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# International Development Research Centre: Involvement In African Research Efforts

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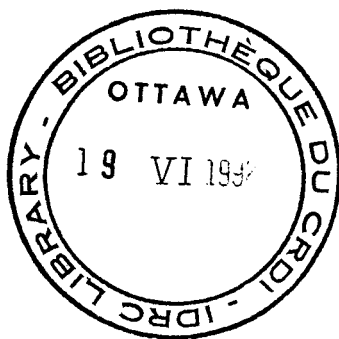
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**INTERNATIONAL DEVELOPMENT RESEARCH CENTRE:  
INVOLVEMENT IN AFRICAN RESEARCH EFFORTS**

*By*

IVAN L. HEAD



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## Notes For An Address

It is an honour for me to occupy this distinguished platform, and I thank the Nigerian Institute of International Affairs for its invitation. This is a nostalgic occasion for me. In June 1967, almost exactly 23 years ago, I was present in this building for its dedication by the then Head of the Federal Military Government, General Yakubu Gowon. In the months and years that followed, in Lagos, in Ottawa and elsewhere, my meetings with and respect for General Gowon increased. Present here on that day 23 years ago as well was the Patron of this Institute, the former Chief Justice Sir Adetokunbo Ademola, whom I had first met in Canada several years earlier.

You have invited me here today, Mr. Director General, in my capacity as President of the International Development Research Centre. This unique organization, funded in its entirety by the Parliament of Canada, but directed by an international Board of Governors, supports scientific research proposed by, undertaken by, and carried out by developing country scientists in their own countries. One of the wise individuals who was an IDRC Governor when the Centre was created 20 years ago is the late Dr. H. A. Oluwasanmi (Vice-Chancellor, University of Obafemi Awolowo, Ile-Ife). More recently, another distinguished Nigerian, Mr. Allison Ayida, served on our Board.

My remarks this afternoon find their foundation in IDRC's experience. For those who may have urgent appointments elsewhere, and may wish to leave now, I am able to summarize my text into three brief sentences by saying that: (1) I shall speak of the immense contribution,

real and potential, of developing country scientists; (2) that their work benefits all humans, North and South; and (3) that this benefit is not a recent phenomenon, even though it is not nearly broadly enough appreciated in the North or in the South. All the rest is detail, but interesting detail, I hope you will find.

During the century when the Venetian, Marco Polo, was discovering the marvels of the Asian world, the best minds in Europe had only to visit Toledo or Cordoba to discover some of the finest Arab universities of the time. The Pakistani physicist Abdus Salam, a Nobel laureate in 1979, enjoys reminding his audiences of the scientific predominance exercised by the Arab and Asian world for most of the Middle Ages. In Arabized Spain, young people from Europe and the Middle East came to learn algebra, an Arab invention, and the importance of zero, an Indian invention, from the greatest intellectuals of the era. When the construction of a bridge or cathedral posed particular problems, a call went out for the technical assistance of Arab engineers. But Abdus Salam no longer harbours any illusions: the flame of scientific creativity has been passed to the West.

Three decades ago, when the then Finance Minister of Ghana, Komla Agbeli Gbedemah, visited the United States, he was refused service in a restaurant because of the colour of his skin. Today, this blatant form of discrimination would not be encountered. North American universities in particular are proud of their African students and their African faculty members. Yet, there is still much ignorance in the industrialized countries about African affairs, the richness of its art and culture, and the extent of influence these have had on Northern societies. How many in the North know that the "San" of Southern Africa, more commonly known as "Bushman", have been

successful in avoiding stress-related diseases because of the depth and richness of their social support systems? How many know about the highly sophisticated science of numerology practiced by the Dogan people of Mali?

Today, thanks to television, we in the North are much more aware of developing country circumstances. Yet, sadly, it is rare that Northerners regard the peoples of the developing countries as individuals, even rarer that we treasure their genius, their talent, their potential as contributors to our own lives. One of those rare instances occurred a few years ago on the occasion when mathematicians worldwide celebrated the centenary of the birth of Srinivasa Ramanujan, arguably the most brilliant mathematician in all history. Decades before the computer era, Ramanujan devised a formula for pi with such accuracy that when tested on a super mainframe half a century later, it proved accurate to 17 million places. This man was born of humble circumstances in colonial India, and against all odds attended a school and came to the attention of a British teacher. Much more easily, he could have sunk into the poverty that surrounded him and never surfaced, perhaps never even survived beyond infancy.

Prof. Richard Askey of the University of Wisconsin has written that "Ramanujan is important not just as a mathematician but because of what he tells us that the human mind can do. Persons with his ability are so rare and so precious that we can't afford to lose them. A genius can arise anywhere in the world". But when poverty and the quest for survival form the daily environment, opportunities to contribute to the development of society are scarce.

The absence of adequate education and research opportunities in all-too-many developing countries leaves those



countries condemned to pursue outmoded low-valued economic activity of a kind that is increasingly irrelevant to world market demand. In human terms, it means that the grip of absolute poverty does not ease, and that the scourges of malnutrition and ill health persist.

It is in this kind of environment that the engineers and scientists from Africa, Latin America, and Asia pursue their research. All together those LDC professionals represent only 10% of the 4 million researchers in the world. Notwithstanding the immensity of the odds, 14 of them have won Nobel prizes (three in chemistry, seven in physics, and four in medicine), most of them, it must be said, for work carried out in the United States or Britain. Developing countries contribute still only 5% of the world's scientific production. These figures, Mr. Chairman, are not the product of lack of talent, they are a reflection of the deadlock environment. It isn't lack of willingness or lack of natural talent that is at fault; it is the lack of resources. This is one of poverty's many tragic faces.

Though relatively few in numbers, scientists from the South are nevertheless contributing in important ways to global development. Researchers in developing countries publish 10% of the world literature in the fields of pedology and agriculture, according to *l'Institut francais de recherche scientifique pour le developpement en cooperation*. In the specific case of bovine reproduction in the tropics, for example, as much as 90% of all scientific activity originates in developing countries.

The director of the science, technology, and development program at l'Institut francais defines two major categories of scientific publication to which the Third World contributes. These can be defined as "world" science litera-

ture, found in some 3,000 major international scientific journals, and "local" or self-directed science literature, which is supported by national reviews and low-distribution publications.

When all the scientific production of researchers in developing countries is considered, significant numbers of them publish in local journals. Those who do so are primarily young researchers working in such fields as animal and vegetable production, tree-growing, and aquaculture. Their focus on local ecosystems appears to me to be completely logical, because species and environmental conditions are, broadly speaking, ecosystem-specific. They have chosen the right thing to do.

It is not sufficient, however, simply to state that these Third World scientists supply only this or that percentage of all scientific production or publication. To leave it at that is to ignore the immense contribution made by them to the world-wide knowledge of tropical ecosystems. This knowledge is becoming an increasingly important factor in world biological production, and in the development of agriculture that respects the environment. These developing country scientists promoted the concept of sustainable development, decades before it became fashionable in the North. We are all, wherever we live, in their debt.

When a question of discovering natural substances produced by the development of tropical plants is involved, the North increasingly turns and listens to the South. The interest is obvious. The Amazonian forest alone maintains more species than any other ecosystem on the planet: 80,000 plant species and 30 million animal species. More than one-quarter of all known medications are plant-based. Tropical plants have produced tranquilizers, blood-pressure reducers, and the raw material

for the first generations of contraceptives. Unlike their colleagues in agriculture and food, natural substance specialists in developing countries publish more in foreign reviews than in local ones. They also associate more with researchers in industrialized countries. In this sector at least, there is better awareness of the South's efforts, and North and South cooperate well.

Examples abound:

Recently, Australian, Belgian, British, and Japanese teams, working with developing country counterparts, have confirmed the existence of a family of alkaloids, extracted from beans and tropical trees, that have the potential to combat diabetes, cancer, and AIDS. IDRC proudly supported for years the work of two Ethiopian physicians who were awarded subsequently the 1989 alternate Nobel prize by the Swedish association, "Right Livelihood", for demonstrating that the fruit of a local plant, the endod, contains substances fatal to snails, the vectors of the bilharziosis parasite. This terrible disease, all too familiar to Africans, affects more than 200 million people. In neighbouring Egypt, Dr. M.M. El-Sawy, who also receives IDRC funding, has demonstrated a similar effect with another plant, the damsissa. These two immensely significant discoveries demonstrate vividly the potential of tropical plants and the contribution of Southern researchers.

The drama of the 6 million people afflicted with AIDS, many of them on this continent, has renewed interest everywhere in viral illnesses. Not only is an attempt being made to understand the viruses themselves more clearly, but there is also interest in their origin. In this respect, the active participation and contribution of a number of African scientists in the huge V International Conference

on AIDS in Montreal last year--which I chaired--were of great importance. Although the industrialized countries' new interest in tropical viruses is still basically self-centered, it can lead to a very useful strengthening of the research capabilities of developing countries, where rich and poor will both benefit.

According to the prestigious Commission on Health Research for Development, headed jointly by John Evans, former President of the University of Toronto and by IDRC Governor Gelia Castillo, a Professor of rural sociology at the University of the Philippines, it is now a matter of priority that every developing country develop a basic health research capability. The distinguished Nigerian Minister of Health, Dr. Ransome-Kuti, has participated in studies associated with that Commission's report and agrees that local competence is the only way for a country to obtain an accurate picture of its own population's circumstances, of its own epidemiology. In this way, instead of having unrealistic policies dictated by foreign organizations or experts, which sadly is still all-too-often the norm, a country could identify its own health priorities and design its own policies, all on the basis of its own requirements. With their national roots, national experts would be in a better position to adapt policies and programs to local priority needs. This Commission is only one of many that supports entirely the philosophy of enhancement of local competence, a philosophy which IDRC has pioneered in the sector of scientific research.

Sadly, however, only 4% of the money earmarked for health research throughout the world is as yet spent in developing countries. The neglect of the enormous innovative potential of billions of healthy people is detrimental to the South, and to the North as well. It is a neglect that is not necessary. A number of innovative

experiments in developing countries has shown that health-care systems can be designed which meet the needs of the majority in equitable fashion, and which do so within the severely constrained financial means of most LDC governments. The most celebrated example is perhaps the demonstration in the Indian state of Tamil Nadu in the early 1960s that tuberculosis patients, cared for at home, healed as well as did those cared for in a sanatorium, and did so without increasing the risks of infection to those around them. This demonstration dealt a mortal blow to the sanitarium industry in the Third World, a happy circumstance because developing countries cannot afford to maintain such facilities. The industrialized countries closed them as well, permitting billions of dollars to be saved and made available for more pressing and more effective health interventions.

In third World regions, where medical research has literally been shackled to the reality of inadequate funding, many new organizational methods have been developed. Irresistibly, health care systems in the industrialized countries have been strongly influenced by these innovations. A number of concepts originating in the South, or first tested here, have been introduced into the health policies of many Northern countries. (These include the cataloguing of essential medications, novel health programs, and simplified instrumentation and operating techniques.) Ironically, but happily, the limited financial resources available to developing countries have saved some of them at least from establishing excessively onerous, and uncontrollably costly, health care systems.

The industrialized countries are beginning to benefit in other ways as well from discoveries in the South. For example, physicians in the North will soon have in their offices a new range of diagnostic tools that are inexpen-

sive, easy to use, and storable at room temperature. These tools have been developed in Third World countries, many as a result of IDRC support, to respond to circumstances in countries with limited financial resources, with few specialized professionals, and with limited refrigeration equipment. IDR is now funding, for example, the development of a number of diagnostic kits, including some designed to detect AIDS. In the medium and long term, these new techniques will enable physicians in the developing countries to offer more in-office services and reduce health care costs without in any way diminishing the quality of service.

As you in this country know so well, the North has long benefited from the South, but in the past this was all-too-often as a result of unequal, zero-sum arrangements. The new sharing of benefits is the product of dignified cooperation. It is a model for the future, and the list of achievements is lengthy. Third World scientists are increasingly assuming leadership in the technology involved with efficient hand water pumps and with water-quality testing techniques. They are as well asserting themselves in the new and potentially hugely important biotechnologies. In this latter context, IDRC helped Brazil master genetic engineering techniques to manufacture an excellent vaccine against yellow fever. The Federal Ministry of Health of Nigeria, in cooperation with the Brazilian team of researchers and with the financial assistance of IDRC, then strengthened its own capacity to produce its own, improved yellow fever vaccine with the development of thermostable formulation, thus leading to regional self-sufficiency in vaccine supply. An important feature of this example is the strengthening of the Nigeria-Brazil link through active collaboration of the Brazilian team which was involved in an earlier and very similar project in Latin America. This research, in keeping with IDRC's mandate,

will increase research and technological capability through a South-South effort.

This Nigerian accomplishment was a world-class triumph of modern scientific and technological methodologies, Nigerians and their African neighbours will share the benefits. Nigerians are entitled as well to claim pride in what was done. It is a tribute to the scientific competence and scientific spirit of Nigeria.

Another example of the South's world leadership is found in the field of fertility control. In India in the early 1970s, Prof. G. P. Talwar was one of the first in the entire world to demonstrate the potential of a contraceptive vaccine. Today, in large part thanks to his work, the National Institute of Immunology in New Delhi is one of the most renowned immunology research centres in the world. A contraceptive vaccine is undergoing clinical testing in several countries. In the 1990s, women everywhere will likely be able to obtain this revolutionary new contraceptive. Because India's National Institute of Immunology remains one of the few facilities anywhere still researching contraceptive methods, it is highly likely that the new, more advanced contraceptive methods needed everywhere in the world will be produced, primarily or for the most part, by research carried out in developing countries by developing country scientists. It is a remarkable example of the everyday interdependence, and the inter-benefit, of South and North.

In addition to these health sector innovations, the Third World is the site of economic experiments that have brought to the attention of governments everywhere techniques and policies designed to alleviate the economic morass that has resulted from unwise policies adopted in the past. Some of these experiments are also of great

interest to the Eastern European countries which are endeavouring to reorganize their own economies. Poland, for example, is turning to Bolivia, a country with a per capita GNP only 1/3 that of Poland, for adaptation of successful Bolivian strategies.

Because they cannot afford poor-quality economic policies, developing countries are powerful detectors of the weaknesses of bad policies. In a wealthy country, it takes years for the ravages of disastrous economic intervention to become unbearable; in a poor country, it frequently takes only a few months for the mistakes to become evident, for capital to flee, for inflation rates to escalate, and for currency values to go into free fall.

Just as Europe in the post World War II period provided an enormous laboratory for political scientists and economists, the Third World is now the focus of attention for the work of indigenous social scientists. Like Europeans after the war, the residents of developing countries are far from passive subjects in this vast experiment. As they work together, it is impossible to differentiate between Northern and Southern theoretical contributions. This is particularly true in the field of macro-economic policy. What is important for success is the emphasis on local contributions when policies are fine-tuned and applied. Unless economic policies are sensitive to local cultural and social circumstance, they are unlikely to be effective or to endure. As with the human anatomy, transplants from foreign sources are likely to be rejected by the host.

Little more than 30 years ago, the economic situations in most developing countries were more or less identical. Today, happily, many of these countries have become increasingly active participants in the international



economy. Of interest to African countries are the successes of the newly industrialized countries in South East Asia. These countries offer some worthwhile lessons. One such, according to the editors of The Economist magazine, confirms the superiority of strategies which promote export industries over policies which support industries dedicated to the production of import substitutes. Another such is the benefit of limited, rather than extensive, government interventions. A third, closely related to the second, is the illustration that abstention from artificially imposed price controls is advantageous.

After 30 years of often unsuccessful economic experiments, Third World countries are realizing that there are very real limitations on the ability of governments to engender economic progress directly. This is leading governments increasingly to restrict themselves to the creation of infrastructures and of conditions favourable to the development of economic initiatives, allowing private sector entrepreneurs to assume risks and to exercise their business skills. This does not mean total governmental abstention. Some of the most successful of the newly industrialized countries, South Korea and Singapore, for example, have found ways of assisting their entrepreneurs by explicit government policy. These often lead to success if they are allowed to be pragmatic. For example, the small, import-substitution businesses set up in South Korea in the 1950s and 1960s did not bring immediate prosperity to that country. By adaptation, however, these industries subsequently formed a useful base for the future success of industrialization through export activities. South Korea is now one of the most vigorous and well-performing economies in the entire world.

Another lesson from these successful countries, one perhaps more psychological than economic, emphasizes

the importance of ensuring that government action be the result of internal rather than external thought and will. Bolivia is one of the best examples of a country experiencing economic recovery because its population accepted sacrifices as a result of steps taken by the government. The population supports the restraints chosen by the government expressly because the program is of internal design and was not imposed from the outside.

It is in this context that IDRC supports research activities. Whether these involve a network researching strategies for the negotiation of national debt in Latin America, or a network researching macroeconomic analysis in Africa, all our support is designed to strengthen the rigorous, original, and independent economic thought of the local social scientists. The same policy applies to research in any of the fields important to the development of society.

Mr. Chairman, there are countless examples of successful contributions by developing country researchers to the solution of regional and global problems. Most unfortunately, these contributions are too rarely recognized, too rarely credited properly. Increased South-North, and especially South-South, cooperation, are essential if we are to be able to generate social and economic equilibria on this troubled planet. That necessary cooperation will only come about, however, if governments and publics alike recognize the value, the effectiveness, and the success of joint efforts.

In the last year, dramatic changes have occurred on the political scene. As we enter the final decade of the 20th century, each country in Latin America will have established a democratic system, with each country electing a new leader. The speed of events leading to the reunification of the two Germanies and to the democratization of

Eastern Europe, has taken our breath away. Africa, not surprisingly, is swept up as well in the current wind of political liberalism. These events are welcomed by everyone, not least by scientists. Research can make an optimum contribution only if the political environment is hospitable. Researchers depend upon government understanding and encouragement. In this country, the enlightened leadership of the Honourable Minister of Science and Technology, Professor Gordian Ezekwe, is a beacon of hope for the rich resource of Nigerian scientific talent. I salute him and his efforts.

No matter how evident is the mutuality of vulnerability of North and South, and how much we all have to gain by full cooperation, or to lose should we fail, the present international aid climate is far from auspicious. For reasons understandable, yet not acceptable, Official Development Assistance to Africa rose only slowly in nominal terms during the early 1980s, and actually fell slightly in real terms. Moreover, since 1985 Africa has been paying out in debt almost as much as it received in aid. And the debt is rising. The moving speeches by Adebayo Adedeji of the Economic Commission for Africa bear eloquent testimony of the dire circumstances of Sub-Saharan Africa. In those circumstances, South-South cooperation has now become a necessity. In Sub-Saharan Africa as in many parts of the developing world, the limited range of resources (both internal and external) available, and the often small national populations, make effective long-term research decisions exceedingly difficult. Worldwide, the 67 countries with populations of less than 10 million each, 52 of which have fewer than 5 million inhabitants, invest on average only 0.1% of their GNP in R&D. In West Africa alone, 14 countries have less than 10 million inhabitants. Building adequate research capacity with such limited human and financial resources

is a next-to-impossible task. Regional cooperation is the only viable avenue to economic and social advancement. Without a research capability, it is difficult to solve regional problems. It is also next to impossible to understand and assimilate the results of research carried out elsewhere. When, as we know, development decisions are investment decisions, research and information are vital. If these tasks cannot be undertaken adequately in each country individually--and they cannot--they must be undertaken through regional cooperation.

In the long term, one of the most effective paths to development is found in the strengthening of scientific and technical potential. Not only is a solid scientific and technical base necessary to overcome the problems associated with underdevelopment, humanity as a whole benefits when the long-term neglect of the innovative contribution of the peoples of the South is reversed.

As with other deficiencies, scientific and technical shortcomings can only be overcome by a sustained effort and by making difficult choices. Although industrialized and developing countries devote about the same percentage (between 5 and 6%) of their GNP to military expenditures, the story is very different in Research and Development. Here, they devote only 2.5 and 0.2%, respectively. One of the results is that the 134 developing countries, which represent four-fifths of the world's population, have produced, as I mentioned at the outset, only one-tenth of the 4 million scientists and engineers active in R&D.

Scientific progress is above all an immense sharing of knowledge. What is good for the individual progress of each country is now proving to be crucial for the future of the entire planet. In a growing number of fields--agricul-

ture, energy, health, economics, and the environment-cooperation is indispensable.

IDRC is a small, but I hope imaginative and active, actor in this field. It will endeavour to remain nimble and observant of niches where it can respond in a way that exploits to the full its comparative advantage. A major part of IDRC's advantage is its source of knowledge about developmental research: how to build vertical linkages to promote utilization; how to create horizontal linkages, especially via networks, to raise research efficiency; how to build and foster indigenous research capacity; how to innovate and learn from risks taken. Gathering, evaluating, and disseminating this knowledge is critical to the enhancement of IDRC's effectiveness, influence, and public image, and as well to maintaining the funding and degree of autonomy that permits the attainment of excellence.

Here in Nigeria, I have been able to witness the dedication and the accomplishments of the large community of Nigerian scientists. To them I am grateful; to them I dedicate this modest lecture. I do so for I am proud of their accomplishments, and supportive of their dedication to the enhancement of the quality of life--to the dignity--of this and future generations of all Nigerians, of all Africans, of all human beings.

Thank you.