

IW93-4

**DESIGNING INTERNATIONAL COOPERATION
FOR ACCELERATING PRODUCTIVITY GROWTH
IN DEVELOPING COUNTRIES**

By

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IW93-4

March 1993

INTERNATIONAL WORKING PAPER SERIES



FOOD AND RESOURCE ECONOMICS DEPARTMENT

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An opening address presented to the
Conference on Global Development Cooperation
organized by
President Carter and U.N. Secretary-General Boutros Boutros-Ghali
Atlanta, Georgia, U.S.A.

December 4 - 5, 1992

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I am grateful to Terry Kelly for his research assistance and to Kofi Adu-Nyako and Sandra Russo for their comments on an earlier draft of this paper.

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**DESIGNING INTERNATIONAL COOPERATION FOR
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Uma Lele²

The Urgency of Increasing Factor Productivity:

The end of the Cold War and the ushering in of a young new administration of the post-World War II generation in the United States offer an important opportunity to explore the lessons of the past experience in economic development and international development cooperation to identify their implications for the future.

Tremendous accumulated knowledge currently exists of the economic development processes and development assistance under highly diverse circumstances, covering a period of nearly half a century. The need to build on that past effort is more urgent than ever before because resources have become scarce, and their efficient use is of utmost importance even to maintain the gains made to date. Lawrence Summers, the World Bank's chief economist, has observed that "two tenths of one percent increase in the total factor productivity in developing countries would do more for living standards than

¹ A keynote address presented to the Conference on Global Development Cooperation organized by President Carter and U.N. Secretary-General Boutros Boutros-Ghali, in Atlanta, Georgia, U.S.A., December 4-5, 1992.

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additional \$100 billion invested at historical rates of return" (Summers, 1992, p. 8). The important questions are:

1. whether policy and institutional reforms will be fast and far reaching enough in developing countries to achieve the necessary increase in total factor productivity; and,
2. whether industrial countries will make their assistance programs more responsive to the real needs of developing countries, to substantially increase their total factor productivity.

The economic development experience of the last several decades offers four essential lessons on development strategy which are relevant for increasing factor productivity, namely:

1. the importance of broad-based agricultural and rural development involving a large number of small producers as the foundation of overall economic growth;
2. the importance of trade orientation, and a sound macro economic policy highly flexible in responding to rapidly changing external circumstances;
3. the critical role of the government in establishing an enabling environment for private initiative; and,
4. importance of human capital and institutional capacity for the development and application of science and technology, and more generally, for learning by doing.

Countries highly successful in broad-based and rapid economic growth have been masters of these four lessons. Those that have been less successful neglected their smallholder agriculture and the rural households, pursued a macro policy as if their per¹ national income rather than permanent income was the basis of expenditure decisions and neglected the critical role of the government in facilitating private initiative while extending the governmental span of control to cover all and sundry activities. In turn,

they overlooked the power of their own nationals and institutions to address the complex developmental challenges by failing to support them adequately.

The experience with foreign assistance similarly *substance* offers three major lessons critical for assisting developing countries to increase their factor productivity, namely:

1. the need to direct aid to address the issues of central importance to their development strategy;
2. the importance of highly selective, quality technical assistance and its deployment on a long-term basis to develop internal human and institutional capacity, with clear attainable goals; and,
3. the central importance of cooperation among different assistance agencies geared towards addressing the substance of the development problem at hand.

Far too large an amount of past external aid has yielded low rates of return. But there are excellent examples of small amounts of aid thoughtfully provided by highly qualified, experienced and committed individuals and organizations over a long period of 10 to 15 years to transform the effectiveness of institutions and individuals in developing countries. Such assistance has yielded spectacular results (Lele, 1992). In each case, assistance has been geared to addressing a central development issue, rather than shifting from one new fad to another, and has involved effective partnership of several aid agencies and developing country nationals.

Translating these seven lessons into future actions is by no means an easy task. Major structural shifts have occurred in international economic relations, and in the domestic

policy environment in the 1980s. Some of those shifts such as the greater recognition of the importance of markets and the demand for democracy throughout the world are positive developments. But these changes nevertheless pose new challenges. Others relating to trade, aid and environmental issues present complex problems. These structural shifts are reviewed first to provide an overall context. The divergent performance of developing countries with regard to economic growth and poverty alleviation is then discussed. The paper then explores the reasoning behind the four economic development lessons, and the three external assistance lessons highlighted in the introduction. It ends with a summary and conclusions.

The New International Context

The international economic environment has become more hostile to developing countries in the 1980s than it was in the 1970s. More disconcerting is the fact that according to the World Bank, there is no sign that the situation will improve in the foreseeable future. *Official development assistance has stagnated* and become more fragmented. Whereas the U.S. was a major donor in the 1960s, its share has declined considerably. (See Figure 1) Instead, nearly 30 major assistance agencies and myriad minor agencies, each with different priorities, are active in development assistance (Lele, 1991). Many small African countries with little or no planning and implementing capacity devote more time and energy mobilizing external resources than in wrestling with internal development challenges. The fallout of the *debt crisis* is not yet over. Developing countries as a group are now

making net contributions to developed countries whereas prior to the debt crisis in 1982 they received net transfers of \$50 billion annually. Large debt repayments have not only reduced amounts available for domestic investment and recurrent expenditures, debt overhang has created uncertainty about future returns to investment and discouraged *new* private capital.

Severe deterioration in the *physical infrastructure* of developing countries, resulting from low levels of investments over nearly a decade, poses a major additional constraint to attracting new capital. In the highly indebted developing countries of Latin America and Africa as much as 13 to 14 percent of the annual GDP, or over three quarters of the total annual investment, is needed for replacement of infrastructure alone (IBRD, 1990).

Commodity prices are currently at their lowest level. This particularly affects Africa and Latin America. Their share of agricultural exports in total exports has declined less rapidly than in Asia, quite paradoxically because they neglected their agriculture. (Figure 2)

Increased volatility of commodity prices is also a problem; they have fluctuated over a range of more than 100 percent in the last decade (Summers, 1992). This causes major disruptions in export earnings and government revenues making planning of resources on a year-to-year basis a mockery. This is a particularly serious problem for small open economies.

Protectionist tendencies are on the increase, just at the time when developing countries

are liberalizing their trade regimes. The Uruguay round has stalled and regional trade agreements in North America and East Asia threaten to reduce market access of developing countries not included in those trading arrangements. The ability of developing countries to increase imports clearly depends on their ability to export as the example of successful East Asian countries illustrates.

Several problematic effects of these international circumstances on developing countries are evident. For the first time since World War II, *Investment rates measured as a share of GDP* have dropped significantly in developing countries, most notably in Africa, but also in Latin America. East Asia is the major exception leading us to ask questions as to why. (Figure 3)

The environmental movement has challenged the intellectual foundation of the traditional economic development processes, such as the increased use of modern inputs to intensify agriculture. This is a particularly serious problem for Africa, where the use of modern inputs is already the lowest in the world. Without modern inputs to raise agricultural factor productivity, extensive agriculture necessitated by rapid population growth threatens further encroachment of fragile lands, causing a different sort of environmental problem. Yet there is little understanding of the interactions between population growth, agricultural productivity growth and the environment.

The forces of democracy, while conducive to individual initiative once established, have reduced the political stability essential to attract new domestic and foreign capital.

Apart from these *objective* structural changes in the international economic and political relations, there is a complex *subjective* change in the industrial world. That change will critically determine the boundaries of future international cooperation. There is *widespread apathy about international development* issues. It is a radically different situation from that which prevailed until the end of the 1970s. The end of the cold war, the attraction of the new erstwhile communist kids on the block, the continued domestic unemployment, the fear of increased international competition and international migration, and, not the least important, aid weariness have all resulted in a decline in interest in the industrial world of the problems of economic development in developing countries.

Yet, historically unprecedented rates of growth have been achieved by many developing countries compared to their industrial country counterparts a century ago, most notable in East Asia. How different is the performance of Asians compared to the others, and how does it relate to the seven lessons highlighted earlier?

The Record of Economic Development:

In his famous book, The Asian Drama, which was widely followed in the early 1970s, Myrdal (1968) had predicted poor prospects for East and South Asian countries. He argued that absence of a democracy and pervasive corruption in that region was a major constraint to growth. However, growth in East Asian countries has been the most dynamic, followed by that in South Asia. (See Table 1) The East Asian success is reflected both in fast growth rates of GNP (often exceeding 6 to 8 percent annually) and the rapid decline in the growth rates of population. Child mortality rates have been lower

in China and Sri Lanka than in New York and Washington, demonstrating that with investment in social sectors, it is possible to improve public health without high levels of per capita income.

Latin American and African countries, on the other hand, have experienced decline in their per capita incomes for two successive decades. (See Table 1) However, there are signs of recovery in early adjusting countries that have received three or more adjustment loans (Corbo et al, 1992). In the African case, the decline is both due to slow growth in GNP and an accelerated population growth, whereas population growth rates have declined throughout the rest of the developing world.

Over half the nearly one billion poor, who earn less than a dollar a day, lived in South Asia in 1985, another 280 million in East Asia, 180 million in Africa, and 80 million in Latin America. East Asia will have reduced the number of poor radically by the year 2000, if present trends of economic performance continue, but the numbers are predicted to show a dramatic increase in Africa and South Asia, and those predictions have become more pessimistic in the last two years. (See Table 2) Of course, regional groupings such as these, while useful for comparison, mask important intercountry differences. For instance, even with a general decline in Africa, Botswana, Mauritius and Kenya performed well.

How should priorities for assistance be determined under these circumstances, particularly given the competing demands of the former eastern block countries? Clearly

different parts of the world need attention, each for quite different reasons, e.g., the former communist block for strategic reasons, given its nuclear arsenal and the ethnic tensions fueled by slow economic growth; Latin America and North Africa because of the international migration and increased social tensions their slow economic growth is prompting in the industrial world; and South Asia and Africa because of the pervasive existence of their oppressive poverty. But given its low and declining per capita income and inadequate physical and institutional infrastructure, Africa is clearly the greatest development challenge to the international development community.

Needless to stress, growth in each of these regions will provide a substantial stimulus to the economies of industrial countries. The increase in U.S. exports in 1991 over 1990 was, for instance, clearly related to the recovery in Latin America and Asia.

Yet past experience also shows that large amounts of per capita aid tied to the inappropriate technology and less than qualified technical assistance from industrial countries in the absence of a *long-term economic development strategy* achieves little growth (Lele and Nabi, 1991; and Lele, 1991). On the contrary, such external aid often causes Dutch Disease effects similar to those caused by commodity booms, and yet does not lay a foundation for future growth (Collier, 1991). It is for this reason that we need to appreciate the fundamental importance of a long-term economic development strategy to which we now turn.

Lessons from Development Strategy at the National Level:

Four basic development strategy lessons emerge from the economic development experience of successful developing countries. Each has proven to be quite robust:

1. the fundamental importance of *smallholder agriculture and rural development* as the foundation of overall economic development;
2. the importance of export *orientation*;
3. the central importance of the *government* in putting in place long-term policies which will foster private initiative; and,
4. the importance of a complex network of *human and Institutional capacity*.

For countries at an early stage of development, agriculture dominates in employment, income, food and export production, government revenues, savings and investment. Broad-based agricultural and rural development is at once an efficient and equitable strategy since there are no scale economies in agricultural production. Increasing food, livestock, and export crop production, involving a large number of small farmers, and ensuring a balance between productive and social sectors is the best way of alleviating poverty, since much of the poverty occurs in the rural sector, and since agricultural and rural development generates considerable employment and income. An agricultural and rural development strategy also generates strong linkages with the urban manufacturing sector as it creates demand for the goods and services produced in the domestic industry. An effective agricultural strategy tends to be an export led strategy since at an early stage of development agricultural exports constitute an important share of total exports. It is the best environmental strategy, since by increasing land productivity it reduces pressure on marginal lands, and through a more balanced regional development

it avoids mega-urban industrial complexes. As prosperous agricultural areas are transformed into semi-urban centers of commerce and manufacturing in the course of industrialization, an agricultural strategy retains households in the urbanizing rural areas. Finally, it ensures increased participation of women who are the bulwark of agriculture while avoiding the migration of men to enclave industrial centers.

An import substitution strategy, in contrast, creates little employment, and tends to foster linkages to external industry by creating investment and consumption demand by a limited number of industries and households mainly for imported items. An import substitution strategy is the classic dualistic strategy which divides urban and rural areas.

As economies develop their agriculture, *an export led manufacturing strategy* plays up to the most abundant factor of production. In developing countries, the abundant factor tends to be labor. An export-led manufacturing strategy leads to a continued rapid growth in income and employment with relatively small incremental growth in units of capital relative to labor. Such a strategy results in a gradual transition of economies into the manufacturing of more advanced industrial products. These tend to be more demanding of skilled labor over time. Apart from the direct effects of an export-led strategy on rapid growth of GNP and exports, an export-led strategy indirectly creates a more healthy economy through competition, innovation, and improved product quality.

South Korea, Taiwan, Malaysia, Indonesia, Thailand and China have all been successful in both their agricultural and manufacturing sector strategies, which explains their

impressive broad-based overall economic growth. Their concurrent investment in the social sectors has produced a healthy and well-educated labor force. Both the economic and social strategies have increased the value of women's time, and provided them greater incentive to substitute the quality of children for quantity. This explains the rapid decline in the growth rates of their populations through reduced infant and child mortality, and the consequent lowering of fertility, as women need to bear fewer children to ensure that they survive.

South Asia has been successful in the development of its agriculture, but has lost time in accelerating industrial growth by delaying economic liberalization and undertaking it on a piece meal basis. That explains its slower economic growth. It has also invested less in the social sectors which explains its smaller decline in population growth rates.

The record of Latin America is mixed. Often, acute import substitution policies have accentuated the already substantial inequalities in asset distribution in Latin America. A development model based on the productivity and incomes of a large number of small farm households and labor-intensive manufacturing that eventually uplifts the entire economy is a far cry from the reality of much of Latin America. While Chile and Mexico have undertaken major policy reforms, like South Asia, much of the rest of Latin America has been slow to adjust

Although there is great knowledge and agreement on *what* strategy the successful developing countries have pursued, there is little knowledge of *how* they have done it.

This is particularly true of the fundamental roles their governments have played in fostering private initiative, and the investments they have made in the development of human capital and individual entrepreneurship. A fact often overlooked is that generating an agricultural revolution requires a more complex and sophisticated network of private, public and community level institutions that work in partnership than does the establishment of enclave modern industrial complexes. Successful agricultural development, therefore, not only precedes successful industrialization, but it provides an important *learning by doing* experience for governments, which makes an invaluable contribution to the development of the rest of the economy. It is not an exaggeration to state that countries that have modernized their smallholder agriculture typically then have in place the capability to industrialize rapidly, provided they do not become hostages of their protected industries and labor unions.

For the agricultural revolution to proceed industrialization in this manner, the public sector needs to play an active role in providing a conducive environment for small farmers to invest in agriculture. This is due to the peculiar nature of the agricultural sector. The dispersed nature and the high degree of diversity of small farm production conditions require investments in location-specific agricultural research and technology, and its extension. The establishment of the physical infrastructure is similarly critical for the development of factor and product markets. Such investments tend to be lumpy, which individual farm households can not afford. Their benefits take a long time to materialize, and are difficult to capture for individual households. These various characteristics of investments provide a classic case for the provision of the so-called "public goods."

Thus, the "nonprice" interventions governments make at an early stage of development tend to be as important in the development of agriculture and the rural sector as is the provision of the right price incentives. These latter have been the center of attention in the course of structural adjustment in the 1980s (Lele, 1992).

Two conceptually distinct types of government action are important at early stages of development: the relatively noncontroversial public goods activities described above, and the currently more *controversial* activities which in a more developed economy would ideally be undertaken by the private sector. At an early stage of development, physical infrastructure tends to be limited, and factor and product markets are either nonexistent incomplete, or interlinked. This means that activities such as money lending, land rentals the sale of inputs and purchase or processing of output often tend to be carried out by the same few actors with a disproportionate market power. This does not offer the competitive market environment ideally desired. *Interlinked and oligopolistic markets* have a particularly adverse effect on the participation of the poor in the growth process, and can undermine the very process of broad-based agricultural and rural development that is so critical to a broad-based economic growth.

Given these conditions, governments of industrial and successful developing countries alike have stepped in to accelerate the process of agricultural and rural transformation as for example through the directed provision of agricultural credit, the supply of modern inputs,, and the stabilization of producer prices to reduce the risks involved in the adoption of new production technology and of consumer prices as a way of stabilizing the incomes

of the poor households (including by now millions of rural poor). Since the poor spend a large share of their income on food, and are vulnerable to real income reduction through food price increases, they need protection. Not only are agricultural prices inherently more unstable than industrial prices, but the decline in the physical infrastructure and the fragmented nascent markets referred to above make prices more volatile. The political and psychological effects of high price instability on producers and consumers alike can be devastating. This is why there is not a single developed country which has not stabilized its agriculture prices, no matter what the latest economic theories say, or how small the share of food in the total budget expenditures of consumers.

The industrialization experience of successful developing countries also suggests that their impressive growth of manufacturing is not simply the result of ensuring market exchange rates, low tariffs, and low and stable inflation rates, although such macroeconomic stability is crucial. In countries such as Japan, Korea and Taiwan, governments have played an active role in supporting targeted industries by ensuring their access to the critical technology, imported production inputs, abundant working capital, the enforcement of quality standards, and so on (Rhee et al., 1984). The main lesson of the successfully industrialized countries is not that governments have left everything to the market, but rather that they have been highly selective in their interventions leaving the rest to private initiative. Moreover, they have been highly flexible in their responses making learning-by-doing an art. In short, the governments of rapidly developing countries have been highly sophisticated in managing the levers of the economic development process.

Government interventions have justifiably come under criticism in most developing countries particularly in this period of resource crunch on grounds that they cost too much, benefit the wrong groups, obstruct rather than facilitate market development and take scarce resources away from other high priority activities. Moreover, governments tend to have limited financial and administrative capacity to perform such functions, particularly at an early stage of development. Many of these criticisms are valid. Governments of some developing countries have been managed by elites who have not represented the interests of their own people.

The process of democratization is, however, leading to a change in that state of affairs with increased demand for accountability. We urgently need research on how to minimize the costs of some of these essential services by increasing competition when necessary between the private and public sectors, without recourse to a rigid ideology, for it is unlikely that agriculture or manufacturing will develop *rapidly* in the now slowly developing countries without an active developmental role of governments. The most important challenge for the future is not to make private sector more efficient, but to make governments more effective, selective, and proficient so that private initiative and competition can thrive.

The supply of both the public goods activities (such as research and infrastructure) and the market intervention activities (such as price or supply stabilization) are now in question in developing countries. Together the absence of both these public actions seriously threatens the prospects for rapid and broad-based agricultural and rural growth,

particularly in the least developed countries, and particularly for those in Africa.

The economic development experience calls for a fundamental reassessment of some of the lessons implemented in the 1980s, one of which is reviewed below in the context of the experience of the relatively more successful Asian countries. For shortage of space, the focus is placed on a relatively less controversial public good, namely the provision of agriculture research. I have examined the type of a role that external assistance played in simpler days. i.e., those of fewer donors with a dearer subset of development objectives compared to the situation today. The example cited of agricultural research in Asia was repeated in the Tea Development Authority in Kenya and cotton development in former French West Africa, and thus its principles have been shown to have general applicability (Lele, 1992).

**Human and Institutional Capacity Building Through Aid Coordination •
Lessons from the Role of Aid in Increasing Agricultural Productivity
Growth In Asia:**

In the 1960s when the U.S. was the dominant donor and the need for aid coordination was relatively limited, a strong partnership nevertheless existed among private U.S foundations committed to economic development (particularly the Rockefeller and Ford Foundations), the USAID, and the U.S. universities. Together they played a singularly important role in helping Asian countries to make a quantum jump in the productivity of their agricultural research systems. The objective of their intervention was to increase food production so as to eliminate food shortages and famines created by recurrent droughts. The droughts not only resulted in frequent incidence of massive deaths, but

by pushing wage costs up and causing burden on the balance of payments, food shortages were setting back the process of industrialization in much of Asia.

The U.S. helped to improve the returns to the investments in agricultural science and technology by helping Asian countries to restructure their National Agricultural Research Systems (the so-called MARS). Instead of being managed by administrators, the restructured NARS began to be managed by scientific leaders. They were assured of the necessary financial resources on a predictable basis and given the administrative autonomy to plan and implement their work plans.

A large number of scientists from developing countries were also trained on U.S. university campuses. Through active involvement of qualified U.S. scientists in the revamping of the research organizations and managements of the NARS, Asian scientists not only began to develop new scientifically attainable work programs in which they could apply their newly acquired skills, they also developed an incentive system, which evaluated their performance based on scientific criteria (Lele and Goldsmith, 1989).

In short, it was not simply the new seed varieties of wheat and rice imported from Mexico and the Philippines as is generally believed, nor indeed even the breeding techniques imparted to Asian scientists through their education and training on the U.S. university campuses, which explains the generation of the Green Revolution. Rather, it is the holistic approach to research capacity development based on the dear objective of rapidly eliminating hunger, and the partnerships in aid giving agencies to achieve that objective

which transformed the NARS to achieve a quantum jump in their research productivity. Between 1965 and 1975, the Asian NARS generated location specific technology which was adapted to literally thousands of villages in Asia within a period of ten years.

The partnership of aid agencies also ensured that the policy and the institutions framework necessary to ensure the adoption of that technology by a large number of small farmers (including an active role for governments in price stabilization, input and credit delivery, etc.) was in place. A strategy and a policy framework for agricultural development was crucial in generating the Green Revolution, and donor conditionality helped to put it in place.

Comparing the Asian experience with contemporary Africa is not easy. Challenges in Africa are much larger, and therefore the need for a clear set of objectives, vision and coordination is even greater. By taking account of these complexities, elsewhere I have documented that whereas the equivalent of 1983 constant U.S. \$23 million spent by the Rockefeller Foundation in India (then with a population of 550 million) had a large impact the \$108 million spent by donors in Senegal (with a population of 8 million) as the first phase of a long-term agricultural research project had very little impact (Lele and Goldsmith, 1989).

The strong demand among Asian policymakers for improving their indigenous science and technology capacity was, of course, a *sin qua non* for the Asian success. That demand was prompted by the frequent and severe food shortages undermining political stability

and the drive for industrialization. Such a persistent and well-articulated demand for indigenous capacity development has been by and large lacking in Africa. It has become weaker even in Asia now that the food problem is believed to be "solved", although as we indicated earlier the incidence of poverty remains massive, particularly in South Asia. Moreover, since much of this poverty is in the rural sector, agricultural intensification and the related development of ancillary rural industry will be critical in the reduction of poverty. Yet, attention to agriculture is now prematurely waning in South Asia for reasons explored later in this paper.

Asia was fortunate earlier to also receive the advice of some of the most qualified international scientists. Moreover, it benefitted from their involvement in her research systems over a relatively long period of 10 to 15 years (Lele and Goldsmith).

How replicable is this model of science and technology capacity development? The Consultative Group on International Agricultural Research (the CGIAR) which is an "informal" grouping of nearly 50 interested and committed governments and private foundations was created precisely with an intention to replicate the Rockefeller, Ford, USAID success in agricultural research in Asia, and to apply it in other parts of the developing world, particularly in Africa. Nearly 40 percent of the CGIAR system's annual budget of about \$300 million is spent on Africa through support of 18 International Agricultural Research Centers (the so-called IARCs).

The CGIAR is justifiably viewed as highly successful institutional innovation, as can be

seen by the fact that professionals in public health and environmental management have aspired to emulate the model. But to date they have been unable to mobilize the necessary international financial support for it. Hence, the review of the CGIAR system and the lessons it offers are particularly pertinent at a time when environmental preoccupations have relegated agricultural development to the background. Moreover, the spread of AIDS and Malaria have become rampant in developing countries, particularly among the poor, calling for urgent deployment of science and technology to abate the health problems.

The CGIAR can boast of many successes in specific research results, e.g., the development of disease-resistant cassava varieties which have resulted in the doubling of yields without additional inputs; the hybridization of maize, sorghum, and potato varieties; and the nearly 45,000 developing country scientists trained in short and long-term training programs. But it has not been able to rejuvenate the NARS to maintain the rates of productivity growth the U.S. assistance earlier prompted.

Moreover, there is a general agreement among agricultural research scientists now that yields of important crops such as rice have peaked on the farmers' fields. Yet, the CGIAR's research on the adoption of modern technology on the farmers' fields has been limited. It does not have the mandate to be concerned about adoption of technology. That is the responsibility of national agricultural research and extension systems. But even given the CGIAR's existing mandate, research breakthroughs of the type and on the scale realized prior to the Green Revolution are not on the horizon in the 1990s. Apart

from the purely scientific factors, a major constraint, once again, is the ineffectiveness of the NARS and the agricultural policy framework in developing countries. The strengthening of NARS is crucial because even with the current highly constrained resources, the totality of the resources commanded by the NARS are vast in relation to the CGIAR system.

However, even mature and relatively well managed Asian (e.g., India, Indonesia) and Latin American (e.g., Brazil, Argentina and Mexico) NARS are now stagnating. The task of developing NARS has, of course, not even begun in Africa, although large sums of money have been spent by donors to their development, and the Special Program on African Agricultural Research (SPAAR) is developing regional research priorities (Lele and Goldsmith, 1989).

Several reasons explain the stagnation. Governments occupied by macroeconomic difficulties and strapped for financial resources have (once again) relegated agricultural research to the background. Research organizations and their management systems need revamping.

Many managers of developing country research systems do not have the necessary state-of-the-art know-how at a time when major changes in the structure of agricultural science, such as the increased use of gene manipulation techniques and other scientific breakthroughs used in plant breeding, need to be absorbed in research methods. Neither the training of scientists, nor the organization and the management of NARS, nor

their incentive systems are appropriate to maintain their high productivity. Most NARS are sadly lacking the recurrent resources needed to pay the wage bill, or carry out even the most basic research trials. Since agricultural scientists have the least voice in policy making even in the best of circumstances, in the period of budget crunch their plight is lamentable indeed.

Privatization of research has become a new buzz word as an answer to these problems. Yet little analysis has been done of agricultural research systems in developed countries to explore why, for instance, a large part of the agricultural research system in the United States is still managed by public Land Grant colleges, which are largely accountable to commodity groups.

Why is the \$300 million CGIAR system not able to do the job which the U.S. science performed earlier? First, for better or for worse, the CGIAR system has placed its basic priority on producing demonstrable research results, rather than simultaneously ensuring that NARS are able to 1) generate research results on a large enough scale to meet location specific needs of millions of small farmers, and 2) to ensure their adoption on farmers' fields. That task is left to the governments. Second, although the CGIAR has carried out training of a massive number of developing country researchers, it is not the mandate of the CGIAR system to improve the productivity of the NARS by improving their organization, management, or work programs. Assisting national governments in that task is the responsibility of the 30 odd disparate donors who finance the NARS. There is little coordination among them, or indeed, within their individual aid agencies, for

example, between their bilateral wings that assist individual NARS and the multilateral wings that contribute funds to the CGIAR system.

In the donor financed projects in support of individual NARS, the *substance* of agricultural research receives little, if any, attention relative to that devoted to the production of research master plans, the construction of buildings and laboratories, the provision of hardware, the supply of technical assistance, the disbursement procedures, and so on. Much of the technical assistance provided by individual donors is inexperienced and short-term. There is little institutional memory. All too often technical assistance works in isolation of national researchers and indeed, even the technical assistance funded by other donors. There is not a scientifically vetted national agricultural research strategy which *precedes* the commitment of millions of dollars by donors, or the implementation of which constitutes the central objective of most donor funded research projects, which is in sharp contrast to the pre-Green Revolution days in Asia. This is in part because the process of aid funding has been separated from its scientific content.

Whereas many developing country nationals are now trained in agricultural research (their supply is now abundant), the most qualified often staff CGIAR centers, or the U.S. and other industrial countries' universities. The most committed and well-trained scientists operating in developing countries often lack the necessary budgetary resources, and the newly trained lack experience needed in the conduct and management of agricultural research. Consequently, they lack the self confidence necessary to appreciate the valuable contribution that networking with other qualified and more experienced research

scientists can bring, particularly in view of the large disparities in the facilities they and their developed country counterparts experience. It is no wonder then, that concerns about national and ethnic sovereignty often mar discussions of scientific priorities or international cooperation in science. Yet it is striking to note the extent to which matters related to research conduct and research management, or the steps needed to make indigenous research scientists productive, are relegated to the background by both developing country policymakers and their national science leaders.

Clearly NARS and other science establishments in developing countries are in need of major assistance. NARS managers, donors supporting NARS and those supporting the CGIAR system need to come together. They need to develop a coordinated approach, the clear objective of which should still be to improve the lot of the millions of small farm households and poor consumers in developing countries.

There is much potential to utilize the resources of the U.S. university system in such an endeavor through long-term collaborative arrangements, involving mutually beneficial scientific collaborations. Such arrangements existed in the 1960s, but they were more paternalistic than they now need to be. The resources of the U.S. university system are vast. The budget of the entire CGIAR effort for the developing world as a whole is only five times as large as the agricultural research effort in the single state of Florida, which has a population of only 12 million. A single department of soil sciences in a major U.S. university has a larger number of soil scientists than the entire CGIAR system. Except for occasional consultations by individual faculty, the U.S. universities are no longer in the

loop of the CGIAR system, although a great deal of U.S. agricultural research has benefitted from collaborations and access to genetic materials from developing countries.

The reduced U.S. input in international agricultural research is a result of the failure of U.S. assistance to play up to the U.S.'s well established comparative advantage. It is also the result of changing fashions in international development assistance which has resulted in too many short-term shifts from agricultural development, to macro economic reforms, to environmental management, rather than viewing each of them as part of an overall economic development challenge. Such shifts have resulted in the replacement of specialists with the knowledge and expertise in particular aspects of economic development, by generalists. They are better able to deal with the changing styles of development aid. This is not a problem which afflicts U.S. assistance alone, but rather more generally the myriad bilateral and multilateral agencies. They have had to be increasingly more responsive to the pressures of their domestic constituencies rather than to the real needs of developing countries.

For instance, ensuring long-term participation of U.S. universities will require a fundamental change in the attitudes of university administrators and U.S. legislators. They have created an academic environment in which international work is inadequately recognized and rewarded, and often perceived as foreign boondoggles or threatening the national self interest by increasing international competition.

Clearly, issues of economic development need renewed attention from the political

economy perspective. This is particularly urgent because agricultural development has been placed on the back burner. The failure of the integrated rural development activities of the 1970s, the macroeconomic difficulties of the 1980s, the declining international prices of agricultural commodities, the lack of support for the role of governments, and environmental concerns all have caused the decline of public investments and public policy attention to agriculture in developing countries, even though it is the most effective foundation for their equitable growth.

Summary and Conclusions:

In this paper I have outlined why improving factor productivity in developing countries should be the basis of future economic cooperation. Resources have become highly scarce and the international economic environment has become more unfavorable to developing countries than before. Further, there is no sign that the situation will improve in the near future. This, then, provides the basis for *increasing factor productivity* as the focus of economic development strategy and external assistance.

The differential performance of developing countries under these difficult international circumstances, and particularly the success of countries in East Asia, suggests that a sound development strategy and a small amount of thoughtful economic assistance can make a significant difference to factor productivity.

That strategy calls for smallholder agriculture as the centerpiece of economic development, a strong role for an export oriented, labor intensive manufacturing sector,

considerable investment in human capital and institutions, and an active and intelligent yet flexible role for the government on a highly selective basis to create an enabling environment for individual initiative. Those have been the ingredients of success in countries that have experienced rapid and broad-based economic growth.

The most successful cases of development assistance have involved deployment of assistance in a coordinated manner for the development of human and institutional capacity, with a view to increase *their* productivity, and to achieve clear and simple developmental goals in a well-defined period. A sustained partnership among private foundations, universities, aid agencies and international institutions has been its essential feature. Such a partnership is aimed at alleviating clearly recognized bottlenecks in the pursuit of definite and attainable goals that fit well in the country's development strategy.

Successful external assistance has typically been of high quality based on the comparative advantage of donors and involving considerable knowledge of local circumstances. It has been provided on a long-term, consistent basis, and it has involved genuine demand for such assistance from the recipients together with a high degree of their active participation.

Provided such conditions can be recreated, there is abundant evidence that a small amount of development assistance can be highly productive. However, since large amounts have been wasted, the challenge is to create those preconditions.

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Table 1. AVERAGE ANNUAL GROWTH RATES IN POPULATION, GDP, AND PER CAPITA GNP FOR SELECTED REGIONS, 1965-1990.

Region	Population			GDP			Per Capita GNP		
	1966 -73	1973 -80	1980 -90	1965 -73	1973 -80	1980 -90	1965 -73	1973 -80	1980 -90
Sub-Saharan Africa	2.7	2.8	3.1	4.8	3.2	2.1	1.6	0.6	-1.1
East Asia & Pacific	2.6	1.7	1.6	8.1	6.6	7.9	5.1	4.8	6.3
South Asia	2.4	2.4	2.2	3.6	4.2	5.1	1.2	1.8	2.9
Mid East & N. Africa	2.7	3.0	3.1	7.7	3.9	2.9	6.8	1.0	-1.5
Lat. Am. & Caribbean	2.6	2.4	2.1	6.5	5.0	1.6	4.6	2.3	0.5
Low & Middle-Income	2.5	2.1	2.0				4.3	2.6	1.5

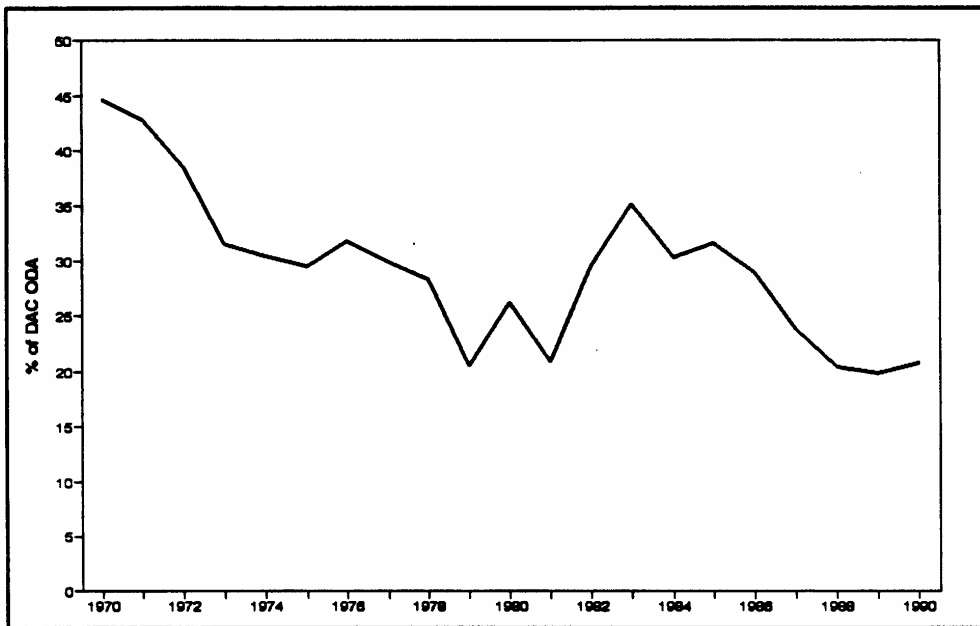
SOURCE: World Development Reports. 1991 & 1992

Table 2. INCREASE IN ESTIMATES OF POVERTY IN THE DEVELOPING WORLD FROM 1990 TO 1992.

	—INCIDENCE (%)—			—NUMBER (millions)—		
	1985	1990	2000	1985	1990	2000
1990 est.						
Sub-Saharan Africa	46.8		43.1	180		265
S.Asia	50.9		26.0	525		365
E.Asia	20.4		4.0	280		70
Mid. East & N. Africa	31.0		22.6	60		60
L. Am. & Caribbean	19.1		11.4	75		60
1992 est.						
Sub-Saharan Africa	47.6	47.8	49.7	184	216	304
S. Asia	51.8	49.0	36.9	532	562	511
E. Asia	13.2	11.3	4.2	182	169	73
Mid. East & N. Africa	30.6	33.1	30.6	60	73	89
L. Am. & Caribbean	22.4	25.5	24.9	87	108	126

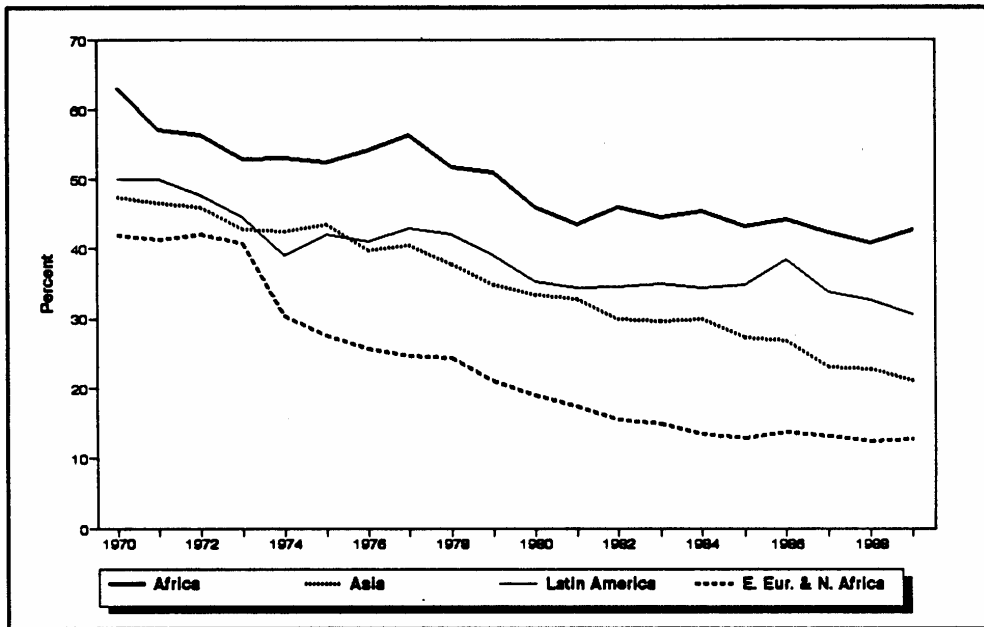
SOURCE: World Development Reports. 1990 & 1992

Figure 1. U.S. ODA as Share of ODA from All DAC Countries, 1970-1990.



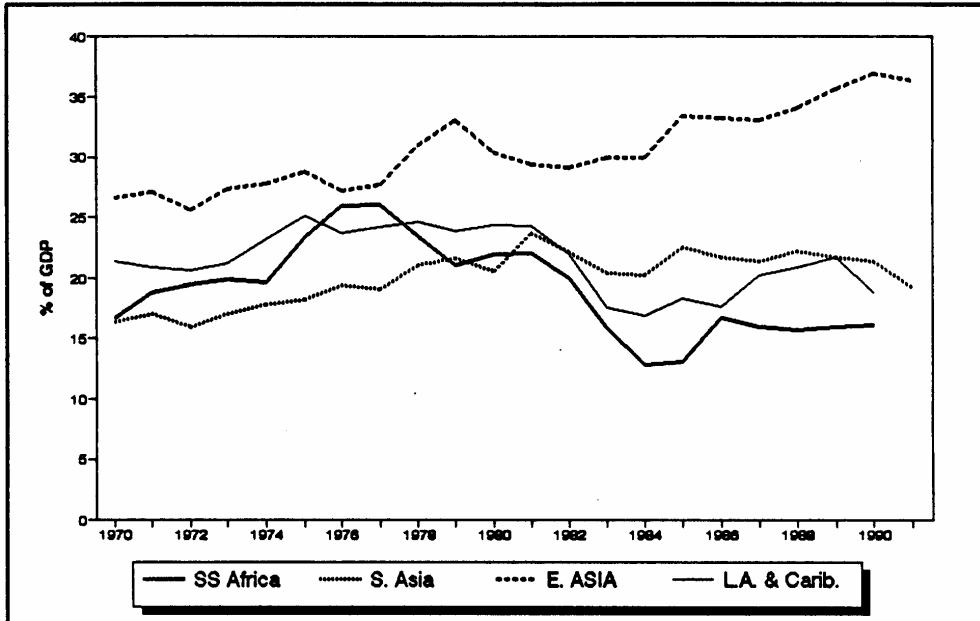
Source: Calculated from OECD Geographical Distribution of Financial Flows to Developing Countries, various years; and Mellor and Masters, 1991.

Figure 2. Share of Agricultural Exports in Total Merchandise Exports, for Selected Regions, 1970-1989.



Source: Calculated from FAO Trade Yearbook, various years; and World Tables, World Bank, various years.

Figure 3. Gross Domestic Investment as a Percent of GNP for Selected Regions, 1970-1991.



Source: World Tables, 1992, World Bank, Johns Hopkins University Press, Baltimore, Maryland.