Research Co-operation

II Trends in Development and Research

SWEDISH INTERNATIONAL DEVELOPMENT
COOPERATION AGENCY

Department for Research Cooperation, SAREC

FOREWORD

This is a translated and slightly edited version of *Guidelines for Research Co-operation* adopted by Sida in 1998 in order to harmonise policies and practices. The Policy build on experiences generated by SAREC, the special agency for research co-operation created in 1975 and, since 1995, Sida's Department for research co-operation.

As we are approaching 25 years since the research co-operation programmes were established, we feel that it is time to invite a broad discussion on the current principles and practices. A major seminar will be organised in June 2000 in order to discuss the support for national research capacity. A similar event in November 2000 will look into the support for thematic research programmes at regional and international levels. The discussions will address the best way to design and link these efforts for maximum impact. Seminars will also be held to review the role of research within Swedish development co-operation and its links to Swedish research.

This English version is made available in order to share experiences and to invite comments and debate from all interested parties. It is presented in two documents:
I An Outline of Policy, Programmes and Practice, and
II Trends in Development and Research.

Contents Sida Research Co-operation

I An outline of Policy, Programmes and Practice

II Trends in Development and Research

I An outline of Policy, Programmes and Practice

II Trends in Development and Research

II Trends in Development and Research

1 Shifts in development co-operation

In the early 1990s three distinct shifts crystallised in the donor community's perception of development co-operation assistance. With the end of the Cold War, issues of democracy and the transformation of political, economic and social systems became far more important for the donors than the creation of wealth in the developing world. The second shift has its roots in the changed conditions for world trade brought on by the rapid industrialisation of parts of Asia and Latin America. The 'old' established industrialised countries began to experience the newcomers as serious rivals, with significant implications for their markets, employment and welfare. Trade and aid relations began to be linked to the question of how the conditions for production in the newly industrialising countries affected working conditions, human rights and the physical and human environment. Notwithstanding the idolatry of 'free trade', a variety of trade barriers were set up.

The third shift relates to 'human security' at both national and international levels. The huge movements of people within Africa and Asia caused by natural catastrophes, civil wars, 'ethnic' conflicts, genocide and environmental destruction rendered the question of security ever more urgent. Within the circle of donors, the concept of 'national security' increasingly began to make way for concern about 'human security', which besides physical security encompasses the satisfaction of basic needs such as food, water, shelter, energy, healthcare and education.

In the industrialised world, these three shifts in perception have been brought together under the umbrella concept of 'global security', which is progressively replacing the concept of 'development' among the donors. In engaging with the concept of 'global security', one ought to clearly distinguish between two different kinds of questions: the one concerns conflicts involving nation-states and groupings of nation-states, while the other deals with issues relating to the damage inflicted on the physical environment of the globe.

As a result of these shifts in thinking, one can detect palpable tension between the perceptions of the industrialised and the developing countries. For the governments of the latter group, national security and development are still of prime importance, taking precedence over 'global security'.

Impressive progress on the development front

To quote the UNDP's Human Development Report of 1997 "In the past 50 years poverty has fallen more than in the previous 500. ---- The key indicators of human development have advanced strongly in the past few decades." Child mortality rates in developing countries are today about half of what they were in the 1960s. Over the same period, rates of malnutrition have been brought down by about a third, primary school enrolment is up from 50 to 75 per cent, and the proportion of rural families with access to safe water has risen from one-tenth to three-quarters. Since the 1970s, in 10 developing countries accounting for about a billion people, the numbers living below the respective 'national income poverty lines' has dropped by about a quarter, and in 15 others accounting for another 1.6 billion, numbers have fallen by about a half. Besides the rise in income, all these 25 countries have witnessed a substantial rise in life expectancy and access to basic social services.

Notwithstanding these impressive advances, massive challenges remain to be overcome in reducing poverty and increasing people's basic well being, especially in the least developed countries of Sub-Saharan Africa and South Asia. In the words of the above-mentioned UNDP report "just when the possibilities for advance should be greater than ever, new global pressures are creating or threatening further increases in poverty".

The post-Bretton Woods age

The principal objective of the Bretton Woods system (the IMF, the World Bank, GATT) was to promote economic development in an orderly fashion in both the industrialised and developing parts of the world, by regulating capital flows, exchange rates and interest rates. This system reigned more or less unchallenged until the mid-1970s. But since then, its central tenets have been almost completely eroded by the radical de-regulation of capital flows, the liberalisation of world trade, and the removal of barriers to the translocation of industries from one part of the globe to another, these moves accelerating in the 1980s.

In the post-Bretton Woods era that we now inhabit, it is no longer possible to demarcate clearly between national, international and global interests and forces. These three spheres are becoming increasingly intermeshed. Mutual dependence between the OECD countries and the industrialising countries of Asia and Latin America (the strong South) has increased significantly. In striking contrast to this trend, sub-Saharan Africa (excluding South Africa), which exemplifies the weak South, has been marginalised even more, not least because of the loss of its strategic relevance with the ending of the Cold War.

In this radically altered perspective, what issues are likely to prove crucial to the development of knowledge and research geared to the benefit of developing countries? What ought to guide the future course of research co-operation assistance? The questions that arise can be grouped under four broad themes, which overlap considerably: global dependence, human security, gender equality and sustainable development. Brief analyses of these four themes are presented below, followed by an examination of their implications for the future of research development and co-operation, as well as the new conditions that will prevail.

2 Increasing global dependence

As presently used, the concept of `globalisation' refers most often to the contemporary processes of liberalisation of international trade and capital movements. However, it is important to underline that there is much more to 'globalisation' than just the economic and financial aspects. Environmental problems of continental and global magnitudes require trans-national solutions. The border-less and instantaneous spread of information, disinformation, advertising and a lot more besides by electronic media affect social and cultural behaviour even in the most remote parts of the world. As does mass tourism. We examine below, in very condensed fashion, what 'globalisation' signifies for, and how it affects, economics and trade, technology and productivity, culture, health, biodiversity and climate change.

Economic globalisation

The leading features of economic globalisation are unimpeded movements of financial capital across national boundaries and the increasing degree of trans-national integration of production and marketing. One striking result is that world trade has increased at a faster rate than world production, and both have been outstripped by the growth in foreign direct investment. Another outcome is the dramatic increase in incomes and material standards of life of some sections of society in both the industrialised and the developing countries.

Economic integration of countries is leading to deep changes in the structures and patterns of production, income and consumption. The dismantling of barriers to trade and investment has brought forth re-allocations of production at a global level to exploit economies of scale, as well as differentials in wages, material and infrastructure costs and productivity. The tendency is towards larger and fewer production plants to cater to regional and global markets, to ensure competitive advantage.

Furthermore, increasing economic integration is also resulting in more uniform production methods among trans-national corporations and more uniform consumption patterns among privileged sections of society. However, these processes have not benefited a great number of countries, and different regions and sections of the population within countries that are seen by trans-national enterprises as being still unattractive in terms of competition, markets and profits. As a consequence, many developing countries, as well as many regions within industrialised countries, are being economically marginalised, resulting in rising unemployment, falling income levels and increasing migration.

Another outcome is the weakening of the nation state. Unimpeded flows of financial and industrial capital, in conjunction with instantaneous global transfer of information and knowledge made possible by contemporary technology, have severely curtailed the ability of states to enforce economic policies of their own. The 'rationality' of the global market compels and controls far-reaching changes in the functioning of labour markets, choice of technologies, political and social organisation, and systems of education. By its very nature, a nation state cannot by itself find and influence solutions to problems brought on by economic globalisation. On the other hand, there are still great lacunae in the development of supranational institutions with the mandate and capability to co-ordinate, and the power to enforce, global economic and social policies for the benefit of the vast majority of the world's population.

The rapid processes of economic globalisation pose a pressing challenge to come up with answers to a battery of questions: What will lead to investments in physical capital and human skills that will ensure economic growth? What are the likely environmental consequences of such growth? What forms of regional integration can bring about growth that is commensurate with more rational use of natural resources? How can one ensure that the benefits of growth also reach weak sections of society? How are the traditional institutions affected by the economic and social changes caused by globalisation and what institutional changes are essential for ensuring sustainable increases in the standards and quality of life? How can one preserve the distinctive features of nations in a globalising world?

The globalisation of new technology

Since the 1960s, the industrialised part of the world is in what may be called the third era of modern technology, which is characterised by several simultaneous technological revolutions. Instead of abating with time, these revolutions are gaining added strength by drawing a growing number of developing countries into their orbits. This latest technological transformation is being led by three groups of new generic technologies: information and

communication technology, biotechnology and new materials technology. They have brought about deep changes in the production, distribution and consumption of goods and services, right across the economy and society, with more unforeseeable structural changes in the offing. They are radically altering the living and working conditions of people in the North and will do so in the South in the not too distant future. Only about a fifth of the world's population has benefited so far from the spread of these new technologies. As for the rest, most of whom live in the developing world, daily life is still scarred by widening gaps in income and entitlements, poverty and deprivation.

Just as the advance of the first industrial revolution two hundred years ago proved unstoppable, the new technology is here to stay, its global march seemingly inexorable. But with the exception of a few rapidly industrialising developing countries, the rest of the developing world has still neither acquired the capacity, nor prepared itself sufficiently well, for reaping the benefits of the new technology, instead of falling prey to it. This is particularly true of 'the weak South', as exemplified by Africa south of the Sahara, which finds itself still outside the charmed circle of technologically advancing nations.

A range of vital questions is confronting the developing world concerning the impact of the new technologies on small scale enterprise in agriculture and industry, the production and export of traditional raw materials, employment, the environment, health, bio-safety and bio-ethics. To be able to meet these challenges, the developing countries, in particular 'the excluded South', need to strengthen and improve their own capacity, competence and quality in many spheres of knowledge. Equally indispensable are institutional reforms and innovations, accompanied by the mobilisation of indigenous stakeholders for agreed action.

Implications for cultural diversity

There are signs that as globalisation spreads, it could detrimentally affect the social and cultural particularities that define the myriad communities, peoples and nations that make up the world. The dynamic of globalising forces tends to promote the 'homogenisation' of social and cultural diversities, which find their expression in various identities, values and traditions. Trans-nationally controlled 'entertainment', 'news reportage' and 'documentaries', which are beamed around the globe through the electronic media, play central roles in this process. But the globalising forces are meeting stiffer resistance in the social and cultural spheres than in others. While this opposition emanates from contemporary consciousness of, and pride in, that which is locally unique, it draws its sustenance and strength through its roots that lie deep in local cultural history.

The persistence of cultural specificity raises doubts about the relevance and viability of the transfer of models of knowledge - acquisition and absorption - and thus, by implication, the transfer of models of development, from one part of the globe to another, unless the models are altered in response to local conditions.

Globalisation of infectious diseases

As indicated in an earlier section, the health situation in many developing countries has improved markedly over the last few decades. Nevertheless, the figures for mortality and morbidity remain unacceptably high in the least developed countries. Widening income gaps between and within countries has brought with it increasing inequity in the distribution of and access to health resources.

At a global level, the knowledge and technology for dealing with many large health problems do exist. But they are of little use to the poorer developing countries, which lack the necessary economic and other resources to be able to apply the available technical solutions. For instance, on the one hand, the negative environmental impact of expanding agriculture, logging and irrigation has resulted in an increase in the risk of malarial infection. On the other, malarial parasites are becoming resistant to the existing anti-malarial drugs. These two trends reinforcing each other presage very severe problems, the beginnings of which are already evident in parts of south-east Asia, south Asia and sub-Saharan Africa.

The widespread and uncontrolled use of antibiotics in many countries, with far too short periods of treatment, has led to the emergence of resistant bacteria, which can seriously endanger effective treatment of several infectious diseases.

These unfolding scenarios, caused in no small measure by the iniquitous distribution of resources, present serious threats to the industrialised parts of the world as well. Fast and expanding mass travel, between and within continents, has dramatically increased the risks of the rapid spread of infections, both old and new, over the globe. The latest of these is the movement of sexually transmitted diseases from Eastern Europe and the Former Soviet Union to Western Europe and North America.

Climate change and global security

The use of fossil fuels leads to the emission of so-called 'Greenhouse Gases (GHG)', a concept which comprises carbon dioxide, nitrous oxides, sulphur oxides, etc. In recent years, a good deal of research has provided enough material to put forward the claim that a large increase in the concentration of carbon dioxide in the atmosphere would lead to a rise in the average global temperature, with

negative consequences for the global climate. This claim has been confirmed by the United Nations Intergovernmental Panel on Climate Change (IPCC) in its second scientific assessment published in 1996.

Global warming can have a catastrophic impact on human and global security: island nations and low lying coastal regions would be permanently drowned by the rise in the level of the oceans brought on by the melting of polar ice; drought would become widespread; and deserts would expand and accelerate. Persistent famines, mass migrations and large-scale conflict would be the result. Agriculture, food and water security, and international trade would come under severe strain.

Until recently, industrialised countries have accounted for most of the emissions of GHG, in particular carbon dioxide, because their economic development has been very strongly based on the use of fossil fuels. However, the same dynamic has also led to a situation where the newly industrialising countries of Asia and Latin America (the strong South) are today contributing significantly to the emission of carbon dioxide. This tendency will spread to and encompass an increasing number of developing countries, unless both the industrialised and the developing countries jointly agree on implementing measures to halt and then reverse the global trend towards a rapid rise in the emission of carbon dioxide. That is the central purpose of the IPCC, which has succeeded in obtaining commitments from most of the industrialised countries to reduce their emissions of carbon dioxide.

The fossil fuel generated climate problem is very complex, with strong vested interests and special alliances. There is still considerable scepticism in the developing world about the need for measures to counter global warming, in particular in the strong South, which in no way wants to jeopardise its own rapid economic development. It is therefore imperative to find innovative solutions, both technical and institutional, to the climate problem, which will be acceptable to both the North and the South.

Global conventions

The increasing pace and scope of globalisation has revealed the urgent need for international systems of regulation for, on the one hand, mitigating the negative impacts of globalisation, and on the other hand, reaping the benefits. Examples of regulatory systems already in place are the global conventions on biological diversity, ocean resources, climate change, ozone depletion, expansion of existing deserts and creation of new ones, as well as trade-related intellectual property rights.

The enforcement of a variety of rights, such as those covering patents, copyrights, plant genetics and plant-species' origins, have altered the foundations of and the ground rules for research in many fields of knowledge. Entry rights that regulate the search for knowledge can confront both the developing and the industrialised countries with new conditions. Examples of this are the differential impacts on different parts of the world of the regimes of intellectual property rights, and the bio-safety and bio-ethical regulations that govern the cross-border movement of genetically modified organisms.

In order to deal adequately with the new conditions arising out of the global conventions and to meet their obligations under the conventions, developing countries need to create and strengthen, both at national and regional levels, not only scientific and technological (S&T) research capacities, but also the capacity to conduct policy analysis and policy research across a range of areas. By the very nature of its scope, policy research will have to transcend the conventional boundaries that still demarcate knowledge-disciplines, and engage itself in multi-disciplinary and trans-disciplinary research of a system-analytical nature.

3 Human security

In addition to physical security, human security means ensuring that people's basic needs are met, which at bottom is about access to secure and adequate livelihoods and income. Seen in this perspective, the vast majority of the people in Africa south of the Sahara, south Asia, the Caribbean and Latin America are still far from attaining human security.

Physical security: Regional migrations and 'ethnic' conflicts in Africa

Migrations of various kinds have always occurred in Africa, but their frequency and magnitude have increased dramatically in recent years. This has led to great economic, social and political problems in several African countries, triggering mass expulsions of migrants by African governments. Tribal identities and ethnic feelings have become intensified, adding fuel to simmering old conflicts, the root causes of which lie in the competition for scarce natural resources, economic entitlements and political influence.

This climate of crises has sharply weakened the legitimacy and authority of the state in Africa. The role of the state is being usurped by other formations based on ethnic and clan loyalties. Through past and current research, some progress has been made in understanding these and other causes and consequences of

migration, but a lot more remains to be done, in particular in field-based empirical studies which uncover the local realities.

Conflicts regarding water

Large parts of the world, in particular Africa and Asia, are suffering from an acute shortage of water, caused by a number of factors, both natural and man-made. Among the latter are population growth and competition between different end-users: town versus countryside, industry versus agriculture, etc.

In recent decades, certain parts of the world have witnessed growing conflict over fresh water, for instance around the great river systems of the Nile, Euphrates, Tigris, Jordan, Indus and Ganges. Although political conflicts in these areas have a variety of causes, the struggle for secure and adequate supplies of drinking and irrigation water is among the most important. Up to date knowledge on macro-hydrology and efficient technologies of water use, in combination with sound policy and effective management, can make critical contributions to the containing and defusing of conflicts.

The human price of forcing 'The Wealth Curtain'

A majority of the world's population does not have access to the educational and economic resources required benefit from the body of knowledge that is on offer globally. At the same time, through films and the electronic media that depict the wealthier parts of the world, and by hearsay, the 'have not' are being made aware of their own lack of material wellbeing. In the absence of the appropriate education and knowledge required to properly interpret what they see in the media, many in the developing world build up high expectations of what they can partake of in the rich countries, if only they can find a way of slipping past the 'wealth curtain' that separates the rich from the poor. There is an increasing number of reports of young people with some school education to their credit, trying to cross the 'wealth curtain' illegally by extremely hazardous means and in the process either losing their lives or ending up as slave labour in Western and East Asian cities.

Population growth, in conjunction with the absence of any realistic prospects of making a decent living where they are, is building up great pressure on the more dynamic and daring of the young in poor countries to try and emigrate at any cost to the industrialised parts of the world.

There is an urgent need to explore and explain the underlying intra-national and international causes that fuel illegal emigration. Such investigation must be holistic and be based on the concrete realities of local culture, society and economy that impinge on the lives of the poor. Such effort calls for other ways of conceptualising

and analysing reality than are currently on offer by entrenched theories and methods of knowledge in the social sciences and humanities. This non-academic 'alternative epistemology' needs all the encouragement and support it can get.

Urbanisation and human security

Only a small fraction of the population in industrialised countries lives in the countryside, the rest is all urbanised. The same historical process is underway in the developing countries. At present, more than half the population of Latin America is in towns and cities. A couple of decades from now, Africa and Asia will follow suit. The rapid rate of urbanisation has its origins in the steadily declining resources and opportunities in the countryside for livelihoods and incomes, for the improvement and development of the young, and for provision of public and private services in education, healthcare, markets, transport, culture and entertainment. The countryside is seen as an eternal 'poverty trap'. For all these reasons, it is impossible to stem the accelerating rate of urbanisation.

Less well known is the striking fact that the growth rate of urban births is now substantially higher than rural births in many parts of the developing world. That singular trend will by itself ensure that the urban population will soon outstrip the rural one.

Urban growth has not yet brought about a decrease in poverty. But it has clearly exposed the causes and consequences of poverty, in a way that the countryside could never do. This awareness, however unwelcome, has forced itself on to the daily experience of the more well off urban dwellers and the various powers that be.

Among the positive consequences of urbanisation are real possibilities for achieving comparatively rapid economic growth, higher productivity, more employment and better social services. These expectations are increasingly being borne out in the cities of Asia and Latin America, whose combined contributions to the total GDP are now much higher than those from the countryside.

Another aspect of urban growth is that the urban poor will increasingly organise themselves to agitate for better conditions of life, which involves, among other things, opportunities for decent livelihoods and the satisfaction of basic needs. Such agitation is likely to escalate in magnitude and strength in the face of the continued indifference to the problems of the poor and the resistance to their demands by the powerful owners and controllers of large-scale resources (whether domestic, foreign or global).

Up to date knowledge is required on the conditions that prevail in urban areas, on how to build on the basis of the existing positive outcomes of urbanisation, and on locally relevant methods,

strategies and institutional innovations for local resource mobilisation which closely involve the urban poor themselves. This should go hand in hand with technical work to develop low cost and sustainable solutions for the provision of clean water, sanitation, shelter, energy, paved streets and public lighting in the areas where the urban poor live.

Diseases of poverty and wealth

To the already existing burden of infectious diseases caused by poverty, with which most developing countries are hardly coping, a new one has been added in the shape of degenerative diseases such as cancer, cardiac and circulatory conditions, and certain types of diabetes, which are attendant on increasing relative wealth and longevity of some sections of the population. The resulting 'double burden' of health care is set to become increasingly onerous, because of the unflagging dynamic of the current 'dual' economic and social systems, and the attendant demographic and epidemiological trends. However, for the foreseeable future, the health situation in the developing world will continue to be dominated by the well-known panorama of poverty-engendered infectious diseases: malaria, tuberculosis, respiratory infections, diarrhoea, measles, AIDS, sexually transmitted diseases, etc.

A number of factors, which are beyond the control of the health sector, greatly affect the overall health situation in developing countries: general levels of nutrition, private and public hygiene, sanitation, environmental pollution, accidents and so-called 'high risk life styles'. The increasing privatisation of health care, which is partly a result of the structural adjustment reforms to which almost all developing countries are now beholden, has widened the 'health gap' between the poor and the well-to-do.

The emerging panorama of 'longevity and welfare related diseases' in the developing world is no longer confined to a small élite, but is spreading to broader sections of the middle-income groups. This further compounds the cost-burden of health care, in the sense, that the expensive treatment must now be made available to larger numbers, necessitating investment by the state in corresponding health infrastructure. Notwithstanding this, and in the light of the great scarcity of resources facing most developing countries, much higher priority ought to be given in allocating resources to tackling the health problems of the great majority, i.e. poverty-engendered infectious diseases.

R&D that contributes to cost-effective prevention and cure, and to the innovation of inexpensive vaccines and medicines, that would be within the purchasing power of the poorest countries, needs to be funded, both at national and international levels. The poorest of the developing countries require support to map out the details of their most pressing health problems. There is a great need for

assistance in these countries for creating and strengthening national capacity to conduct health research.

The democratic transition

During the late 1980s and the early 1990s, there grew demands, both inside and outside many developing countries, for democratisation of states run hitherto on one-party, authoritarian and dictatorial lines. The general elections that followed shortly thereafter for electing national parliaments and local assemblies signalled the start of the democratic process in many countries. It became possible for new political parties to be set up, for older parties to emerge from the sidelines, and to exercise their rights, however rudimentary, to freedom of speech, assembly and expression.

Social scientists have studied these democratisation processes with keen interest. Broadly speaking, one can detect two main approaches in democracy research, which sometimes overlap considerably. The one originates in the studies of the democratic movements and social organisations that emerged, for instance, in parts of Asia and Latin America; the other in the analyses of the collapse of the totalitarian regimes in Eastern Europe and the Soviet Union. The former approach is based on the conviction that for democracy to take root and flourish, one needs to mobilise forces from oppressed sections of society in the service of democracy, in order to oppose the power exercised by a small élite under the protection of dictatorships. The latter is based on studies of the struggle between 'civil society' and the state nomenclature.

In some countries of East and South-east Asia, and in the southern cone of Latin America, strong economic growth and the associated rise of the middle class have preceded the transition to democracy. This has prompted the thesis that, under certain contexts, rapid economic development under authoritarian regimes can result in the rise of a strong middle class which sees its future prosperity as being contingent on a democratic rather than a dictatorial order, and which therefore actively agitates for a democratic transition (a striking example of the law of unintended consequence!).

The concept of 'formal democracy' has by now been fairly comprehensively studied and described. Its workings have been analysed and understood. However, there is still much to be done on situation-specific 'real democracy': the forces that initiate and propel its advent, the forms it takes in practice, the way it works, and the impact it has on politics and society. An important objective of the research effort now being expended on real democracy is to arrive at ways of decentralising the decision-making processes and institutions, and in making them effective.

Causes and consequences of human insecurity

As outlined in the previous sections, the majority in the developing world are living in very insecure conditions. Their insecurity relates to the issues of food, water, energy, shelter, healthcare, private and collective property, repression, civil war and environmental destruction. Widely differing descriptions, opinions and explanations are on offer as to the causes and consequences of human insecurity. Similarly with proffered solutions.

Some maintain that the debt burden, globalisation, free trade and the 'new world order' espoused by the G-7 group of industrialised countries has worsened rather than mitigated global human insecurity by making the rich richer and more powerful, the poor poorer and more impotent. Others lay the blame on overpopulation, unsustainable use of natural resources, low productivity in agriculture and industry, endemic corruption in high places and unaccountability of governments, etc.

These debates deserve serious notice. To steer a proper course towards a better future, the developing world has to arrive at a comprehensive and valid understanding of why and how large-scale human suffering arises, and to find commonly agreed ways to overcome it. To generate the required knowledge, one needs to promote pluralistic research, unhampered by special interests.

4 Gender relations and gender equality

As the global movement to achieve greater economic and social development has gathered pace, it has become increasingly clear that the status and role of women, and the relations between women and men, are among the central issues that will determine the outcome. Until recent decades, women have suffered massive discrimination and exploitation in almost every sphere of life, over and above the injustices that have been the historical lot of the majority of the populations in the developing world.

The situation has begun to change for the better, albeit very slowly. Women in the developing world have today considerably greater access to economic opportunities, education, healthcare and other social services, legal rights and public office, than they had a couple of decades ago. But the picture is very uneven, as a global survey by UNDP reveals. UNDP employs three indices to measure the advances being made: The Human Development Index (HDI), the Gender-Related Development Index (GDI) and the Gender Empowerment Measure (GEM). While the HDI relates to basic human wellbeing (health, longevity, education and standard of living), the GDI measures the inequality in HDI levels between women and men, and the GEM the gender-related access to participation in economic and political life and decision-making.

The survey (The Human Development Report, UNDP, 1995) shows that the developing world is far behind the industrialised world on all three counts, the values of the indices being, on average, about one-third lower. And there are striking differences within the developing world: Latin America is ahead of Asia and the Middle East (about one-sixth on all indices), while sub-Saharan Africa still has a considerable distance to cover (about one-half to one-third lower than Latin America).

The global struggle to achieve gender equality and to eliminate inequities in gender relations has gained momentum thanks largely to women activists campaigning through community-based and non- governmental organisations linked through national, international and global networks. They have received a variety of support from many governments and state institutions, in both the developing and industrialised worlds. However, formidable challenges remain.

As before, striving for equality in access, entitlement and empowerment will be the three key approaches to future progress. Again, as before, the primary issues to tackle will be the following:

* proper valuation and recognition of household work, bringing-up of children and family care; equitable sharing of these responsibilities between both parents.

* changing the social, cultural and ideological values and attitudes that are at the root of violence against women, both inside and outside the household.

* sustainable livelihoods (including paid employment and self-employment); abolition of wage discrimination by gender; financial credit and technical advice for micro-enterprise.

* education, healthcare (including reproductive healthcare) and social day care for children.

* property and inheritance rights, divorce rights and divorce settlements.

* abolition of legal discrimination, access to legal systems and provision of legal literacy to women community leaders.

On all these issues, there continues to be a great need for in-depth knowledge, of both a locally-specific and a more generally valid nature. Such knowledge is indispensable not only for crafting and implementing appropriate policies and strategies, but even more so for empowering activists who are the primary agents of change.

5 Sustainable development

The world population of about 6 billion is currently growing at the rate of about 90 million per year and is estimated to rise to 8 billion by the year 2020. Most of this increase is expected to occur in the developing world. However, the natural resource base to sustain the global population is finite and is rapidly shrinking on a per capita basis. Furthermore, the present widespread practice, in both the industrialised and developing parts of the world, of environmentally destructive use of natural resources is further eroding that base. Historically, and even at present, the industrialised world is by far the greatest polluter and destroyer of the environment, but the developing world is emulating its example. To avoid irreversible global catastrophes, it ought to be in the evident self-interest of both the industrialised and the developing worlds to jointly embark on the road to sustainable development. This implies finding and practising ways of sustainably using natural resources, innovating new technologies less destructive to the environment that will provide rapid but sustainable increases in productivity, and not least, replacing the now dominant paradigm of 'consumerism' by one of 'essential consumption'.

Sustainable use of natural resources

The so-called 'Green Revolution' of the 1970s and the 1980s led to dramatic increases in the productivity of cereal agriculture. It was based on the development of high yield varieties of maize, wheat and rice, which were then cultivated under intensive use of irrigation and chemical fertilisers and pesticides. That 'revolution' has reached its limits. Agricultural growth rates have been declining for some years now and the negative effects of industrialised agriculture are becoming evident: toxic contamination of soils and water bodies, water logging and salination of soils, and the erosion of genetic diversity in food crops.

Water shortages have reached crisis proportions in many parts of the developing world, in particular the Middle East, Southern Africa, the Sahel Belt that stretches from West to East Africa, and parts of South Asia. These arid and semi-arid areas must retain their ability to produce enough food to feed their current and future populations.

The problem is compounded by the fact that expanding agriculture and trans-national timber trade accelerate the processes of deforestation, soil erosion, spreading of existing deserts and creation of new ones.

The large-scale clearing of tropical rain forests by national and trans-national timber companies is particularly alarming, given the absolutely vital role they play in sustaining the world's priceless

genetic diversity in flora and fauna. This genetic diversity is indispensable for future increases in agricultural productivity and for pharmaceutical innovations to combat present and future diseases.

The industrialisation and urbanisation of coastal zones, as well as large-scale commercial aquaculture of sea food destined for the high-price markets of the industrialised world, are causing immense and irreversible damage to the ecology and natural regenerative productivity of coastal belts, on which the livelihoods of the coastal fishing communities depend.

As in the industrialised world today, within the next few decades the majority of the population in the developing world will be living in urban areas. In addition, all the indications are that urban growth will continue to accelerate. In the severe competition for food, water, energy and other entitlements, the rural population will increasingly lose ground to the urban one.

Humanity is faced with a double challenge, that of survival and development. On the 'survival front', the questions one is faced with concern adequate supplies of food, water, shelter, energy, etc, in an environmentally sustainable way, to a world population that will have grown by a couple of billions in the next few decades. On the 'developmental front', the pressure will continue to build up, firstly, with regard to maintaining the current momentum in increasing the quality of life (in both material and social terms), and secondly, with regard to widening the arc of the 'sustainable good life' to include more and more of the global population. This dual challenge is setting the global agenda for new revolutions in production, productivity, social relations and social equity.

Agricultural productivity in Africa

Over the last four decades, Asia and Latin America have engineered dramatic rises in agricultural productivity. In vivid contrast, sub-Saharan Africa (excluding South Africa) has experienced a long-term trend decline in agricultural productivity. Africa's inability to launch itself on a rising productivity trajectory has a number of causes. Besides soil, water, pest and climatic conditions, which in parts of the continent are severely non-conducive to higher productivity, and the persistence of traditional technologies in small-scale farming, one can adduce dysfunctional pricing policies by governments, traditional land-human relations (use, tenure and ownership), labour migration to mining areas and towns, etc. Given these highly continent-specific natural, economic and social causes, there is justified scepticism about whether the knowledge, experience and models that have led to higher productivity in Asia and Africa (let alone Europe and North America) would work in the African context. In fact, the attempts

made so far in transferring such models do not seem to have yielded the expected returns.

There is a need to accumulate more fundamental knowledge on Africa's soil biology and complex conditions for cultivation. And the same applies to 'new-old' systems of farming such as agro-forestry, which needs to be balanced against other commercially attractive and legitimate cash crop production by small holders. Similarly, one needs to know more about locally-specific land-human relations, and economic and social disincentives, that would work against increased productivity.

Technology for sustainable development

Sustainable development is based on the premise of least possible damage to the environment in the production, distribution and consumption of goods and services. But most modern technology in use today, in both the industrialised and developing worlds, is still very far from approaching this ideal. It is therefore contingent upon international development co-operation to strive for the universal introduction and strengthening of the paradigm of sustainable technology.

The new paradigm comprises the principles of recycling of raw materials and energy, and high degrees of efficiency in their use, as well as the bio-degradability of waste and the rehabilitation of degraded environment. A systematic application of these principles could lead to a range of new technologies of fundamental importance to sustainability scenarios, energy technologies being part of the vanguard. In proportional terms, very little of the global R&D in industry and infrastructure is at present geared to such objectives. And almost nothing is in evidence in the developing world. All of which adds up to a powerful argument for devoting development assistance resources to promoting research on and the transfer of sustainable technologies.

Innovation and transfer of technologies are not enough on their own. Their proper use is the key to sustainability, which is where technology policy and technology management come into play.

6 Changed onditions for research development and research co-operation

The widening knowledge-gap between developing countries

In talking about the 'knowledge-gap between countries one ought to differentiate between 'traditional' and 'modern' knowledge. Roughly speaking, the latter concept stands for the knowledge that is generated by methods, which have their historical origin in Western Europe and were spread around the globe over the last

two centuries. As such, 'modern' knowledge has acquired a non-location-specific and 'universal' nature. In contrast, 'traditional' knowledge has retained its distinctive location and cultural specificities, and developed within well-defined geographical boundaries. Thus it is scarcely meaningful to compare different bodies of traditional knowledge and speak about gaps between them. The concept of the 'knowledge gap between countries' makes sense only in the context of modern knowledge.

It is of course no longer news that the distance between the industrialised and the developing countries in the arena of modern knowledge has greatly increased during the 19th and 20th centuries, and the rate at which the gap is widening has accelerated drastically over the last five decades. What is new and striking, however, is the fact that the knowledge gap between developing countries is also growing at an accelerating pace. One statistic is enough to drive home the point: nearly all of the mere five per cent of the global R&D which takes place in the developing world as a whole today is concentrated in about half a dozen developing countries in Asia and Latin America. The reason for this is that, in this strong South of newly industrialising countries, the state has invested substantial resources at all levels of education and in R&D. The rewards have been handsome: a diversified and skilled workforce of substantial proportion, a firm base of knowledge and skills for backing up rapid industrial and economic development, and a S&T infrastructure for facilitating the absorption of the know-how and the know-why of imported technology. This drive to acquire and create knowledge has been in high gear since the 1970s.

Even in the 'weak South' there has been striking growth in higher education. For instance, at the end of the colonial period, sub-Saharan Africa (excluding South Africa) had only 6 universities, now there are over 150. Furthermore, research has become an integral aspect of universities, however modest the investment and the output. Autonomous research institutions have proliferated. There is a substantial stock of university graduates in a wide range of disciplines.

Notwithstanding its creditable performance so far, in comparative terms the 'weak South' is way behind the 'strong South' in investment in education and training. Again in comparative terms, R&D allocations have been marginal and ad hoc. The principal cause behind this poor record, in particular in sub-Saharan Africa (excluding South Africa), is the onset of continental-wide economic crisis in the early 1970s, which worsened with every passing year and still persists in most African countries. With African governments reeling under the impact of over two decades of economic crises, public investment in education and research was relegated to the bottom of the list of priorities. Little wonder then

that the 'weak South' still finds itself largely isolated from the bulk of global knowledge.

Other serious consequences for higher education and research will flow from the widening knowledge-gap between the developing countries. The largest proportion of donor contribution to research is at present earmarked for research results of potential benefit to the developing world. All the signs are that this policy will continue to apply in the foreseeable future. This strategy puts a premium on speed, cost-effectiveness and risk minimisation in achieving results. This, combined with the persisting cuts in the development aid budgets of most donors, is likely to reinforce the trend of channelling a greater share of the research funding towards the 'strong South' with its potential to deliver results.

In recent years, trans-national corporations (TNCs) have begun to move a part of their R&D activities to the strong South, for instance in the areas of cash crop agriculture, food processing, pharmaceuticals, capital goods, electronics and telecommunication. Although this movement is still very small in terms of the total R&D of the TNCs, the fact that it has started at all is significant. Besides the S&T infrastructure, what attracts the TNCs are the comparatively much lower costs involved in hiring local R&D personnel, who can match up to the same standards of competence as their counterparts in the West. Given the state-of-the-art information and communication technologies, the actual geographical location of R&D personnel is becoming less and less of a constraint. Much more important to the TNCs are the criteria of cost-effectiveness, quality and reliability.

R&D investment from the North to the South is following the same pattern and taking on the same strategic role as Foreign Direct Investment (FDI) in firms: the total annual flow of FDI from the North to the South is today substantially higher than the total annual flow of development aid; and most of it goes to half a dozen industrialising countries in Asia and Latin America. Very little finds its way to the excluded South, in particular sub-Saharan Africa (excluding South Africa).

Changing conditions for financing of higher education and research

In relation to the situation existing at the start of the decolonisation process in the late 1940s and early 1950s, higher education and research have expanded greatly in the South. In terms of sheer volume, the expansion has been the greatest in Asia, followed by Latin America and then by Africa. However, in per capita terms and in relation to the actual need, and most importantly in terms of quality of output, the performance by the South is still very modest

and falls far short of the intellectual capacity and competence built up in the North.
The accelerated growth in higher education and research in the South has been financed almost exclusively by the public sector, mostly by the national governments of the developing countries, with some modest support by the international donor community. There is no gainsaying that the achievement to date would have been impossible without the state shouldering most of the burden. This is as true of the strong South as of the weak. This reflects precisely the role of the state in Europe, as it built up its higher educational and research infrastructure over several centuries.

While everything still points to the vital role that the state has to and will continue to play, recent years have nevertheless witnessed cutbacks in the public financing of higher education and research, in a number of industrialised and developing countries. Furthermore, in several leading OECD-economies, the hitherto prevailing custom of public funding of the core budgets of a wide range of R&D activities is being replaced by targeted funding of a limited number of 'leading sectors'. At the same time, some sectors of university-based research have attracted significant amounts of private funding. In some 'front- line' areas of science and technology, private financing has become the dominant source. This shift is linked, among other things, to certain changes in the system of intellectual property rights (IPR), which further strengthen the rights of individual practitioners of university-based R&D. Private universities are on the increase in some countries of the strong South.

The changing balance between public and private financing, in conjunction with the new global IPR regime, is altering the conditions for research, research co-operation and the dissemination of research results. In view of this, research donors have to rethink their current stance. They will be obliged to craft new policies and strategies, more appropriate to the changing circumstances.

The role of the European Union as a research donor
The European Union (EU) provides support to research of relevance to developing countries through a special programme, albeit as a small fraction of a very much larger framework of support to European regional R&D programmes. Most of the support is earmarked for projects in which researchers from EU-countries collaborate with their counterparts in developing countries.

The EU has the potential to become a very major provider of research funds to the developing world. That potential remains unrealised so far. What is lacking is a policy decision by the powers that be to convert that potential into actuality.

Efforts are currently underway in the Commission to launch an initiative to provide research issues with a clearer role within general development assistance. A central feature of the initiative will be that in future negotiations with recipient countries the Commission will stress that support for promoting indigenous research capacity is one of the EU's priorities.

Research co-operation and partnership

Until recent years, with a few exceptions, research co-operation was characterised by research by industrialised countries 'for' rather than 'with' developing countries. From the early 1990s, however, there seems to be a growing trend towards greater 'partnership' . Large international research programmes now invite decision-makers from developing countries to participate in the formulation and implementation of research agenda that address the interests of the South. International and regional forums have been, and are being, created to this end. One talks more often now of partnership in, and dialogue for, identifying research problems that take account of local conditions in the developing world. The 'partnership' approach implies that the 'recipe' is not pre-determined but grows out of an interactive process.

Information technology and global research environment

Information technology (IT) has become a self-evident and common tool that researchers in the industrialised world now routinely deploy in their work. To them, the computerised processing and transfer of information and knowledge is a daily affair. Computerised modelling has become an indispensable technique in many theoretical and experimental sciences, in particular in areas that deal with large and complex systems. Increasingly, research groups in the North are linking themselves into the growing number of 'virtual' universities being created in cyberspace in many specialist areas of knowledge.

IT presents both a great opportunity for, and a worrying threat to, the future of higher education and research in developing countries. The opportunity arises through the technological possibilities that IT offers for very rapidly ending the developing countries' isolation from the 'global mainstream' of knowledge production, and for dramatically increasing their access to global stocks of knowledge at (in the longer term) very low costs. The threat consists in their present incapacity, in terms of essential threshold investment and technical skills, to join the IT-revolution in time and being sidelined in perpetuity from the 'global mainstream'.

To the degree that IT is available to them, the best researchers in the South are being sought after as members of globalised research environments and virtual universities. There is a danger that the best minds in the South may largely concentrate their energies on

the collaborative work with their global peers that IT makes possible, and feel less motivated to contribute to the upgrading of local research capacity and competence than they would otherwise have felt as being the essential base for their own work. In order to avoid the resulting fragmentation and weakening of local and national research bases, national authorities in the South and international research donors need to provide IT facilities to research environments in the developing world.

In today's world, a pre-condition for turning out high quality research is access to reliable, continuous and rapid communication between researchers spread across the globe. If timely and sufficient investment in IT is not made, not only will the research conducted in the South decline rapidly in quality, but also its very relevance will be at stake.

Over the last two decades, several donor agencies have contributed substantially to the creation and strengthening of regional research networks in the South. This has enabled both the previously existing and newly created research capacities at local and national levels in the South to be mobilised and brought into dynamic research programmes, which would otherwise not have been possible. It stands to reason that these networks be strengthened through the provision of IT-facilities, making it possible for them to dramatically increase the speed and efficiency of intra-network communication, which is bound to translate into higher levels of performance.

7 Concluding remarks

It is increasingly being recognised that knowledge is as crucial a determinant of development as investment capital, skilled labour and appropriate and accountable institutions. A growing number of developing countries (among them the continental states of China and India, which between them account for more than a third of the global population) have built up, and are continuing to build up, intellectual capacity and competence that can fuel their own further development. But in the least developed countries, in particular in sub-Saharan Africa, which constitute the 'weak South', there is still a long way to go. Therefore, as we have argued above, one of the principal goals of donor-funded research co-operation with countries of the 'weak South' ought to be the expansion and strengthening of research capacity and research competence.

Another theme that looms large in this review is the question of human security. Poverty is at the root of human insecurity. The causes and consequences of poverty are only partly national. They are just as much regional, international and global. Solutions to the inter-linked problems of poverty, human insecurity, the destruction

of the environment, consumerism and unsustainable global systems of production and trade require collaborative intellectual effort across the 'development divide'. Research donors can facilitate and catalyse the search for new knowledge to tackle these global problems by backing up research programmes which are regional, international and global in nature.

SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
S-105 25 Stockholm, Sweden
Tel: +46 (0)8-698 50 00. Fax: +46 (0)8-20 88 64
Homepage: http://www.sida.se