Colombia and evaluated 80 plants from 16 countries and territories.

Once plants have been identified as effective and safe, the network members publicise the plants' medicinal uses and share their results with other groups, particularly families and health professionals in remote areas. Information is given on the best time to collect plants and on standard procedures for preparing plant-based remedies. In Honduras, a dissemination workshop held in 1995 attracted local healers and representatives from schools, mothers groups and community health clinics. Several of the workshop participants developed plans to cultivate medicinal plants.

Also in Honduras, TRAMIL co-hosted a joint meeting in 1995 between traditional healers and physicians — said to be the first official dialogue between these two groups ever held in the country. The gathering also included policymakers. This meeting reflects TRAMIL's efforts to get decision-makers and conventional health professionals to recognize the validity of medicinal plants and to support their conservation.

BUILDING ON SUCCESS

One measure of a successful project is whether its achievements can be reproduced elsewhere. The following examples show how the benefits of research can multiply when more widely applied.

TRANSPLANTING BANANAS

New varieties may help to save banana and plantain crops in Africa

Bananas and plantain are two of the most important sources of food in Africa. Disease, however, poses a major threat to these crops. In Ghana, Black Sigatoka leaf spot disease has caused plantain production to drop by one million tonnes between 1984 and 1990. In Uganda, where the average person eats 200 kilograms of bananas a year, the volume of bananas that can be harvested from each hectare of land has declined from 9 to 4.5 tonnes.

Chemical control of pests and diseases is beyond the means of most farmers in these countries. Their livelihoods and food supplies are increasingly at risk. The introduction of new varieties of bananas and plantains, however, may come to their rescue.

After more than 30 years, much of it supported by IDRC, researchers at the Fundacion Hondurena de Investigacion Agricola (FHIA) in Honduras have developed several disease-resistant, high-yielding hybrids of bananas and plantains. In 1995, Ghana and Uganda were selected as testing sites for four of these varieties to assess how they adapt to African growing conditions.

The most notable of these varieties is Goldfinger. Developed at FHIA with IDRC support, it resists many banana diseases and grows well in poor soils and cooler temperatures. It is also a versatile food staple. When green, it can be boiled and eaten like a vegetable. When ripe, it has a pleasant, apple-like flavour. It's ideal for fruit salads, juices, and purees such as baby foods because it doesn't turn brown when cut.

A large multinational banana producer is establishing a 50-hectare plantation in Honduras to experiment growing the new banana varieties, including Goldfinger. It is the first time that a major producer has made such a commitment to testing organic bananas.

If Goldfinger and the other introduced varieties thrive in Africa, farmers should be able to boost production by at least 30% and enjoy a better quality of fruit. Incomes would climb by an estimated 50% through the sale of bananas and plantains to local markets. Most importantly, a nutritious food source would be restored.

TAPPING CLOUDS

Giant nets convert fog into drinking water

The village of Chungungo lies in the shadow of the coastal mountains in northern Chile — one of the driest regions in the world. Water for its 350 residents came from a town 50 kilometres away, transported once or twice a week in an old tanker truck.

Canadian and Chilean scientists solved the village's water shortages by developing a system of large nets to collect moisture from the mountain fog above Chungungo. It's a variation on an ancient technology.

The fog-water collectors resemble oversize volleyball nets. Made of locally available polypropylene mesh, each net is stretched between two posts and hangs two metres off the ground. As clouds pass through the nets, beads of water form on the mesh. The water runs down the nets into gutters that drain into a 100,000-litre reservoir. A pipeline carries the water down the mountain and into the village taps. About 11,000 litres of water flows into Chungungo a day — more than twice the amount it used to get from the truck deliveries at a quarter of the cost.

This success is now being replicated in the village of Collanac in Peru. The fog catchers there are part of a larger IDRC project to restore vegetation in the area using a unique irrigation system. Water harvested from the clouds is being distributed to plants through clay pots. The pots' porous walls allow just enough water to seep through to meet the needs of each plant.

This simple technology saves enormous quantities of water, critical in a region where just 1 to 2 centimetres of rain falls each year. In turn, improved cultivation techniques help people to grow more crops — both to eat and to sell.

The fog-catcher is being tested for use in Ecuador and Namibia. A potential site is also being considered in the Cape Verde Islands off the coast of Africa. Interest is growing and other agencies are now exploring the use of fog catchers in coastal regions of the world.

NET SAVE

Bednets dipped in insecticide could save millions of children

Each day, malaria kills about 2,800 children in Africa. Researchers have found a way to prevent perhaps one-third of these deaths through the use of mosquito nets treated with insecticide.

IDRC is part of an international consortium that funded research in Africa on the efficacy of these bednets in battling malaria. Studies completed in 1995, in Kenya and Ghana, involving almost 200,000 people showed that sleeping under the nets could save the lives of as many as half a million children every year.

Malaria is one of the leading causes of sickness and death in the developing world. The World Health Organization (WHO) estimates that there are 300 to 500 million clinical cases of malaria each year, resulting in 1.5 to 2.7 million deaths. It is responsible for as many as half the deaths of African children under the age of five. And the situation is getting worse. The parasite is becoming increasingly resistant to drugs and environmental changes are putting more people at risk of contracting the disease.

The polyester bednets offer protection during the night, when the mosquitoes that transmit the malaria parasite are out in full force. The nets are impregnated with an insecticide called permethrin, which is commonly used in medicated lice shampoo.

Malaria is so pervasive in tropical settings that its eradication is considered impossible. Emphasis has shifted to controlling the disease's spread. In much of sub-Saharan Africa, bednets may eventually prove to be the single most effective way to prevent malaria transmission.

Since 1976, IDRC has contributed almost \$11 million to 50 projects dealing with malaria. Currently, it is funding 20 malaria projects, including five that are studying insecticide-impregnated nets in Africa.

INSURANCE POLICY FOR FISH

The world's first gene bank for fish expands

Each season, up to 20,000 Steelhead salmon used to thrash their way up the Thompson River in British Columbia to their spawning grounds. In 1996, chronic overfishing had so decimated the population that fewer than 4,000 made it.

The crisis in the West Coast salmon fishery mirrors trends in other parts of the world. Fish stocks are declining or disappearing altogether, victims of overfishing, habitat loss and pollution. This is especially worrisome for people who rely on fish for food. It also narrows the genetic base used in fish breeding, leading to lower production, susceptibility to diseases and poor survival in the wild.

Now, thanks to the International Fisheries Gene Bank (IFGB) in Vancouver and its expanding network of regional gene banks, endangered fish stand a fighting chance of survival.

The genetic conservation of aquatic species is a much neglected field. Although gene banks for plant species have existed for decades, the IFGB is only four years old. It was created following the Earth Summit in Rio de Janeiro in June, 1992 to promote and coordinate the conservation of aquatic biodiversity through a network of regional gene banks of frozen fish sperm. It is a program of the World Fisheries Trust, a British Columbia-based society dedicated to the preservation and conservation of the world's wild fish stocks. IDRC has supported the IFGB and its training programs in fish sperm collection and freezing techniques since its inception.

Armed with portable freezing and storage containers the size of a small suitcase, workers can go to remote locations to fast-freeze the fish sperm on site. The sperm is then transported back to a permanent gene bank where it can be saved for re-stocking at any time in the future.

The technology and collection techniques are being used in both Canada and the developing world. With IDRC support, the IFGB trained members of the Shuswap Nation of British Columbia to collect sperm from the salmon of the Fraser and Thompson rivers. Last fall, the Carrier-Sekani Nation of Central B.C. began to use gene banking to help protect salmon of the Endako River.

In 1995, a regional gene bank was established in Venezuela with partial funding from the Venezuelan government. Plans are underway for banks in three sites in Brazil. These will be partially financed by electric companies to try to counter the effects on the fish population of the construction of hydroelectric dams on the Parana and Uruguay rivers. The IFGB has also attracted private sector funding in Canada from B.C. forestry and mining companies.

BUTTING OUT

An international initiative follows Canada's lead in battling the effects of smoking

An amateur wrestler in The Gambia, a small country in West Africa, urgently puffed on a cigarette just before his championship match. When asked why, he answered that "cigarettes make me strong."

Misconceptions about smoking are widespread in the developing world, where tobacco use has been climbing at an average rate of 3% a year. In China alone, it is increasing at a rate of 11% a year. It is estimated that half the men and almost 10% of women smoke in developing countries. These growing statistics are alarming. The World Health Organization (WHO) estimates that by the year 2020, seven million people will die in the South each year due to tobacco-related illnesses. Smoking is expected to cause more premature deaths than AIDS, tuberculosis and complications of childbirth combined.

The problems associated with tobacco production and consumption extend beyond health to social and economic development. Many countries rely on tobacco as a source of revenue, employment and foreign exchange. But a World Bank study determined that tobacco

represents an annual economic loss of \$70 billion US to the South because of premature deaths, lost work time and medical care. Tobacco also takes over highly productive land that could be used for growing food.

The International Tobacco Initiative (ITI) was created in 1994 to support the development of public policies aimed at reducing the threat posed by tobacco in the South. Its headquarters are at IDRC. It also receives funding from IDRC and from Health Canada. ITI's aim is to raise awareness of the need for further research in developing countries on the causes and consequences of tobacco use, to encourage a global commitment to deal with tobacco's harmful effects, to support research toward the transition away from growing tobacco to crop alternatives and to raise more funding for these efforts.

Some of the activities supported by ITI last year included an analysis of the impact of large tax increases in South Africa on smoking, a study of why more people in Turkey are switching to foreign brands of cigarettes, and the preparation of a brief on women and tobacco in the South for the Canadian government's submission to the Fourth World Conference on Women held in Beijing.

Canadian involvement in ITI reflects Canada's leadership in tobacco control. In the last decade, tobacco consumption declined in Canada at a faster rate than in any other country in the world. This is due to public policy and powerful lobby groups pressing for tobacco control. Through its support of ITI, Canada is applying its expertise on a global scale.