A photograph of a man with dark skin and short hair, wearing a red button-down shirt, looking intently through a white and black compound microscope. He is positioned on the right side of the frame, leaning over the microscope. The microscope is the central focus, with its eyepiece, objective lenses, and stage clearly visible. The background is dark and out of focus, suggesting a laboratory or office environment. The lighting is dramatic, highlighting the man's face and the microscope.

Local people
finding local answers to
local problems

CANADA
TODAY / D'AUJOURD'HUI

Adapt and Apply



The IDRC supports programs in Africa, Asia, the Middle East, the Caribbean and Latin America. As of January 1979, the greatest concentration of programs was in Asia (29.4 per cent) and in Latin America and the Caribbean (19.9 per cent). The centre had spent \$61,417,000 on programs involving agriculture and the food and nutrition sciences; \$33,572,000 on social sciences and human resources; \$22,298,000 on health sciences; and \$17,611,000 on information.



Around the world, North American farm machinery stands rusting in the fields. Twenty years ago the industrial nations of the northern hemisphere tried to end world hunger by transferring their technology to the south and found that there are reasons why the machine that works in Manitoba may not work in Sierra Leone.

In 1970 Canada's International Development Research Centre began a modest program to help

developing nations find their own answers to problems of hunger, health and education. The basic principle of the IDRC is that solutions must fit the facts of life in the place where they are to be applied.

In this issue of CANADA TODAY/D'AUJOURD'HUI we talk about the facts of life in a number of places and about IDRC programs that support local people finding local answers to local problems.

The Canadian Parliament established the International Development Research Centre in 1970. In the sweeping language of the act, the IDRC is intended to "initiate, encourage, support and conduct research into the problems of the developing regions of the world and into the means for applying and adapting scientific, technical and other knowledge to the economic and social advancement of those regions."

The key word is *adapting*. Problems differ from place to place and ignorance is the mother of arrogance. The IDRC's board has eleven Canadian members and ten non-Canadian members, including six from developing countries. Its expenditures are modest: In its first eight years it spent about \$143 million in support of 819 projects — a few receiving \$1 million or more, a few less than \$5,000. In 1978, one hundred and ninety-three projects had been completed and hundreds more were in a second or third phase.

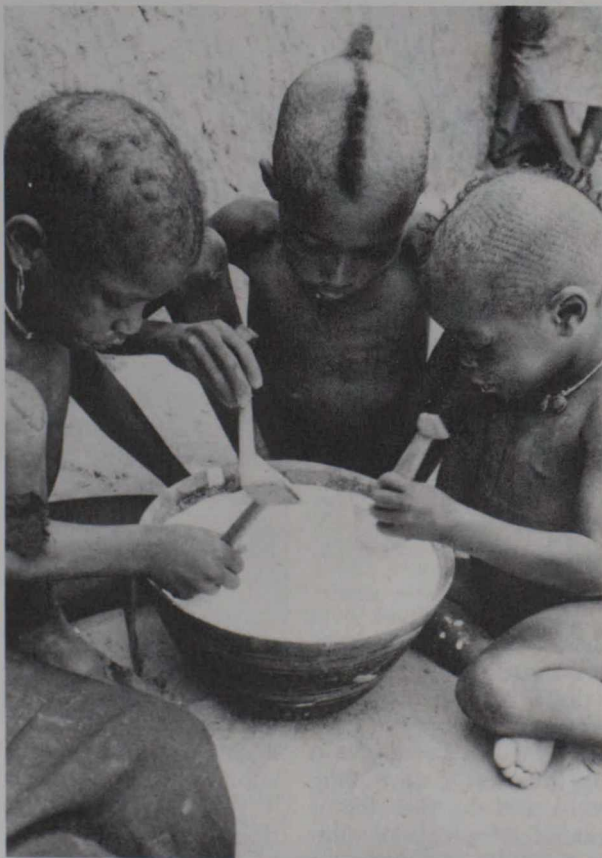
The IDRC is involved in health, education and food-production programs. The greatest emphasis is on food, particularly crop research in semi-arid tropical areas. In broad terms, the IDRC helps developing countries cope, adjust, survive and prosper in a rapidly changing world. It strives to help define the social, economic, political and cultural consequences of change and to disseminate information about development problems and solutions. It is a member of the worldwide Consultative Group for International Agricultural Research (CGIAR).

Waste Not, Want Not

In developing countries, grain is harvested and threshed by hand and often stored in small containers. It spoils. It is eaten by insects, rodents and birds, spilled in handling and overexposed to the sun. Processing technology is poor, transportation inadequate, and distribution unfocused. Cereals lose weight and nutritional value. In some countries one third of each year's harvest is wasted. In Bombay an estimated 3,600 tons of cereals are eaten by rodents yearly, enough to feed a village of 20,000.

Various western techniques and technologies have been applied to different parts of the problem — irradiation, chemical pesticides, hermetically-sealed storage bins, prefabricated silos and refrigerated grain stores. For a variety of reasons, none of them worked very well. Rice mills designed for the well-graded, uniform grain of Japan were unable to handle the heterogeneous mixtures delivered to small Asian and African mills.

The IDRC believes the solution lies in a "systems" approach, encompassing all parts of a prob-



lem in a particular place. One has been tried in Maiduguri in Nigeria where sorghum, millet, maize, cowpeas and small amounts of wheat are grown. Ten years ago farm families sold only 10 to 15 per cent of their crops. The prices varied 30 to 40 per cent among the regional markets. Most households prepared grain and converted it to flour two or three times a week. The women dehulled the grain by hand-pounding with mortar and pestle, winnowed it and sent it to small plate mills, where it was ground into flour or grits. Imported wheat flour was used for traditional dishes and packaged cereals.

A survey of 1,100 households by the Home Economics Department of the North Eastern State analyzed present and potential tastes and found that the use of packaged cereals was rising and that wheaten bread, not a traditional dish, was being served at breakfast. Snack foods were popular — children in 40 per cent of the homes were regularly given money to buy them.

In 1974 the Nigerian Ministry of Agriculture and

Natural Resources and the North Eastern State's Ministry of Natural Resources, with IDRC assistance, built a new mill in Maiduguri. The Mill Managing Committee sent two Nigerian Ministry of Agriculture employees to Toronto to assemble and test it. It is powered with a 30-horsepower diesel engine and has four units: a pre-cleaner, a dehuller, plate and hammer mills and a flour sifter. A unit for heat-sealing plastic bags was added. It can mill and sift the varieties of sorghum, millet, maize, and cowpea into fine flour, grits and middlings. The mill buys grains from farmers and does its own dehulling and milling, eliminating middle men and cutting losses in handling and spoilage. Its flours and grits are cheaper and more nutritious.

A bakery was built to teach people to make bread from local flours, and a test kitchen was set up to adapt the local flours to packaged cereals and



Cassava, a staple throughout the Third World, may be boiled like a potato or made into tapioca or bread.



Children from the higher grades help those in lower grades. These children in the Philippines must master three languages — the local one, Pilipino (the national one) and English.

traditional wheat dishes. Home agents took new recipes to householders. A number of products were developed including more nutritious fried snack foods made with high protein blends of sorghum, millet and cowpea flour.

The project is working well. Local grain production for market is up; grain loss in the milling process is down 15 per cent; and the shelf life of grain products has been extended from a maximum of three days to a minimum of two weeks. A similar IDRC supported project is under way in Botswana.

Each One Teach One Hundred and Fifty

Southeast Asia has four related problems in primary education: Half the school-age children are

not in school, and many who are must drop out for a week, a month or a year at a time to work on family farms. The half who are in school are in crowded classrooms, often three to a desk. Their number is growing rapidly. (In the Philippines the enrollment in primary and secondary schools has risen from 3.2 million in 1946 to an estimated 14 million today. That number is expected to double again by the year 2000.) There is not money to hire enough teachers and build enough schools.

A current experiment may help resolve the dilemma. The broad goal of the Southeast Asian Ministers of Education Organization is to make education available and accessible to all. In 1973 the Regional Centre for Educational Innovation and Technology undertook a radical teaching program with research units in the Naga district of Debu Island in the central Philippines and in two villages near Solo in Java, Indonesia. The IDRC has assisted the projects — called Impact in the Philippines and Pamong in Java — since 1974.

Pupils in Impact and Pamong use

"As much as a beggar will not advance in private life, a nation that begs will also not develop. . . . Only a nation which relies on its own efforts will succeed in the long run."

Finance Minister Ronnie de Mel of Sri Lanka

self-instruction modules, test themselves and advance at their own pace. Those who must drop out can later pick up where they left off. The teachers have become instructional supervisors. The interior walls of the schools have been taken down and most students work outside. The programs began with 1,065 children in the five rural schools in Cebu and 526 in the two villages near Solo. Two new sites in the Philippines, Lapu-lapu and Sapang Palay, were added later. In time, it is hoped, each teacher (or instructional supervisor) will oversee between 70 and 150 pupils.

The first three grades are given structured

with little supervision. They are tutored by high school students. The instructional supervisors move about and give help where it is needed. At some schools, kiosks — thatched roofs over picnic tables — are set up on the school grounds, and there are outposts in private homes where adults can pick up modules. Modules extend the teachers' reach; kiosks and outposts increase the space.

There are difficulties: It is often hard to get parents involved, and upper-grade students may be reluctant to take time to tutor the younger children. In the Philippines the students who speak a local tongue must learn both English and their national language, Pilipino, and it is difficult to raise all students to module-reading levels by grade four. Nevertheless, the programs have measured well in terms of academic results and costs. In Java the fourth and fifth grade students took the Standardized Official Tests, and their aggregate scores were almost 50 per cent higher than those of pupils in traditional schools. The Education Development Office in Jakarta gave tests to fifth and sixth grade Pamong pupils and to pupils in traditional schools, and the Pamong pupils outscored the others in all subjects, though only by a point or two. In the Philippines the Impact pupils outscored comparison pupils by an aggregate of 25 per cent.

Cost comparisons are difficult, but a conservative analysis suggests substantial savings. Replacement of text books and other aids by modules cut operational costs an estimated 15 per cent. In the Cebu project, 12 instructional supervisors and 5 instructional aides replaced 55 teachers, and total salary costs were reduced from 264,000 pesos to 67,740 pesos a year. The Solo team reduced their staff from 40 to 14. Since there is, in both places, a continuing shortage of teachers, those replaced were easily reassigned.



An IDRC exhibit at the Ontario Science Centre included this simple, but sophisticated, plastic pump. It was designed by a University of Waterloo team of fluidics experts, a mechanical and a chemical engineer and a biologist who worked with research teams in Africa and Asia. Its cost is about one tenth of the cost of a standard cast iron model and it has no movable parts that could wear out. A filter purifies the water from unprotected open wells. A Pembroke, Ontario, high school student made this model.

instruction. Students from higher grades monitor some programmed lessons.

Those in grades four through six work with self-instruction booklets, 32 to 100 pages long, that lead them step by step to tests that may be taken

Trees

Trees used as windbreaks can help reclaim the desert, but the wrong ones in the wrong places can disrupt the natural flow of air and change the climate. Some seedlings are eaten by animals, and some species inhibit the growth of crops already in place. Scanty and erratic rainfall may limit the planting season to three weeks a year.

With some help from the IDRC, a number of countries — Tunisia, Nigeria, Egypt, Senegal and Sudan — are searching for the right trees for the semi-arid lands around the Sahara and in East Africa.

Last year Sudan's Ministry of Agriculture began test-planting the *prosopis* tree in the Kerma Basin of

the Nubian Desert. The foliage of some varieties of *prosopis* is unpalatable to livestock, yet its nutritious pods can be eaten by humans and cattle.

In Nairobi the International Council for Research in Agroforestry, supported in the planning stages by the IDRC, is trying to combine the growing of trees with growing food crops and pasturing animals.

Scientists from the Forestry Research Institute of Malawi have begun forestation designed to supply fuel from swift-growing trees that can be integrated with traditional crops.

The Philippine Council for Agriculture and Resources Research (PCARR) is working, with IDRC assistance, to develop the leucaena tree as an improved source of income for farmers. The tree is already a marvel. It produces wood more rapidly than any other known species. Resprouting



Milkfish raised in tanks are an important food source in the Philippines.

vigorously from stumps, it can be harvested every five or six years. The wood — strong, dense and attractive — can be converted to commercial lumber, plywood, pulp, paper, rayon and cellophane. The PCARR's genetic research team is trying to develop a strain that can be established easily from seedlings and that will grow in a broader range of climatic and agronomic conditions.

Planting the Ponds

In Asia, where no one assumes that nature is bountiful, fish farmers multiply the natural harvest of the sea. Fish have been cultivated there for a long time. In the sixteenth century Magellan found the natives of the Philippines raising fish in saltwater ponds, and the Chinese were nurturing carp 2,000 years ago.

Old methods are being modernized, and the harvests are expanding. Since 1972 the IDRC's Agriculture, Food and Nutrition Sciences Division

has invested some \$4.4 million in 17 aquaculture research projects.

Feeding and harvesting high protein fish is about three times as cost efficient as feeding and harvesting cattle. Trout can be raised to maximum size in a volume of recycled water equal to their own displacement, and coastal farms off Singapore have produced 250 kilograms of mussels per square metre. Much of the technology is simple and inexpensive.

In 1973 the IDRC held a workshop for researchers from all over Asia in Malacca, Malaysia. They agreed that the critical fact hampering expansion was that fish seldom breed well in captivity. Experiments made forty years ago in Brazil had demonstrated that fish would breed when injected with pituitary extracts. Scientists at the University of British Columbia and the British Columbia Research Council, working with a commercial fish packer, collected 250,000 pituitary glands from Pacific salmon, extracted crude gonadotropic hormone, stabilized it and shipped it to IDRC-sponsored projects around the world.

The most spectacular result was in the Philippines. Cultivated milkfish feed millions in the Philippines, Indonesia and Taiwan. The fish live in fresh and brackish water, as well as in the sea, and they grow fast; but in the traditional system, fingerlings have to be gathered from the sea to replenish the ponds. The Aquaculture Department of the Southeast Asian Fisheries Development Centre injected female milkfish with gonadotropin from British Columbia salmon, and for the first time in history, captive milkfish spawned.

Hormones from Canadian salmon are injected into Chinese carp in Mardi, Malaysia.



In Malaysia the Malaysian Agricultural Research and Development Institute injected carp, and the carp were soon spawning every month of the year. Researchers in Asia are now attempting to produce the gonadotropin from fish closer to home. They have found, not surprisingly, that carp injected with extracts from carp reproduce more than those injected with extracts from salmon.

The IDRC is also involved in other aspects of fish farming. In Africa the problem is the opposite of that in Asia — *tilapia* breed prolifically and overcrowd their ponds, preventing the fry from developing beyond a certain size. In Kenya a project is trying to develop a non-reproducing *tilapia* hybrid, which would be removed from the natal ponds and grow into a larger, marketable fish.

disposing of waste, contaminate their water supplies. They may also not have enough fertilizer for their crops.

Farmers in Asia attack all three problems by converting animal and plant waste to a biogas mixture of methane and carbon dioxide. There are more than 8,000 biogas plants in China, 36,000 in India and 27,000 in Korea.

The process is simple. The waste — animal dung, human waste and inedible vegetation — is mixed with water and left in a large chamber, partly underground. The waste decomposes, taking some 30 to 50 days and producing the biogas, which is stored in a drum and drawn off as needed. The slurry that remains makes an excellent fertilizer.

The widespread use of biogas is fairly new. The



In Thailand, rice is traditionally piled beside the road. IDRC aided programs are developing methods to reduce losses.

Feeding the fry after they have spawned and absorbed their yolk sacs presents another problem. A small project at the University of Victoria found that carp, like cattle, can digest cellulose and inorganic nitrogen, a promising start toward developing cheap feed. In the future carp may be put out to pasture.

Biogas Plants

Farmers in developing countries often use cow dung for fuel. They lack adequate sanitation, and in

first plants in India were built in 1951, but 70 per cent of those now in use were built during the 1975-76 energy crisis. The IDRC commissioned a state-of-the-art review in 1977 and found that reliable designs for biogas plants were available, but poor construction had resulted in many failures. It found that little attention had been paid to burner and appliance efficiency, which were generally inadequate.

The researchers concluded that current designs may produce plants that are more expensive than they need to be. Large, community plants are likely to be most cost effective, and while the economics of biogas production depend on the particular environment, it may be successfully produced in many more rural areas.

Home Grown

There are 2.5 million medical doctors in the world — one for every 1,250 people — but they are not spread around evenly. In Israel and the Soviet Union there is a doctor for every 400 people; in many other places there is less than one for every 100,000. In the last 20 years, while the number of doctors in the world has grown, the contrast has become greater. In Africa there is, statistically, a doctor for every 7,000 people; but most are in cities, and vast rural areas have none.

Disparities in services match disparities in health. Average life expectancies vary from 30 to 75 years, and the death rates of children in the poorest countries are a hundred times as great as those in developed countries.

The problems are formidable. Doctors cannot be trained fast enough to match population growth and to bring the ratios in Africa, Asia and South America up to the North American or European levels. Highly educated doctors are seldom willing to serve in deserts, rain forests and isolated villages.

There is, however, a practical solution. In an IDRC booklet called *Doctors and Healers*, Alexander Dorozynski suggests we often assume that the western medical system is the only effective one. Most deaths of children in underdeveloped countries, he notes, are caused by respiratory infections — pneumonia, bronchitis, bronchiolitis, otitis media, croup, tonsillitis and the common cold — or by diarrhoea and these diseases can be recognized and treated by locally trained medical auxiliaries. Such auxiliary systems were once widespread but have now declined.

India's old system of auxiliary schools offered four years of medical training to high school graduates. The system appeared to value the lives of the colonial elite (who were treated by properly certified physicians) more than the lives of the ordinary natives. It fell into disrepute when independence came.

The auxiliary schools were replaced by fully accredited medical schools, and the number of certified physicians rose while the number of auxiliaries declined. There was, however, no corresponding improvement in general health. Most of the new doctors were unwilling to practice in small, poor, isolated, ill-equipped villages; and

many could not find appropriate practices in the cities. A great many Indian doctors emigrated to the already well-cared-for western nations. As Margaret Mead pointed out, "the introduction of medicine has meant a loss of faith in the known, and when the new medicine proved too expensive, people found themselves without any medicine."

The IDRC is now encouraging auxiliary projects around the world. Community people — the mayor, the traditional medicine man, any person of good sense who commands respect — are trained to recognize and treat pneumonia with simple means — sulfonamides and antibiotics. The most dangerous consequence of diarrhoea, dehydration, is easily recognized and can be coped with, even within the family. In Papua, New Guinea, medical auxiliaries, by treating dehydration, have reduced mortality from diarrhoea to the rate of about one per cent — matching the average in many hospitals.

Auxiliary systems, each adapting the traditions, opportunities and skills of the particular place, are in use in Iran, Sudan, Afghanistan, Algeria and many other countries. In Brazil women who cannot read or write give injections and perfusions at "rehydration centres." Using simple equipment — a needle mounted on a tube connected to a fusion set and a razor

blade to shave the scalp when necessary — they have reduced deaths from dehydration in isolated villages to two per cent.

On the high plateau of Chimaltenango, above Guatemala City, health promoter Pedro Chacach, 35, treats patients for 25 cents each. His office is part of his home, a stone and mud house with an earth floor. He speaks, reads and writes the native dialect, his own, and Spanish. In three months of instruction he learned to recognize and treat the common diseases. There are 50 health promoters among the 200,000 plateau Indians. The system is linked to ten separate health care delivery systems that have been started in Guatemala. One program gives two years of training to "rural health technicians," who are then assigned as middle men between the health promoters and medical doctors.

The most spectacularly successful auxiliary system has developed in China without any direct aid from the West; although an unusual Canadian doctor played a pioneering role when he taught Chinese teenagers battlefield surgery in the late 1930s. The broad medical care auxiliary program was developed in the 1950s, when the teaching and



The IDRC supports health and research programs conceived and pursued by scientists in Third World countries. In this picture an Ivory Coast researcher works on black fly control. The fly carries onchocerciasis, which causes blindness.

practice of traditional Chinese medicine — acupuncture, moxibustion (the cauterization by burning herbs on the skin) and herbal medicine — were merged with western medicine. By 1958 there were thirteen medical schools and several hundred secondary schools teaching various levels of medicine. In the 1960s new emphasis was put on rural health. Medical doctors in rural clinics began teaching the rudiments of patient care to young farmers. These “barefoot doctors” attend classes for three to six months; and after they have practiced for a time, they receive additional training.

They diagnose common diseases, prescribe



Traditional medicine men, such as this one in Senegal, are often converted through training into health auxiliaries.

traditional Chinese and western drugs, practice acupuncture and use some western techniques. Women practitioners become midwives, provide maternal and child care, advise on the use of contraceptives and perform abortions. There are now over a million barefoot doctors practicing in the countryside; and the health of a huge population, which has been chronically ill through much of history, has improved remarkably. Smallpox and cholera have been almost eradicated; and two parasitic diseases, lishmaniasis and schistosomiasis, which were once widespread, have been brought under control.

Norman Bethune, a maverick, was the pioneer Canadian teacher. He went to China in 1938 as a

volunteer physician and surgeon and wound up as the chief medical man with Mao Tse-tung's Eighth Route Army. In the face of impossible odds, he founded over twenty teaching hospitals, training hundreds of doctors and nurses.

He described the results: “The doctors who run this hospital range in age from nineteen to twenty-two and not one of them has received any training in a modern hospital; the nurses are young people between fourteen and nineteen. These are our greatest resources: They study diligently, strive to improve themselves and are willing to listen to

“The new name for peace is development.”

Pope Paul VI

criticism. Sometimes I'm unhappy with them from the point of view of medical knowledge, but when I see their purity, their sincere efforts to study, their love of their comrades and their selfless diligence, I can always find a way to suppress my dissatisfactions.”

Bethune died near Mao's front lines in 1939 from a septicaemic infection received while operating barehanded on a soldier. He was fifty years old.



Dysentery is the great killer of infants. It can be controlled by health aides using easily learned techniques. Here one in Bangladesh does a swab.

Paraguay's Health Auxiliaries

In 1977 two Paraguayan physicians, Ruben Mallorquin and Anibal Rolon, decided to use teacher volunteers as rural health aids. The IDRC gave assistance and arranged an advisory visit by the director of a similar program in India.

The teachers, who attended a two-week training course, spend their weekdays in the classroom, consult patients after school, and visit families assigned to them on weekends. They offer vaccinations, rudimentary health care and advice on such matters as sanitation. Some of the families can be reached only on foot, by horse or by horse-drawn cart. The 100 teachers in the program serve about 26,000 people.

An unexpected effect of the program is that one district health inspector is supervising the installation of six or seven times as many latrines as before.



Ivan Head

A Comment from Ivan Head

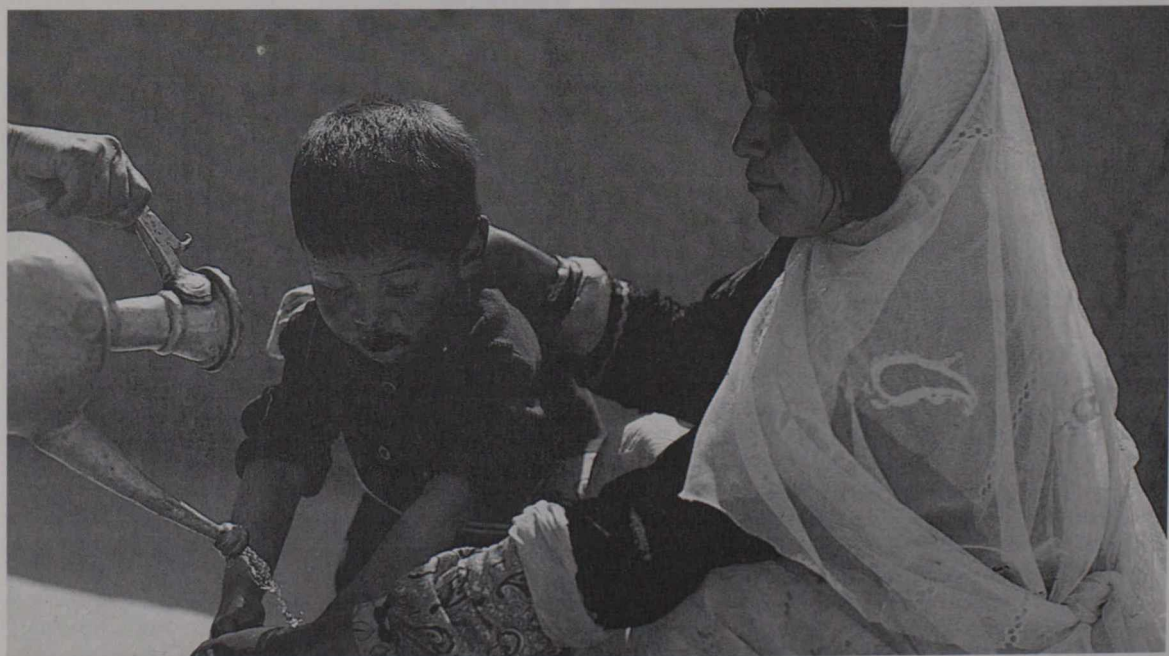
What is the prospect of the underdeveloped world, the southern half of the world, ever catching up in any real sense with the industrialized nations? Is this a realizable goal? Would the rise of the standards of life in the south mean a lowering of standards in the north? Ivan Head, IDRC president, comments below:

"If we're talking about the poorest of the poor achieving within the lives of people now living, say by the year 2000, a degree of dignity, of achieving better nutrition, better health care, better shelter, better education, then this can be done.

"For the first time since World War II, the people of the developing world have attained enough resources to start acquiring new things that they need. The first thing that any family leader wants is more food. When worldwide food consumption surpasses population growth, it means that on a per capita basis, the poor are becoming better off.

"In a modest fashion, the IDRC is contributing to the dignity of individuals in the developing countries. We do so in large measure by concentrating our efforts on the "essential needs": food, shelter, health, education. In the final analysis, however, the centre regards the essential need as the acquisition of competence on the part of the developing countries to identify and solve their own difficult problems. It's the responsibility of the developing countries to help themselves. The assistance that IDRC offers is in modest amounts, but in areas we think important, such as agriculture, such as shelter. We tend to concentrate on supporting research and, most importantly in my opinion, on supporting it in a way that will enhance the programs that are originated and continued in the developing countries themselves.

The most rudimentary form of preventative medicine is often the most effective. Here, a health auxiliary shows an Iranian mother how to wash a child.



"Development is difficult but it is clearly inevitable. In the developed world, we should not assume that this resource transfer is a one-way street, that north-south relations are played according to the rules of a zero-sum game in which each point gained by one participant is a point lost to the other. In fact, evidence now reveals clearly that development is a mutually beneficial operation in which all win, or in default of which all lose. The trade figures of the most vigorous national economies are an indication of the important role played by developing-country markets. According to the World Bank, 46 per cent of all Japanese merchandise exports are sold in the developing countries; 39 per cent of US merchandise exports go to the same markets, as do 23 per cent of German merchandise exports. The less-developed countries' imports of merchandise from the industrialized countries in the 1970s grew more than 50 per cent faster than merchandise trade

among the industrialized countries.

"In 1976 the industrialized countries enjoyed a \$70 billion favourable balance of trade with the less developed countries. There cannot be any doubt that if developing countries are to continue buying our products, and especially to buy more of them, they must find the means of paying for them. They will not do so until they become more productive themselves, until their people become healthy, well-fed, educated individuals — engines of production, and engines of demand.

"Economic advantage is not the only benefit. There are a host of others — the promotion of political stability and peace; increasing the likelihood of sound environmental practices; decreasing the likelihood of great outbreaks of contagious disease; assuring equitable access to needed but unevenly distributed resources, adding to cultural activity, and contributing to basic humanitarian principles of fairness and justice."

15 May 1979

The IDRC puts great emphasis on the publication of the results of IDRC-supported research. Below is a partial list of books and films currently available to interested individuals and groups. Write IDRC, Box 8500, Ottawa, Canada K1G 3H9, for a complete listing.

Publications

Give Us the Tools. Science and technology for the Third World. D. Spurgeon, ed. Ottawa, IDRC, 1979. 198 p. IDRC-131e.

Cultural Action and Social Change. R. Nettleford. Ottawa, IDRC, 1979. 239 p. IDRC-111e.

Doctors and Healers. A. Dorozynski. Ottawa, IDRC, 1975. 64 p. IDRC-034e.

Housing Asia's Millions. Problems, policies, and prospects for low-cost housing in Southeast Asia. S.H.K. Yeh, A.A. Laquian, ed. Ottawa, IDRC, 1979. 244 p. IDRC-104e.

Hawkers in Southeast Asian Cities. Planning for the bazaar economy. T.G. McGee and Y-M. Yeung. Ottawa, IDRC, 1977. 139 p. IDRC-083e.

Project Impact. A progress report on Innotech Project Impact in the Philippines and Proyek Pamong in Indonesia. Clyde Sanger. Ottawa, IDRC, 1977. 56 p. IDRC-088e.

The Sociology of Food. Ruth K. Zagorin. Ottawa, IDRC, 1977. 12 p. IDRC-099e.

Man and Tree in Tropical Africa. Three essays on the role of trees in the African environment. Gunnar Poulsen. Ottawa, IDRC, 1978. 32 p. IDRC-101e.

Low-Cost Technology Options for Sanitation. A

state-of-the-art review and annotated bibliography. Witold Rybczynski, Chongrak Polprasert, and Michael McGarry. Ottawa, IDRC, 1978. 184 p. IDRC-102.

Fish Farming. The aquaculture research program. Bob Stanley, W.H. Allsopp, and F. Brian Davy. Ottawa, IDRC, 1978. 40 p. IDRC-120e.

The Cost of Foreign Aid to Developing Countries. Nihal Kappagoda. Ottawa, IDRC, 1978. 15 p. IDRC-TS12e.

Films

When the Harvest Is Over. Postharvest technology systems in Kenya; designed to instruct farmers in basic techniques in grain preservation and pest control. 30 min. (Also available in Swahili.)

Project Impact: The Overview. Background of the mass primary education experiment in Southeast Asia. 38 min. *Project Impact: The System.* More details about the experiment. 37 min.

Tropical Oysterculture Techniques. Techniques and problems involved in "farming" oysters, a source of low-cost much-needed protein. 30 min.

Pods of Protein. Modern scientific breeding techniques used to produce new high-yielding insect- and disease-resistant varieties of cowpeas, a grain legume that represents up to 60 per cent of the protein intake of people in the Sahelian area of Africa. 20 min.



The IDRC has focused on food programs. It emphasizes a comprehensive approach that includes such diverse elements as crop innovations, scientific research, technical training, health care and loans to buy fertilizers and market crops. The project in the rural highlands of Caqueza, Columbia, has become a model for other areas.

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